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INVENTORY

2 MAR 1972

REPORT R-123

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AIR-TO-AIR ENCOUNTERS
IN SOUTHEAST ASIA (U)

Volume I ACCOUNT OF F-4 AND F-8 EVENTS
PRIOR TO 1 MARCH 1967 (U)

~~XXXXXXXXXXXX~~

John S. Attinello, Project Leader

Reproduced From
Best Available Copy

October 1967

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INSTITUTE FOR DEFENSE ANALYSES
SYSTEMS EVALUATION DIVISION

Prepared under contract with the
WEAPONS SYSTEMS EVALUATION GROUP
as WSEG Report 116

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OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WEAPONS SYSTEMS EVALUATION GROUP
WASHINGTON, D C 20305

20 October 1967

MEMORANDUM FOR HOLDERS OF VOLUME I, WSEG REPORT 116

SUBJECT: RED BARON Report

1. The Weapons Systems Evaluation Group, in conjunction with the Systems Analysis Division of the Institute for Defense Analyses, has published Volume I of a series of four volumes on "Air-to-Air Encounters in Southeast Asia." Because of the voluminous data collected and the adaptability of the data to analysis from a variety of viewpoints, all of the data collected will be published. Volume I is a compilation of available data on F-4 and F-8 air-to-air encounters between January 1965 and 1 March 1967.
2. Volume II will be a compilation of available data on F-105, RF-4C, RF-8, RF-101, A-1 and A-4 air-to-air encounters between January 1965 and 1 March 1967. Publication date is expected to be March 1968.
3. Volume III will be a compilation of available data on all air-to-air encounters between 1 March 1967 and 1 June 1967, and is expected to be ready for publication in March 1968.
4. Volume IV will be the report of analyses, recommendations, and conclusions derived from the viewpoint of future research and development requirements. This volume will be published in December 1967.
5. The user organizations are encouraged to utilize these data for analyses from the viewpoint most appropriate to their requirements. WSEG would be most interested in receiving copies of any analyses developed. In addition, comments or information concerning the value and method of utilization of these documents would be appreciated.

FOR THE DIRECTOR:

Jack E. McMahon
JACK E. McMAHAN
Colonel, USA
Executive Secretary

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REPORT R-123-11-1

AIR-TO-AIR ENCOUNTERS IN SOUTHEAST ASIA

Volume T.
ACCOUNT OF F-4 AND F-8 EVENTS PRIOR TO 1 MARCH 1967 (U)

October 1967

This report has been prepared by the Systems Evaluation Division of the Institute for Defense Analyses in response to the Weapons Systems Evaluation Group Task Order SD-DAHCIS 67 C 0012-T-104A dated 6 December 1966.

In the work under this Task Order, the Institute has been assisted by military personnel assigned by WSEG.

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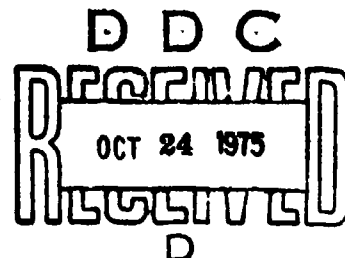
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FOREWORD

This report is a product of the Weapons System Evaluation Division of the Institute for Defense Analyses in conjunction with the Weapons Systems Evaluation Group in response to WSEG Task Order SD-35-T-104, as modified in a memorandum for Director, WSED, from Director, WSEG, dated 4 August 1966. The memorandum resulted from a request by the Deputy Director, Tactical Warfare Programs, ODDR&E. The Task was coordinated with the Joint Chiefs of Staff, (J-3 and J-5).

At its inception (October 1966) the RED BARON Project team consisted of:

- John S. Attinello, Project Leader
- Douglas N. Beatty, Ass't Project Leader
- John W. Walden, Cdr., USN, Senior Navy
- Malcom J. Agnew, LCol., USAF, Senior Air Force

Phillip J. Conley, Jr., LCol., USAF, and Thomas J. Hughes, Capt., USN, also worked part time on the project from its inception, primarily acting as an interview-debrief team. LCol. Agnew and Cdr. Walden were the other team.

In November John Rubino, Charles Tiffin, William Eason, Capt., USN, and Charles R. Shaw, Col., USA, joined the project. In December Robert J. Lynch, Jr., Col., USMC, joined, and Philip Brooks, Col., USAF, became Senior Air Force representative. Richard Stewart, Capt., USN, was assigned in February 1967. These later military arrivals shared their time with other WSEG projects.

While developing interview methods and techniques, the project was valuably assisted by two psychologists from IDA/RESO, W. Sinaiko and W. Richard Kite.

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For interviews in the U.S., teams consisting of military and civilian project members supplemented the two teams designated initially to collect data in the combat theater. In the SEA theater, two Navy-Air Force teams (Conley-Hughes and Agnew-Walden) conducted the interviews. LCol. Agnew and Cdr. Walden also interviewed SEA returnees at European bases.

As interviews were conducted, it became apparent that much more data were being collected than had been initially estimated from official reports. Therefore, a rapid increase in qualified personnel was needed to collate the data for publication.

Roy G. Anderson, Rear Admiral, USN, Senior Navy Member of WSEG, through appropriate channels, obtained the services of four Navy fighter pilots for a period of two weeks. The assistance to the RED BARON Project of the following Navy pilots is acknowledged:

- Dennis E. Becker, Lt., USN
- Benjamin Cloud, LCdr., USN
- Samuel C. Flynn, LCdr., USN
- William D. Kiper, LCdr., USN

A. J. Beck, Major General, USAF, Senior Air Force Member of WSEG, with the cooperation of Headquarters, USAF, obtained the services of nine tactical fighter pilots for a thirty-day period. The assistance to the RED BARON Project of the following Air Force pilots is acknowledged:

- Thomas H. Curtis, Maj., USAF
- Leslie C. Long, Capt., USAF
- Robert S. Maxwell, Capt., USAF
- R. P. Moore, Maj., USAF
- Sam P. Morgan, Jr., Capt., USAF
- Michael G. Pennacchio, Capt., USAF
- William P. Robinson, Maj., USAF
- Ronald W. Scott, Capt., USAF
- Ronald J. Ward, Maj., USAF

The project also acknowledges the assistance of the following individuals who assisted the interview teams in the data collection phase:

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J. J. Berkow, Col., USAF, ARPA R&D Field Unit,
Bangkok, Thailand
R. Hiller, Assistant for Operations Analysis,
CINCPACAF Staff
E. Kapos, OEG Representative, CINCPACFLT Staff
G. Koyiades, COMNAVOCEANO
R. Linsenmeyer, Chief, Scientific Research Advisory
Group, CINCPAC Staff
J. V. Patterson, Col., USAF, ARPA R&D Field Unit,
Saigon, Vietnam
B. Powers, OEG Representative, CINCPACFLT Staff
H. L. Wood, Col., USAF, Headquarters, 7th AF
D. G. Lynch, LCol, USMC, OPNAV

The project acknowledges the assistance of Dennis O. Medlock and his assistant Marie Zoellner and the many members of the IDA support staff who transcribed the interview tapes. The assistance of the SED Publications Department is also acknowledged, particularly that of Walter J. Hamilton and his graphics artists, who were responsible for the special illustrations and who coordinated work with Computer Graphics, The Boeing Company, Seattle.

The commands, whose cooperation made it possible to reach the participants of air-to-air engagements are also acknowledged.

COMMANDS

Commander-in-Chief, Pacific
Commander-in-Chief, U.S. Pacific Fleet
Commander-in-Chief, Pacific Air Forces
Commander, Seventh Air Force, Tan Son Nhut AB, Vietnam
Commander, Task Force Seventy-Seven
Deputy Commander, 7/13th Air Forces, Udorn Airfield,
Thailand
Commander, 8th Tactical Fighter Wing (TFW), Ubon Airfield,
Thailand
Commander, 366th TFW, Danang AB, Vietnam
Commander, 355th TFW, Takhli AB, Thailand
Commander, 388th TFW, Korat AB, Thailand

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Commander, 432nd Tactical Reconnaissance Wing, Udorn
Airfield, Thailand
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Commanding Officer, USS TICONDEROGA (CVA-41)
Commanding Officer, USS BON HOMME RICHARD (CVA-31)
Commanding Officer, USS ENTERPRISE (CVA(N)-65)
Commanding Officer, USS HANCOCK (CVA-19)
Director, ARPA R&D Field Unit, Saigon, Vietnam
Director, ARPA R&D Field Unit, Bangkok, Thailand
Commander, 41st Air Division, Yakota AB, Japan
Commander-in-Chief, U.S. Air Forces, Europe
Commander, Seventeenth Air Force, Ramstein AB, Germany
Commander, 81st TFW RAF, Bentwaters, England
Commander, 36th TFW, Bitburg AB, Germany
Commander, 50th TFW, Hahn AB, Germany
Commander, Naval Air Forces, U.S. Pacific Fleet
Commander, Fleet Air, Miramar, California
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Nevada
Commander, 15th TFW, McDill AFB, Florida
Commander, 831st Air Division (TAC), George AFB,
California
Commander, 835th Air Division, McConnell AFB, Kansas
Commander, 3525th PTW, Williams AFB, Arizona
Commander, 4531st TFW, Homestead AFB, Florida
Commander, 4453rd Combat Crew Training Wing, Davis-Monthan
AFB, Arizona

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I. INTRODUCTION

At the request of the Director of Defense Research and Engineering, the Weapons Systems Evaluation Group has undertaken a study of air-to-air encounters in Southeast Asia. The project code name is RED BARON. Data that have been collected on approximately 320 such encounters through 1 June 1967 will be analyzed primarily to assist in the selection of suitable research and development programs for future high-performance fighter aircraft. A secondary purpose of the study is to provide data for use by the military services and of the scientific community. This volume is a partial documentation for the secondary purpose.

A. DATA SOURCES

Data contained in this report were taken from two sources: the official reporting media and personal interviews with participants. Past WSEG experience in collecting combat data^{1,2} has shown that the official reporting media, which are designed primarily for military operational and statistical needs, are inadequate for many analytic purposes. The project groups conducting these earlier studies found that personal interviews with participants were necessary for R&D analyses. In Project RED BARON, interviews were considered the primary data source, supplemented, where available, by official reports.

¹WSEG Staff Study 134, Adequacy of Data from Southeast Asia Combat Air Operations for Research and Development Analyses of Aircraft Losses and Damages (U), SECRET, February 1967.

²WSEG Report 101, Requirements of Defense R&D Agencies for Data from Combat Air Operations in Southeast Asia, SECRET, August 1966.

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For purposes of this study, encounters that were investigated were defined to include the following types:

- Sighting of enemy aircraft (either visually or by radar),
- Either U.S. or enemy aircraft initiating hostile or evasive maneuvers,
- Either U.S. or enemy aircraft expending ordnance, and
- Loss or damage in combat of either U.S. or enemy aircraft.

During the data collection phase, an effort was made to assure the exhaustiveness of the information contained in this report. However, it was established that certain aspects of air-to-air combat could not be included. For example, during the conduct of CAP and escort missions, frequently it was necessary for the fighter force to intercept radar contacts which proved to be friendly aircraft. Also, during the course of missions, aircraft sighted were initially identified and called as enemy; only to be recognized later as friendly. These occurrences were not reported and therefore are not documented in this volume.

While numerous sightings of enemy aircraft are contained in this volume, it is believed that there are many other sightings which were not documented (and therefore not included). This is partially substantiated by the numerous instances which were mentioned during interviews for which no date or location was recalled and which were not correlated with reported sightings.

The first type was considered in detail only if the sighting was of R&D interest, e.g., if a U.S. aircraft made no attempt to engage enemy aircraft because of inferior or malfunctioning U.S. equipment. Where no R&D implications were indicated, sightings were noted to record the information collected for potential use for other analyses.

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Since "test type" instrumentation does not exist on most combat aircraft, the validity and quality of data are limited to the tolerances of human senses and recollections (aided where possible by official and personal records, notes, tapes, etc.). A detailed account of the precautions taken to insure the validity and quality of data gathered in such interviews is presented in Section II.

Originally the data sample consisted of 248 encounters through 1 March 1967. However, from this date through 22 May, 65 more encounters were identified (not including "sightings"). In the 23-month period from first encounter to 1 March, 47 "confirmed plus probable" MIG kills were reported. In the six-week period in April-May 1967, the 65 engagements resulted in 37 "confirmed plus probable" MIG kills.¹

B. DATA PRESENTATION

Though the analyses to be conducted in the RED BARON study were to be limited to exposing problems for R&D considerations, interest in the basic data was expressed in many areas of the military and scientific communities. To satisfy these needs the data have been formalized and will be published in several volumes as follows:

		<u>U.S. Aircraft Involved</u>	<u>No. of Encounters to 1 March 1967</u>
Volume I	{	F-4B	13
		F-4C	55
		F-8	8
		F-104	1
		U-2	1
		<hr/>	
		Total Events Reported Volume I - - - - -	78

¹Concurrently, there was a shift in targeting policy (NVN airfields were bombed by U.S. aircraft from 23 April) and the introduction of new equipment (e.g., SUU-16/A guns installed in some F-4C aircraft). Because of these factors the additional engagements were included in the RED BARON data base.

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	<u>U.S. Aircraft Involved</u>	<u>No. of Encounters to 1 March 1967</u>
Volume II	F-105	151
	RF-4C	13
	RF-8	
	RF-101	
	Misc. (Incl. A-1, A-4)	6
Total Events Reported Volume II - - - -		170
Total Events Volumes I and II - - - -		248

Volume III - Encounters from 1 Mar 1967 through 1 Jun 1967.

For ease of study and analysis, the available information has been summarized under the following headings:

- Primary Mission and Tactical Situation
- Mission Route
- Aircraft Configurations
- Flight Conditions Prior to Encounter
- Initial Detection
- Action Initiated
- Situation Development
- Ordnance
- Equipment Problems
- Aircrew Comments
- Data Sources

Following the above, an edited narrative is presented which integrates all the information sources pertaining to the designated air-to-air engagement. Wherever an air-to-air engagement proved to be of sufficient complexity that a perspective drawing aided in its understanding, such a representation was developed.

Although every precaution has been taken to depict the engagements accurately, the artists' representations serve only as guides to the reader in following through the complex series of situations and should not be interpreted as the precise flight paths of the aircraft involved.

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Terrain features have been added to the drawings principally to give perspective and to present an appreciation of ground features that existed in the general locale. Tracks relative to ground features should not be taken literally except where the narrative makes specific reference thereto.

The perspective representations of the air-to-air engagements were the result of cooperative efforts of the SED Graphics Department and the Boeing Company, Computer Graphics Division. These drawings were developed with the aid of a specialized analog computer (Illustromat 1100), by employing maps and overlays developed during interviews. Artists then added perspective views of aircraft in approximate attitudes and positions indicated in the Event Summary charts. Although the flight paths are to the same scale as the terrain, the aircraft shown are greatly enlarged for illustrative purposes.

The names and official call signs of the participants have been replaced by standardized nomenclature to give anonymity to the interviewees. This precaution was followed throughout to encourage frank and honest answers to all questions posed by the interview teams.

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II. DATA DEFINITION AND COLLECTION

A. BACKGROUND - GOALS AND LIMITATIONS

The broad goal formulated for the data definition/collection effort was to obtain sufficient data to enable reconstruction of the various air-to-air encounters in appropriate detail with maximum accuracy and completeness ("reconstruction" being the key word).

The scope and degree of detail was not simply defined. It revolved around the needs of the R&D community and the limitations of the available data. The primary limitation was human ability to sense and recall. There were no recording devices in U.S. aircraft, and, therefore, with few exceptions (such as taped communications and photographs), all data had to be extracted from the minds of participants and observers.

There was also the question of the adequacy, for event reconstruction, of data reported from Southeast Asia through the standard reporting systems. WSEG experience¹ showed that while these systems offered certain worthwhile information for R&D purposes, they were far from adequate for the purposes of this specific study.

It was decided that WSEG would interview participants in air-to-air encounters as the principal source of data.

¹WSEG Report 101, Requirements of Defense R&D Agencies for Data from Combat Air Operations in Southeast Asia (U), July 1966, (SECRET). WSEG Staff Study 134, Adequacy of Data from Southeast Asia Combat Air Operations for Research and Development Analyses of Aircraft Loss and Damage (U), February 1967, (SECRET).

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B. APPROACH

The data collection program involved several interrelated areas of operations. They were:

1. Identification of air-to-air encounters and the participants.
2. Development of more specific data needs and resolution of needs with limitations.
3. Collection of appropriate documentary information on Southeast Asia air-to-air encounters.
4. Development of optimum interview techniques.
5. Location of and arrangements for interviewing participants.

These operations were not necessarily sequential and were continued throughout the data collection phase.

Items 1 and 3 initially were interrelated, i.e., the means of identifying encounters was through search of existing documentation -- various formally and informally maintained "box scores" and other files.

Early information was gained from the Office of the Chief of Naval Operations and the USAF air staff. Additional basic documentation came from the USAF Tactical Fighter Weapons Center, CINCPACFLT, CINCPACAF, COMNAVAIRPAC, and the Commander, 7th Air Force. It was quickly determined that the various "box scores" did not agree. This was attributed to a variance in definition of what constituted an air-to-air encounter/engagement and possibly administrative or communications failures within the commands.

Additionally, early in the study, the CNC and the Chief of Staff, USAF, were advised of WSEG Project RED BARON and requested to provide reference to appropriate documentation. Numerous replies were received from various offices within the Services.

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Gradually, sources of documented information were increased until they included: standard reporting system (OPREPs, COACT, Navy 3480 Reports, Guided Missile Performance Reports); various reports of associated studies made by OEG representatives and other analytical groups; letters from pilots who could not be interviewed; various records kept at all levels of command; gun-camera films; tapes of communications made by pilots; and miscellaneous message traffic among military commands.

Identification of participants was a particular problem since there is no existing mechanism for providing this information. With a relatively few exceptions, names of participants were not included in reports. However, names were gradually acquired through informal communications with USN and USAF pilots and, as the interview program proceeded, other persons were identified by the interviewees.

Some specific items of data desired were defined by visits to various Service R&D and training organizations and through meetings with representatives of various industrial organizations concerned with components of U.S. fighter weapons systems. (These visits and conferences also provided information on the technical and operational aspects of the weapons systems concerned.) Eventually, a categorized list of data specifically desired from each encounter was formulated.

Having established the data requirements, an interview program was desired which would:

- Allow the greatest number of interviews, while
- Maximizing the quality, depth, and scope of information obtained from each interview.

There were uncertainties about the interview program, however. They involved such considerations as the human ability to recall stressful incidents and the effect of elapsed time between the event and attempt to recount it. Large numbers

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of people throughout the world had to be interviewed, great quantities of interview data had to be reduced, and time and manpower had to be considered.

With the assistance of IDA psychologists, H. W. Sinaiko and W. R. Kite, basic interview concepts were delineated. These concepts stressed unhurried informality, anonymity of the interviewee, a chronological approach to the entire flight in question (not just the air-to-air encounter period of it), and much use of visual aids -- maps, sketches, airplane models -- to reconstruct events.

A systematic program was developed to interview a maximum number of participants in the combat theater and throughout CONUS and Europe. There was little chance to control the elapsed time between events and interview. As a result, the elapsed time varied from days to more than one year.

Efficiency of operation was approached in various ways. Several levels of encounter were defined according to their complexity and intensity,¹ and the basic interview procedure was somewhat expanded or abbreviated according to the level of encounter and the knowledge of the interviewee. Data formats were devised which attempted to facilitate the recording (and subsequent reduction) of information while stimulating the memory of the interviewee.

A total of ten persons were trained as interviewers. Where it was possible to communicate with a participant but not practical or possible to interview him, he was contacted by mail.

While there was the desire to interview a maximum number of pilots, it was superseded by a desire to maximize coverage over the largest number of encounters. Consequently, where a

¹Sighting only (visual or radar); either side taking hostile or evasive action; expenditure of ordnance by either side; loss or damage by either side.

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choice had to be made as to whom to interview, breadth of coverage was the first consideration.

At the start, various test interviews were conducted, their results evaluated, and improvements made before a large scale program was undertaken. Minor changes in procedure were made throughout the program.

C. DESCRIPTION OF INTERVIEW PROCEDURE

In spite of the small changes that evolved and flexibility included to accommodate each situation, the basic interview procedure remained largely constant after the early test cases.

Ideally, the interviewee was given advance notice and a general idea of what would be discussed. The interview team consisted of two persons, one a military pilot with a significant amount of flying experience and the second person a military officer or civilian. The team would meet with one crewman at a time in a closed room, with minimum distraction, and with what was intended to be more than ample time allotted for the meeting. The team attempted to create an air of relaxed informality.

The interviewee was given an explanation of the study, how it came about, what it hoped to accomplish, and what his role was. It was emphasized that his name would not appear in print and that, in general, attempts would be made to preserve the anonymity of the persons interviewed. This was done to encourage frank and honest answers. The complete interview procedure was explained in detail.

Next, the pilot was asked to give an uninterrupted narrative of the encounter in question. He was asked to start from planning for the mission and discuss all aspects through the flight's return to base. He was first given examples of the kind of detail desired. Early in the project it became standard for the interviewers to use a tape recorder for the

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narrative phase. This, of course, depended upon the interviewee's consent and he was always free to go back and erase anything he wished from the tape. He was assured that the tape was only for the use of the interviewers in gaining complete, accurate information from the meeting and its use was limited to the project.

Next, depending on the intensity and complexity of the encounter, a sketch of the action was made. Again, the sketch covered a greater part of the mission than just the air-to-air encounter, dealing with ingress and egress as well. The technique was to put a transparent paper overlay on a large scale map and trace the paths, in plan view, of the various aircraft known to have been present (as they were believed to be) relative to known geographical points. The third dimension to the picture was introduced by means of a keyed time-sequence vs. altitude plot at the top of the overlay.

With regard to time, early in the study it became clear that the air-to-air combatant rarely had any reasonable concept of the time duration of events or phases of the combat. He could, however, recall well the sequence of events. This caused the injecting of time-sequences into the interview process. The procedure was for the interviewer to "stop the action" at a point where something significant was occurring and try to elicit a detailed account of the scene at that instant -- the location and altitude of each participant; status of the interviewee's aircraft in the way of speed, g's, fuel state, avionics modes, etc.; action by the individual and his reasons therefor; communications which took place; enemy actions; etc.

After such a stop the description would continue until the next significant event occurred at which point the action would be stopped again. These stops correspond with the "T" (or "Time") marks in events and pictures. While one team member

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worked with the pilot in making the sketch, the other kept notes on a specially designed note pad.

Upon completion of this step-by-step microscopic phase, the interviewers consulted their checklist on data items and asked specific questions about points which had not come out.

Finally, the interviewee was encouraged to comment on the whole range of considerations which might be of interest to the study -- comments derived from his experience in this specific encounter as well as from his overall experience.

The duration of an interview was from minutes to several hours, depending on the significance and complexity of the encounter and the knowledge of the interviewee.

D. GENERAL COMMENTS ON DATA

WSEG identified 248 air-to-air encounters that occurred prior to 1 March 1967. Participants in 164 of these encounters were interviewed, with a total of 331 interviews conducted.¹ In addition, 37 written accounts of engagements were received. In general, priority was given to the more complex encounters; events for which no interviews were conducted were usually a sighting only, with no R&D significance.

The study group found that human ability to recall the details of incidents stressful to them is sometimes quite remarkable. With regard to the validity of recall, various comparisons were made between OPREP reports of the encounter and interviews and between interviews of various participants in the same encounter. There was generally good agreement. Where significant discrepancies appeared, they could usually be traced to the confusion of a fast moving, complex situation

¹ If an individual was interviewed in connection with two or more different encounters, this would be considered as two or more interviews.

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rather than memory failure or some psychological phenomena. (Discrepancies between various accounts of the same event did cause some difficulty in the final reconstruction process. In almost all cases, discrepancies were resolved through repeated study of the data, use of logical deductions, and/or reinterview.)

Intuitively, it might appear that the best information would be obtained by minimizing the time lapse between encounter and interview. However, there are opinions and illustrations which counter this. The thought cannot be proved or disproved at this time. As noted earlier, elapsed time between encounter and interview ran from a period of days to more than a year. Dates of events and interviews have been included in the published data.

The interview techniques, in general, were highly regarded by interviewees for effectiveness in stimulating accurate, detailed recall. In some cases, through the procedures used, interviewees were able to correct and clarify their conceptions of events.

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III. EVENT RECONSTRUCTIONS

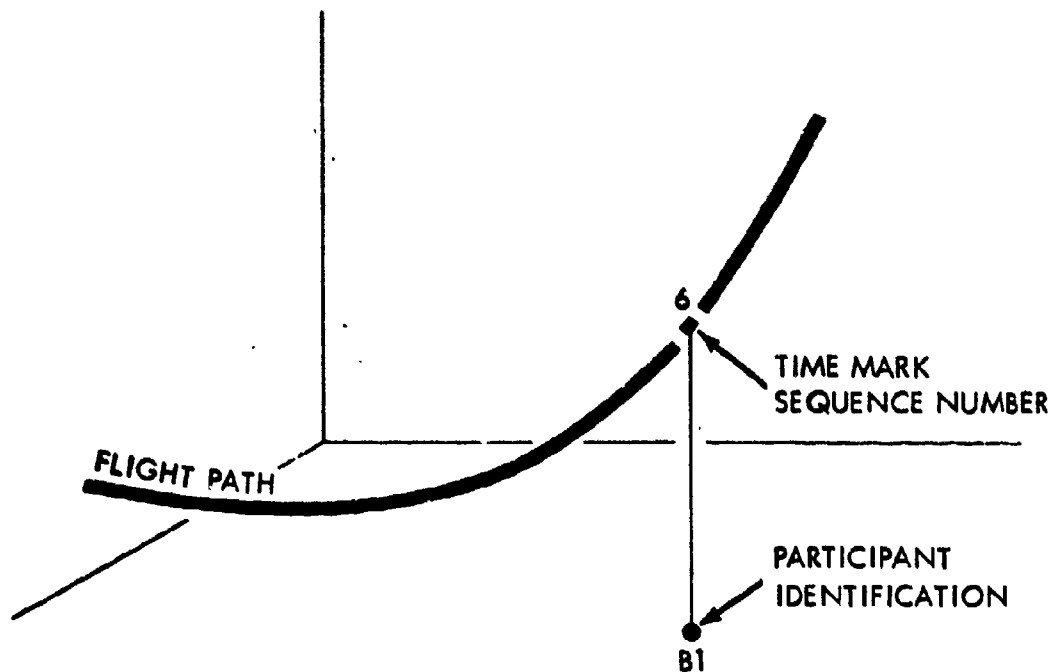
The account of each event is presented in at least two basic parts: (1) An outline which gives an abbreviated presentation of the highlights of the event, and (2) A narrative of the encounter.

All of the events contained in this Volume are summarized in Table 1. A Glossary of Terms was developed to aid in the interpretation of events and is included at the end of this report. The glossary also contains descriptions and illustrations of the more common aircraft maneuvers.

In addition, whenever an air-to-air engagement proved to be of sufficient complexity that a perspective drawing aided in its understanding, such a representation was developed. The perspective drawings were keyed by an Event Summary Chart which describes the actions of friendly aircraft (BLUE 1, 2, etc.), and enemy aircraft, as well as known communication information, at significant points in the event. As explained in Section II, these are identified by "time marks" (T_0 , T_1 , T_2 , etc.), and are instants in time when significant points arose and are not intervals of seconds or minutes of clock time. In the perspective sketch, a vertical line representing altitude appears on the flight path at each of these "time marks" with the time mark sequence number printed at the top and the participant to which it referred printed at the bottom (e.g., B2, M3, etc.). The keyed flight paths presented in the sketches were color coded such that the paths of all friendly aircraft were shown in blue and those of enemy aircraft, in red.

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It is recognized that precise flight paths could not be reconstructed since the participating airplanes did not carry instrumentation for recording of position. Thus, while every effort was made to depict the engagements as accurately as possible, it must be remembered that artists' representations serve only as guides to the reader in following the complex series of situations and should not be interpreted as the precise flight paths of the aircraft involved.

Terrain features have been added to the drawings principally to give perspective and to present an appreciation of the ground features that existed in the general locale. Sometimes these features were referenced during interviews to assist the pilot to recall details of the event, but it was rare that exact features played a significant part in the encounter even though most encounters took place at low altitude. Tracks relative to ground features should not be taken literally except where the narrative makes specific reference thereto.

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Table 1. LIST OF EVENTS

Event	Date/Time	Aircraft Involved No./Type		Results Lost/Damaged	
		U.S.	Enemy	U.S.	Enemy
I-1	3 Apr '65/1110H	4 F-3E	3 MIG-17	0/1	0/0
I-2	9 Apr '65/0840H	4 F-4B	4 MIG-17	1/0	1 Prob/0
I-3	31 May '65/1505H	2 F-4C	8 Poss MIG	0/0	0/0
I-4	4 Jun '65/0712H	2 F-4B	4 MIG-17	0/0	0/0
I-5	17 Jun '65/1030H	2 F-4B	4 MIG-17	0/0	2/0
I-6	10 Jul '65/1700H	4 F-4C	2 MIG-17	0/0	2/0
I-7	11 Jul '65/1520H	1 F-4C	2 Unid.	Sighting	
I-8	5 Oct '65/1040H	4 F-4C	5 MIG-17	0/0	0/0
I-9	6 Oct '65/1040H	2 F-4B	3 MIG-17	0/0	1 Prob/0
I-10	8 Oct '65/1520H	4 F-4C	2 Unid.	Sighting	
I-11	1 Nov '65/1030H	4 F-4C	4 Unid.	Sighting	
I-12	23 Dec '65/0730H	2 F-4C	2 MIG?	Sighting	
I-13	9 Jan '66/0926H	F-8E	Unkn.	Radar	
I-14	22 Jan '66/1925H	2 F-4C	1 Unid.	Sighting	
I-15	3 Feb '66/2100H	4 F-4B	Unknowns	0/0	0/0
I-16	3 Feb '66/2100H	1 F-4B	1 MIG-17	0/0	0/0(deleted)
I-17	6 Feb '66/-----	1 U-2	1 MIG-21	Sighting	
I-18	4 Mar '66/1703H	{2 F-4C 4 F-4C	{3 MIG-17 3 MIG-17	{0/0 Sighting	0/0
I-19	10 Mar '66/1025H	4 F-4C	1 YAK-25	Sighting	
I-20	5 Apr '66/0915H	2 F-8E	1 Unid.	Sighting	
I-21	21 Apr '66/1232H	2 F-4C	Unknown	Radar	
I-22	23 Apr '66/1615H	2 F-4C	1 MIG-21	0/0	1 Prob/0
I-23	23 Apr '66/1421H	4 F-4C	4 MIG-17	0/0	2/0
I-24	25 Apr '66/1137H	2 F-4C	2 MIG-21	0/0	0/0
I-25	25 Apr '66/mid-afternoon	4 F-4C	2 MIG-21	0/0	0/0
I-26	26 Apr '66/1520H	2 F-4C	3 MIG-21	0/0	1/0
I-27	26 Apr '66/1425H	4 F-4C	1 MIG-21 4 MIG-17	0/1*	0/0
I-28	29 Apr '66/mid-afternoon	4 F-4C	4 MIG-17	0/0	2/0
I-29	30 Apr '66/0900H	2 F-4C	4 MIG-17	0/0	1/0
I-30	8 May '66/1615H	4 F-4C	3 Unid.	Sighting	
I-31	10 May '66/1810H	4 F-4C	3 MIG-17	0/0	0/0
I-32	12 May '66/1622H	3 F-4C	4 MIG-17D	0/0	0/0
I-33	30 May '66/1750H	2 F-4C	4 MIG-17	Sighting	
I-34	12 Jun '66/1446H	{2 F-8E 2 F-8C	4 MIG-17	0/0	1+1 Prob/0
I-35	14 Jun '66/0040H	2 F-4B	2 Colt	0/0	1 Prob/0

*Damaged by AAA.

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Event	Date/Time	Aircraft Involved No./Type		Results Lost/Damaged	
		U.S.	Enemy	U.S.	Enemy
I-36	21 Jun '66/1535H	4 F-8E	4 MIG-17	1/0	2/0
I-37	13 Jul '66/1102H	4 F-4B	6 MIG-17	0/0	1/0
I-38	14 Jul '66/1251H	3 F-8E	3 MIG-17	1/0	0/1
I-39	14 Jul '66/1200H	4 F-4C	2-3 MIG-21	0/0	2/0
I-40	20 Jul '66/1550H	3 F-4C	1 MIG-?	Sighting	
I-41	7 Aug '66/0910H	1 F-104C	1 MIG-21	Sighting	
I-42	Aug-Sep '66/1430H	3 F-4C	1 MIG-?	Sighting	
I-43	5 Sep '66/1645H	2 F-8E	2 MIG-17	1/1	0/0
I-44	14 Sep '66/1655H	4 F-4C	1 MIG-21	0/0	0/0
I-45	16 Sep '66/1020H	3 F-4C	4 MIG-17	1 Prob*/0	1/0
I-46	20 Sep '66/0920H	3 F-4C	2 MIG-17	1/0	0/0
I-47	21 Sep '66/1121H	2 F-4C	2 MIG-21C	0/0	0/0
I-48	23 Sep '66/0800H	2 F-4C	4 MIG-17	Sighting	
I-49	27 Sep '66/1600H	4 F-4C	2 MIG-17	Sighting	
I-50	---Sep '66/-----	2 F-4C	3 MIG-?	Sighting	
I-51	1 Oct '66/0814H	1 F-4B	1 MIG-?	0/0	0/0
I-52	5 Oct '66/0748H	2 F-4C	Poss MIG	1 Prob/0	0/0
I-53	9 Oct '66/0830H	2 F-4B	2 MIG-?	1/0**	0/0
I-54	9 Oct '66/0845H	4 F-8E	2 MIG-21	0/0	1/0
I-55	---Oct '66/-----	3 F-4C	Unknown	Sighting	
I-56	2 Nov '66/1700H	3 F-4C	1 MIG-21	Sighting	
I-57	3 Nov '66/1541H	3 F-4C	2 MIG-21D	0/0	0/0
I-58	4 Nov '66/1548H	4 F-4C	1 MIG-17	Sighting	
I-59	4 Nov '66/1556H	3 F-4C	1 MIG-?	Sighting	
I-60	5 Nov '66/1630H	4 F-4C	2 MIG-21D	0/0	2/0
I-61	5 Nov '66/-----	1 F-4B	Unknown	Two radar contacts	
I-62	21 Nov '66/Late morn	F-4P	MIG	Radar	
I-63	4 Dec '66/1665H	4 F-4C	2 Unid.	Sighting	
I-64	5 Dec '66/1105H	4 F-4C	1 MIG-?	Sighting	
I-65	30 Dec '66/1620H	2 F-4C	3 MIG-17	0/0	0/0
I-66	20 Dec '66/0207H	2 F-4B	2 Colt ?	0/0	1/0
I-67	30 Dec '66/1610H	4 F-4C	1 MIG-21?	0/0	0/0
I-68	2 Jan '67/1500H	4 F-4C	5-7 MIG-21	0/0	3/0
	2 Jan '67/1510H	4 F-4C	5 MIG-21	0/0	1/0
	2 Jan '67/1515H	4 F-4C	? MIG-21	0/0	3/0
I-69	3 Jan '67/1550H	4 F-4C	MIGs	Sighting	
I-70	5 Jan '67/1201H	4 F-4C	2 MIG-21	0/0	0/0
I-71	6 Jan '67/1030H	2 F-4C	4 MIG-21C	0/0	2/0
I-72	6 Jan '67/0920H	3 F-4C	2 MIG-?	0/0	0/0
I-73	16 Jan '67/1545H	4 F-4C	3 MIG-21	Sighting	
I-74	17 Jan '67/0807H	4 F-4C	2 MIG-17	0/0	0/0
I-75	21 Jan '67/0855H	3 F-4C	1 MIG-17D	0/0	0/0
I-76	22 Jan '67/1140H	4 F-4C	2 MIG-?	0/0	0/0
I-77	23 Jan '67/-----	12 F-4C	None-SAMs	1/1	0/0
I-78	5 Feb '67/1530H	4 F-4C	8 MIG-17	0/0	0/0

* Loss probably due to MIG.

** Not Included in official box score.

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GLOSSARY OF TERMS
(All Terms Unclassified Unless Otherwise Stated)

AA - air-to-air weapon
AAA - antiaircraft artillery
AAM - air-to-air missile
AAWC - Anti-Air-Warfare Commander
AB - afterburner
ACM - air combat maneuvering
ACT - air combat tactics
ADF - automatic direction finder
AEW - airborne early warning
AGL - above ground level
AIM-7 (D&E models) (SPARROW) - semiactive radar type, air-to-air missile
AIM-9 (B&D models) (SIDEWINDER) - passive IR type, air-to-air missile
AIM-9C (SIDEWINDER) - Radar guided air-to-air missile
AI radar - airborne intercept radar
Aircraft commander - a pilot designated pilot-in-command of a given aircraft (Air Force name for front seater in F-4)
ALKALI - Soviet air-to-air missile - radar beam rider type
ALQ-51 - Broadband deception ECM system
ALQ-71 - Noise jamming ECM pod (production model of QRC-160-1)
ANCHOR (Various colors) - See Figure 9 on page 31 - code names for specific refueling tracks
AN/APA-157 - CW radar illuminator and fire control computer for SPARROW missile system.
Angle-off - angular position off the tail of the reference aircraft
APQ-72 - airborne intercept radar in F-4B aircraft

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APQ-94 - airborne intercept radar in F-8E aircraft

APQ-100/109 - airborne intercept radar in F-4C/D aircraft

APR-25 - vector homing and warning system - providing 360° directional warning of threat signals in certain bands with instantaneous bearing to radiating source.

APR-26 - crystal video airborne warning receiver to detect SA-2 guidance signals

APR-27 - airborne radar warning receiver

armed reconnaissance - an air mission flown with the primary purpose of locating and attacking targets of opportunity, i.e., enemy materiel, personnel, and facilities in assigned general areas or along assigned ground communications routes, and not for the purpose of attacking specific briefed targets.

ASE circle - allowable steering error - circle on radar display provided by fire control computer.

ATOLL - Soviet air-to-air missile, infrared seeker type

autotrack - automatic tracking in which a servo mechanism keeps the radar beam trained on the target.

Back - the individual occupying the back seat of the F-4; in Navy called RIO, in Air Force called pilot or GIB.

BARCAP - Barrier combat air patrol - a MIGSCREEN for one or more missions

barrel roll - See Figure 2 (page 27) - a 360° rolling maneuver in which the flight path of the aircraft describes a helix about the intended direction of the flight.

BDA - bomb damage assessment

BINGO (fuel) - minimum fuel quantity reserve established for a given geographical point to permit aircraft to return safely to home base or aerial refueling point.

bogey - unidentified aircraft

boresight mode - in the boresight mode the radar antenna is aligned and locked to the roll axis of the aircraft.

break - an emergency turn in which maximum performance is desired instantly to destroy an attackers tracking solution.

break X - minimum range indication for missile launch. X appears in the radar scope at minimum range.

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CAP - combat air patrol - an aircraft patrol provided over an objective area, over the force protected, over the critical area of a combat zone, or over an air defense area, for the purpose of intercepting and destroying hostile aircraft before they reach their target.

(NAVY) Condition I CAP (Standby): aircraft ready for immediate (maximum delay of two (2) minutes) takeoff. Aircraft with engine not running (starter batteries plugged in) will be positioned for take-off. Pilots in cockpit and deck drew on alert.

CAS - calibrated air speed (knots)

CBU-24 - canister dispensed air-to-ground bomblet type munition; the canister is carried externally on the aircraft and opens after release at a preset altitude.

centerline tank - a fuel tank carried externally on centerline of aircraft.

chaff - a type of confusion reflector, which consist of thin, narrow metallic strips of various lengths to provide different responses, used to create false signals on radarscope.

chandelle - a maximum performance climbing turn in which speed is converted to altitude while reversing direction.

CMR-312 (Little Ears) - aural radar warning receiver

CROWN - call-sign for rescue force commander

CRT - Combat Rated Thrust - maximum augmented thrust condition of engine

DF - direction finder

DME - distance measuring equipment

dot - (aim dot, steering dot) - electronic dot appearing in radar scope when radar is locked on providing computed steering vector information

element - Air Force term for the basic fighting unit (two aircraft)

EWO - electronic warfare officer

FANSONG - tracking radar for Soviet SA-2 surface-to-air missile system (CONFIDENTIAL)

fighting (wing) position - an area for the wingman in which optimum coverage and maneuverability is achieved in maximum performance maneuvers.

finger-four formation - see Figure 6 (page 29) - also fingertip formation - a four-plane formation in

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which the aircraft occupy positions suggested by the four finger tips of either hand, the fingers being held together in a horizontal plane.

flak - antiaircraft fire

fluid element - the second or supporting element in fluid four formation, flying in a high or low element position.

fluid-four - see Figure 5 (page 29) - a tactical formation having the second element spread in both the vertical and horizontal planes to enhance maneuverability, mutual support and look-out ability.

fraggged - mission directed by fragmentary operational order from higher headquarters.

Front - the individual in the front seat in the F-4 aircraft; in the Navy called the pilot, in the Air Force called the aircraft commander.

g - unit of acceleration (32.2 ft/sec^2)

gaggle - slang for a number of aircraft operating in close proximity, not necessarily in any semblance of formation.

GAM-83 - BULLPUP; air-to-ground guided missile

GCI - ground control intercept

GUARD - emergency UHF radio channel usually monitored by all aircraft and ground stations as a secondary frequency.

Hard turn - a planned turn in which the intensity of the turn is governed by the angle-off and range of the attacking aircraft.

HEAT - armament switch setting for using infrared missiles

hot mike intercom - intercommunication system continuously active (hot)

IAS - indicated air speed

ICS - intercommunication system

ID - identification; to make identification

IFF - identification, friend or foe; aircraft transponding beacon received by radar distinguishing friend from foe.

Immelmann - see Figure 8 (page 30) - maneuver in which the aircraft completes the first half of a loop and then rolls over to an upright position thus changing direction 180° with a simultaneous gain in altitude.

IMN - indicated Mach number

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IP - initial point; a well-defined point, easily distinguishable visually and/or by radar, used as a starting point for a bomb run to the target.

IR missile - an infrared or heat-seeking missile

IRON HAND - a code name for a flight with special ordnance and avionics equipment whose mission is to seek and destroy enemy surface-to-air missile sites.

JCS target - a target appearing on the JCS target list

jinking - constant maneuvering in both the horizontal and vertical planes to present difficult target to enemy defenses by spoiling the tracking solution. Bank, pitch and velocity are all simultaneously changed in this maneuver.

karst - a limestone outcropping or ridge

kt - abbreviation for knot (nautical miles/hour)

LAU-3 - a rocket launcher adaptable to external bomb racks holding 19 2.75 inch air-to-ground folding fin rockets

LAU-17 adapters - stub pylon on F-4

loose deuce - a term to describe fighter tactics in which two to four airplanes maneuver to provide mutual support and increased fire power.

Lufberry circle - a circular tail chase, ascending or descending

M - abbreviation for Mach number

MER - multiple ejection rack

mi - nautical mile, as used in this report

MIGCAP - combat air patrol mission whose actions are directed against MIG aircraft

MIG SCREEN - mission wherein protecting fighters are placed between the threat and the protected force in a specific area

military power - maximum unaugmented thrust condition of engine

missile free - authority is granted to fire unless target is identified as friendly

missile tone - audio signal indicating AIM-9 is locked on to an IR source

MRT - military rated thrust - see military power

MSL - altitude referenced to mean sea level

OPREP - message report in joint operational reporting system

PANAMA - call sign for GCI site located near Danang

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pipper - aircraft weapon sight indicator (a dot of light within a lighted ring)

PIRAZ - positive identification radar zone

PRF - pulse recurrence frequency

QRC-160 - noise jamming ECM pod

RAG - replacement air group

ready light - light which indicates a particular avionics/ munitions system is operating and available for use

RED CROWN - voice call for USS LONG BEACH (CLN-9)

RESCAP - rescue combat air patrol

RHAW - radar homing and warning

RIO - radar intercept officer

RO - abbreviated form of RIO

road interdiction - to prevent or hinder, by aerial means, enemy use of a road or route

ROLLING THUNDER - code name for air strikes against North Vietnam

Route Package - see Figure 9 - geographical division of North Vietnam for purposes of air strike targeting

rudder reversal - a climbing aircraft maneuver in which direction is changed by rotation around the aircraft's vertical axis

SA-2 - Soviet surface-to-air missile system

SAM - surface-to-air missile

SAR - search and rescue

scissors - See Figure 1 (page 27) - a defensive maneuver in which a series of turn reversals are executed in an attempt to achieve offensive after an overshoot by the attacker.

SCAN-ODD - MIG airborne intercept radar (CONFIDENTIAL)

section - a Navy term for a tactical element of two or more aircraft (usually two)/an Air Force term for two flights of four

SHRIKE (AGM-45) - air-to-surface radar seeking missile

SIDEWINDER - see AIM-9

SIDEWINDER tone - see missile tone

SIF - selective identification feature - electronic device with variable codes for identification

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SILVER DAWN - a code name for an intelligence collecting aircraft (SECRET)

"S" maneuver - a weave in a horizontal plane

Snap-up - a rapid pullup to establish a climb in order to launch a weapon

SPARROW - see AIM-7

"Split-S" maneuver - see Figure 7 (page 30) - 180° rotation about the aircraft longitudinal axis followed by a 180° change of heading in a vertical plane (half loop starting from top)

STBY - standby

steering dot - see dot

Switchology - a coined word addressing the human engineering considerations of switch arrangements

TACAN - tactical air navigation - an active electronic navigational system which locates the aircraft with respect to another installation

TARCAP - target combat air patrol - aircraft assigned the air-to-air defense role in the target area

TAS - true air speed in knots

TCA - track crossing angle - the angle between flight paths
. measured from the tail of the reference aircraft

TOT - time over target

TRACK (various colors) - see Figure 9 -- code names for specific refueling tracks

TROJAN HORSE - a code name of a U-2 air reconnaissance program (SECRET)

unit (of turn) - divisions on an angle-of-attack indicator on F-4 aircraft

UHT - unit horizontal tail (applied to F-8 aircraft) - a tail design whereby the whole surface rotates about a pivot point

unloading - decreasing g's

V_c - closing velocity (relative)

vector box - see APR-25

WILD WEASEL - F-105F specially equipped for locating and attacking SA-2 sites (employed on IRON HAND missions)

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yo-yo - see Figures 3, 4 (Page 28)

High Speed - an offensive tactic to in which the attache maneuvers through both vertical and horizontal planes to prevent an overshoot in the plane of the defender's turn.

Low Speed - a dive for airspeed and a pull up for position closure.

ZUNI - five inch air-to-ground unguided rocket

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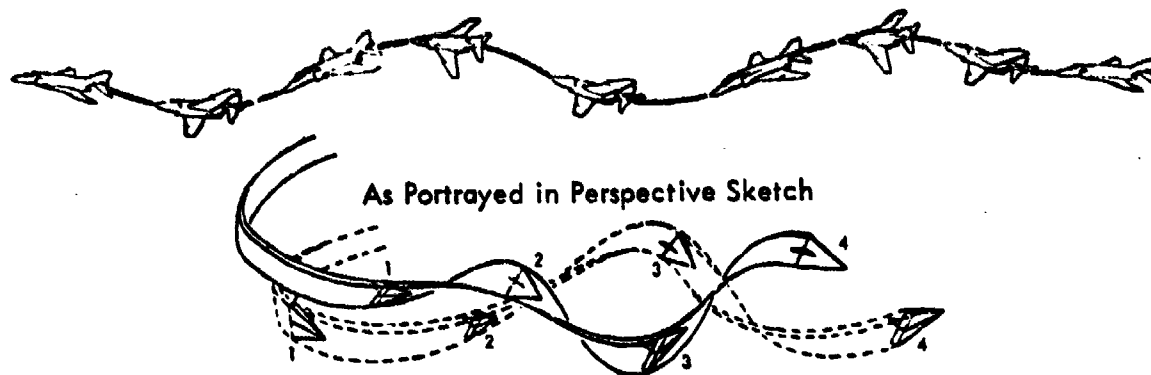


FIGURE 1. Scissors



FIGURE 2. Barrel Roll

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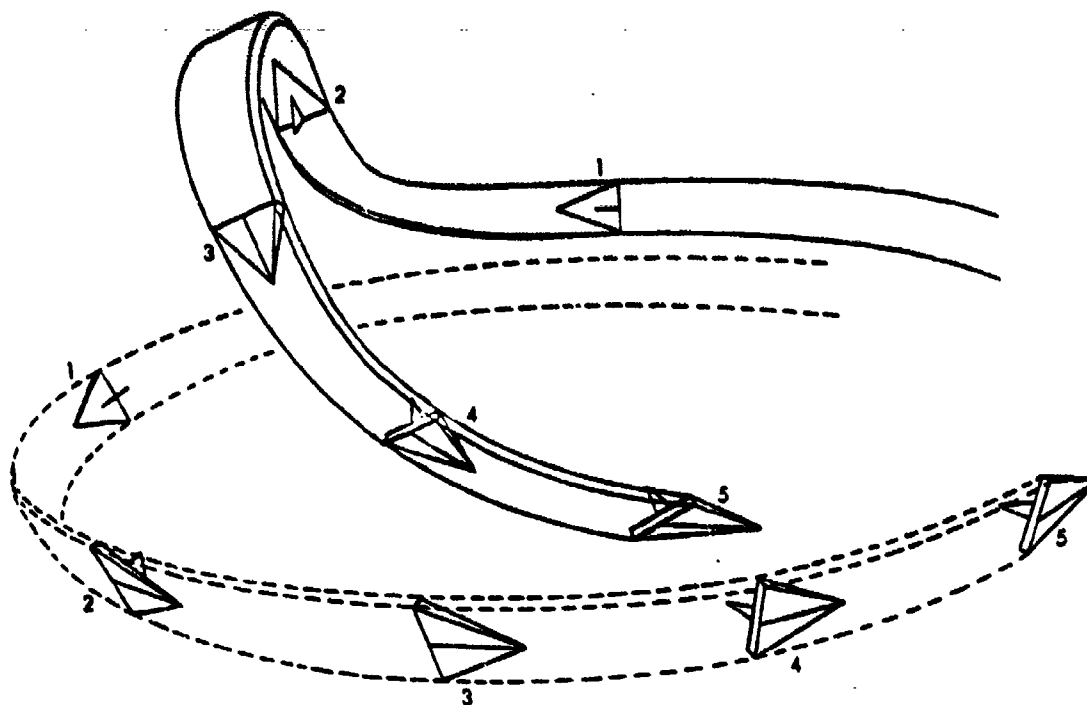


FIGURE 3. High-Speed Yo-Yo

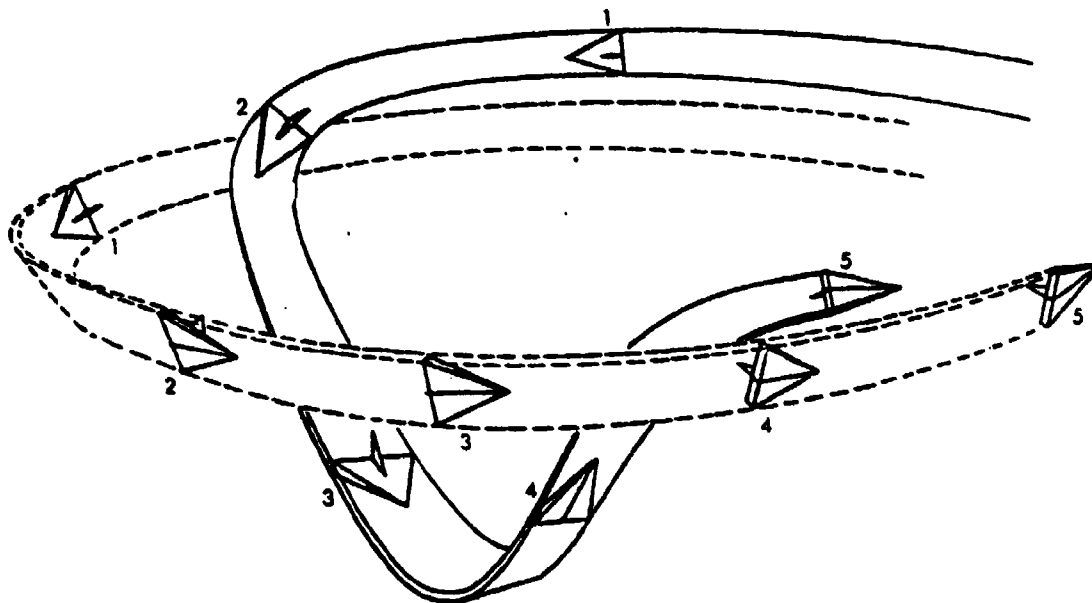


FIGURE 4. Low-Speed Yo-Yo

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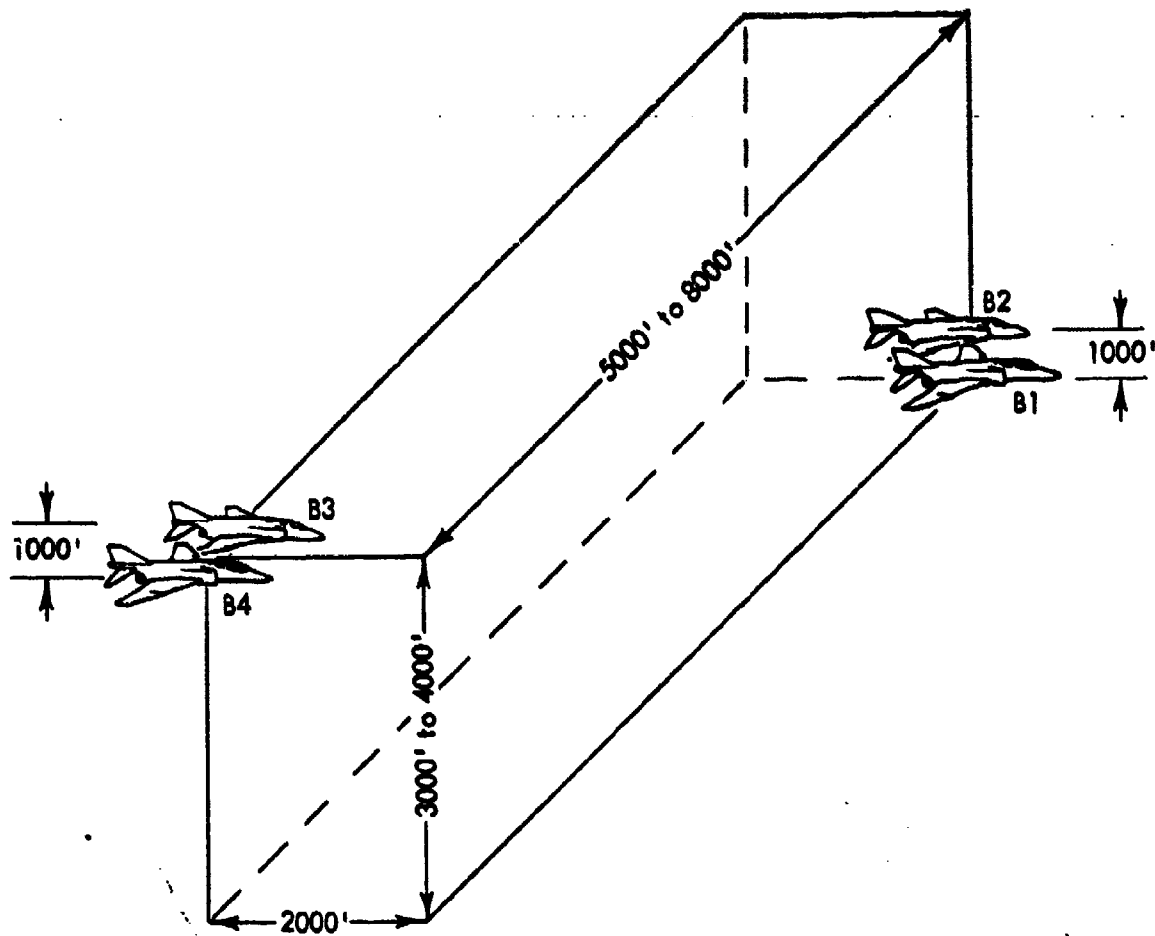
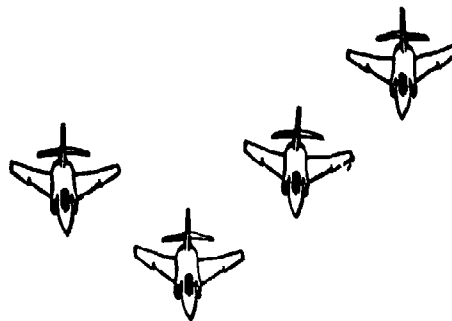


FIGURE 5. Fluid Four

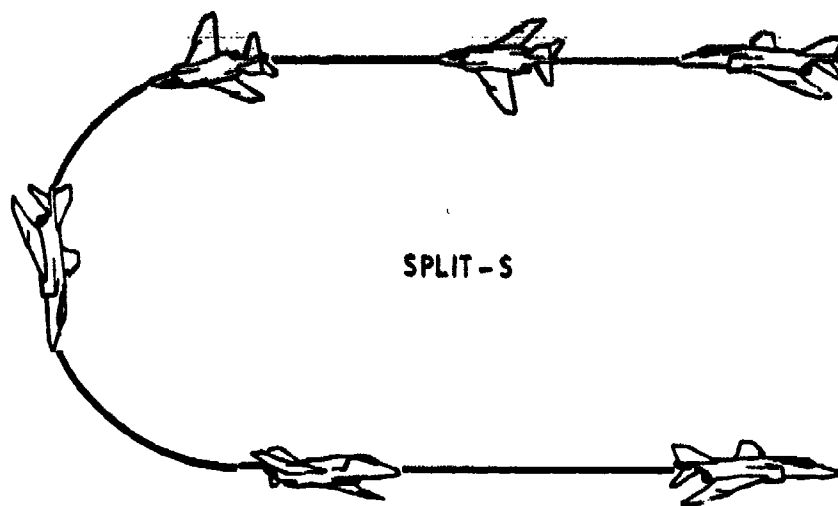


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FIGURE 6. Fingertip or Finger Four (All at Same Elevation)

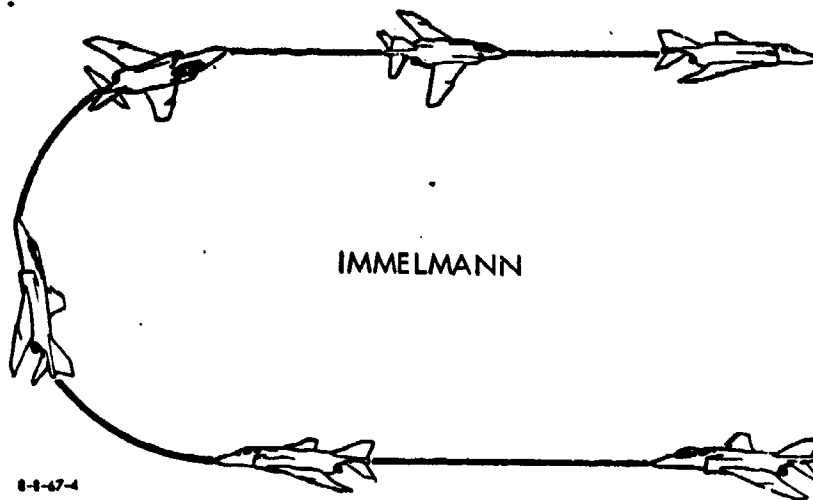
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SPLIT-S

FIGURE 7. Split-S



IMMELMANN

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FIGURE 8. Immelmann

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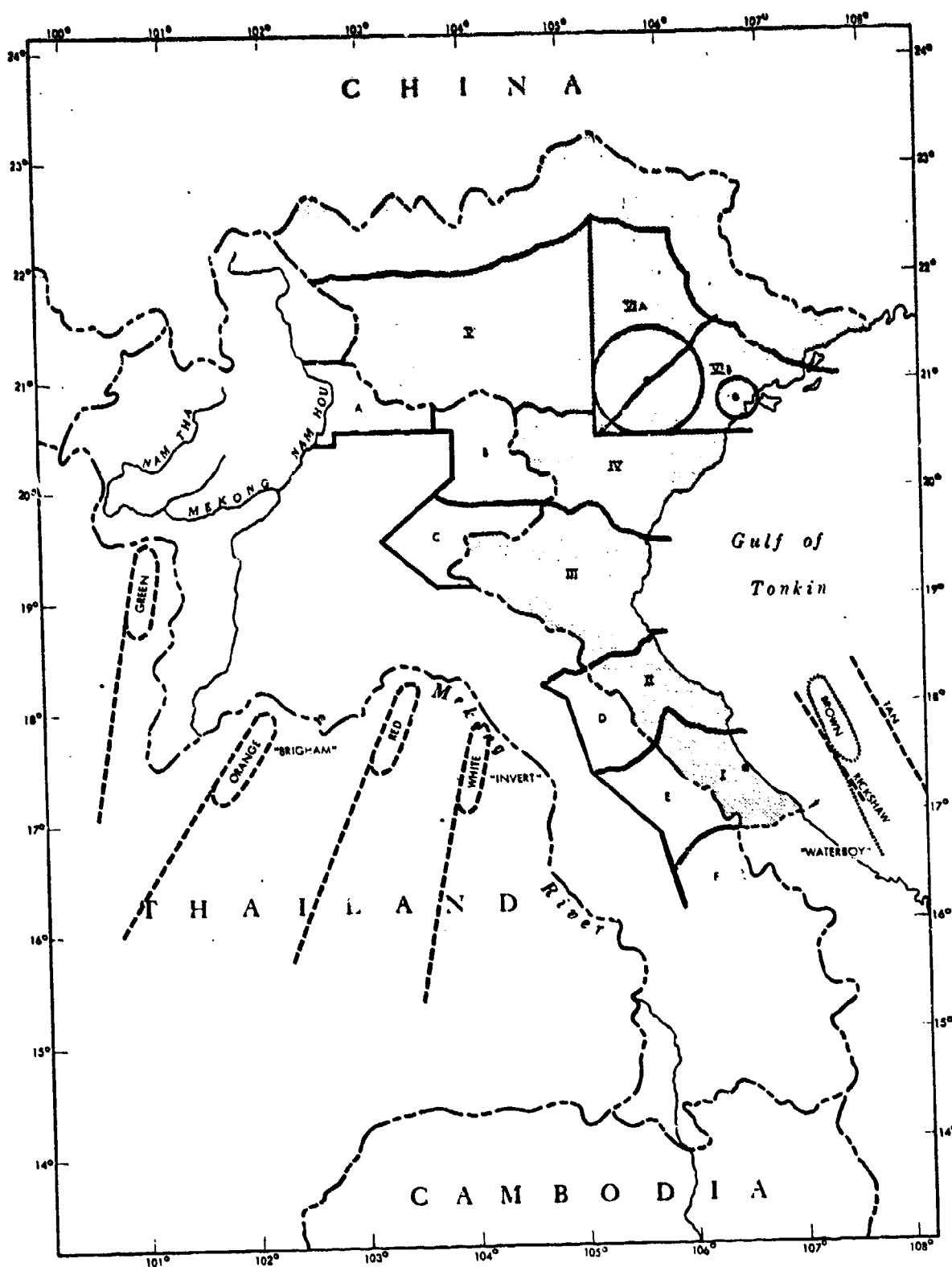


FIGURE 9. Location of Route Packages and Tanker Refuel Tracks

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EVENT I-1

Aircraft Involved: Four F-8Es vs three MIG-17s

Result: One F-8E damaged

Vicinity of Encounter: 19°58'N/105°51'E
Route Package IV

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 3 Apr 1965/1110H

Four F-8E aircraft (BLUE flight) were providing flak suppression and TARCAP for a strike group of eight A-4C aircraft (GREEN flight). BLUE flight had completed a ZUNI attack on each end of the target bridge where flak sites were suspected. The attack was the last made of a larger (34 aircraft) flight group on the target.

2. MISSION ROUTE

The strike group, with BLUE flight, was launched from the aircraft carriers in the Gulf of Tonkin, and proceeded on a northwesterly heading to the coast. The coast line was crossed east of the target. The flight approached the target on a westerly heading. Egress from the area was by reverse route except for the airplanes that diverted to Danang.

3. AIRCRAFT CONFIGURATIONS

F-8E BLUE 1, 2, 3, 4

2 - SIDEWINDER (AIM-9D)

4 - ZUNI (expended on flak suppression)

500 rds - 20mm

IFF, TACAN, APQ-94, UHF operating, gray and white paint

MIG-17 MIG 1, 2, 3

Estimate 23mm and 37mm guns

Believed to be silver colored.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: A haze condition reduced visibility in the target area to 1-2 mi. Weather was clear above 12,000 ft.

	BLUE
	1 2 3 4
<u>Altitude:</u>	--8000-11,000 ft---
<u>Heading:</u>	Circling target, left turn (30-40° bank)
<u>Speed:</u>	-----350 kt-----
<u>Fuel State:</u>	-----4000 lb-----
<u>Flight Formation:</u>	

BLUE flight had completed a ZUNI attack with each aircraft making individual runs. In recovering from the attack, BLUE 1 pulled off the target and established a tight orbit. BLUE 2 went wide. BLUE 3 saw BLUE 2 in a wide orbit and followed. BLUE 4 joined the orbit on opposite side of the circle from BLUE 1. Low visibility in the area was a factor.

5. INITIAL DETECTION

The MIGs were first sighted by a member of the strike group, but were mistaken for A-4s in the haze and at the range first sighted. Three MIGs were sighted in a dive toward BLUE 1 and were evaluated as hostile as one MIG opened fire on BLUE 1.

6. ACTION INITIATED

BLUE 1 observed tracers passing his left wing and felt hits. The tracers were thought to be AA ground fire. No report of MIGs had been received. BLUE 1 turned hard right and exited the area, while climbing to about 18,000 ft.

7. SITUATION DEVELOPMENT

At the coast BLUE 1 turned SE and again saw tracers pass the left side. A reverse turn to the left revealed a MIG at 7 o'clock, 2000 ft behind. BLUE 1 engaged afterburner, accelerated to 1.0 Mach, turned hard left, and was unable to locate the MIG. BLUE 1 diverted to Danang because of damage and loss of utility and PC-2 hydraulic systems.

8. ORDNANCE

No ordnance expended by BLUE 1, except four ZUNIs in air-to-ground. MIGs fired an unknown number of 23mm/37mm rounds.

9. EQUIPMENT PROBLEMS

Utility and PC-2 hydraulic systems rendered inoperative by enemy gunfire. Emergency utility system operated satisfactorily.

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10. AIRCREW COMMENTS

EVENT 1-1

Experience

	<u>Total Hours</u>	<u>F-8 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1	2500	600		Pilot had flown TF-9 and A-4.
BLUE 2, 3, 4	-----Not interviewed-----			

Comments on this Encounter

BLUE 1 - Radio was clear of chatter. Felt he had received insufficient training in air combat tactics. Did not realize there were MIGs in the area until second sighting of tracers. The pilot was directing his attention to look for flak and was not looking for air targets. Low visibility due to haze contributed to the loss of flight integrity.

Comments from Overall Experience

BLUE 1 - Good, reliable guns are required with the restraint of a positive ID. A lead computing gunsight with minimum tracking requirement needed. Tail warning highly desirable. For interceptor role or for use of AI radar a second crewman very desirable.

11. DATA SOURCES

Project Interviews: BLUE 1, 3 March 1967

Messages, Reports:

CTG 77.7 Msg 030417Z Apr 1965
CTG 77.7 Msg 030441Z Apr 1965
CTG 77.7 Msg 031451Z Apr 1965
CTG 77.7 Msg 040117Z Apr 1965
CTG 77.7 Msg 040202Z Apr 1965
CTG 77.7 Msg 040221Z Apr 1965

12. NARRATIVE DESCRIPTION

Following a flak suppression run, the four members of BLUE flight became separated in the haze, which reduced visibility in the target area to 1-2 mi. BLUE 1 was orbiting over the target at about 8000 ft when tracers and hits were observed by the pilot. B-1 was in a 30-40° bank speed 350 knots. BLUE 1 immediately broadcast that he was hit, and turned right to exit the area heading 100°. BLUE 1 thought the tracers were from ground fire. BLUE 1 was concentrating on looking for flak in the target area, and was not maintaining a lookout for enemy fighters.

On the way to the coast, BLUE 1 climbed to about 18,000 ft. After crossing the coast BLUE 1 turned to a southerly heading and upon rolling out on course the pilot saw more tracers, again on the left side. BLUE 1 turned hard right, saw nothing, reversed the turn to the left and saw a MIG at 7 o'clock at a range of 2000 ft and 200 ft up not firing. BLUE 1 engaged afterburner, nosed over, and accelerated to 1.0 Mach and came out of AB. While in a shallow dive, to maintain 1.0 Mach in military power, BLUE 1 turned hard left to reacquire the MIG, but it was not in sight.

BLUE 1 broadcast the presence of the MIG and established a course for Danang. The gunfire damaged the utility and PC-2 hydraulic systems in BLUE 1. En route, BLUE 4 joined BLUE 1, confirmed the damage, and escorted BLUE 1 to Danang. The emergency utility system functioned satisfactorily and allowed the pilot to land safely. Most hits were by the 37mm cannon.

BLUE 4 was in a left turn at 11,000 ft about 220° and three miles from the target when on rolling his wings level he saw two airplanes at his 3 o'clock position level at a range of about two miles and identified them as friendly aircraft. As BLUE 4 banked left and continued to observe the target, he saw three airplanes assumed to be A-4s diving towards the target area and one opened fire with guns. This airplane was then observed to flatten out in a pursuit curve, while the other two continued to dive on the target area. At this time BLUE 4 positively identified all three attacking airplanes by their silver color and silhouette as MIGs. He went to 100 percent power and attempted to close on the firing MIG. BLUE 4 selected an AIM-9D and had a good tone but withheld launch of the missile because of the many friendlies in the area. At this time BLUE 4 heard BLUE 1 report that BLUE 1 was hit and was exiting. BLUE 4 then broke off the chase to locate and join BLUE 1.

BLUE 2 and 3 did not see the MIGs in the haze.

The F-4 flight assigned as TARCAP at 25,000 ft never made contact with the MIGs.

The F-8s in the strike group had used radar to spot the attack aircraft but at the time of the encounter were watching the target for flak.

¹MSG 030441Z Apr 65 and CINCPACFLT Staff Study 3-67 quote MIGs as MIG-15.

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EVENT 1-2

Aircraft Involved: Four F-4Bs and four MIG-17s

Result: One F-4B missing
One MIG-17 probably destroyed

Vicinity of Encounter: Gulf of Tonkin, 25 mi SW
of Hainan Island

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 9 Apr 1965/0840H

MIG barrier in northern Tonkin Gulf about halfway between Haiphong and Hainan (approx 20°00'N/108°00'E) to divert any MIGs away from a strike in the Hanoi/Haiphong area. The first element (BLUE 1 (Lead) and 2) launched about 20 min ahead of the second element (BLUE 3 and 4) because one aircraft aborted launch and had to be replaced. Each element engaged MIGs independently.

2. MISSION ROUTE

Element 1 (BLUE 1 and 2), launched in vicinity of Point Yankee, proceeded to the NW (heading: 315°) clearing Hainan Island by about 30 mi, proceeding to the CAP station (approx 20°00'N/108°00'E). Element 2 (BLUE 3 and 4) launched approximately 20 min later and proceeded on same general heading.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2, 3

2 - SPARROW (AIM-7D)
2 - SIDEWINDER (AIM-9B)
1 - centerline tank
No camouflage paint.

BLUE 4

4 - SPARROW (AIM-7D)

MIG-17 MIG 1, 2, 3, 4

No missiles
Cannon
Not all-weather version; no radome in duct
Highly polished silver finish.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Solid undercast with few breaks, tops at 23,000 ft. Visibility at altitude, unlimited.

	BLUE		BLUE			
	1	2	3	4		
<u>Altitude:</u>	----- 35,000 ft -----	-----	Data not available			
<u>Heading:</u>	----- 135° -----	-----				
<u>Speed:</u>	----- Mach 1.2 -----	-----				
<u>Fuel State:</u>	Unknown (probably full internal)					
<u>Flight Formation:</u>	First and second elements were about 50 mi apart at initial MIG detection.					

5. INITIAL DETECTION

(First element data only)

First element heard that second element had MIGs on radar. First element turned south, went to AB, to attempt to join engagement. First element sighted four MIGs at great distance (30-50 mi) pulling contrails. As they approached, they could also distinguish F-4Bs pulling contrails.

6. ACTION INITIATED

BLUE 1 requested clearance to fire, and used radar acquisition to begin SPARROW attack.

7. SITUATION DEVELOPMENT

BLUE 1(L) fired SPARROWS at MIG and followed up with SIDEWINDERS, breaking off engagement when other MIG section started to pull behind him. He departed area to the south, checked fuel, and requested permission from ship to reattack and pursue over land (Hainan) if necessary. He reentered area and resumed engagement using boresight acquisition (optical sight plus radar). Proceeded with another SPARROW attack and then departed area because of low fuel.

Engagement took place at supersonic speeds at about 40,000 ft. Total time of engagement was approximately 20 min.

BLUE 3, 4 (second element) were seen to fire missiles at MIGs. BLUE 4 did not return from mission; cause of loss is unknown. BLUE 4 credited with shooting down one MIG.

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EVENT I-2

8. ORDNANCE

	(No. fired/No. hits)	
	SPARROW AIM-7D	SIDEWINDER AIM-9B
<u>First Element:</u>		
BLUE 1	2/0	
		1/0
BLUE 2	2/0	
		1/0
<u>Second Element:</u>		
BLUE 3	0/0	0/0
BLUE 4	4/1	

Remarks

1 did not guide, 1 motor did not fire

Target evaded missile successfully

2 motors did not fire

1 did not guide; the other would not fire--was returned to ship

BLUE 3 reported seeing MIG on fire in level fight at contrail level.

BLUE 4 did not return from mission.

9. EQUIPMENT PROBLEMS

BLUE 1 had great difficulty with the SPARROW missile systems, in that missiles would eject but motor would not fire. Subsequent investigation at the Naval Missile Center, Point Mugu, revealed a malfunction in the launching mechanism switches, which caused the umbilical to separate prior to motor ignition thus accounting for the motor no-fires. Shipboard test equipment available at the time did not have the capability to detect this problem.

BLUE 2 had one SIDEWINDER that would not fire.

10. AIRCREW COMMENTS

BLUE 1(L) (Front)

Squadron Commanding Officer, had about 1000 hr in the F-4B, and had many missile firings -- a well-experienced pilot. This was first MIG engagement. Data on other crew members not available.

Comments from Overall Experience

Air-to-air IFF would help by clearly identifying friendly targets in a poor visibility condition. (Not a factor in this engagement.)

There is a need for a close-in weapon as a backup on any missile system. If an ID pass has to be made, aircraft should have a weapon to give him an immediate attack capability if the target proved hostile. Guns would also be useful as an air-ground weapon (stopping a truck convoy, for example).

11. DATA SOURCES

Project Interviews: BLUE 1 (Lead) - Front, 17 January 1967

Messages, Reports:

CTF77 110322Z (MIG Encounter Recap)

CTG87.4 100745Z

Amplifying Reports on Missile Firings by BLUE 1 and 2.

12. NARRATIVE DESCRIPTION

BLUE 1 and 2 were launched from carrier at about 0800H and proceeded to the NW on a heading of 315°, clearing Hainan Island by about 30 mi and then proceeding to the CAP station in the Gulf of Tonkin. They then proceeded to orbit at their assigned stations. The second element (BLUE 3 and 4) was not able to launch from the ship until about 0820H. BLUE 3 and 4 rendezvoused and proceeded in a northwesterly direction to join the first element. At about 0840H, BLUE 3 and 4 radioed that they had obtained a radar contact and were "going to investigate." Their altitude at the time was "at or about the contrail level" (approx 40,000 ft). Shipboard radar observed BLUE 3 and 4 turning right and advised them that they were to the right of track. By about 0842H, BLUE 3 and 4 were advised that they were overland; however, radar position was indefinite due to close proximity to Hainan and NVN which was causing sidelobing and ringing on the scope from land returns.

To BLUE 3 and 4 sighted the MIGs visually at this time and engagement, which lasted until about 0905H, started in the vicinity of 18°20'N/108°30'E. Targets were identified as MIG-17s. MIG 4 dropped his tanks and attacked BLUE 3 and the action ensued.

In the meantime, BLUE 1 and 2 were on their patrol mission approximately 50 to 60 mi north of this area. When they heard radio transmissions, they turned and headed south to assist BLUE 3 and 4. BLUE 1 directed the other members of the flight (BLUE 2, 3, and 4) to go to afterburner and obtain separation from the MIGs. BLUE 1 then requested and was granted clearance by the carrier to fire. At a distance of about 30 to 50 mi. BLUE 1 sighted the MIGs.

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EVENT 1-2

T₁ He could distinguish contrails of both MIGs and the F-4Bs, as the color was distinctively different. The F-4B contrail was considerably darker and heavier than that of the MIG-17. BLUE 1 and 2 continued to head towards the MIGs, and as they approached, BLUE 2 acquired targets on radar and made a left turn to fly on a collision course with MIGs.

T₂ BLUE 2 started to climb up to MIG altitude, which at that time was about 44,000 ft. The MIGs were in a westerly heading in a wide finger-4 formation -- one of the MIGs was well below the contrail level.

T₃ BLUE 2 then fired a SPARROW missile at a range of 5 mi. The missile could not be observed even after sharply banking the aircraft. Apparently the missile motor did not fire.

T₄ At this point BLUE 1 was passing under the MIGs, turning right to obtain separation. The MIGs turned to left, were still in a widely spread formation. Individual airplanes were clearly discernible.

T₅ BLUE 1 flying at 40,000 ft with BLUE 2 in a wide-wing position acquired a MIG on boresight at 6 mi to right and obtained a radar lock-on.

T₆ BLUE 1 fired a SPARROW at a range of 3 mi. His steering dot was steady, slightly beyond optimum but still well within range. The missile fired, trajectory appeared normal, but did not appear to guide.

T₇ BLUE 1 then switched to HEAT and continued, just turning in behind the MIGs. He pulled up on the left rear MIG, heard a SIDEWINDER tone, closed in behind him with a straight tail shot and fired a SIDEWINDER at 1.5 mi.

T₈ At this point the MIG broke hard left and the missile tried to follow but slid just behind him. BLUE 1 pilot was surprised that at this altitude the MIG could turn as fast as he did. The other MIG section started to drop behind BLUE 1.

T₉ BLUE 1 and 2 dropped their noses down as they broke off and accelerated, departing the area to the south, while they came out of burner and orbited. When in orbit they dropped their centerline tanks, called the ship and requested permission to make another attack and pursue the MIGs over land if necessary. Communication was relatively poor but they received what they thought was an affirmative answer. BLUE 1 and 2 then returned north to resume the attack. During this time they could see the other element (BLUE 3 and 4) firing missiles at MIGs in the distance.

BLUE 3 heard BLUE 4 reporting that he had one more missile and was making his last run. Immediately thereafter both pilot and RIO of BLUE 3 saw an F-4B making a snap-up towards the MIGs which were at the contrail level. They lost sight of the F-4 as he zoomed and then heard the transmission "Op away." Within 30 sec to 1 min after they saw the F-4 in the zoom climb, both crew members of BLUE 3 saw a MIG on fire flying straight and level at the contrail level. The MIG fell slowly off into a dive. The rear seater of BLUE 3 heard BLUE 4 report "Good shooting; all missiles gone; I'm going home." BLUE 3 then questioned who got the MIG. Transmission was made -- no answer to the transmission was received. Both crew members of BLUE 3 were positive that the burning aircraft was a MIG-17.

T₁₀ BLUE 1 and 2 then reentered the area, made a boresight acquisition on MIGs, heading east at an altitude of 47,000 ft. The initial lock-on was made at 12 mi. BLUE 1 and 2 were in afterburner.

T₁₁ They broke lock and reacquired at a range of 7 mi. The 3 MIGs were still heading east, not maneuvering.

T₁₂ BLUE 1 fired a SPARROW at a range of 3-1/2 mi. The missile ejected, but the motor did not fire.

T₁₃ BLUE 1 noted that his fuel was approaching BINGO and he did not have enough for another SIDEWINDER attack. BLUE 1 then broke left and headed south to depart the area.

BLUE 2 remained in the area and continued the attack. He acquired a MIG in a right turn at 10° left, 6 mi. He then turned hard right to pull the dot into the ASE circle and fired a SPARROW at a range of 3-1/2 mi in a right turn. The missile motor apparently did not fire. He then fired a SIDEWINDER missile acquiring the target at 10° right, 3 mi, and launched the missile at about 1-1/2 mi. BLUE 2 attempted to fire the missile on station 8D but this one did not fire. He then rejected the right missile and selected the left SIDEWINDER which did fire but apparently did not guide, although the target was in afterburner. BLUE 2 then maneuvered into a stern position on the MIG-17 and again attempted to fire the SIDEWINDER missile on station 8D at a range of 1.2 mi. Again the missile would not fire. BLUE 2 then returned to the ship. This SIDEWINDER was examined back aboard the ship and the EPU was found to have fired, but not the motor.

BLUE 4 did not return from this mission. The cause of loss was not known. Extensive investigation of the event was made and no definite conclusions were reached. The Chinese claimed that on that day an F-4 was shot down by friendly forces, but careful investigation of that possibility has been made and this has been ruled out. It is presumed that BLUE 4 was lost either due to fuel exhaustion or hit by a MIG.

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EVENT 1-2 SUMMARY

Note: This reconstruction covers the first element only.

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₀	Alt: 35,000 ft Approx Mach 0.9	Lit AB and headed south B1(L) instructs second element. (See Communications)		B3, 4 reported targets on radar, identified visually as MIGs B1 directed other element to go to AB and obtain separation from MIGs	MIG 4 dropped tanks. All rolled in to attack B3, 4	First element was 50-60 mi N of second element, heard activity on radio and headed S to join engagement
T ₁	Alt: 38,000 ft (B1) Mach 1.2 Alt: 35,000 ft (B2) Mach 1.2 in AB MIGs sighted by B1 and 2		B4 requested clearance to fire on MIGs	B1(L) requested clearance to fire from ship		MIGs approx 30-50 mi away. Could see contrails of both MIGs and F-48s. F48 contrail was considerably darker and heavier than MIGs.
T ₂	Alt: 38,000 ft (B1) Alt: 35,000 ft (B2) Mach 1.3 in AB	B1 gave clearance to fire B2 acquired target on radar, made left turn to obtain collision course with MIGs, started climb		Ship gave clearance to fire	MIGs appeared to turn into first element (B1, 2) MIGs were in westerly heading, wide finger-four formation. One MIG was well below contrail level	
T ₃	Alt: 41,000 ft (B2) Mach 1.3 in AB	B2 fired SPARROW missile				Range - 5 mi, MAP mode, wide display, linear polariz., narrow speed gate, 10 mi range, interlocks in Missile motor did not fire

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EVENT 1-2 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T4	Alt: 40,000 ft (B1) Mach 1.6 in AB Passed under MIGs Position of B2 not known	Turned right to get separation			MIGs turned left. were in widely spread formation	Individual air-planes clearly discernible
T5	Alt: 40,000 ft (B1) Mach 1.1 B2 flying wide wing position	Acquired MIG on bore-sight at 6 mi off to right. At 5 mi obtained radar lock-on (B1)			MIG-17 at 44,000 ft Mach 0.9, not maneuvering. Heading E.	Range - 5 mi radar lock on. switched to MAP mode to obtain autotrack
T6	Alt: 40,000 ft (B1) Mach 1.1 30° right bank	Fired SPARROW at range of 3 mi to target (Nose was pulled to right to center the steering dot)			MIG at 44,000 ft	Had steady steering dot, slightly below optimum, but well within range. Missile fired, trajectory good but did not guide.
T7	Alt: 44,000 ft (B1) Mach 1.2 10° left bank	Switched to HEAT, obtained good tone; fired SIDEWINDER at 1.5-mi range. Target heading ENE			MIG at 44,000 ft	SIDEWINDER picked up guidance
T8	Alt: 44,000 ft (B1) Mach 1.2	Tried to follow MIG but could not turn with him			MIG broke hard left and down	SIDEWINDER could not follow hard left turn and went behind MIG-17
T9	In turn trying to follow MIG (B1)	B1 dropped nose down and broke off, eased off g, accelerated, and departed area S. Came out of AB, orbited. B2 followed B1(L).		Called others to check fuel state	Other element of MIGs dropping behind B1	
While in orbit, B1 and B2 dropped centerline tanks. Called ship, requesting permission to make another attack and to pursue over land if necessary. Got apparently affirmative answer. Element returned N to resume attack. During this time saw other element firing missiles at MIGs in the distance.						

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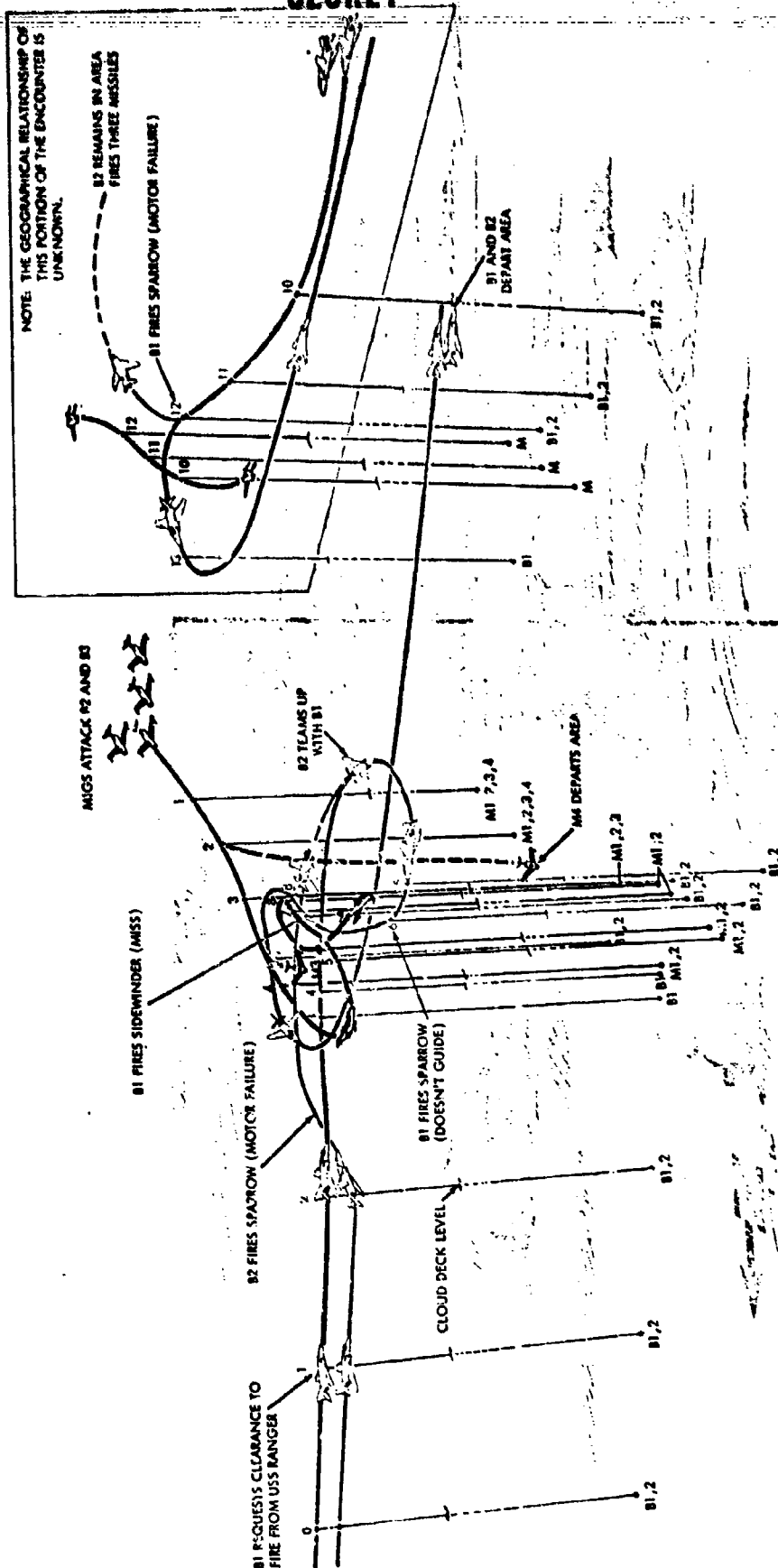
EVENT I-2 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T10	Alt: 40,000 ft (B1) Mach 1.3 Heading 030°, in AB	Boresight acquisition. Initial lock-on at 12 Lock-on was ken. Did not see second element (B3,4)			Three MIGs headed E at altitude of 47,000 ft	
T11	Alt: 40,000 ft Mach 1.3 (B1)	Lock on again at range of 7 mi			MIGs headed E, not maneuvering	
T12	Alt: 43,000 ft Mach 1.3 20° right bank (1.2 g) (B1)	SPARROW fired at range of 3.5 mi				MAP mode, wide display, normal clutter linear polar, narrow speed-gate, interlocks in Missile ejected, but motor did not fire
T13	Fuel was getting low -- not enough for another SIDEWINDER attack (B1)	Broke left and headed south to depart B2 remained in area and continued attack				
B2 fired 3 additional missiles (see narrative for details). There was insufficient information available to reconstruct that part of the engagement.						

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EVENT I-2.



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EVENT 1-3

Aircraft Involved: Two F-4Cs vs eight possible MIGs

Result: No damage

Vicinity of Encounter: 20°26'N/105°33'E
Route Package IV

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 31 May 1965/1505H was TOT; sighting took place after strike aircraft had completed attack.

Two F-4Cs (BLUE 2 and 3) out of a total of eight F-4Cs conducting escort and high cover for a flight of 16 F-105s striking JCS Target 47.11, Hoai An Ammo Depot at 20°25'57"N/105°32'45"E.

11. DATA SOURCES

Messages and Reports:

OPC-4 Wrap-Up ROLLING THUNDER 16 Alpha Three Telecon NR1246 (311439Z May 65)
PACAFCC msg. 311419Z May 65

12. NARRATIVE DESCRIPTION

BLUE flight was from Ubon.

While climbing out from air-to-ground delivery after MIGCAP -- heading 180° at 16,000 ft, BLUE 2 sighted two flights of four suspected MIG-15s or 17s at 7000 to 8000 ft above him. BLUE 2 executed a right 180° climbing turn into the MIGs' 6 o'clock position at 10-mi range. MIGs jettisoned their drop tanks and proceeded north at estimated speed of Mach 0.8. BLUE 2 reached BINGO fuel at this time and was forced to break off pursuit. While climbing off target, BLUE 3 sighted four unidentified aircraft approximately 10,000 ft above him. No chase was attempted because of BINGO fuel state.

The weather was 0.4 to 0.8 cloud cover with bases at 9000 ft and tops at 17,000 ft. Visibility was about eight miles.

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EVENT I-6

Aircraft Involved: Two F-4Bs vs four MIG-17s

Result: No damage

Vicinity of Encounter: 20°20'N/105°20'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 4 Jun 1965/0712H

F-4B aircraft (BLUE flight) were on BARCAP for ROLLING THUNDER armed rescue mission (17C1). CAP was positioned west of normal station to provide measure of protection for rescue operation of downed pilot 11 mi east of Sam Neua.

2. MISSION ROUTE

BLUE flight came from Yankee Station. Route unknown.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2

SPARROWS and SIDEWINDERS

MIG-17 MIG 1, 2, 3, 4

Unguided rockets

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 15,000 ft overcast.

	BLUE	
	1	2
<u>Altitude:</u>	----- 13,000 ft -----	-----
<u>Heading:</u>	----- 120° -----	-----
<u>Speed:</u>	----- Unknown -----	-----
<u>Fuel State:</u>	----- Unknown -----	-----
<u>Flight Formation:</u>	----- Abeam -----	-----

5. INITIAL DETECTION

BLUE flight initially sighted MIGs (MIG 1, 2) 4 mi on the left, heading 250°, in left turn, followed by second section in long trail.

6. ACTION INITIATED

BLUE 1 continued straight ahead and BLUE 2 turned left for the identification run.

7. SITUATION DEVELOPMENT

MIGs 3 and 4 attacked BLUE 2 and fired air-to-air rockets. BLUE 1 then attacked MIGs 3 and 4, obtained radar lock-on at 4 mi, closed to 2-1/2 mi, however the SPARROW missile would not fire. BLUE 1 continued from 60° angle off toward the trail position and attempted a SIDEWINDER attack. MIGs 1 and 2 attacked BLUE 1 and fired two salvos of 6-10 unguided rockets. BLUE 1 broke off the attack and took evasive action. BLUE 2 was never in position to fire.

8. ORDNANCE

BLUE 1, 2 - None expended (B-1 attempted to fire AIM-7 but no missile select light)

MIG 1, 2, 3, 4 - Three salvos of unguided rockets (no hits)

9. EQUIPMENT PROBLEMS

BLUE 1 could not fire missiles due to missile malfunction. The missiles had checked out properly on deck and system was in standby, but the light did not come on when switched to ready. After recovery, the right missile would not check out, and the left missile was slow to tune. Aircraft system checks were good. If the AN/APA 157 had been "ON" instead of in "Standby," the pilot would have known he had a bad missile and the left missile should have tuned and been ready for firing.

10. AIRCREW COMMENTS

Not interviewed

11. DATA SOURCES

Messages, Reports: CTG77.6 040446Z June 65
CTG77.6 041255Z June 65

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12. NARRATIVE DESCRIPTION

EVENT 1-4

BLUE 1 and 2 were in abeam formation at 13,000 ft, heading 120°, airspeed unknown, and sighted four MIG-17s (two leading, two trailing farther back (distance unknown)) in a left turn heading 250°, altitude unknown. The MIGs appeared to be under GCI control. BLUE 1 continued straight ahead, and BLUE 2 turned left to make an identification run on the MIGs (1 and 2). MIGs 3 and 4 fired unguided rockets at BLUE 2 and missed. BLUE 1 turned left behind MIGs 3 and 4, obtained radar lock at 4 mi, and attempted to fire a SPARROW from 2-1/2 mi. There was no missile select light and the pilot could not fire. The missile system had been in standby, and when switched to ready, the light would not come on thus indicating a malfunction. BLUE 1 continued through 60° angle off toward trailing position to make a SIDEWINDER attack on MIGs 3 and 4. He was then attacked by MIGs 1 and 2 firing two salvos of 6-10 unguided rockets at BLUE 1 which missed. MIGs 1 and 2 had pulled up into a 15,000 ft overcast and commenced their attack from above, apparently GCI directed. BLUE 1 broke off attack on MIGs 3 and 4 and took evasive action. BLUE 2 made an identification pass but was never in position to fire. The engagement lasted 3-4 minutes.

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EVENT 1-5

Aircraft Involved: Two F-4Bs vs four MIG-17s

Result: Two MIG-17s destroyed

Vicinity of Encounter: 20°08'N/105°15'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 17 Jun 1965/1030H

Six F-4B aircraft (BLUE flight) in three elements were on BARCAP for two strike groups attacking the Thanh Hoa bridge and the Ninh Binh barracks. The F-4s were in the last orbit after 30 min on station as the last strike group was just completing its attack. The three elements were separated.

2. MISSION ROUTE

Departed YANKEE Station and after refuel from A-3B tankers proceeded to CAP station located about 30 mi NW to Thanh Hoa. The sections were to patrol on a line running from 20°08'N/105°45'E to 20°55'N/105°25'E.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2

3 - SPARROW (AIM-7D)
2 - SIDEWINDER (AIM-9B)
600-gal centerline tank
IFF not on
Grey and white paint

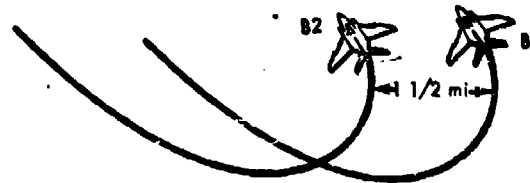
MIG-17 MIG 1, 2, 3, 4

2 wing tanks
No missiles
Wing markings
Silver

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Ceiling (0.8 to 0.9 cover) at 17,000 ft with tops below 30,000 ft. Visibility unlimited.

	BLUE
<u>Altitude:</u>	10,000-11,000 ft
<u>Heading:</u>	310°, just turning NW
<u>Speed:</u>	375 to 400-kt CAS
<u>Fuel State:</u>	7000 lb
<u>Flight Formation:</u>	Other two sections of 2 aircraft each were stationed to east of position of BLUE 1 and 2.



5. INITIAL DETECTION

Contacts detected at 30 to 35 mi on radar, closed at high speed to visually acquire four bogeys on heading of 200°, 5 mi at 15,000-ft altitude. BLUE flight heading 280° at visual contact.

6. ACTION INITIATED

At radar sighting, an intercept course was established and speed increased. At visual sighting, course held to intercept range.

7. SITUATION DEVELOPMENT

On visually acquiring MIGs, BLUE flight continued intercept course, and each aircraft fired a SPARROW when the MIGs turned into the flight. BLUE 1 fired at MIG 2 and BLUE 2 fired at MIG 3, both BLUE aircraft scored hits.

BLUE flight then climbed to 30,000 ft above overcast to gain separation. BLUE flight then turned left and descended to scene of engagement but could not reacquire other MIGs.

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8. ORDNANCE

EVENT 1-5

(No. fired/No. hits)

SPARROW
AIM-7D

Remarks

BLUE 1	1/1	Fired at 2 to 3-mi range, almost head on.
BLUE 2	1/1	Fired at max range.
MIGs		None observed.

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	4000	400	30	Sixty combat missions in A-1 in Korea and two SPARROW firings.

Not available for other crew members

Comments on this Encounter

BLUE 1

Switchology is a concern in getting SPARROW ready. Normal procedure is to tune SPARROW and put it in "standby." When ready to fire, two switches have to be thrown (CW and ARM) with a short interval between each operations. More automatic switching is desirable in times of high stress.

The F-4s had a centerline tank. When they made radar contact, they boosted up to about 550 kt to investigate and this is above the speed at which one can safely jettison the centerline tank. One cannot afford to jettison tanks every time there is a radar contact, because such contacts are frequent and have to be investigated. This event took place with the centerline tanks still in place. This should be considered in designing systems to strip cleaner for an encounter.

Frequent nonenemy contacts were made on such missions, and aircraft lacked a good identification capability. They cannot identify at long enough range. A positive means of identification is required; the intercept with the EF-10 BRAVOS in the last stages of this event points this out very clearly.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front), 7 Dec 66; BLUE 1 (Back), 2 Nov 66; Letter from BLUE 2 (Front), 20 Mar 67.

Messages, Reports:

Air-to-Air Missile System Flight Report for BLUE 1 and BLUE 2.

CTF 77, Msg 181518Z June 1965

CTG 77.6, OPREP-5 170359Z June 1965

CTG 77.6, Msg 172026Z June 1965

12. NARRATIVE DESCRIPTION

Replacement Air Group (RAG) trained the squadron principally for night intercepts. Because of visual identification requirements, they developed "ident-SPARROW" tactics after deploying whereby the head aircraft made identification (and fired, if not outside parameters) while the second aircraft was the primary firing aircraft. After a head-on pass, the element was to continue, climbing for about 5-mi separation and turning back into MIGs. This tactic was developed because of the concern for the MIGs better turning capability.

This mission was briefed to protect two strike groups that were to hit the Thanh Hoa bridge and the Ninh Binh barracks. They departed the carrier, refueled at 20,000 ft, and proceeded to station at 35,000 ft. There were six F-4 aircraft involved. They broke up into three sections of two each. Two aircraft orbited north of Thanh Hoa, two east of Ninh Binh, and two NW of Thanh Hoa. The two NW of Thanh Hoa are the subject of this event.

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EVENT 1-5

At about 1025H after being on station at 10,000 to 11,000 ft in a counter-clockwise, NW-SE orientation, race-track pattern in line abreast, 1-1/4 to 1-1/2 mi apart, for approximately 30 min, BLUE 1 switched to strike frequency to check when the strike would be completed. One strike group reported that they had finished and another strike group said that they would be finished in 5 min. Lead then went back to the BARCAP frequency, told the flight that they would make one more turn and depart the area at 1035H.

At approximately 1030H with both aircraft flying at approximately 10,000 to 11,000 ft in a race-track pattern with radar on 50-mi scale, just as they turned to the NW, BLUE 1 picked up a radar contact about 30-35 mi, which was interpreted to be coming from the vicinity of Hanoi or just to the west of it. They went into an "ident-attack" formation. The wingman went in a 3-mi trail and the element headed directly for the contact. During the run-in toward the contact, they noted drift on the radar scope and established from that, that the unknowns were on somewhat of a southerly to southwesterly heading. They turned from a heading of about 330° to a heading of about 280° to effect an intercept. (RIO thought intercept course 310°, turning to 280° prior to firing.) The element accelerated to about 550 kt. They climbed slightly to 14,000 ft and spotted the contacts visually at about 5 mi (four airplanes) 15° to the right. Both RIOs had determined that there were four contacts, and they had determined that they were not locking up on the same airplane. BLUE 1 was locked on the MIG 2 contact and BLUE 2 was locked up on either MIG 3 or MIG 4. The bogeys were cutting across the F-4B's nose at almost a 90° angle, just slightly above at 15,000 ft, just under the overcast; MIG 2 was flying in trail of MIG 1 at about 1500 to 2000 ft. MIG 3 and MIG 4 were in a good section formation in the neighborhood of another 2000 to 3000 ft behind MIG 2. At almost the same time that BLUE 1 spotted them, they either spotted the F-4s or got a vector in their direction. MIG 1 turned, came directly towards BLUE 1. BLUE 1 could tell that they were "small silver airplanes," but no positive identification was made at this time. MIG 2, instead of cutting across the corner to join his leader to close the gap, flew the same track over the ground that his leader did. By the time he turned the corner, banked up in a steep bank turning toward his leader, the lead F-4 was close enough to make a positive ID on him. He shouted "MIGs;" BLUE 1 RIO reported "...we are in range. Fire. Fire. Fire." The steering dot was just slightly out of the circle. Lead made a slight turn and fired Station 8, right-wing SPARROW at about 2-mi range (RIO reported firing at 3.5 mi). It appeared that the SPARROW went off about 10 ft behind the MIG 2 tail. (About this same time, MIG 2 rolled up on his wing and was a mass of flames. Smoke started pouring from the center of the aircraft on aft, and "the whole thing was a sheet of flame." The F-4 wingman saw this also. In the meantime, the second section of MIGs had tended to cut across the corner of this turn and close on MIG 1. The F-4 wingman fired at MIG 3 and his missile hit when MIG 3 was directly above BLUE 1 and MIG 1 (which passed about 500 ft to the left, canopy-to-canopy, of BLUE 1). Neither BLUE 1 nor the pilot of BLUE 2 saw MIG 3 get hit; both were engrossed in the maneuvers of MIG 1. BLUE 2 RIO observed his missile hit a MIG and explode. The MIGs did not appear to fire at any time.

The F-4s commenced a separation maneuver in AB, flew into the clouds, lost sight of the MIGs, completed the separation maneuver, turned to the left at 30,000 ft and came back out of AB; no radar contacts and no visual sightings were made. They could see the vapor trails from a SPARROW missile. It was obvious that they returned to the same area, but made no sightings or radar contacts. While attempting to reacquire the MIGs, radar contacts were detected to the SE. The F-4s thought it logical for the MIGs to head that way, toward the strike force. BLUE flight headed toward the contacts and identified them as friendly EF-10Bs. BLUE then returned to the firing area. They searched the area and sighted one parachute about 2000 ft off the ground. They were extremely low on fuel and departed the area. BINGO fuel was 5800 lb and the initial contact had been made at 7000 lb.

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EVENT 1-5 SUMMARY

Time Mark	Action Aircraft (BLUE 1)		Other Friendlies	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₀	B1 coming left counterclockwise to NW orbit, 375 to 400-kt IAS, ft. Configuration: centerline tank 3 SPARROW 2 SIDEWINDER		B2 slipping back to line abreast at 1-1/4 mi as section approached NW leg.	Checked with progress of strike and shifted back to CAP frequency		BARCAP to NW of target. Radar on 50-mi scale. Missiles turned and CW on.
T ₁ (about 1032)	B1 made radar contact about 340° True at 30-35 mi as he came out of turn.	B1 accelerated to 550-kt IAS and proceeded on heading of about 330° climbing to 14,000 ft to investigate	B2 slipped into 2-mi trail. B2 obtained radar contact at about 25 mi.	Lead directed: "ARM; fuel transfer switches on."	Heading S to SW at 400 to 450-kt IAS.	Attempting to establish drift.
T ₂ (about 1034)	Contacts drifted left. Intercept course of 280°, section at 550-kt IAS and 14,000 ft.	Changed course to 280° True.		Backs of B1 & 2 agreed that contacts were multiple bo-geys, agreed to different "lock-ons." B1 took M1; B2 took M3.	Continued straight and level at about 15,000 ft.	
T ₃ (about 1035)	Sighted contacts visually about 15° to starboard, 5 mi.		Both aircraft were locked on.		Four silver aircraft in two sections turned left into F-4s. M2 followed path of M1. M3 & 4 cut inside of turn to close on leader.	

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EVENT I-5 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1)		Other Friendlies BLUE 2	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₄ (about 1035v)	B1 identified second aircraft as it presented plan view in turn as MIG-17 about 3-mi range.	B1 called "MIGs." B1 may have changed course slightly (up to 10°) but basically was flying straight and level; dot was in circle but out of center.		Lead RIO reported "... we're in range. Fire...."	Lead MIG approached head on.	
T ₅ (about 1036)	Jockeying slightly to get dot in center	B1 fired one SPARROW at M2 at 2-3 mi; went to AB after firing and commenced climb to 30,000 ft	B2 fired at M3; firing at maximum range with interlocks completing the firing circuit. After firing and seeing his SPARROW leave rail, B2 saw M2 burst into flames from B1 missile.		M1 passed 500 ft on left on opposite heading to B1. M1 passed 100 yd abeam B2.	SPARROW appeared to explode 10 ft aft of M2. B2 saw M2 brought down, but didn't see his own hit because of concern for M1. RIO of B2 saw their missile impact and M2 explode.
T ₆ (about 1037)	B1&2 in AB climbing to 30,000 ft on a heading of about 280°	On reaching about 5-mi separation, B1&2 turned to port and descended back through clouds, dropping out of AB - looking for remaining two MIGs.		B1 RIO had called for turn to right because MIGs last seen on stbd quarter.	M2 rolled in a sheet of flame from center fuselage aft and went out of control M3 exploded.	F-4s returned to scene of engagement (could still see smoke trail of SPARROW) but could not detect MIGs.

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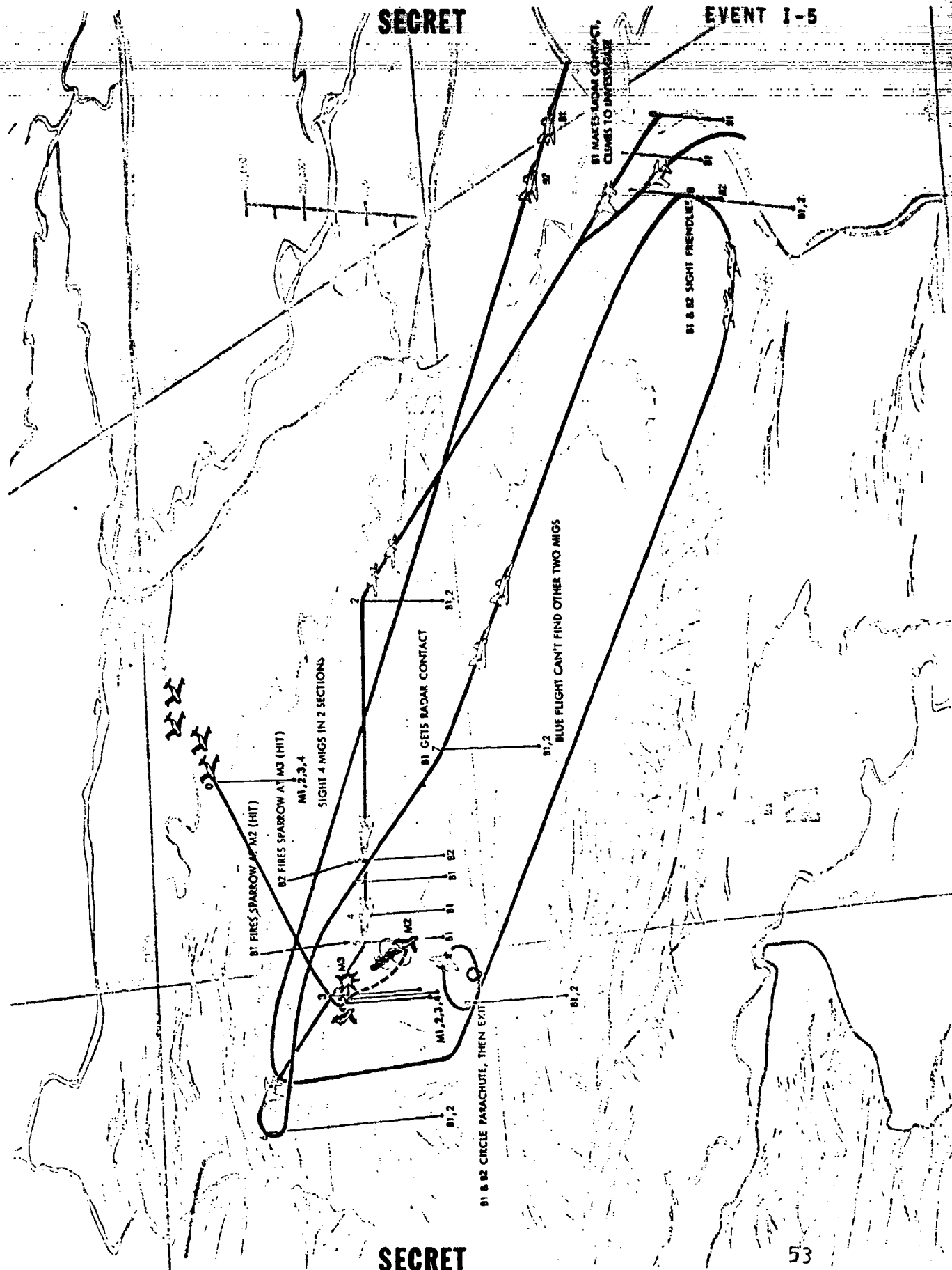
EVENT I-5 SUMMARY (Continued)

Mark Time	Action Aircraft (BLUE 1)		Other Friendlies BLUE 2	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T7 (about 1038)	B1 heading to SE searching for MIGs, got radar contact toward strike group and investigated	B1 prepared to engage radar contacts	B2 returned to ident-trail formation.			
T8 (about 1040)	B1 maneuvering to visually identify radar contacts and be ready to fire	B1&2 sighted EF-108s which were providing active ECM support for strike group	B2 in trail			Turned back to NW to search area of engagement for remaining MIGs.
T9 (about 1043)	B1 searching for remaining MIGs, sighted parachute about 2000 ft from ground and watched it descend to ground	B1 departed area, low on fuel after parachute landed and MIGs not located during search.	B2 continued in trail.			

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EVENT 1-5



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EVENT 1-6

Aircraft Involved: Four F-4Cs vs two MIG-17s

Result: Two MIG-17s destroyed

Vicinity of Encounter: 21°17'N/105°18'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 10 Jul 1965/1659H

A flight of F-4C (BLUE flight) aircraft was to follow a force of F-105s striking the Yen Bai ordnance and ammunition depot and provide MIGCAP.

2. MISSION ROUTE

Take-off from Ubon, refueled at approximately 18°00'N/104°00'E and proceeded to just south of the target 21°40'N/104°50'E, turned east and established an orbit 25 mi east of the target.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7)

4 - SIDEWINDER (AIM-9B) on inboard pylons

2 - 370-gal tanks on outboard pylons

Radar on; TACAN and IFF off

Painted light grey on upper surfaces, white underneath

MIG-17 MIG 1, 2

Silver with North Vietnamese markings

Red stripes on the wings

Two external fuel tanks per aircraft

No missiles observed

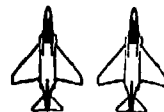
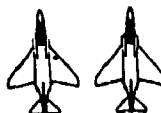
No afterburner operation observed

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered cumulus with bottoms at 8000-10,000 ft, tops about 14,000 ft. To the northwest of the target there were thunderstorms, buildups with tops at 28,000-30,000 ft. The action of the engagement took place mostly in clear areas.

BLUE
1 2 3 4

Altitude: -----22,000 ft-----
Heading: --Turning through E---
Speed: -----Mach 0.92-----
Fuel State: About 8000-8500 lb, near BINGO
Flight Formation: (Fluid-four)



REAR
ELEMENT
LOWER

5. INITIAL DETECTION

The MIGs were initially detected on radar at about 33-mi range, dead ahead. Visual contact was made head-on at 10 mi by BLUE 1 (Back). The MIGs' track was displaced about 1/2 mi to the left and at the same altitude as BLUE flight. Due to the element separation, BLUE 1 and 2 saw the MIGs before the following element (BLUE 3 and 4). In the lead element BLUE 2 identified the MIGs first, In the second element BLUE 3 sighted the MIGs first.

6. ACTION INITIATED

At radar contact it was decided to go to an identification formation called the loose-deuce, with the lead element (composed of BLUE 1 and 2) making the identification pass. Due to fuel considerations, the lead element did not accelerate in afterburner, and insufficient separation was achieved at identification.

7. SITUATION DEVELOPMENT

As enemy and friendly flights passed, each turned into the other, but due to separation of the elements of the BLUE flight, the MIGs ended up attacking BLUE 3 and 4, firing cannon at a high angle off. During the turn into the MIGs the two elements of the flight became separated, and after the MIGs attacked. BLUE 3 and 4 split.

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SITUATION DEVELOPMENT (Continued)

EVENT 1-6

BLUE 4 unloaded g's and after accelerating to supersonic speed, executed a steep zoom-climb. A wing-over and a 180° turn at the top enabled him to get on the tail of the MIG who could not follow the maneuver. BLUE 4 then fired four SIDEWINDERS, resulting in a kill.

BLUE 3 attempted to gain separation through a scissors maneuver but was unable to gain an advantage. However, through acceleration separation was achieved and on reattack BLUE 3 was able to force the MIG to overshoot. BLUE 3 fired four SIDEWINDERS resulting in a kill. Time lapse from first radar sighting to the time BLUE flight was headed home was less than 4 minutes. The engagement of BLUE 3 from the initial turn to the firing of his last missile was about 1-1/2 minutes. The engagement of BLUE 4 from the split until the last missile was fired was judged to be "1-1/2 minutes at the most."

8. ORDNANCE

(No. fired/No. hits)

	<u>SIDEWINDER</u> <u>AIM-9B</u>	<u>CANNON</u>	<u>Remarks</u>
BLUE 1, 2	No firing.	✓	
BLUE 3	4/2		Fired No. 1--no tone; No. 2 and 3 exploded to the right of the MIG; No. 4--unknown.
BLUE 4	4/2		No. 1 and 3 detonated near MIG; No. 2 and 4 fired in haste.
MIG 1		1/0	Fired on BLUE 3 and 4 on initial break and on BLUE 3 in scissors maneuver.
MIG 2		1/0	Fired at BLUE 3 and 4 on initial break.

9. EQUIPMENT PROBLEMS

BLUE 2 - Radar was not operating at peak performance.

BLUE 3 - Radar became inoperative during the high-g scissors maneuver.

BLUE 4 - Intercom between cockpits went out during the engagement. Could only operate radar on emergency and, therefore, was not searching. No automatic lock-on could be established. The radar later failed.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	2500	250	Unknown	Had not completed checkout until Ubor.
<u>BLUE 2</u>				
Front	1000	250	75	TAC background.
Back	700	400	60	Had only observed one SIDEWINDER firing.
<u>BLUE 3</u>				
Front	2600	250	60	Little ACM. Fired only one SIDEWINDER.
<u>BLUE 4</u>				
Front	2700	200	50	Never fired a SPARROW or SIDEWINDER; air-to-air experience.
Back	2000	350	50	Had never fired a SPARROW. ADC experience with GENIE firing.

Comments on this Encounter

BLUE 1 (Front) - Expressed desire for a fighter with maneuverability and some advantage that can be exploited. Some optical aid should be available for visual JD. Ash tray would be desirable in F-4. Seat restraint harness is too restrictive for good visibility. Canopy distorts view in some areas. Heads-up display to give range to target would be helpful. Had trouble with SIDEWINDER due to head pitting. Believed caused on takeoff when AB kicked up debris.

BLUE 2 (Front) - Expressed desire for a tail warning radar. Needs missile with less minimum range. Backseat is helpful for radar observation.

BLUE 2 (Back) - Feels that MIGs were GCI'd since they made 180° turns away from them and into them.

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Comments on this Encounter (Continued)

EVENT 1-6

BLUE 3 (Front) - Gun not necessary; it will get people into trouble. Would like capability to fire all missiles on F-4 with centerline tank on. Less minimum range for missiles instead of guns. Front cockpit means of going to boresight on F-4. Command destruct on SIDEWINDER in case it locks on friendly. Had intercepted Navy aircraft many times that he did not know were in the area. Because of lack of ACT at time of event, did not know how to maneuver the F-4 as well as he could later after some experience.

BLUE 4 (Front) - Felt that all the requirements demanded of pilots flying multi-mission aircraft meant that some aspects (e.g., ACM) would not receive sufficient training.

BLUE 4 (Back) - Expressed desire for better visibility at 6 o'clock. Could not see MIG when they pushed the nose over. Would like internal gun. Ran a lot of intercepts on Navy aircraft and first thought the bogey picked up was Navy. Likes two-man crew but wants an RIO for the second crew. Second crew needed as specialist to operate the equipment, particularly in degraded environment.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front), 13 Jan 1967; BLUE 2 (Front), 9 Jan 1967; BLUE 2 (Back), 7 Mar 1967; BLUE 3 (Front), 9 Jan 1967; BLUE 4 (Front), 16 Mar 1967; BLUE 4 (Back), 9 Mar 1967.

Messages, Reports:

2AD, 101509Z July 65, 2DOTO 03538
2AD, 101159Z July 65, 2DOTO 03532
CINCPACAF 110101Z July 65, DO 31195
PACAF Tactics & Techniques Bulletin No. 25, 27 Sep 65
USAF Fighter Weapons School CAD Bulletin No. 10, 7 Feb 67
CINCPACFLT Staff Study 11-66

12. NARRATIVE DESCRIPTION

As bombing action was initiated in the northernmost part of Vietnam in the summer of 1965, particularly north of Hanoi, a certain pattern of enemy air activity was noted. As the bombing flights continued to follow a pattern, the enemy actions also assumed a pattern.

The pattern was evident in the MIG warnings which were broadcast by the BIG EYE support aircraft. The MIG warnings at this time were of two types: Yellow warning signified the MIGs were airborne, and red warning signified the MIGs were about 10 min away from a possible engagement. The following events developed the pattern of interest. As the first strike entered the area, the first warning was "yellow," followed by "red"; however, shortly afterward the red warning was changed to yellow. As the last flight departed the area after the strike, the red warning would be called, and the MIGs would follow the flight out of the area. Unaccountably, the MIGs did not attack.

The timing of the second red warning was such that the escort had only minimum fuel remaining. Information would be received that MIGs were coming up from Phuc Yen, and it was suspected that the MIGs could determine from their GCI, when the escorts would return to base. Consequently, the only possible action on the part of the escorts, which were low on fuel was at most one fast intercept or attempted intercept.

The pattern was noted by the strike force pilots. A recommendation was made to Seventh Air Force to take advantage of the fact that the MIGs always retreated when the attack force came into the area and then attempted attacks on the last flights. On 10 July, the morning strike flights again observed this pattern of MIG activity. As a result, the afternoon flight was briefed that a plan to engage the harassing MIGs would be put into effect. BLUE flight was instructed to change the takeoff time for this particular flight, 20 min later than the normal strike flights. The escort would then follow the last F-105 flight and arrive approximately 15 min after the normal F-4 flight.

A tactic was designed to give the F-4 flight the appearance of the last F-105 flight on target. They would actually meet the last strike flights and press on to the north, on a search-type mission. Radio silence was to be maintained, and the speeds and altitude flown on the way into the orbit area would also give the appearance of an F-105 flight. From the planned holding orbit the F-4s would be in a position to attack any MIGs attempting to attack the withdrawing strike flights.

Action Prior to Engagement

BLUE flight consisted of four F-4C aircraft. Each aircraft was armed with four SPARROW (probably AIM-7D) missiles and four SIDEWINDER missiles -- two each on each of the inboard wing pylons. The outboard wing pylons carried the 370-gal fuel tank. No centerline tank was carried since there were only a few in the theater at that time. The aircraft were not camouflaged, but painted light grey on the upper surfaces and white on the lower surfaces.

More than the normal ground checks were performed for this mission. During climb-out, SPARROW missile tuning was accomplished. The SIDEWINDER was checked on the ground to see if its head would track a flashlight, and in the air by sighting another aircraft to assure that a tone developed. The SPARROW missile tuning was accomplished every 15 min. If one would not tune immediately, the pilot was instructed to leave it on. This procedure insured that the SPARROWS were immediately available despite wear on the radar.

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-6

As planned, BLUE flight maintained radio silence from Ubon to the refueling point. The rendezvous, refueling, and subsequent departure from the tankers with full tanks was accomplished in complete radio silence. The tankers had been briefed on this special mission, and no radio contact was attempted. The refueling point as noted on the map (Figure 1) was not the one that was later chosen for communication. BLUE flight was assigned a radio frequency different from that of the strike flights, although the strike frequency was monitored.

Formation and Radar Search

The flight refueled at 28,000 ft (MSL) and 310-kt CAS and proceeded north at Mach 0.85 and about 20,000-ft altitude which approximated that of the F-105 strike aircraft. The track was toward the target, and the flight was spread in a fluid-four formation -- BLUE 1 and 2 on the left, BLUE 3 and 4 on the right roughly 2000 ft apart and the element spread approximately 5000 ft. This formation was selected to obtain more coverage to the rear of the F-4. The second element (BLUE 3 and 4) provided cover by weaving behind the Lead. The radar coverage was assigned to BLUE 1 and 3 (the element leaders); one searched high and the other searched low. BLUE 2 and 4 were assigned the responsibility for visual search. If a target appeared it would be called out until Lead (BLUE 1) locked on. After lock-on the flight would resume its assigned sweep modes.

En route to the orbit area the radar was set on a range scale of 100 mi. In the area, each aircraft was assigned quadrants for search with the Front scanning the sky visually, and the Back responsible for the radar contacts. The track to the orbit area was in the direction of the target. As a result, the aircraft searched ahead and to the side as they orbited, expecting the MIG threat in the area indicated in Figure 1.

During the orbit, BLUE 4's radar was not operating properly. Although the radar checked at take-off, after reaching altitude, loss of pressurization in the wave guide caused the radar malfunction. The radar could be operated in emergency mode but due to other failures the automatic lock-on feature did not function. Consequently, all operation of BLUE 4's radar was manual and was not operated unless other flight members reported a contact.

BLUE flight was far enough behind the preceding flight of F-105s to be out of radar range. The IFF was switched off during this mission, and the flight employed the inertial system for navigation.

Just south of the target, the flight turned east. To minimize detection the turn was executed by a single radio command.

In addition to the F-105 strike aircraft, two other CAP flights of F-4s and a few B-66 aircraft were in the area. An EC-121 BIG EYE aircraft was stationed over the Gulf of Tonkin. The flight did not recall receiving any warning or other information from the BIG EYE aircraft. (Note: This disagrees with CINCPACFLT 110101Z July 65 which states that "...MIGCAP which subsequently destroyed two MIG-17s reports receipt of BIG EYE warning.") The BIG EYE aircraft later reported that it had identified six or eight MIGs airborne during the engagement.

During the flight to the orbit area and during the time spent in clockwise NE/SW orbit, BLUE flight investigated several radar contacts. The contacts proved to be either friendly aircraft or radar lock-on to ground clutter. The orbit altitude was 22,000 ft since SAMs were not considered a threat at that time. The orbit altitude was slightly lower than normal (30,000-38,000 ft) to simulate an F-105 flight.

When almost to BINGO fuel levels for normal return (which was about 8000 lb in this area), it was decided to make one more pass to the N, from which the threat was expected.

Action at MIG Detection

After just completing the turn at the southern end of the orbit, BLUE 1 picked up a radar contact at 33 mi (one other flight member quoted 45 mi). Shortly afterward, BLUE 3 also locked on. BLUE 1 instructed the flight to assume the loose-deuce formation. The element composed of BLUE 1 and 2 was to make the identification by accelerating ahead of BLUE 3 and 4. The ideal separation was from 7-10 mi to permit the lead element to break away after identification and permit the second element to fire SPARROW missiles.

Due to the fuel state, which was about 7000-8000 lb at this time the lead element chose not to use afterburner and accelerated in military power. The absolute BINGO fuel levels for the area of operation were 6500 lb to engage in combat and 3500 lb to reach home. In order to enter the engagement at a reasonably high airspeed and prevent losing radar contact, the second element (BLUE 3 and 4) flew an S-pattern to gain separation for the identification. The result of these conflicting requirements was that when the MIGs were visually contacted, the elements were separated by only 2-3 mi instead of 7-10 mi desired. As a result a SPARROW shot could not be safely attempted by the second element.

When BLUE flight prepared for the ID, BLUE 1 had no confirmation that the other flight members had acquired the target. Actually, they had. The lack of communication resulted from a continuing attempt to minimize radio transmissions to conceal the presence of the aircraft. At initial contact by BLUE 1, one bogey was noted. It tracked down the scope and then turned 180° and went away from BLUE flight. After following the radar contact for awhile, it was realized that there was an overtake velocity of about 200 kt.

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-6

The flight continued to follow the target, until it was clear the target would reach China before an intercept could be accomplished. A right turn toward home was initiated when the overtake velocity changed to 900 kt. The flight immediately returned to an intercept course. Due to the high overtake velocity, the MIGs were visually sighted a short time thereafter.

T₀ - Only two MIGs were seen slightly high and to the left.

T₁ - BLUE 2 (Front) identified the MIGs first; they were difficult to identify and were not smoking. Positive identification was not made until the MIGs were at 90°N beam (9 o'clock).

The MIGs started to turn after the lead element but rolled out and continued to turn after the second element. The two MIGs were in close formation, not in fighting position.

T₂ - BLUE 1 and 2 turned left into the MIGs. During ID BLUE 1 led the first element only while BLUE 3 was in control of the second element. BLUE 1 and 2 jettisoned tanks, lit AB, and in the turn observed the MIGs turning behind BLUE 3 and 4 and jettisoning their tanks. (BLUE 1 mistakenly assumed the tanks were missiles.)

T₃ - BLUE 1 and 2 initially started to turn left, but BLUE 1 unloaded and accelerated while BLUE 2 started a climbing turn which split the element.

T₄ - After accelerating, BLUE 1 climbed to 24,000 ft and orbited the area. During this orbit the other members of the flight were contacted and their actions were monitored.

T_{5,6} - BLUE 1 called for a "join up" south of the river at the termination of the engagement.

T₄ - BLUE 2 started a climbing left-hand turn and jettisoned tanks when the Back reported that the MIGs had done likewise. BLUE 2 continued looking for two other MIGs since they had been briefed to look for MIGs in groups of four, but none were ever seen. During the turn the MIGs were lost from view.

T₅ - At the top of the climb to 35,000 ft BLUE 2 observed BLUE 4's attack and subsequent hit on a MIG.

T₆ - BLUE 2 flew toward BLUE 4, but the action was completed before BLUE 2 had joined.

T₂ - BLUE 3 and 4 heard BLUE 2 call identifying the bogeys as MIGs and lit afterburners at ID. As the MIGs passed BLUE 3 and 4, the MIGs dropped their tanks, and (T₃) BLUE 3 and 4 did likewise, (T₄) breaking into the MIGs. The MIGs then turned very tightly behind BLUE 3 and 4, firing. Both BLUE 3 and 4 saw the firing, but BLUE 3 did not notice any tracers, just "the nose of the MIG lighted up" by muzzle flashes. The MIGs were not tracking, and although the MIGs initially out-turned BLUE 3 and 4, the F-4s accelerated during the turn which permitted BLUE 3 and 4 to gain separation.

BLUE 4 was initially flying a fighting wing position with BLUE 3, at 200 ft out and 200-300 ft behind. Because he felt that BLUE 3 had sufficient lookout protection (i.e., from BLUE 3, Back), BLUE 4 broke right during the turn in an attempt to either "sandwich or split" the MIGs.

The MIGs split, one following BLUE 3 and the other following BLUE 4.

T₅ - After the MIGs split, BLUE 3 executed several reverses, the MIG slid by behind in an overshoot and BLUE 3 again reversed. During these maneuvers BLUE 3 felt that the MIG had an airspeed advantage, hence BLUE 3 did not unload the aircraft and attempt to disengage.

During the scissors maneuvers BLUE 3's radar went out. When the MIG overshoot, BLUE 3 decided to gain separation.

T₆ - BLUE 3 executed a roll right and went into a 30° dive. The MIG tried to follow ending up at 7 o'clock, three-fourths of a mile away. This was followed by a slight left turn resulting in a 5-mi separation. During this period, Back proved extremely helpful to Front by keeping him informed of the enemy positions.

T₇ - After gaining the separation BLUE 3 started a hard left turn into the MIG, attacking in almost a head-on position. The Back, aware that the radar was out, told the Front to "Go HEAT." The Front interpreted this as a problem in acquiring the MIG, and replied, "Go boresight." During the subsequent communications resulting from the misunderstanding (T₈) the MIG passed head-on, very close and firing but scored no hits.

After the aircraft had passed, BLUE 3 made a slight left turn to keep the MIG in sight and then made a very steep (about 60°) dive to 10,000 ft. The afterburner had been turned on in the initial break and was still operating so that the speed increased to Mach 1.3.

T₉ - BLUE 3 then initiated a high-g barrel roll with the MIG behind at approximately 1 mi. After reaching the 270° position, (T₁₀) the MIG opened fire from 7 o'clock at 1/2-mi range; however, the firing range was excessive and no hits were scored. As BLUE 3 dished back (emerged from the maneuver), the MIG overshoot. The MIG changed his attitude to pull up but could not change the direction in which the aircraft was moving due to a stall.

After the MIG overshoot, he started to turn, then leveled and descended toward a cloud.

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-6

T₁₁ - BLUE 3 was now at about 13,000-15,000 ft, Mach 0.9-0.95, with the MIG ahead. BLUE 3 fired a SIDEWINDER at 1-1/4-mi range, without tone. This first missile went unobserved. Shortly thereafter, BLUE 3 fired a second SIDEWINDER which produced a large fireball at, or just to the right of, the tail cone. A third missile was fired and detonated slightly to the right of the MIG. A fourth missile was fired but was unobserved. Following the first missile, the next three were fired within a period of 10 sec, all with a good tone. BLUE 3 did not see the MIG blow up, just the fireball entering the cloud.

T₁₂ - After the fourth missile was fired, BLUE 3 broke left with the intent of heading to Udorn as fuel level had reached 3000 lb.

T₅ - BLUE 4, after breaking right, started a dive from 20,000 ft in afterburner and unloaded the aircraft. BLUE 4 accelerated to about Mach 1.4 at 12,000 ft (T₆) and started a 4-7 pull-up. The MIG had lost ground, but continued to follow BLUE 4. During the pull-up, BLUE 4 lost sight of the MIG. He climbed to 33,000 ft (T₇) and came back over the top, inverted in a "sort of Immelmann" to rejoin the engagement. At this time the radar was completely inoperative.

On rolling out at the top of the climb, BLUE 4 observed the MIG at about 28,000 or 29,000 ft falling off on the left wing in a 090° bank, doing a vertical recovery. The MIG smoothly pulled out in a 020° bank, descending slightly, to the left. The MIG at this time was 4000-5000 ft in front of BLUE 4, as BLUE 4 came out of afterburner.

BLUE 4 felt that the MIG must have started to climb at the same time as BLUE 4's climb was initiated, and lost sight of BLUE 4 during the ensuing climb.

T₈ - The fall-off to the left and the turn gave BLUE 4 an excellent firing position. BLUE 4 came out of afterburner, completed the Immelmann, made a slight turn to the left, fired the first SIDEWINDER. At the time BLUE 4 was straight and level with a slight descent (15° nose down) closing on the MIG. The first missile, fired with tone, did not contact the MIG. It went by the tail pipe and then detonated off to the left about 4-6 ft from the left wing tip. On detonation, the MIG rocked the wings six to seven times rapidly and at low amplitude. A second SIDEWINDER was fired rapidly without tone.

The MIG was still flying and continued to roll slowly to the left in a left bank. BLUE 4 then established a tone with the third SIDEWINDER and fired. The missile tracked well and exploded short of the tail pipe but in line with it. The fireball expanded until only the wing tips were seen. No debris was seen leaving the aircraft at any time during the encounter, but when the fireball subsided, the MIG started to emit dense white smoke from the tailpipe. Before the explosion of the third missile, BLUE 4 saw fire in the MIG tailpipe but could not ascertain if it was afterburner operation or not.

During the firing BLUE 4 continued to descend with the MIG, continuously closing. At the time the MIG reached about 6000 ft, the MIG was 60° nose down and inverted.

T₉ - BLUE 4 was about to overshoot so he rolled inverted, pulled the nose through the MIG and fired a fourth SIDEWINDER but did not observe the missile.

At this time BLUE 4 (Back) broadcast flak warning. The flak was in the area of both BLUE 4 and the MIG. BLUE 4 lit the afterburner and began maneuvers to evade the flak while exiting the area.

BLUE 4 never considered firing the SPARROW. He had set up for HEAT at the initial encounter and planned to use the SIDEWINDER.

The intercom was not functioning properly, and BLUE 4 had difficulty communicating with the Back whose duty was to "clear the 6 o'clock position."

After the encounter, all aircraft exited the area low on fuel and joined about 30 mi from Udorn. The flight landed at Udorn with about 1800 lb of fuel.

Later information from the BIG EYE aircraft revealed that a large flight of MIGs was 10-15 mi behind the flight as they exited the area.

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EVENT I-6 SUMMARY
Keyed to Figure 1

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T _{0A}	B1 2,3,4 altitude 22,000 ft, Mach 0.9, almost at BINGO fuel	Coming out of turn at southern end of orbit, in fluid-four formation				
	B1 fuel state 6000 lb	B1 (Back) picks up one bogey at 33 mi goes to military power		B1 calls contact ahead at 30 mi and ID posture. No confirmation that others have acquired bogey.	Bogey at 11:30 o'clock at same altitude	Military power used since fuel is low
	B2 fuel state 8000 lb	Goes to military power		None		
	B3&4	Throttle back and start weave to gain separation. Acquires targets on radar		None		
T _{0B}	B4 fuel about 8500 lb				Bogey turns 180° closing velocity 200 kt	B4 is not searching due to radar problems. He operated it on emergency only after others had called bogeys.
T ₁	B1 Mach 0.92 altitude 22,000 ft	Range of bogey 20 mi, breaks lock and on reacquisition identifies two targets		B1 (Front) asks B1 (Back) to check lock-on.		Lead almost calls off the chase at this point since Lead felt bogeys would fly into Red China.
	B2 Mach 0.92 altitude 22,000 ft B3&4 Mach 0.85 fuel 8000 lb	Gets radar lock-on at range 17-20 mi. Both have radar lock at this time				

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EVENT 1-6 SUMMARY (Continued)
Keyed to Figure 1

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₂	Status for all aircraft same				Closing velocity goes from 200 to 900 kt. Heading stays same. Indicating 180° turn by MIGs. Range about 18 mi.	
T ₃	B142 Mach 0.92 altitude 22,000 ft B384 Mach 0.85 altitude 22,000 ft 2-1/2 mi in trail of lead element	Visually acquire MIGs				

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	B1 Mach 0.92 altitude 22,000 ft in full military power, tanks on	MIGs visually acquired by B1				
	B2 Mach 0.92 altitude 22,000 ft on left in close wing formation on B1	MIGs sighted at about 11 o'clock up, hard to identify at first. no smoke from MIGs. B2 sees the MIGs first. Buck sees MIGs at about 045° off, range less than 1 mi, seen now due to canopy restric- tions		B2 (Buck) starts to call out over air but advises Front who calls	MIGs about 2000 ft higher, range approximately 1 mi MIGs in close for- mation, level	Sun behind them helped to identify as MIGs pass abeam, since sil- houette "stood out."
	B384 Mach 0.85 altitude 22,000 ft about 2-1/2 mi in trail					
T ₁	B1 same status	Lights afterburner accelerates		B1 calls ID and break to left for B1 and B2 only	MIGs pass to left of B1B2, 1/2 mi away in a close formation. Pass about 1500 ft up	
	B2 same status	B2 gets definite ID when MIGs pass 9 o'clock, lights after- burner				
	B384 same status					
	At this point the action of the flight		has sufficiently separated to treat each		aircraft individually.	

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 1)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₂	B1 in afterburner Mach ~0.95 altitude 22,000 ft	Starts a 4 to 5-g level turn, jettisons tanks		None	MIGs start to turn after B1's 2, see second element (B3&4) roll out and continue	
T ₃	In afterburner, has completed 180° of turn, altitude 22,000 ft, tanks gone	Goes to 0 g and accelerates for separation		None		During turn loses track of all other aircraft, except MIGs. Sees MIGs jettison tanks and thinks MIGs are firing missiles at him
T ₄	In afterburner, Mach 1.3, altitude 15,000 ft	Has accelerated sufficiently, starts climb. Sees enemy aircraft during climb.		None	During the climb B1 sees an enemy aircraft 5000-7000 ft below and back at 7 o'clock	Loses contact with MIGs
T ₅	In afterburner, Mach 1.2, altitude 25,000 ft	Ends climb, shuts off afterburner and sets up orbit		B1 calls rest of flight. Contacts B2, B3, B4, and monitors their actions. Hears B3 call that he is in a scissors. Also hears B3 call, "I got one." Hears B2 say that B2 has B1 in sight		
T ₆	Mach ~0.9, altitude 24,000 ft	Has B2&4 on radar. Join up with others south of Red River		B1 calls for join-up and egress, because fuel is low. Join-up south of River.		

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₂	In afterburner	Starts wide turn and climb to the left			MIGs start to turn into B182, see second element (B384), roll out and continue. Then turn after B384. MIGs at 7:30 o'clock	
T ₃	Climbing in afterburner	After receiving word that MIGs jettisoned tanks, B2 punches off tanks		B2 (Back) sees tanks jettison and advises Front to do same. Front advises flight to drop tanks	MIGs start very tight turn and drop their tanks. Turn is "amazing."	During the climbing turn, wings are rolled level periodically to check airspace for other possible MIG, as they were advised to expect them in flights of four. Also plenty of jinking
T ₄	Climbing in afterburner	B2 loses sight of MIGs.				
T ₅	Altitude 35,000 ft	Sees B4 at 2 o'clock down maybe 5000-10,000 ft and a "couple of miles out." Sees B4 fire at least two missiles. At 25,000-30,000 ft sees one missile detonate behind MIG. Following this MIG noses over trailing smoke, into an increasingly steep dive.				

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T 5 (Continued)		Back sees MIG trailing light greyish-white smoke in a 050°-055° dive. Also sees a missile fired, and the aircraft nose over trailing more smoke.				
T 6	Altitude 35,000 ft	Descends to altitude of B4 to join up. Joined at 25,000 ft and then climbed together to optimum cruise altitude				

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 3)		Other Friendly	Communications	Enemy Actions (MIG 1.2)	Remarks
	Status	Action				
T ₂	Altitude 22,000 ft Mach ~0.85	Lit afterburner		Hears B2 call, "They're MIGs, they're MIGs, break left."	MIGs start to turn after B12 see second element (B384) roll out and continue. MIGs at 11 o'clock 1-2 mi from B3	B3 is in command of his element (B384).
T ₃	Altitude 22,000 ft Mach ~0.85, afterburner on	Jettisons tanks			MIGs jettison tanks and start a hard turn	B3 calls the MIGs turn "unbelievable."
T ₄	Breaking to left, afterburner on	Continues turn to left accelerating, loses track of B4			MIGs shooting one at B3 and one at B4. Range 2000-3000 ft and coming up	B3 sees no tracers just nose of MIG light up. B3 now follows only the MIG which stayed behind him.
T ₅	Afterburner on	Reversed and started several "scissors" or reverses with the MIG. Did not go to 0 g because B3 felt MIG had airspeed advantage.	From T ₅ on the actions of B3 and B4 are separated and the time marks are not synchronized.	Calls B4 for help, but B4 says he cannot help, has a MIG on him.	MIGs split. MIG slid by behind in overshoot and reversed.	B3 feels MIG made a mistake in reversing after the overshoot. The MIG should make a single pass only. Radar goes out during the scissors maneuvers. MIG shoots at each crossover.

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 3)		Other Friendly	Communications	Enemy Actions (MIG 1.2)	Remarks
	Status	Action				
T ₆	Afterburner on	Rolls right and down in 030° dive, then made a slight left turn, gaining separation			MIG seen at 7 o'clock, range 3/4 mi, continues to follow B3	Has gained speed advantage so B3 decides to gain separation
T ₇	Altitude 20,000 ft Afterburner on	Start hard (6.5 to 7 g) left turn into MIG		Back calls, "Go HEAT." Front replies, "Go bore-sight."		Front thought could not get lock on and did not realize that the radar was out
T ₈		MIG passes head on, starts slight left turn to keep MIG in sight and then dives at 060° to 10,000 ft		Conversation between Front and Back	MIG shoots, nose lights up	
T ₉	Altitude 10,000 ft Mach 1.3	Starts high-g barrel roll. Comes out of afterburner.			MIG astern at 1 mi	
T ₁₀	270° through barrel roll (i.e., in a 090° bank to left)	Dished back from the barrel roll in a left turn			MIG at 7 o'clock range 1/2 mi and firing During left turn MIG overshoots due to higher speed of MIG. MIG changes attitude to pull up but cannot change direction. MIG starts to turn then leveled and headed toward a cloud, descending range 1-1/4 mi	B3 felt MIG was out of range MIG is now stalled as indicated by condensed vapor over the wings.

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EVENT 1-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 3)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₁₁	Altitude 13,000-15,000 ft. Mach ~0.9-0.95	Fired first SIDEWINDER, no tone Fired three more SIDEWINDERS within 10 sec. good tone on all missiles				B3 does not know what happened to missile Missile #2 detonates with large fireball at the tail cone or just to the right of it Missile #3 detonates slightly to right of Mig
T ₁₂	Fuel State 3000 lb	After firing last missile broke hard left with intent to go home. En route to Udorn, joins up with B1,2,4.				Fuel was main concern throughout encounter.

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EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Actor Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₂	Altitude 22,000 ft Mach \approx 0.85	Lights afterburner, sees MIGs			MIG starts to turn after B1A2 see second element (B3A4) roll out continue, MIGs about 2000 ft up and to the left	
T ₃	Altitude 22,000 ft Mach \approx 0.85, afterburner on	Jettisons tanks			MIGs jettison tanks and start a hard turn. MIGs pass about 2000 ft to left side	
T ₄	Afterburner on	Accelerating and descending in a left turn. In fighting wing 200 ft out and 300 ft back of B3. During turn B4 slips to outside of B3			MIGs turn to inside, start firing	MIGs were not tracking
T ₅	Afterburner on, altitude 20,000 ft, Mach 0.9	Hard right break and descent away from B3	From T ₅ on the actions of B3 and B4 are separated and the time marks are not synchronized.			
T ₆	Mach 1.4, Altitude 12,000 ft	Starts a smooth 4-g pull-up. Pulls straight up, relaxed g's momentarily, and then comes back over the top.			MIGs split, one follows B3, other follows B4. MIG following B4 back about 5000 ft	Maneuver planned to split MIGs or permit sandwich of MIGs.
					MIG pulls up at same time as B4	

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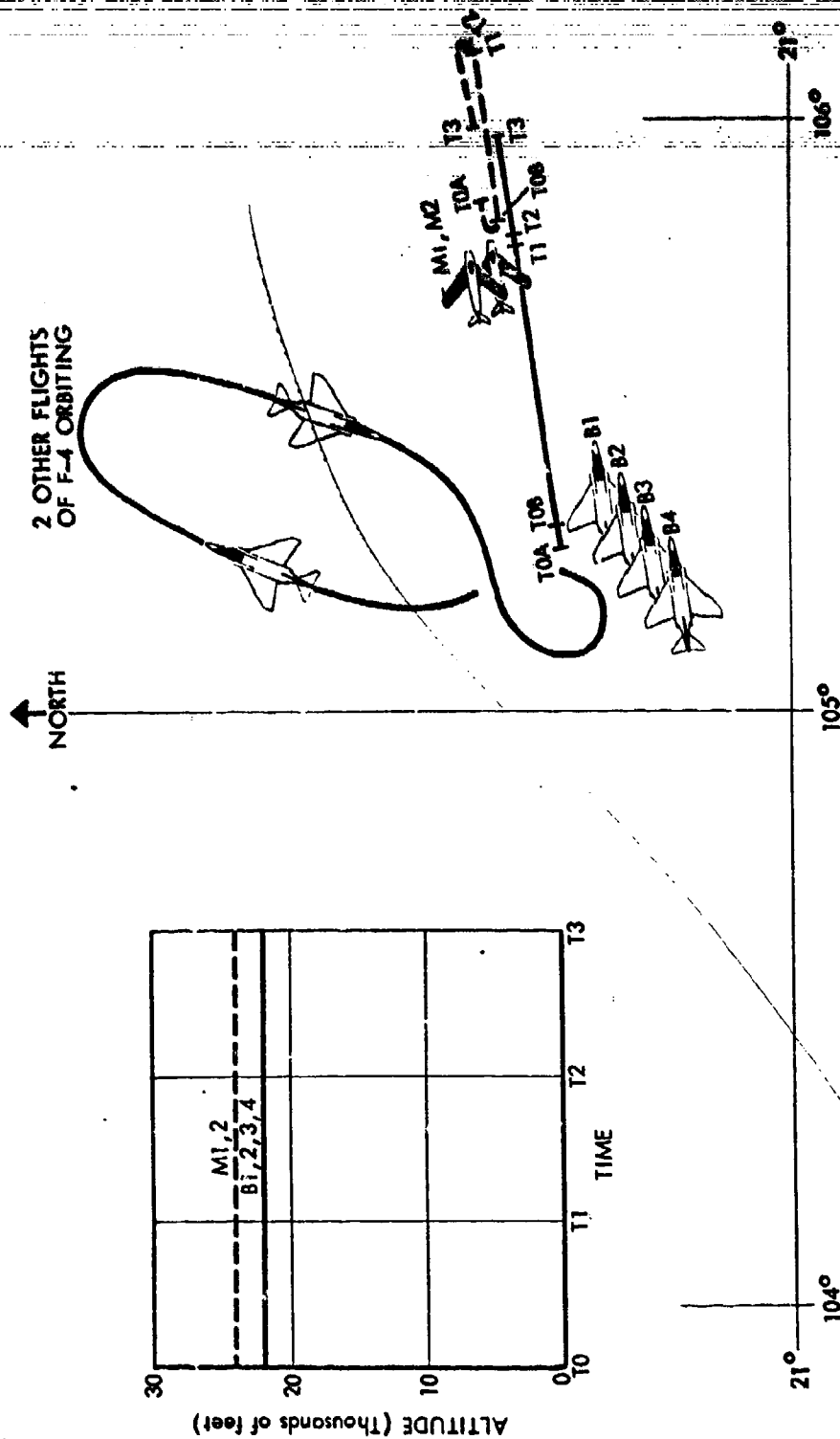
EVENT I-6 SUMMARY (Continued)
Keyed to Perspective Sketch

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1.2)	Remarks
	Status	Action				
T ₇	Altitude 32,000 ft 350-kt CAS, came out of afterburner	Topped out of vertical climb inverted, 1/4 roll to 135°, slight turn to left, range to target 4000-5000 ft			MIG at 28,000 or 29,000 ft in a vertical recovery to the left in 090° bank, nose to the west	Radar completely out in B4 at this time
T ₈	Altitude 28,000 ft 015° nose down level	Fired first SIDEWINDER missile. Good tone closing on target, range 3500 ft Fired second missile in haste. No tone, range 2500 ft Fired third missile, good tone, range 2000 ft			020° bank in left turn, descending to pick up air-speed Still in left turn, 050° bank, 020°-030° nose down. Emits white smoke from tail after explosion. No debris	Missile detonates 4-6 ft from left wing tip. MIG rocks wings in shallow rapid fashion 5 or 6 times Unknown results for second missile Missile detonates in line with tail pipe, but short
T ₉	Inverted in steep dive after MIG, Altitude 6000 ft	Fired fourth missile range 1000 ft, closing rapidly, about to overshoot. Used over, lit afterburner, went supersonic, climbed to altitude and cruised home. Meets B2 first, then B3&1. Sees B2 coming at 5-7 mi behind. B4 is at 45,000 ft.		Back starts yelling flak	060° nose down in left turn, almost inverted	B4 did not observe the missile

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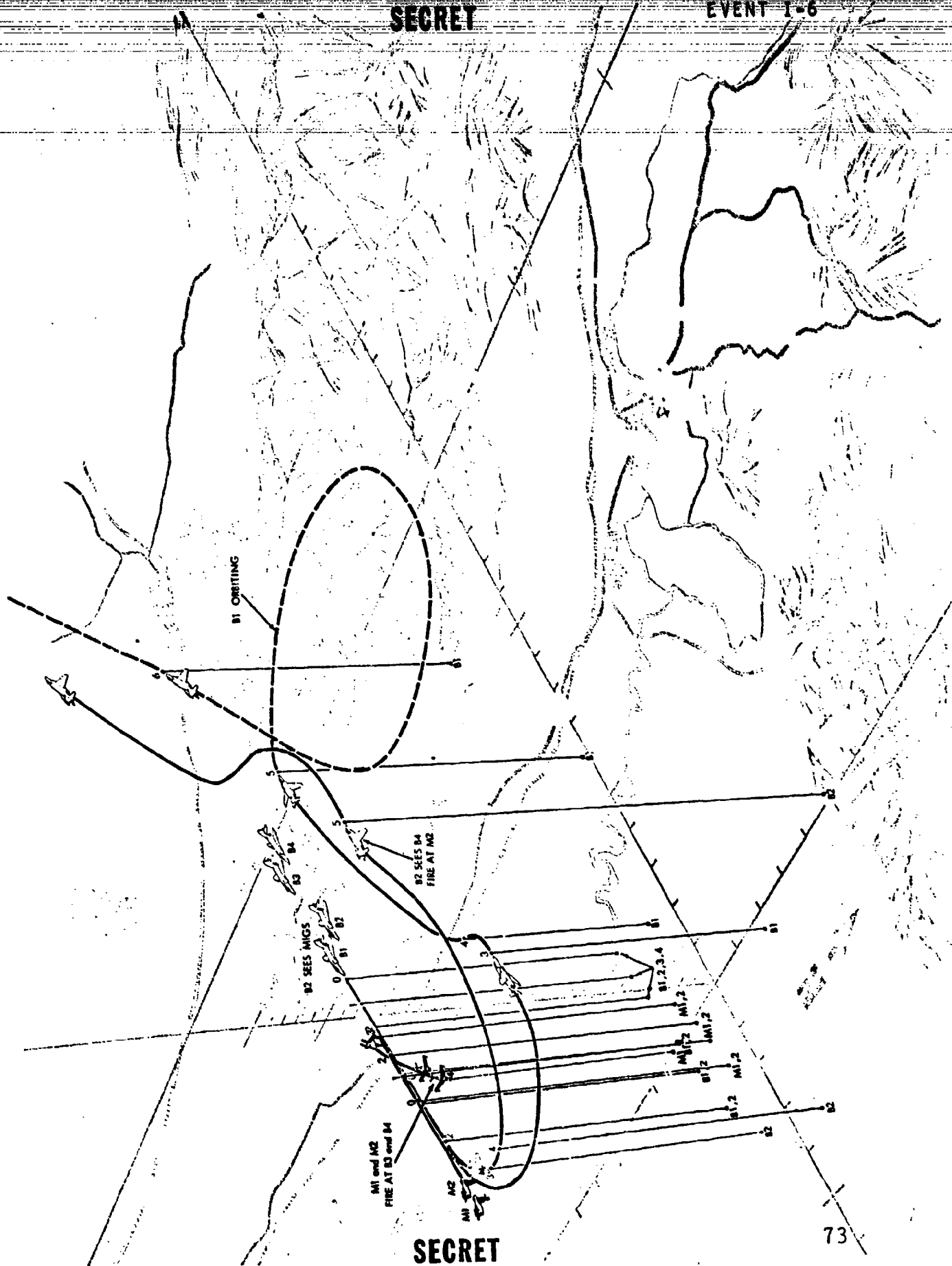
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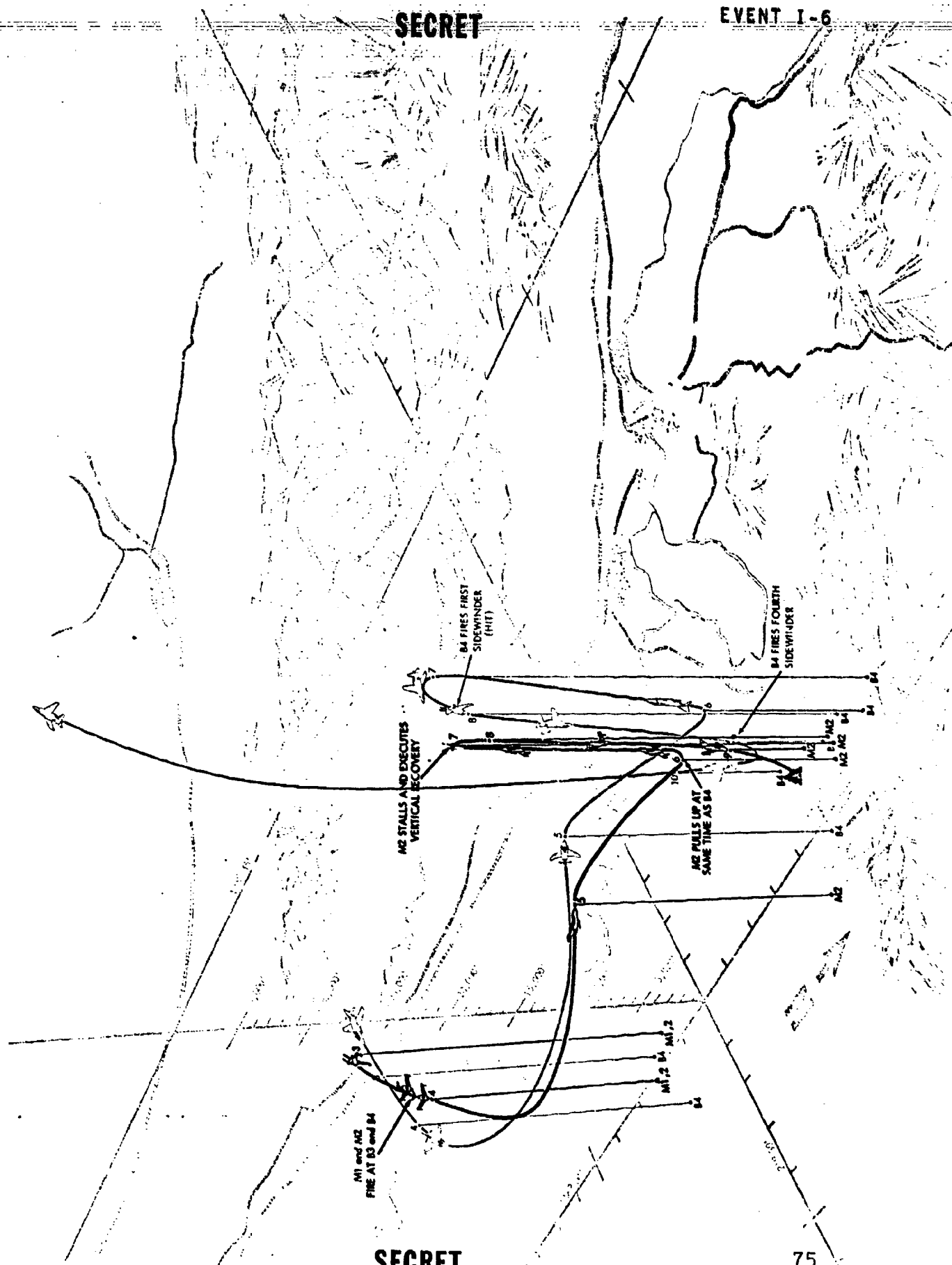
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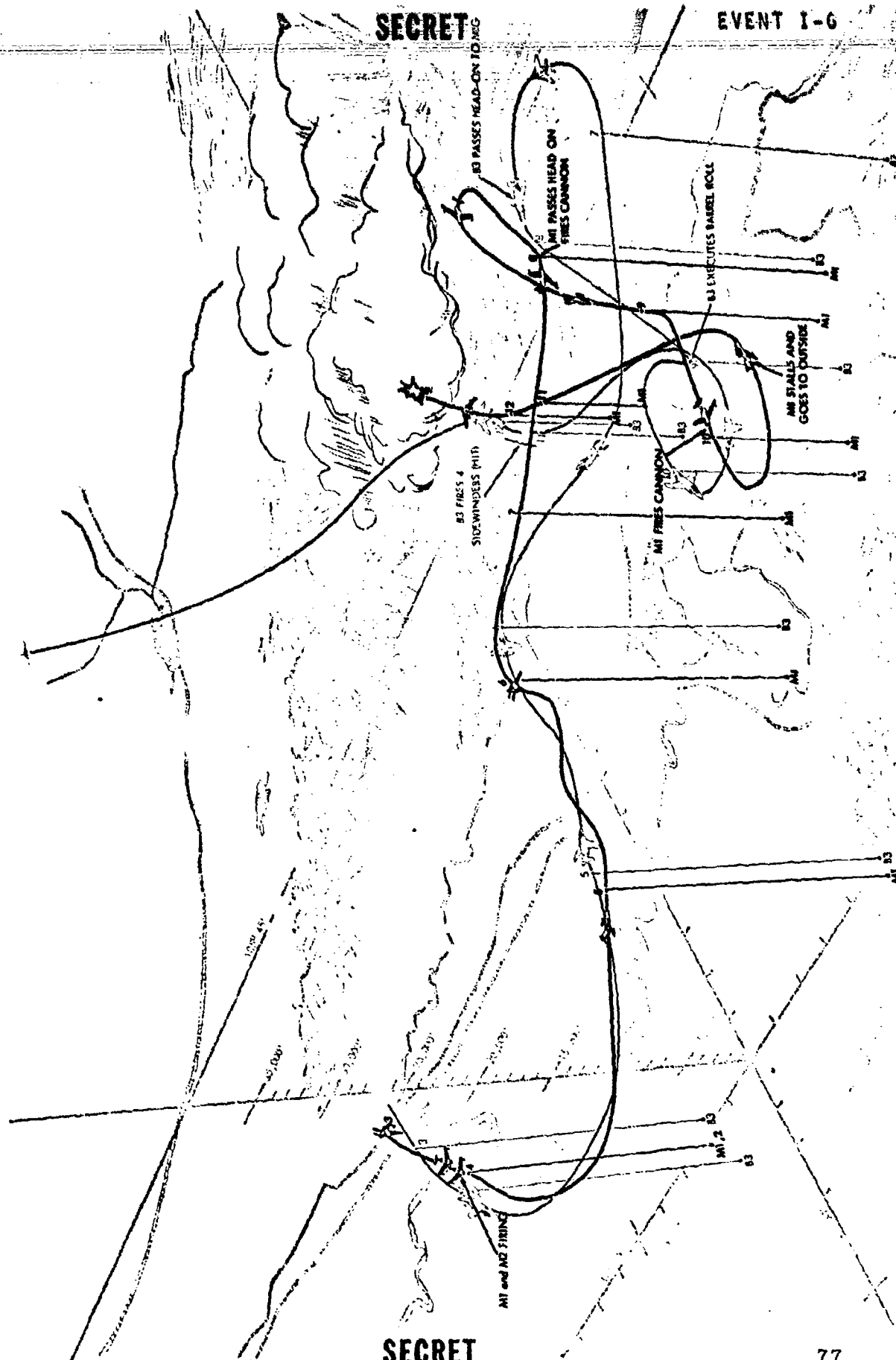
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EVENT I-6



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EVENT 1-7

Aircraft Involved: One F-4C vs two unidentified aircraft

Result: Sighting only

Vicinity of Encounter: 21°55'N/105°30'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 11 Jul 1965/1520H

BLUE flight of F-4C.

11. DATA SOURCES

Messages, Reports:

2AD 112142Z July 1965 DOCO 03558
CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

At 1520 local time BLUE flight located approximately 21°55'N/105°30'E noticed two contrails heading SE at approximately 22°45'N/104°40'E. Flight headed toward tracks, jettisoned tanks and applied maximum power. The two aircraft in question made 180° turn and took an apparent NW heading to Meng-Tzu. When BLUE flight determined that the two aircraft had crossed the Chinese border, BLUE flight returned to Phuc Yen area until BINGO fuel and returned to home station.

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EVENT I-8

Aircraft Involved: One RB-66 and four F-4Cs vs
five MIG-17s¹

Result: No damage

Vicinity of Encounter: 21°30'N/106°40'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Oct 1965/1241H

One RB-66 (GREEN flight) on an ECM mission with four F-4Cs (BLUE flight) in the general area to provide MIGCAP for both GREEN flight and the strike force. BLUE flight was not in orbit with GREEN flight.

2. MISSION ROUTE

BLUE flight took off from Korat and flew due east to rendezvous with the tanker over the Gulf of Tonkin. BLUE flight flew north to just above Haiphong and flew west to the orbit area.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7)
4 - SIDEWINDER (AIM-9D)
2 - 370-gal tanks
1 - 600-gal centerline tank

RB-66 GREEN 1

Unknown

MIG-17 MIG 1, 2, 3, 4, 5

Unknown

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Reported as good, with no thunderstorms.

	<u>BLUE</u>	<u>GREEN</u>
	1 2 3 4	1
<u>Altitude:</u>	-25,000-26,000 ft--	33,000 ft
<u>Heading:</u>	-----Unknown-----	
<u>Speed:</u>	-----Unknown-----	
<u>Fuel State:</u>	Full internal and partial in external tanks	
<u>Flight Formation:</u>	Unknown	

5. INITIAL DETECTION

GREEN gave MIG alert for the area. About a minute later GREEN was alerted to MIG presence at sound of firing. GREEN then called for BLUE flight MIGCAP. BLUE flight obtained a radar contact in the general location of the bogey.

6. ACTION INITIATED

GREEN turned to follow MIGs. BLUE pursued the radar contact.

7. SITUATION DEVELOPMENT

The MIGs made one more pass at GREEN flight after the initial run, and then broke away. BLUE flight followed the contact until they entered a high threat SAM area, then disengaged. The command post gave instructions to terminate the strike and GREEN and BLUE flights exited north of Haiphong.

8. ORDNANCE

BLUE 1, 2, 3, 4 - None

MIGs 1, 2, 3, 4, 5 - Guns

9. EQUIPMENT PROBLEMS

None reported

¹CINCPACFLT Staff Study 3-67 gives aircraft as MIG-17.

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ASSEMBLY COMMENTS

EVENT I-8

1. 1994

Total
Hours

F-4
Hours

Combat Missions

1

400

150

30

No air-to-air gun experience; no missile firing.

Overall Experience

1 - Likes F-4 radar. Wants more ACT training for this environment.

1 (Back) - Weather not a factor.

15 DATA SOURCES

Interviews: BLUE 3 (Back), 10 March 1967

• Reports: CINCPACFLT Staff Study 3-67

1.1. NARRATIVE DESCRIPTION

BLUE and GREEN flights proceeded to the planned orbit area, with GREEN preceding BLUE flight. Upon arrival in the area, BLUE flight was in radio contact with the airborne command post, strike force and GREEN flight.

1000 flight notified GREEN that they were about 20 mi from GREEN and GREEN gave a
1001 alert for the area they were in. About 45 to 60 sec later, GREEN called MIG attack.

GREEN was at 33,000 ft and jamming when the crew noted sound of firing plus "slight" thought to be a near miss. The pilot saw three MIGs followed by two others. GREEN turned to follow the MIGs and transmitted for DF steer to BLUE flight. The MIGs broke off after another pass on GREEN, two went north and three went south.

On hearing the call, BLUE flight jettisoned all external tanks and lit afterburner. The original plan was for BLUE to CAP about 1000-2000 ft below the altitude of the B-66s. After another flight of F-4s at lower altitude to "sandwich" anyone attacking the B-66s. At the time of the call, the flight was at 25,000-26,000 ft. BLUE flight was conducting a random radar search. Part of flight was searching on the 25-mi scale and the remainder on the 50-mi scale.

Shortly after hearing the call, BLUE 3 (Back) got a single radar contact at 18-20 mi. It was almost a beam contact and BLUE flight swung in behind the contact. The contact was on a parallel course heading south. They locked on at 14 mi with 200-kt overtake.

BLUE flight followed the contact but broke off due to the proximity to Hanoi missile-
area and the fact that the B-66 needed protection. BLUE flight never closed to
less than 10-15 mi to the bogey.

At the time BLUE flight disengaged, the command post called off the strike. BLUE then rendezvoused with GREEN and stayed with the B-66 until the GREEN left the area after the strike force.

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EVENT I-9

Aircraft Involved: Two F-4Bs vs three MIG-17s

Result: One MIG probable kill

Vicinity of Encounter: 21°30'N/106°15'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 6 Oct 1965/1040H

Two F-4Bs (BLUE 1, 2) BARCAP for strike group attacking JCS target 18.74 Vu Chua Railroad Bridge north of Kep airfield. In NNW racetrack pattern north of Kep airfield.

2. MISSION ROUTE

Departed carrier on YANKEE Station at about 18°30'N/between 107° and 108° E, rendezvoused overhead with A-3 tanker, taking on about 4000 lb fuel. Then proceeded on heading 360° to 15 mi north of Cam Pha then westward to TARCAP in vicinity of 21°30'N/106°15'E.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2

3 - SPARROW (AIM -7D)
2 - SIDEWINDER (AIM-9B)
1 - 600-gal centerline tank
Radar and TACAN operating
Navy color (not camouflaged)

MIG-17 MIG 1, 2, 3

Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Broken to scattered clouds 3000 ft with tops about 4000 ft

	1	2
<u>Altitude:</u>	-----2500 ft-----	
<u>Heading:</u>	-----190°-----	
<u>Speed:</u>	-----400-kt TAS-----	
<u>Fuel State:</u>	-----Unknown-----	
	(Centerline tank was empty)	
<u>Flight Formation:</u>	BLUE 2 in 1500-ft trail behind BLUE 1	

5. INITIAL DETECTION

BLUE 1 had radar contact at 18 mi and lock-on at 13 mi. BLUE 2 also achieved radar contact immediately after BLUE 1 reported the pick up.

6. ACTION INITIATED

BLUE flight accelerated to about 500-kt TAS with BLUE 2 increasing his spacing behind BLUE 1 to be in firing position if BLUE 1 identified the bogeys as MIGs. BLUE flight in shallow left interception turn.

7. SITUATION DEVELOPMENT

After BLUE 1 made visual ID at about one mile, he made right turn, passed over top of the MIG-17 flight, climbed, observed MIG at his 7:30 position, and then executed descending separation maneuver followed by a hard right turn to reengage.

BLUE 2 fired SPARROW at MIG 2, which detonated in close proximity to and probably downed MIG 2.

BLUE 2 started to position for attack on MIG 3 when he observed MIG 1 closing on BLUE 1 who was in hard right turn. BLUE 2 advised BLUE 1 to unload and BLUE 2 shifted his attack to MIG 1, who disengaged by going to the deck and proceeding to the south into the heavily defended area around Hanoi. MIG 3 had already disengaged to the south.

8. ORDNANCE

	SPARROW AIM-7D	SIDEWINDER AIM-9B	Soviet AAM	Remarks
BLUE 1	0/0	0/0		
BLUE 2	1/0	0/0		
MIG 1, 2, 3	-----No firing observed-----			~3000-ft range, 2 g, detonated within 10 ft behind MIG 2. Probable kill.

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9. EQUIPMENT PROBLEMS

None

EVENT 1-9

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	-----Not interviewed-----			
Back	-----Not interviewed-----			
<u>BLUE 2</u>				
Front	3500	600	105	All fighter background.
Back	-----Not interviewed-----			

Comments on this Encounter

BLUE 2 (Front) - Turning and acceleration rate of the MIG-17 very impressive. The MIG leader was aggressive and a good fighter pilot.

Comments from Overall Experience

BLUE 1 (Back) - Satisfied with the APQ-72 AI radar. Would like a moving target indicator for low altitude work. A more precise gain control for the radar is desirable. Would also like ground mapping radar capability. Need capability to lock-on one target and search for other targets without losing original lock. Need IFF interrogation capability computer. Requirement exists for short range missile for close in work.

BLUE 2 (Front) - Would like to see fighter with about the gross weight of an F-8. Maximum speed of 1.4 with rapid acceleration capability from 220 knots to Mach 1.1 and better turning capability than the MIGs. Fighter needs guns or short-range missile. Sold on energy maneuvering diagrams. Need a clean airplane with nothing hanging. Does not favor multimission aircraft which degrades pilot capabilities as well as weapon system performance for any given mission.

11. DATA SOURCES

Project Interviews: BLUE 2 (Front), 19 January 1967
Messages, Reports:

CTG 77.5 OPREP-3 070705Z Oct 1966

Letter: BLUE 1 (Back), 15 March 1967

12. NARRATIVE DESCRIPTION

BLUE (1, 2) were northwest of Kep airfield in BARCAP orbit altitude of about 2500 ft underneath a scattered to broken 3000-ft cloud deck with tops to about 4000 ft. BLUE 2 was in about 1500-ft trail behind BLUE 1. There were also F-8s in the area acting as TARCAP for the A-4s hitting the Vu Chua Railroad Bridge north of Kep airfield.

T₀ - On a southbound leg, BLUE 1 (Back) detected a suspicious grouping of targets at 18 mi in the karst ground return.

T₁ - Subsequent lock-on at 13 mi showed the targets to be airborne with a closing velocity of 600 knots. BLUE 1 (back) had a radar with exceptional lock-on sensitivity and maintained lock-on throughout the intercept.

BLUE 2 achieved radar lock-on at about 8 mi. BLUE 2 gained separation of about one mile behind BLUE 1 as BLUE 1 accelerated from 400- to 500-knot TAS. This was the planned maneuver to place BLUE 2 in firing position if the bogeys were identified as MIGs.

T₂ - At 10 mi the bogeys were observed to move to the left and closing velocity went to zero as they made a 270° turn rolling out on a heading of about 090°.

T₃ - BLUE 1 made visual ID at about one mile and called, "They're MIGs" three times. The MIGs were at 1 o'clock about 500 ft low in a climbing left turn.

T₅ - BLUE 2 achieved lock-on and fired a SPARROW which detonated about 10 ft behind MIG 2, probably resulting in a kill.

About this time MIG 1 discovered the attack and made a hard left turn. MIG 3 followed in this turn.

T₆ - After having fired the SPARROW at MIG 2, BLUE 2 easily slid into gun range behind MIG 3 (no guns though) and passed close enough to MIG 3 to see the MIG pilot's hand on the stick. BLUE 2 started a high side yo-yo to get to missile firing range on MIG 3.

T₄ - After ID and passing over the MIG flight in a right turn, BLUE 1 reversed and climbed in an effort to gain an advantageous position on the MIGs.

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EVENT I-9

T₇ - BLUE 1 (back) observed MIG 1 at 7:30 low and about 1/2 mi with a 90° angle off. BLUE 1 (back) advised BLUE 1 (front) and BLUE 1 descended in AB accelerating to separate from the MIG. BLUE 1 at Mach 1.2, thought he had sufficient separation and made a 6-7 g right turn in an effort to reengage the MIG.

T₈ - BLUE 2 approaching 8000 ft in his yo-yo observed MIG 1 cutting across BLUE 1's turn and closing to firing range on BLUE 1. BLUE 2 advised BLUE 1 to stop his turn and accelerate. BLUE 2 discontinued his efforts to attack MIG 3 and rolled on around in a barrel roll to position at 6 o'clock on MIG 1 (MIG 3 at this time disengaged to the south).

T₉ - BLUE 1 and MIG 1 were at about 500 ft AGL. BLUE 2 attempted to get below MIG 1 to employ his missiles. As BLUE 2 passed through 1000 ft, MIG 1 apparently observed BLUE 2 and fainted into BLUE 2 but continued to chase BLUE 1.

T₁₀ - As BLUE 2 passed below 500 ft, MIG 1 broke right to the deck (possibly as low as 25 ft) and disengaged to the south.

BLUE 1 and 2 departed to the east in low fuel state, were able to pick up 1500 lb of fuel from an A-3 tanker (BLUE 1 took 1000 lb and BLUE 2 took 500 lb) and landed back aboard the carrier.

BLUE 1, 2 retained 600-gallon centerline tanks throughout the engagement. By the time they realized the bogeys were MIGs, they were above the published safe release speed for empty tanks, and did not wish to risk possible aircraft damage through a high speed jettison.

A low altitude engagement facilitated by effective employment of radar resulted in probable kill of one MIG-17. No damage to BLUE flight.

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EVENT I-9 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3)	Remarks
	Status	Action				
T ₀	2500 ft ~400-kt TAS	B2 in 1500-ft trail behind B1		B1 reported radar contact B2 also had contact B2 indicated target probably F-8 TARCAP		B2 backseater thought he had targets in the ground return
T ₁	2500 ft, 500-kt TAS	B1 has lock-on at 13 mi. B1 accelerating to 500-kt TAS B2 falling back for spacing			Bogey closure rate ~600 kt Bogeys start left 360° turn	
T ₂	2500 ft, 500-kt TAS	B1 observes zero closure rate indicating bogeys making turn			Bogeys continue rapid left turn	
T ₃	2000 ft, 500-kt TAS	B1 sees MIGs at about one o'clock, 1 mi 500 ft low		B1 calls "They're MIGs" three times	Three MIG-17s in 500-ft trail climbing left turn	
T ₄	1500+ft, 500+kt TAS AB	B1 in right turn passed over top MIG flight. B1 made climbing left turn B2 had lock-on				
T ₅	1500 ft, 500-kt TAS	B2 fired SPARROW 2 g's ~3000-ft range just before break X			M1 in hard left turn M3 slow to tighten his turn	SPARROW detonated ~10 ft behind M2. Probable kill, not verified at time. A-4 flights later reported what they thought to be burning wreckage in the area.

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EVENT I-9 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3)	Remarks
	Status	Action				
T ₆	1500 ft, 500+ -kt TAS AB	B2 tailed in behind M3 (within gun range if he had had a gun) passed close enough to M3 to see pilot's hand on the stick. B2 pulled up in high side yo-yo to reposition for attack on M3			M1 pulling around rapidly in his left turn	
T ₇	B1 8000 ft AB B1 500 ft 1.2 Mach	B1 observed M1 closing toward his 6 o'clock with about 90° angle off 1/2-mi range B1 nosed over zero g and headed for the deck to accelerate away from M1 After what B1 considered adequate separation he started 6-7-g right turn to reengage M1.			M1 closing on B1 M1 cut across B1's turn	
T ₈	B2 8000 ft out of AB	B2 in his high side yo-yo observed M1 cutting across B1's turn and closing to B1's 6 o'clock. B1 discontinued attack on M3 and completed a left barrel roll descending rapidly to attack M1. B2 slow in leveling his wings allowing M1 more closure advantage		B2 advised B1 to level his wings and run	M1 continued to close on B1 approaching firing range -- 500-ft altitude	
T ₉	B2 550-600 kt no AB 1000 ft B1 500 ft Mach 1.0+	B2 attempting to get below M1 to use his missiles			M1 observed B2 feinted into him but continued to chase B1. M1 closed to ~3000 ft on B1. Did not fire.	

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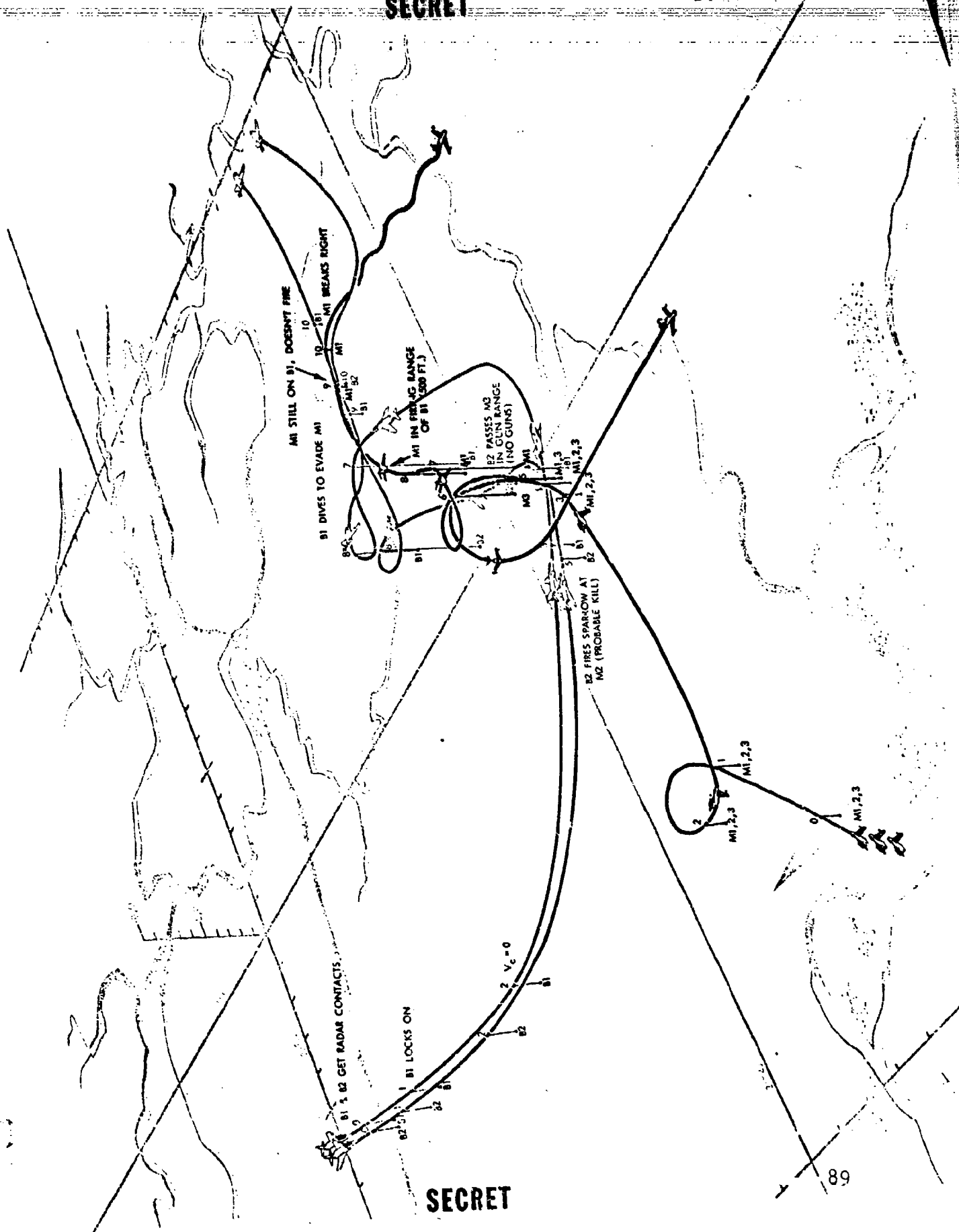
EVENT 1-9 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (K16 1,2,3)	Remarks
	Status	Action				
T ₁₀	B2 500 ft	B2 still trying to get into missile firing position	.	B2 advised B1 M1 has broken off and told B1 to come out of AB.	M1 broke right and down to about 25-ft altitude jinking around ka-sts and disengaged to the south.	B1 had been in AB since 10 at T ₃ .

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EVENT 1-9



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EVENT I-10

Aircraft Involved: Four F-4Cs and two RB-66s
vs two unidentified aircraft

Result: Sighting only

Vicinity of Encounter: 21°34'N/104°18'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 8 Oct 1965/1530H

Escorts on IRON HAND mission.

11. DATA SOURCES

Messages, Reports

CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

Escorts on IRON HAND mission visually sighted two unidentified aircraft, escorts turned toward unidentified aircraft, when they entered Hanoi area.

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EVENT 1-11

Aircraft Involved: Four F-4Cs and two EB-66s vs
four bogeys

Result: Sighting only

Vicinity of Encounter: 22°24'N/105°32'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 1 Nov 65/1030H

BLUE 1 and 2 (F-4C) were escorting GREEN 1 (EB-66) and BLUE 3 and 4 (F-4C) were escorting GREEN 2 (EB-66).

GREEN 1 and 2 were separated by about 20 mi at time of encounter.

11. DATA SOURCES

Messages: 2d Air Div message 020537Z Nov 65, DIO 00003

12. NARRATIVE DESCRIPTION

BLUE 1 sighted four aircraft, possibly MIGs, at about 25,000-ft altitude, climbing, at 6 o'clock and about 5 mi distance from GREEN 1. BLUE 1 and 2 were weaving at 30,000 ft, GREEN 1 circling at 30,000 ft, at 0.8 Mach. BLUE 3 and 4 and GREEN 1 condition unknown. BLUE 1 turned into the bogeys' path on a heading perpendicular to theirs. As BLUE 1 headed into the bogeys' path, they broke off to the east and disappeared into the clouds. BLUE 3 was able to pick up the bogeys on radar at 18 mi, lock on and hold for about 30 sec but lost contact as the bogeys maneuvered away. BLUE did not pursue the bogeys.

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EVENT 1-12

Aircraft Involved: Two F-4Cs vs two MIGs

Result: Two MIGs sighted. Intercepted and visually identified an A-3B.

Vicinity of Encounter: 19°40'N/108°20'E
Route Package I

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 23 Dec 1965/0730H

Four F-4Cs were on armed reconnaissance in Route Package I. After tanking, BLUE 1 and BLUE 2 were to alternate with BLUE 3 and BLUE 4 to maintain an "on-station" escort in the Gulf of Tonkin. Due to some unstated difficulties, BLUE 1 and BLUE 2 returned to Danang, and BLUE 3 and BLUE 4 arrived on station first.

2. MISSION ROUTE

BLUE 3 and 4 departed Danang and, after completing the armed reconnaissance mission in Route Package I, refueled from airborne tankers. The flight then proceeded to Point Bravo (18°00'N/107°00'E) where BLUE 3 and 4 came under the control of BIG EYE. After the second intercept the flight returned to Danang.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 3, 4

- 4 - SPARROW (AIM-7D)
- 4 - SIDEWINDER (AIM-9E)
- 2 - 370-gal external wing tanks
- 4 - 750-lb bomb
- TACAN and IFF

MIG MIG 1, 2

Ordnance load was not observed. Not positively identified, either MIG-15 or 17, high tail, gray color.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Weather was clear over the gulf, visibility unrestricted. There was an overcast over land, clouds 1500 to 2000 ft.

	BLUE	
	3	4
Altitude:	31,000 ft	31,000 ft
Heading:	040°	040°
Speed:	0.92 Mach	0.92 Mach
Fuel State:	14,000 lb	14,000 lb
Flight Formation:	BLUE 3 and 4 were directly abeam with about 8000-ft separation, level in altitude. When BLUE flight was vectored in for the visual IF, BLUE 3 went into a 3-mi trail.	

5. INITIAL DETECTION

BIG EYE detected a bogey in the vicinity of 20°40'N/106°50'E, between Hainan Island and North Vietnam heading toward Haiphong. BLUE 3 and 4 obtained radar contact at approximately 70 mi. Later, BLUE 3 and 4 were vectored to intercept a second bogey and acquired a radar contact at approximately 40 mi.

6. ACTION INITIATED

BLUE 3 and 4 were vectored 040° for an identification pass when the first bogeys were at a range of 40 mi. Both engaged afterburner and accelerated to 1.2 Mach. The bogeys were lost in clouds near Haiphong, and BLUE flight turned to resume station.

When vectored to intercept the second bogey, considered a hostile by BIG EYE, BLUE 4 jettisoned the external tanks, engaged afterburner, and accelerated to 1.2 Mach.

All switches were positioned for a SPARROW launch on each ID pass. Given the initial vector.

7. SITUATION DEVELOPMENT

On the first visual identification pass BLUE 3 lost radar contact momentarily, BLUE 4 assumed the lead. BLUE 3 took a trail position with a separation of approximately 3 mi. At 20 mi the target initiated a steep dive. BLUE 4 followed by flying the steering dot and deselected afterburner. BLUE 4 attained an in-range position at an altitude of 12,000 ft while descending in a 10° dive but could not see the target. BLUE 4 covered the entire range spectrum of the SPARROW missile but could not see the target. At a range of 1-1/4 mi and 7000-ft altitude the target appeared to execute a split-S maneuver.

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EVENT I-12

BLUE 3 was in trail as BLUE 4 pulled up nose high anticipating an overshoot. BLUE 4 (Front and Back) visually sighted the MIGs at 4 o'clock low. The bogeys were gray colored, high-tail MIG-15 or 17. The MIGs dove into the clouds. BLUE 3 did not see the MIGs.

BLUE 4 climbed for altitude and headed to seaward, southeasterly. BLUE 4 was then vectored 247° to intercept a bogey that was reported to be attacking BIG EYE. At an altitude of approximately 20,000 ft, external wing tanks were jettisoned and afterburners were engaged, as BLUE 4 accelerated to 1.2 Mach. BLUE 3 was still in trail attempting to overtake BLUE 4.

BLUE 4 was cleared to fire without visual identification. BLUE 4 realized the target was still 7 mi from BIG EYE and elected to visually identify the target before firing. At approximately 3 mi BLUE 4 identified the bogey as a Navy A-3B. BLUE 4 returned to base because of BINGO fuel.

8. ORDNANCE

	<u>SPARROW</u> <u>AIM-7E</u>	<u>SIDEWINDER</u> <u>AIM-9B</u>	<u>750-lb</u> <u>Bomb</u>	<u>Remarks</u>
BLUE 3	0/0	0/0	4	All bombs were dropped on a road in Package I.
BLUE 4	0/0	0/0	4	

9. EQUIPMENT PROBLEMS

BLUE 3

Lost radar contact at approximately 40 mi on initial ID pass. Operation of the radar was intermittent.

BLUE 4

None

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 3</u> - Front	Not interviewed			
Back				
<u>BLUE 4</u> - Front	1700	200	10-15	Tac background
Back	500	150	10-12	

Comments on this Encounter

BLUE 4 - Front

A gun would have been useful on the first ID pass because the intercept ended in good position for a gun attack, but insufficient time remained to maneuver for a missile launch before the MIGs disappeared into the clouds.

The front attacks are of little use when a visual identification is required. A gun and closer range missile are needed. SPARROW missile is of limited use in SEA because of limitations in the beam area. For air-to-air, a 50-mi radar range satisfies the needs.

BLUE 4 - Back

If the bogey on the first intercept had been classified as hostile, as all warnings indicated, a kill could have resulted.

11. DATA SOURCES

Project Interviews:

BLUE 4 - Front, 9 Jan 1967

BLUE 4 - Back, 16 March 1967

12. NARRATIVE DESCRIPTION

Four F-4Cs were scheduled to fly an armed reconnaissance in Route Package I, refuel from airborne tankers, and then BLUE 1 and 2 were to alternate with BLUE 3 and 4 to maintain an on-station escort in the Gulf of Tonkin. BLUE 1 and 2 returned to Danang for an unstated reason.

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EVENT 1-12

BLUE 3 and 4 completed the assigned armed reconnaissance mission. Refueling was completed at 28,000 ft, 310 kt, in the vicinity of 17°10'N/107°30'E. BLUE flight climbed to 31,000 ft maintaining 0.92 Mach and proceeded to Point Bravo. At Point Bravo, BIG EYE control vectored BLUE flight 060° to establish a race-track pattern (headings 060°-240°) approximately 20 mi off the coast of North Vietnam. BLUE 3 and 4 radar scopes were in 100-mi scale, 3-bar scan, with antennas level.

Almost immediately BIG EYE gave a "MIG airborne" warning. Ten to 15 sec after the alert, BLUE 3 and 4 achieved radar contact with two targets at 70 mi. BLUE flight asked BIG EYE if they were to make an ID pass. BIG EYE replied "negative, negative." The contacts were at 31,000 ft, 0.67 Mach, traveling on a course that appeared to take them from Hainan to Haiphong.

BLUE flight queried BIG EYE again about an ID pass and BIG EYE gave a vector of 040° to investigate the target. BLUE 3 lost radar contact with the target and went into a 3-mi trail position as BLUE 4 assumed the lead. BLUE flight engaged afterburners, positioned all switches to launch a SPARROW, and accelerated to 1.2 Mach, while maintaining 31,000-ft altitude. BLUE flight used AI radar to improve the collision bearing. BIG EYE information would have resulted in a long tail chase.

BLUE flight achieved a radar lock-on at 40 mi in the rear hemisphere of the target with an overtake speed of 250 kt. At 20 mi, the target started a dive. BLUE 4, utilizing the steering dot, followed and deselected afterburner. BLUE flight passed through 12,000 ft at 400 kt, in a 10° dive, with 150-kt overtake speed. BLUE 4 was locked on as the in-range light came on at 5 mi. The target was closed through the entire range of the SPARROW missile. BLUE 4 did not visually acquire the bogey. At 1-1/4 mi, while descending through 7000 ft, the target was believed to execute a split-S as evidenced by a rapid downward movement of the elevation strobe, which was followed by the radar breaking lock as the target had exceeded the lock angle of the radar.

BLUE 4 pulled nose high and to the right anticipating an overshoot. BLUE 4 (Front and Back) sighted two MIGs at 4 o'clock, low diving for the clouds. BLUE 3 had been in trail during the entire intercept but did not see the MIGs. BLUE 4 was unable to determine the type of MIG but identified the bogeys as gray in color with a high tail. When the MIGs disappeared into the clouds, BLUE 4 climbed to 20,000 ft and continued the right turn to a southeasterly heading with BLUE 3 still in trail.

BLUE 4 was vectored 247° to intercept a hostile declared to be attacking BIG EYE. BLUE 4 jettisoned the external wing tanks, selected afterburner and accelerated to 1.2 Mach, and again positioned the switches for a SPARROW launch. BLUE 3 was still in trail attempting to close on BLUE 4.

BLUE 4 was cleared to fire without a visual identification by BIG EYE but BLUE 4 felt this procedure was unusual and therefore requested BIG EYE to authenticate. BIG EYE authenticated properly, but BLUE 4 again asked BIG EYE for clearance to fire. BIG EYE again cleared BLUE 4 to fire without the normal ID. BLUE 4 was locked on with an in-range light but realized the target was still 7 mi from the BIG EYE. BLUE 4 elected to make a visual identification before firing. At 3 mi, BLUE 4 identified the target as a Navy A-3B. BLUE 3 was in trail attempting to overtake BLUE 4 throughout the intercept.

BLUE 4 was at BINGO fuel and returned to Danang. BLUE 3 remained on station for approximately another 5 hr by in-flight fueling.

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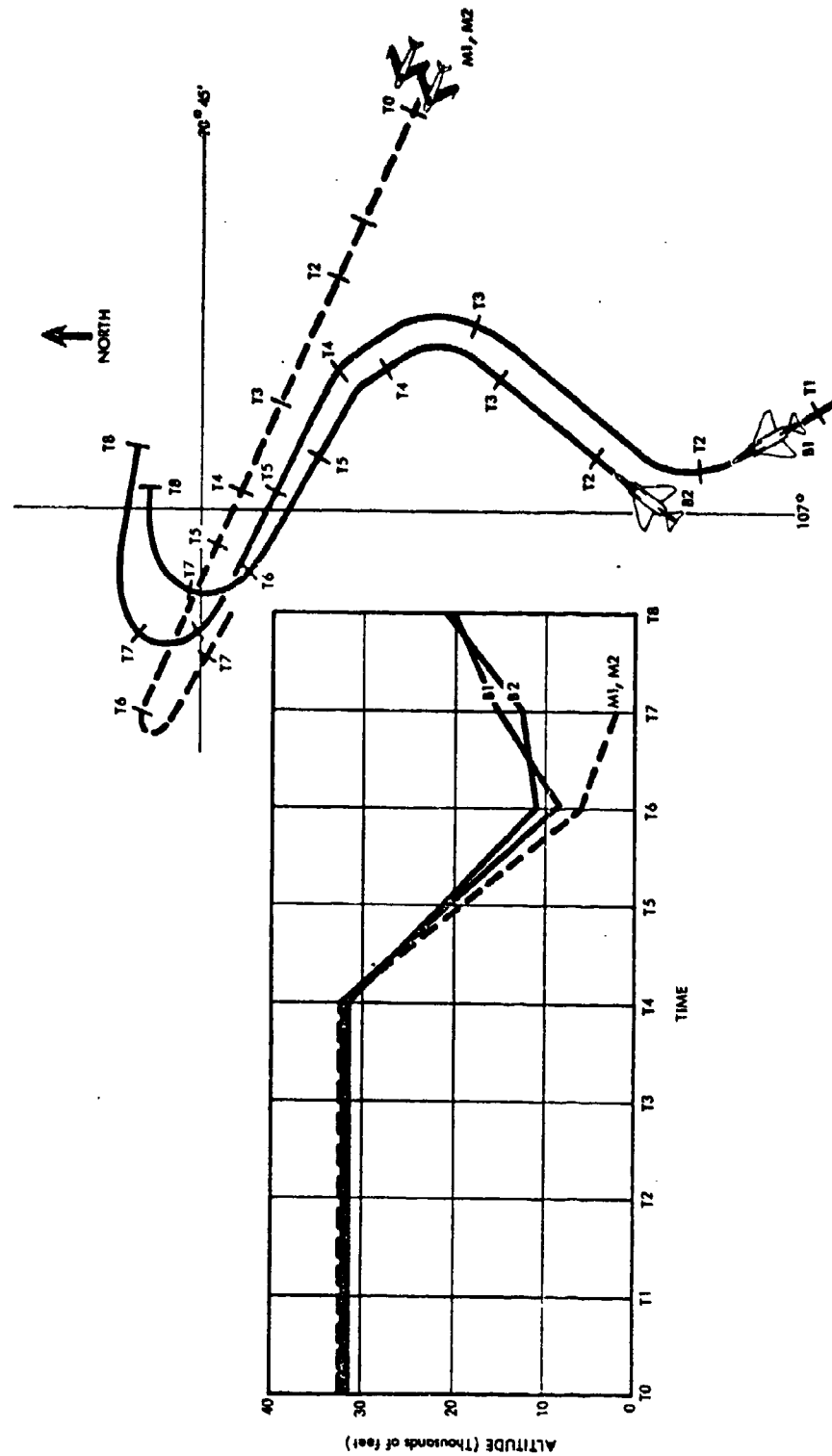
EVENT I-12 SUMMARY

Time Mark	Action Aircraft (BLUE 3, 4)		Other Friendly	Communications	Enemy Actions (MIG)	Remarks
	Status	Action				
T ₀	BLUE flight 31,000 ft 0.92 Mach under BIG EYE control. heading approximately 060°			BIG EYE	Heading approx 285° en route from Hainan to Haiphong. 31,000 ft, 0.62 Mach	BLUE flight asked BIG EYE if ID pass was desired. BIG EYE replied "Negative"
T ₁		BLUE flight turns right to 040°. BIG EYE requests ID pass		BIG EYE. "Vector C40° for ID pass."		B3 loses radar contact. Target 40 mi
T ₂		B4 takes lead, B3 in trail approx 3 mi				
T ₃		B4 begins correcting to maintain closure. B3 in trail				
T ₄		B4 rolls out astern target 250-kt closure. Approx 20 mi behind target, begins dive to keep a centered steering dot.	B3 in trail		Enemy starts dive	
T ₅		B4 passing through 12,000 ft, 10° dive, 400 kt, about 8-mi range of target, 150-kt V _c	B3 in trail		Diving	
T ₆		B4 7000 ft 300 kt, descending. Target 1 1/4 mi ahead	B3 in trail		Does a split-S	B4 realizes target had split-S, pulls nose up high in a climbing right turn
T ₇		B4 sees MIG 4 o'clock low, just prior to MIG going in cloud	B3 follows B4 but did not see MIG		Just before disappearing into clouds.	
T ₈		B4 climbs to 20,000 ft on an easterly heading	B3 still in trail	BIG EYE, Gives vector 247°		Then makes an ID pass on a Navy A-3B

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EVENT I-12



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EVENT 1-13

Aircraft Involved: One EC-121 and F-8Es (unknown number) vs unknown aircraft

Result: Radar contact only

Vicinity of Encounter: 19°40'N/107°15'E
Route Package IV

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 9 Jan 1966/0926H

A number of F-8Es were escorting an EC-121 (BIG LOOK) over the Gulf of Tonkin when bogeys were reported by the SAR destroyer.

11. DATA SOURCES

CTO 77.5 OPREP-3 090752Z Jan 66

12. NARRATIVE DESCRIPTION

An unknown number of F-8Es were escorting an EC-121 (BIG LOOK) over the Gulf of Tonkin, position 19°40'N/107°15'E. A bogey was detected on radar by the SAR destroyer as approaching from the north bearing 010°/distance unknown.

The F-8Es were sent to intercept the contact. At 30 mi from the bogey position at 0.9 Mach one F-8 obtained radar contact. The bogey reversed course and the F-8s were recalled by the controller to return to station. No visual sighting was made. The number of aircraft approaching was not determined.

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Event 1-13A

Aircraft Involved: Two F-4Bs, and one EF-10B vs
(a) two possible MIG-21s and
(b) two possible MIG-17s

Result: No Damage

Vicinity of Encounters: (a) 21°00'N/108°00'E
(b) 19°40'N/106°00'E

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 11 Jan 1966/0120H

A flight of two USMC F-4Bs (BLUE flight) were escorting an EF-10B (GREEN flight) on a nighttime FIRECRACKER mission over the Gulf of Tonkin.

2. MISSION ROUTE

BLUE flight originated from Danang, rendezvoused for air-to-air refueling over Tiger Island, and rendezvoused with GREEN flight at approximately 19°/106°. The flights then proceeded to Hon Mai, where one orbit was made to 21°/108°. After the single orbit, a return was made to Danang without refueling (See Fig. 3).

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2

4 - SPARROW (AIM-7D)
2 or 4 - SIDEWINDER (AIM 9B)
Centerline tank
Grey and white paint

MIGs

Unobserved except for GREEN and RED lights.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear night but no moon. Cloud deck over land in north at about 9000 feet becoming scattered and broken to the south of Thanh Hoa.

BLUE 1, 2

GREEN 1, 2

<u>Altitude</u> :	20-25,000'	20-25,000'
<u>Heading</u> :	B-1 223°/B-2 040°	223°
<u>Speed</u> :	Mach .9	MACH .7
<u>Fuel State</u> :	Unknown	Unknown
<u>Flight Formation</u> :	F-4s orbiting the EF-10B on opposite sides (See Fig. 1)	

5. INITIAL DETECTION

BLUE 2 called two contacts on radar, three miles from B-1 and closing. BLUE 2 was about 15 miles from B-1 at this time.

6. ACTION INITIATED

BLUE 1 turned hard to the left and B-2 turned 180 degrees to follow GREEN 1.

7. SITUATION DEVELOPMENT

BLUE 1 made radar and visual contact with two different bogeys and followed the radar contact as it descended to the north at supersonic speed. After breaking off this contact due to proximity of land, B-1 rejoined B-2 and G-1 as they neared the end of the mission. BLUE 2 again got a radar contact and B-2 and G-1 departed to the south. B-1 again got a radar and visual contact and pursued the radar contact to the land mass before breaking off.

8. ORDNANCE

None expended.

9. EQUIPMENT PROBLEMS

None reported.

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Event 1-13A

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	500	200	20	Had flown F-8
<u>BLUE 1</u>				
Back	775	715	30	Had EF-10B experience
<u>BLUE 2</u>				
Front	375	150	3	
<u>BLUE 2</u>				
Back	200	120	3	

¹Since USMC was not flying missions over the north which counted for rotation purposes, this is an estimate of the number of such missions flown by each crew. Because of this situation a crew could leave the theatre with much less than 100 missions over NVN at that time.

Comments on this Encounter

BLUE 1 (Back)

It was very difficult for the F-4s to communicate with the EF-10B so that their position and actions could be known.

11. DATA SOURCES

Project Interviews:

BLUE 1 - Back, 2 Feb 1968

12. NARRATIVE DESCRIPTION

The mission was a nighttime FIRECRACKER mission conducted over the Gulf of Tonkin. A single EF-10B (GREEN flight) was to make one orbit to the north over the Gulf and return. The other scheduled EF-10B aborted. Two F-4Bs (BLUE flight) escorting GREEN were trying a new tactic at this time in order to provide radar coverage for the EF-10Bs. As the EF-10B moved along its track, the two F-4s flew in an elliptical orbit around the EF-10B such that, as the F-4B overtaking the EF-10 from the rear lost radar contact, due to the fact that the EF-10 was too far off to the beam, the lead F-4 would then reverse its course approximately 15 miles in front of the EF-10 in order to pick it up on its radar (See Fig. 1). Navigation itself was difficult since the onboard navigation equipment did not function accurately and locations were determined by use of radar contact with the coast line.

A destroyer radar picket was on station near the orbit area. Upon query, the destroyer informed GREEN and BLUE flights that they were the only friendlies airborne at that time.

In addition to navigation difficulties there were significant communication difficulties between the EF-10B and BLUE flight due to the fact that the EF-10 was constantly listening on its ELINT mission and was not monitoring the F-4s. Also the EF-10 had no radar coverage of its own and, therefore, could not perform station keeping assists to locate the F-4s.

One other situation had a significant impact on this particular mission. At the time of this mission, that is, 11 January 1966, a truce was in effect and the F-4s were under explicit instructions that, under no circumstances, were they to cross the enemy coast line and overfly North Vietnam.

The EF-10B with its F-4 escort proceeded up the orbit track, the EF-10B was cruising at .7 Mach number, approximately 20 to 25,000 ft. As the EF-10 reached the northern terminus of the orbit, at about 21°N/108°E, the EF-10B made a turn to reverse course. Due to the communication difficulties, mentioned previously, the F-4s were caught out of position. In particular, BLUE 1 was caught approximately 15 miles farther north than GREEN flight so that after reversal, BLUE 1 found himself too far in trail of the EF-10B. BLUE 2, however, was in approximately a reversed course to the EF-10B and was painting B-1 on the radar (See Fig. 2).

T₀ - At this time BLUE 2 picked up two radar contacts approximately 3 miles behind B-1 and closing. B-2 immediately notified B-1 of this situation, and broke right looking in the direction of the contacts. B-1 at this time was about 21,000 feet. BLUE 2 immediately turned 180° to continue on with GREEN 1.

T₂ - After turning through approximately 60°, BLUE 1 saw two lights coming at them. Despite lack of accuracy in observing lights at night, they were estimated to be about

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Event 1-13A

12. NARRATIVE DESCRIPTION (Continued)

2 miles away. Red and green lights were seen, then they banked up and went out. Two more lights were seen about 12 miles away. BLUE 1 continued through a hard turn with speed about Mach .8. B-1 was in full afterburner and it took approximately 30 seconds to complete 60 degrees of the slightly descending turn. After 60 degrees of turn BLUE 1-back went to the scope and BLUE 1 rolled out heading approximately north northeast (010 magnetic) at about Mach 1 and 15,000 feet.

T₂ - BLUE 1-backseat got a radar contact at 9 to 10 miles in ground clutter and locked on to the contact. At this time the speed of the F-4 was about Mach 1.2 but the target was opening at 50 knots. BLUE 1 then saw land coming up, but it was not ascertained whether the landfall was Red China or North Vietnam; however, due to the ground rules, mentioned earlier, they could not cross land so BLUE 1 broke off. At this point BLUE 1 asked the PICKET Destroyer if they had any radar contacts behind them. The destroyer said, no, he had no IFF squawks. (Comment: this is what he should have had since the enemy would not have been squawking on the IFF.)

T₄ - BLUE 1 after making an in-place turn at the coast, picked up GREEN 1 and BLUE 2 about 50 miles down the track on radar. The radar was on 1.00 mile range scale at the time. BLUE 1 then accelerated to about Mach .95 in order to close on GREEN 1 and BLUE 2, who were proceeding back down the orbit at approximately Mach .7 at this time.

T₅ - BLUE 1 caught up with GREEN 1 and BLUE 2 somewhere off the coast near Thanh Hoa. The approximate coordinates were 19°45'N, 105°E. As B-1 caught up with the rest of the flight, BLUE 2 was abreast of GREEN 1 so BLUE 1 started to make a 360° turn behind GREEN 1 in order to reestablish the orbit pattern around GREEN 1.

T₆ - After BLUE 1 had gone through about 180° of his 360° (BLUE 1 was now heading back approximately north northeast) BLUE 2 called two radar contacts from 270° (about 10 mile range) BLUE 1 therefore continued to turn. BLUE 1 expected to pick up the EF-10 on the radar, expecting the contact to appear somewhere in the left lower center portion of the scope.

T₇ - Upon rolling out of the 360° turn BLUE 1-backseat picked up a contact heading 240°; however, the contact appeared at longer range and more toward the center of the scope (i.e., higher up the scope and more to the center) than expected. To find the EF-10 B-1 backseat then locked up on the contact.

The contact was suspicious however, since the closing velocity at 175 knots was considerably lower than it had been previously despite the track being in the general direction of the orbit. However, it was thought that the EF-10 had accelerated at the call of contacts. In order to establish the position of GREEN 1, BLUE 1-back called for a 10 count ADF check. While attempting to make the check, due to communication problems enumerated earlier, BLUE 1 saw a set of aircraft lights at 20 to 30° off to the right of the nose at what appeared to be 10 to 12 miles. The radar contact at this time was apparently over land at about a range of 6 miles. Since B-1 was close to the land it was anticipated that the EF-10 would then turn south to break off from the land contact and since the contact had not it was suspected by BLUE 1 that this was not the EF-10. After establishing the EF-10 location by an ADF direction finding check B-1-back found that the ADF needle was indicating a location at B-1's 8 o'clock position, so that GREEN 1 was definitely off the scope. The conclusion at that time was that the contact on the scope was hostile. The other light was still seen.

At this point BLUE 1 went to afterburner; however, a position check indicated that they were crossing over the coast. At this time B-1 was about 20,000 feet, Mach .9, and flak was coming up. Due to the overland restrictions BLUE 1 broke off.

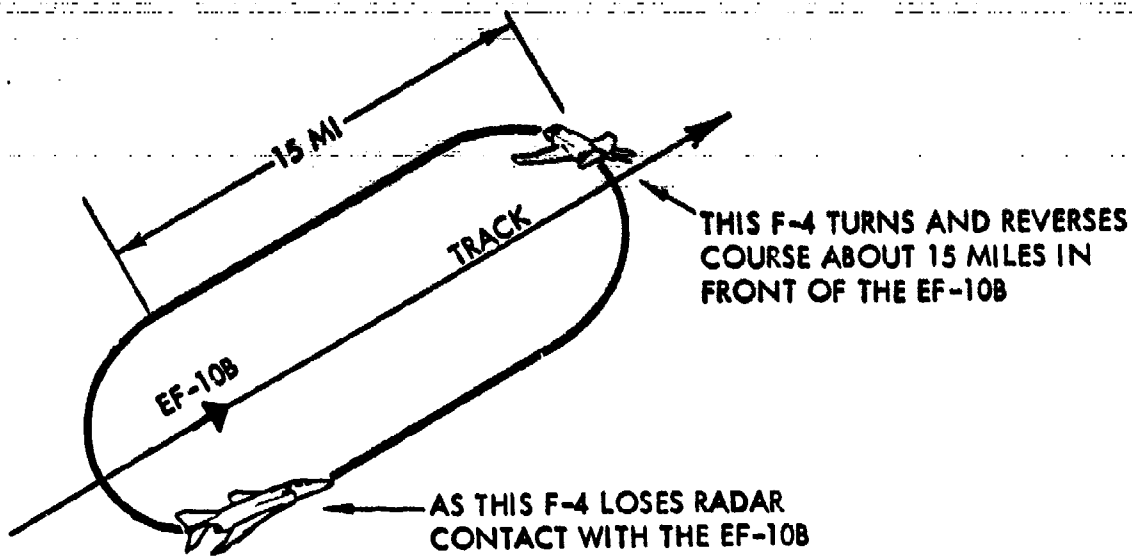
The crews on this mission concluded that, due to the speed of the targets acquired at the northern end of the orbit, the contacts were probably MIG-21 aircraft. Of interest was the sighting of lights on enemy aircraft. It was unknown by the crew whether this was an apparent decoy; leaving the lights on to distract the pilots to other targets while a closer one made an attack, or the fact that the aircraft were out on training mission during the truce period and had not turned off their navigation lights after takeoff.

At the point at which BLUE 1 had completed his 360° turn, (T₇) and picked up the radar contact, BLUE 2 and GREEN 1 had broken off to the south-southeast heading back toward Danang. After leaving the coast, BLUE 1 then also followed the EF-10 and BLUE 2 back to Danang without further incident.

Due to the simplicity of this event the only drawings are a large scale picture showing the track and the location of the two MIG encounters, and a smaller sketch illustrating the F-4 positions of orbit around the EF-10 during the mission.

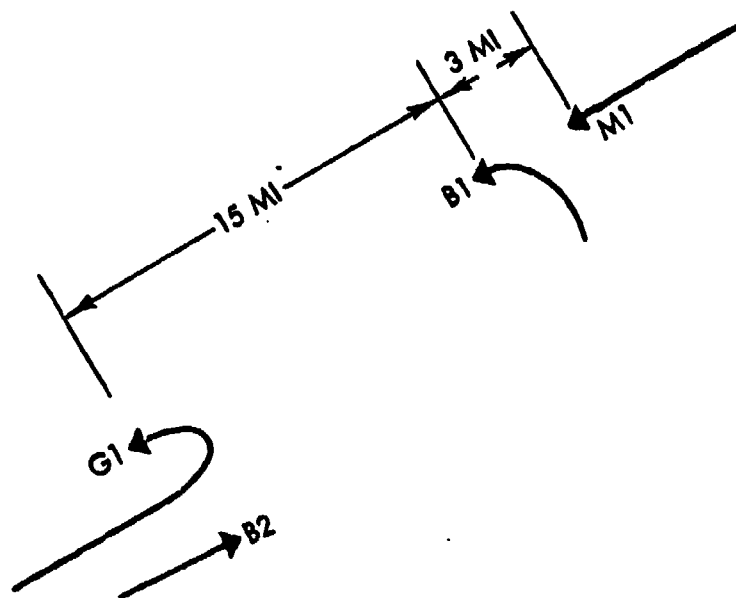
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FIGURE 1. Sketch of F-4 Orbit About EF-108

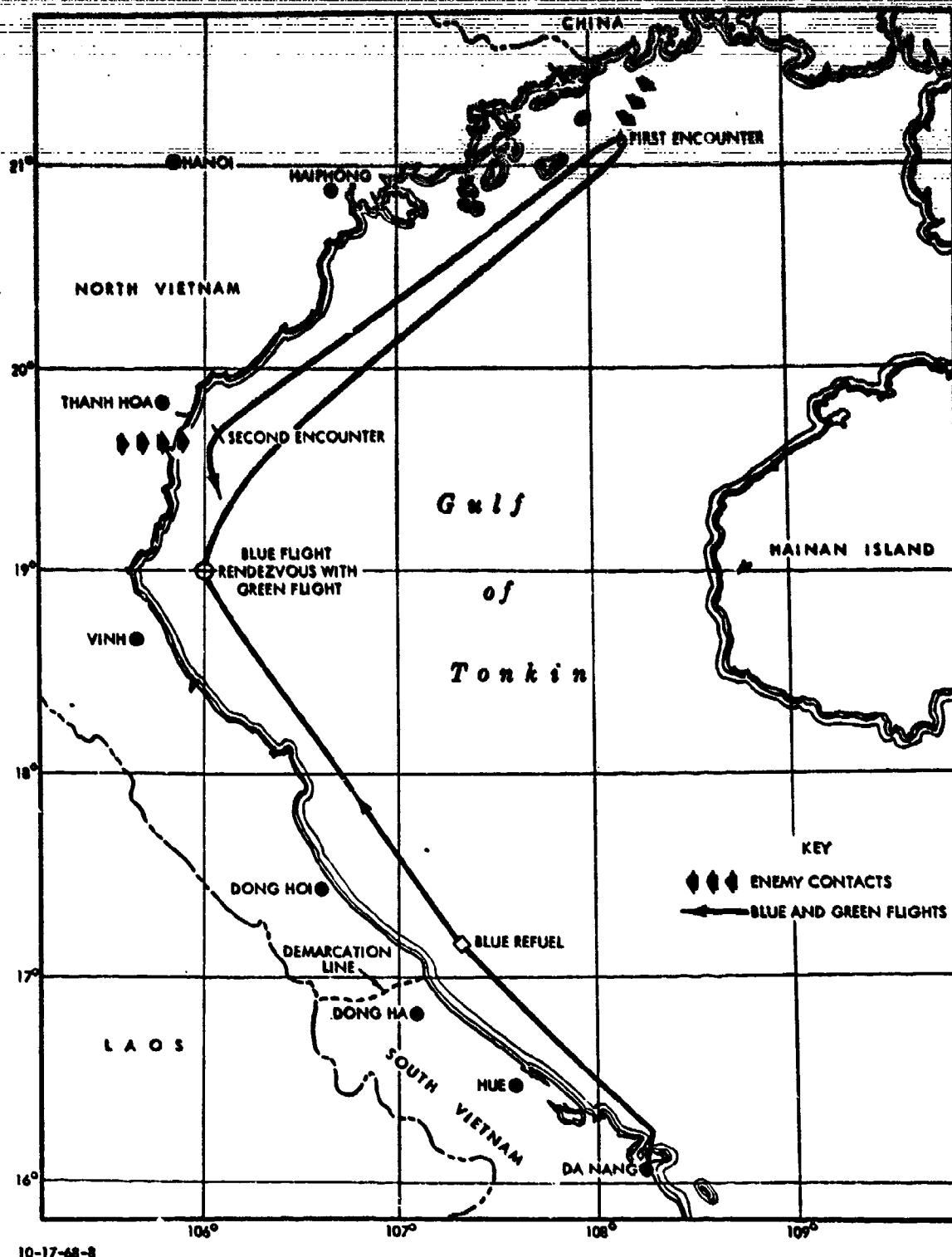


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FIGURE 2. Flight Positions at T_0

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10-17-68-8

FIGURE 3. Generalized Mission Route

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EVENT 1-14

Aircraft Involved: Two F-4Cs vs one unidentified aircraft

Result: Sighting only

Vicinity of Encounter: 19°33'N/103°22'E
Laos

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 22 Jan 1966/1925H

Two F-4Cs (BLUE 1 and 2) on strike.

11. DATA SOURCES

Messages, Reports:

2AD 230042Z Jan 66 DOCO-O 12444

CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

BLUE flight reported sighting an unidentified jet aircraft at 19°33'N/103°22'E at 1925H local time. It was grey color, swept or delta wing. Sighting was brief, no distinctive markings noted, and the type of aircraft was not identified.

The sighting was made while in a turn following a strike. BLUE flight was heading W turning to S, and the unidentified aircraft was in the same turn, at 9 o'clock position and slightly below BLUE flight. BLUE flight was at 3000 ft. No other U.S. aircraft were operating in the vicinity at the time. No hostile action on part of the unidentified aircraft was taken and it disappeared from view almost immediately.

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Event 1-18

Aircraft Involved: Four F-4Bs vs unknown number
and type of enemy aircraft

Result: No damage

Vicinity of encounter: 20°20'N/105°00'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 3 Feb 1966/2100H

Four F-4Bs (BLUE flight) escorting two EF-10Bs (GREEN flight) on nighttime ECM/ELINT mission (Code Name FIRECRACKER) in NW/SE racetrack pattern.

2. MISSION ROUTE

From Danang to initial orbit point about 20°N/105°E without refueling, then to orbit.

3. AIRCRAFT CONFIGURATIONS

Unknown

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear, bright moonlight.

	BLUE	GREEN
	1 2 3 4	1 2
<u>Altitude:</u>	-----25,000-----	--25,000--
<u>Heading:</u>	-----180°-----	--180°--
<u>Speed:</u>	-----Unknown-----	--Unknown--
<u>Fuel State:</u>	-----Unknown-----	--Unknown--
<u>Flight Formation:</u>		

BLUE 1 and 2 on left and BLUE 3 and 4 on right, trailing GREEN flight 5-10 mi. GREEN 1 and 2 in close formation to maintain visual contact.

5. INITIAL DETECTION

BLUE 2 backseat observed MIG identified with red star on tail pass abeam and close aboard. He could also see the pilot. Approximately 2 min before this there had been a MIG alert from an unknown source with no coordinates given. Subsequent detections were made as a result of cannon fire observed. (See para 7 and 12 below). After being alerted by BLUE 2 back, BLUE 2 front called for BLUE 1 to break.

6. ACTION INITIATED

BLUE 1 turned and gained radar contact, then lost it as the hostile aircraft descended into the radar horizon line and ground return. Other action later initiated in response to other detections. (See para 7 and 12 below). BLUE 3 and BLUE 4, and GREEN 1 and GREEN 2 broke away from BLUE 1 and BLUE 2.

7. SITUATION DEVELOPMENT

Following initial visual detection and maneuvering, BLUE 1 and 2 regrouped and continued escort of GREEN flight. Subsequently, BLUE 1 observed aerial cannon fire nearby and BLUE 2 gave brief chase to the source, abandoning chase due to fuel state and proximity of SAM sites. BLUE 2 observed out-of-range cannon fire from his 7:30 position. BLUE 3 and 4, in response to the initial cannon fire, made a 360° turn and gained radar contact on three bogeys, also observing some distant cannon fire. BLUE 3 and 4 pursued their bogeys to the NE, giving up the chase, as did BLUE 1 and 2, due to low fuel state and proximity of SAM sites.

8. ORDNANCE

Enemy: cannon

9. EQUIPMENT PROBLEMS

None reported

10. AIRCREW COMMENTS

None interviewed

¹Single AB operation; cannon armament and visual contact indicate aircraft could be MIG-17D.

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Event 1-10

11. DATA SOURCES

Messages, Reports:

CG 1MAW OPREP-3 040753Z Feb 66
USAF Tactical Fighter Weapons School Combat Analysis Division Bulletin #3, 1966
CINCPACFLT Analysis Staff Study 3-67

12. NARRATIVE DESCRIPTION

A four-plane F-4B flight was escorting two EF-108s on a night ECM/ELINT mission over North Vietnam. They were flying in a NW/SE racetrack pattern in the vicinity of 20°20'N/105°00'E. BLUE 1 and 2 were on the left and BLUE 3 and 4 were on the right, trailing the EF-108s at 5-10 mi. At approximately 2045H a MIG alert was received on guard channel from an unknown source with no coordinates given. About 2 min later BLUE 2 observed a MIG, identified by a red star visible on the tail, pass abeam and close aboard and called, "MIG in formation." Visual contact was then lost, BLUE 1 turned and gained radar contact, losing it as his contact descended rapidly into the radar horizon line and ground return. BLUE 1 and 2 regrouped, continuing the escort.

At some later time the EF-108s commenced a final left turn to depart the area with the BLUE flight in radar trail. After 90° of the turn BLUE 1 observed cannon fire from his 6:30 position at an estimated 1500-ft distance. BLUE 1 broke sharply into the attack and called, "MIG attack." BLUE 2 subsequently detected a target at 4-mi distance taking evasive action, heading 060° and intermittently using single burner. BLUE 2 followed but after 1 min abandoned the chase due to proximity of SAM sites and to low fuel state.

Approximately 1 min later when on retirement course, BLUE 2 received cannon fire from his 7 o'clock position. Firing appeared to be out of range and BLUE 2 accelerated and commenced evasive action.

When BLUE 1 observed cannon fire, BLUE 3 and 4 were positioned approximately 1/2 mi behind and 3 mi abeam of BLUE 1. When BLUE 1 broke sharply away, BLUE 3 and 4 made a right 360° turn and upon completion of turn made radar contact with three unidentified targets at approximately 6-8 mi. Upon completion of the turn, BLUE 3 observed cannon fire from his 3 o'clock position, out of range with rounds falling well short of the F-4Bs. BLUE 3 and 4 then made radar lock-on on one of the three targets and pursued the bogey as it turned to about 060°, descending. BLUE 3 and 4 closed to within 4 mi and descended to about 8000 ft. BLUE 4 obtained a radar lock on the target and achieved an in-range light. However BLUE 4 did not get a clearance to fire. At this point they were approaching a confirmed SAM installation. Because of this and low fuel state, they broke off the tail chase and retired from the area without further incident. The low fuel state was a problem since post-strike refuel was not planned and therefore no tanker was available.

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Event 1-16

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EVENT 1-1/

Aircraft Involved: One U-2 vs one MIG-21

Result: No damage

Vicinity of Encounter: 20 mi NE of Dien Bien Phu,
Approx coordinates:
21°35'N/103°20'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 6 Feb 1966/----

One U-2 aircraft (BLUE 1) on photoreconnaissance mission.

11. DATA SOURCES

USAF Tactical Fighter Weapons Center - Combat Analysis Division Bulletin No. 3
CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

Three minutes after BLUE 1 at 68,000 ft sighted bogey at 60,000 ft, BLUE 1 photographed an aircraft passing directly below on an attempted intercept. Aircraft proved to be a MIG-21 with a probable missile under each wing. Two other visual sightings of very high altitude and high Mach bogies were made in this area on the same date.

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EVENT 1-18

Aircraft Involved: Two F-4Cs vs three MIG-17s
Four F-4Cs vs three MIG-17s
Four F-5s vs MIGs

Result: No damage

Vicinity of Encounter: 21°50'N/104°15'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 4 Mar 1966/1703H

Three flights of aircraft were on a MIGSCREEN in the area between 21°54'N/104°14'E and 21°20'N/105°06'E. The flights flew the same track stacked in three layers. Four F-4Cs (GREEN flight) were in the top orbit at about 15,000-ft MSL flying a fluid-four. Another flight of four F-4Cs (BLUE flight) was at an intermediate level of 13,000-ft MSL flying two elements in trail. On the bottom orbit was a flight of four F-5s (YELLOW flight)¹ at 10,000 ft on the same track.

The MIGSCREEN was set up to cover the retirement of a 24-plane F-105 strike force (one of which is BROWN flight) which was operating in the area against the Lao Kat rail line. In addition, there were two EB-66s in the area with their own CAP.

2. MISSION ROUTE

BLUE flight left Udorn, refueled at either RED or WHITE ANCHOR and proceeded north to enter orbit approximately 21°10'N/104°50'E. GREEN flight refueled in the same area and proceeded to the same orbit.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4 and GREEN 1, 2, 3, 4

- 4 - SPARROW (AIM-7) (Both D&E were being used at this time. Exact load unknown.)
- 4 - SIDEWINDER (AIM-9B)
- 1 - 600-gal centerline tank
- 2 - 370-gal wing tanks
- Camouflage paint
- IFF and TACAN off

F-5 YELLOW 1, 2, 3, 4

- 2 - SIDEWINDER (AIM-9)

F-105 BROWN 1

Unknown

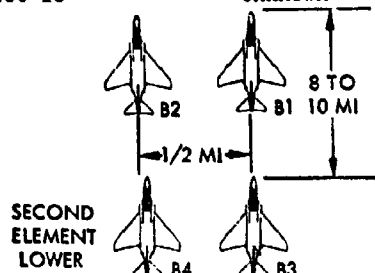
MIG-17 MIG

- Silver color
- No external stores reported
- Chinese markings

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear with dense haze and smoke to about 13,000-ft MSL. Air-to-air visibility was 3-4 mi or less, depending on altitude and direction.

	BLUE	GREEN	YELLOW	BROWN
	1 2 3 4	1 2 3 4	1 2 3 4	
Altitude:	13,000-ft MSL ²	15,000-ft MSL ²	10,000-ft MSL	Unknown
Heading:	----- North ² -----	----- NW ² -----	----- Unknown -----	Unknown
Speed:	480- to 520-kt TAS	480- to 500-kt TAS	----- Unknown -----	Unknown
Fuel State:	----- 8500 lb -----	----- Unknown -----	----- Unknown -----	Unknown
Flight Formation:				



¹ There was some discrepancy concerning the F-5 orbit altitude. In this case the flight leader and OPREPs have been followed.

² The flights were continually jinking, changing altitude and direction.

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EVENT 1-18

5. INITIAL DETECTION

BLUE 2 (Back) heard a MIG red warning but no other flight member heard it. Shortly thereafter BLUE 4 (Front) saw a MIG-17 at BLUE 3's 6 o'clock, low in firing position, at angle-off, distance less than 1000 ft.

About 2-3 min later GREEN 2 (Front) followed by GREEN 3 (Front) saw three MIG-17s passing under the flight.

6. ACTION INITIATED

Both BLUE 3 and BLUE 4 broke right and jettisoned tanks to evade the MIG immediately following BLUE 4's sighting of MIG on BLUE 4.

GREEN 2 and 3 called GREEN 1 but Lead never saw the MIGs.

7. SITUATION DEVELOPMENT

Immediately after initiation of their break, a MIG was seen at BLUE 4's 6 o'clock and BLUE 3 and 4 split. Due to the action taken, formation spacing, and visibility, BLUE 1 and 2 quickly lost contact with BLUE 3 and 4. Both BLUE 3 and 4 successfully disengaged by unloading and accelerating. On the way out, BLUE 4 was attacked a second time by a MIG-17 and again disengaged by accelerating.

GREEN lead did not acknowledge the communications of the other members of GREEN flight; consequently, the lead was never transferred to a flight member who could direct subsequent action. As a result, the MIGs were lost in the haze before GREEN flight could engage. GREEN flight then continued in their orbit.

8. ORDNANCE

BLUE and GREEN flights - none

MIGs - cannon (incl 37mm) firing on BLUE 3 and 4

9. EQUIPMENT PROBLEMS

BLUE 4 - Periodically fading radio which hampered communications, unreliable inertial navigation, which prevented rendezvousing with BLUE 1 and 2.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Missions	Remarks
<u>BLUE 1</u>				
Front	3300	500	Unknown	Background in tactical fighters, considerable ACT experience. Had fired the SIDE-WINDER but no SPARROW.
<u>BLUE 2</u>				
Back	500	200	5	No missile-firing experience.
<u>BLUE 3</u>				
Front	1600	250	Unknown	Never fired missile from F-4.
<u>GREEN 1</u>				
Front		500		Combat experience in Korea. Never had fired missile.
Back	500	250	50	Never had fired missile.
<u>GREEN 3</u>				
Front	3500	300		Tactical fighter experience. Completed fighter weapons school. Never fired SPARROW.
<u>GREEN 4</u>				
Front	2600	400	60	B-66 and ADC experience.

BROWN ----- Unknown -----

Comments on this Encounter

BLUE 1 (Front) - Roll rate of F-4 is satisfactory. Would like an external gun. Felt heat-seeker missile was better than "guided" for SEA situation partly because of its simplicity. It must have longer range, higher-g limits and more look angle than present missiles. Likes second crew member in aircraft which has complex radar to operate. Also, he represents a second set of eyes. Likes two engines, and wants higher thrust-to-weight ratio. Fatigue due to second mission contributed to poor showing.

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EVENT 1-18

BLUE 2 (Back) - Too many friendlies in the area. They would be chasing them all the time if they followed every contact. Back provides another look out. Ground clutter is bad.

BLUE 3 (Front) - Saw MIGs only because they had just completed the turn. Gun would permit improved tactics since minimum range is not a problem. Two reliable guns were wanted. High-g capability in short-range missile needed. Second crew member in F-4 needed to help look outside and is valuable for SAM protection. Better aircraft would be possible if not multipurpose. Better maneuverability needed.

GREEN 1 (Front) - Communications channels very garbled.

GREEN 1 (Back) - Weapons system all right. The stereotyped missions that they had been flying let the enemy know what to expect and so SAMs and then MIGs were sent against them.

Due to the MIGCAP, F-4 and F-5 aircraft did not feel it was necessary to drop ordnance at sight of MIGs.

Feels that CAP aircraft at the strike force function more efficiently since the strike force need not primarily consider enemy aircraft.

Never had to jettison ordnance because of MIGs.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front), 25 January 1967; BLUE 2 (Back), 17 March 1967; BLUE 3 (Front), 23 January 1967; GREEN 1 (Front), 13 March 1967; GREEN 1 (Back), 10 January 1967; GREEN 3 (Front), 24 January 1967; GREEN 4 (Back), 25 January 1967; one member of BROWN flight, February 1967.

Messages, Reports:

6252 TFW Danang DOI TELECON 118 4 Mar 66
2AD 041739Z Mar 66 DOCO-O 4520
6252TFW Danang DOI TELECON 238 8 Mar 66
2AD Message 091107Z Mar 66

CINCPACFLT Staff Study 3-67

Letter: GREEN 2 (Back)

12. NARRATIVE DESCRIPTION

BLUE, GREEN and YELLOW flights were fraggd for a MIGSCREEN orbit just south of the Red River and northwest of Yen Bai. The flights from Danang had performed CAP missions in the same area for several previous days, with the same TOT.

On the morning of 4 March, BLUE and GREEN flights had been in the same area on a mixed screen mission similar in type to the one for the afternoon. During the morning mission they had experienced flak, and on the preceding day's mission had had SAMs fired at them. Due to the flight time of the morning mission, at the time of the encounter they had been flying 5-6 hr.

BLUE flight had not been able to poststrike refuel after the morning mission and had to recover at Udorn. Consequently, in the afternoon they launched out of Udorn for the mission.

The flights were new to the theater and were experimenting with tactics. BLUE flight had decided to split the flight into two separate elements to provide radar coverage of each other's 6 o'clock. This radar coverage was lost in the turns which were made toward the target at each end of the orbit. Due to the visibility limitations in the haze, the cluttered communications channel (large number of aircraft in the area using the same frequency) and the degraded radar coverage because of the terrain, was unable to ascertain position of flight elements of BLUE flight. GREEN flight was in a modified fluid-four with the second element displaced aft.

While in the orbit, the flights were continuously jinking, making up to 045° increments of turn, every 20-30 sec, in an effort to clear their 6 o'clock and confuse the flak. On the afternoon orbit, unlike the morning mission, no flak was seen. Many brush fires burning on the hills contributed to the poor visibility at the lower level in the haze. Visibility was as low as 1 mi at 8000-9000 ft when looking away from the sun.

YELLOW flight was seen only momentarily. At the time of the MIG encounter BLUE and GREEN flights did not know YELLOW flight's position.

Because of the very limited visibility and cluttered radar return, BLUE flight was not monitoring the radar very closely.

A. BLUE Flight

TOA - BLUE 1 and 2 were making a turn at the NW end of the orbit and BLUE 3 and 4 had just completed a jinking turn and headed north when BLUE 4 saw one MIG-17 coming up behind BLUE 3 from 5 to 6 o'clock low. The silver color of the MIG-17 blended well with haze and when first noticed was less than a mile away. BLUE 4 called for BLUE 3 to break right. The MIG closed rapidly and BLUE 3 observed the 37mm cannon firing.

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EVENT 1-18

When BLUE 3 and 4 were attacked, BLUE 4's call alerted BLUE 1 and 2. BLUE 1 was on the outside of a turn and did not see the MIGs attacking BLUE 3 and 4.

T_{1A} - On observing the MIG, BLUE 3 broke hard right, selected afterburner, and jettisoned tanks.

BLUE 2 (Back) did see the second element at 9 o'clock. He saw an F-4 turning right with a MIG on his tail, followed by another F-4 behind the MIG, and another silver aircraft following the second F-4. The latter aircraft overshot the second F-4. BLUE 2 took the lead and headed toward the engagement but lost sight of BLUE 3 and 4 as they dove into the haze.

T_{2A} - BLUE 1 and 2 could not obtain a good fix on BLUE 3 and 4, and therefore continued their orbit. BLUE 1 and 2 heard BLUE 4's call when he was under MIG attack for the second time. BLUE 1 and 2 made radio contact with BLUE 3 but did not rejoin either BLUE 3 or 4 until all returned to Danang.

In the break, the MIG-17 on BLUE 3 overshot underneath and started a high S-roll over the top, but then dropped low and to the inside of BLUE 3. Then the MIG was forced outside and forward of BLUE 3 by about 100 ft. As the MIG was forced outside, BLUE 3 pulled the nose up and executed a rudder reversal back to the left. The result of these maneuvers put BLUE 3 and the MIG into a scissors, each approaching head on.

T_{3A} - BLUE 3 then broke hard right and down to avoid a mid-air collision. The MIG pulled inside of the turn but did not stay in that position. As the MIG fell away, BLUE 3 unloaded and descended to the mountain tops.

T_{4A} - BLUE 4 followed the initial right break during this maneuver; however, BLUE 3 saw a MIG on the tail of BLUE 4 and called it. Almost immediately BLUE 4 (back) also saw the MIG. The MIG appeared to overshoot from 5 to 7 o'clock to BLUE 4 broke left, unloading in afterburner.

T_{5A} - On losing the MIG, BLUE 3 pulled up to 15,000 ft in an Immelmann to search for the MIG. The MIG slid to the outside at 5 o'clock low. BLUE 4 then headed for the deck coming out over a mountain to obtain separation and the MIG fell well behind.

BLUE 3 then stayed on station for a short time until BINGO was reached and then he recovered at Udorn.

T_{6A} - When BLUE 4 lost the MIG, he was heading E-NE toward the Red River; he then turned to the south to avoid the heavy flak and SAM areas which were located to the immediate east of his position. BLUE 4 then exited to the south and started a climb to cruise out. At about 15,000 ft another MIG-17 attacked BLUE 4.

T_{7A} - BLUE 4 broke hard left and the MIG dove downward. BLUE 4 accelerated to 1.3 Mach and initiated a straight-up climb breaking contact with the MIG.

T_{10A, 11A} - At this time BLUE 4 was south of the position of BLUE 3, and due to fuel state, headed south to home.

According to the persons involved, the MIGs seemed to be under GCI. The MIGs approached on the deck and were on top of BLUE flight with almost no warning. However, the MIGs overshot the flight possibly due to lack of visual acquisition.

B. GREEN Flight

T_{0B} - GREEN flight heard BLUE flight's initial MIG call but due to excessive radio communications by other aircraft in the area, it was not ascertained if MIGs had attacked or where the encounter occurred. GREEN Lead indicated that there had been other MIG calls earlier which had proven to be F-4s.

T_{1B} - Shortly after hearing the call, GREEN 2 (Back) got a radar contact which appeared on the bottom sweep among the ground clutter at very short range (5 mi). Immediately, GREEN 1 (Front) called out, "MIGs at 11 o'clock low." GREEN 2 (Back) looked up and saw three MIG-17s popping up out of the haze layer, at about 9 o'clock.

The MIGs were on a reciprocal heading crossing from left to right and were below the flight about level with the mountain tops in the area (2000-3000 ft above the ground).

T_{2B} - GREEN 3 and 4 were starting to cross to the southside of the orbit track when the MIGs were called. When GREEN 3 rolled up to the right to check underneath, he saw one MIG at 5 o'clock and on rolling up further saw another MIG.

The MIGs rapidly disappeared into the haze before GREEN flight could alert Lead to the presence of the MIGs. The orbit was then continued without further contact, either radar or visual.

As BROWN flight was heading NW, wingman sighted enemy aircraft at 4 o'clock 4 mi out and level, on the way in toward target. The wingman called out the MIGs on the way into the target; and the flight continued on without jettisoning ordnance. Immediately after this, one of the MIGCAP was heard to call out "bogeys" on his radar. Due to the direction of the bogeys, they were identified as the strike flight. Shortly thereafter, the F-4 was heard to call "bogeys" and engage enemy aircraft. BROWN flight continued on to expend ordnance on the target and return. On return from the target, the enemy aircraft were spotted again.

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EVENT 1-18 SUMMARY

Time Mark	Action Aircraft (GREEN 1,2,3,4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3)	Remarks
	Status	Action				
T08	G1,2,3,4 480-520-kt TAS Altitude about 15,000-ft MSL Heading NW	Continue orbit for 2-3 min	BLUE flight in same general orbit.	Hear B384 jumped by MIG Communication channels become very cluttered.		GREEN flight in modified fluid-four finger-tip formation. Echelon right, echelon level.
T18		G384 start crossing from right to left. G2 Back obtains radar contact in ground clutter at 5-mi range slight look-down. Front calls out 3 MIGs at 11 o'clock low and "Lead we've got MIGs going under us." Back looks up and sees 3 MIGs popping up at 9 o'clock. Front never sees MIGs although he hears the call. Back sees 2 MIGs.		G384 acknowledge, but G1 never does.	Three MIG-17s passing in reciprocal heading from left to right, about 2000-3000 ft below the flight	B2 back on 25-mi scope, 3-bar scan, slight down look
T28		G3 rolls up to right to check underneath. Sees one MIG at 5 o'clock.		G3 calls MIG passing underneath 5 to 6 o'clock	MIGs proceeding SE. Disappear into haze	
NOTE: T ₀ for GREEN flight is the only corresponding T-mark with other flights.						
T0	B182 altitude 13,000-ft MSL at NW turn point in left turn speed 480-500-kt TAS		GREEN flight in same general orbit above BLUE	B182 hear the call that B384 have been jumped by MIGs.		B182 did not have radar coverage of B384 during the turns.

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EVENT 1-18 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
T ₁		B2 looks out and sees at 9 o'clock B3&4 with MIGs. B1 with B2 in lead heads toward B3&4.		B2 takes the lead since he has seen MIGs.		The scene observed by B2 was: One F-4 (B3) turning down to the right toward the haze with a much smaller aircraft on its tail. Another F-4 (B4) was following behind the MIG and then another small silver aircraft which had overshoot the second F-4 (B4).
T ₂		B2 loses 33&4 as they descend into the haze.				
NOTE: Since B1&2 are separated from B3&4, only T ₀ and T _{0A} are common to both. T ₁ and T ₂ for BLUE flight is not synchronized with T _{1A} and T _{2A} .						
Action aircraft B3 and B4 only.						
T _{0A}	B3&4 altitude ~13,000-ft MSL. Heading about north. Speed 480-kt TAS.	B4 sees a MIG-17 coming in on B3 at 5 to 6 o'clock low, range inside 1 mi	GREEN flight in same general orbit above	B4 calls B3 to break right	MIG-17 with 75-100-kt overtake	BLUE flight in general heading of 330°. B3&4 had just completed a 30°, 4-g link to the right to clear their 6 o'clock.
T _{1A}	B3 starting 4-5-g right break, speed 500-kt TAS, altitude ~10,000-ft MSL	B3 sees MIG, breaks hard right, into AB, jettisons tanks, 5-6 g. B4 breaks to right with B3. Jettisons tanks, goes to AB.			MIG closing and firing on B3 20° angle off, range inside 500 ft	Observed 37mm cannon firing

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EVENT I-18 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 3, 4)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
T2A	B3 in hard right break, altitude 9000 ft	B3 sees MIG overshoot and one second later B3 reversed up and over to the left, by pulling nose 30°-40° up and doing rudder reversal.			MIG passed underneath.	
T3A	In AB 7000-8000 ft 6-6.5 g's, 500 kt 070°-080° bank	B3 pulled into MIG canopy to canopy, then broke hard right to avoid mid-air collision with MIG. Descended and armed SIDEWINDERS		B4 calls out warning B3 of possible mid-air between B3 and MIG	MIG passes out in front of B3 and turns back into B3 200-300 ft in front	
T4A	Altitude 6000 ft, 500-kt TAS, 090°-110° bank B4 in AB 4th right turn	B3 still sees MIG on. His tail so continued to turn into MIG. B4 breaks left and down		B3 sees a MIG on the tail of B4 and tells B4 to break hard right. Called reverse B4 Back calls MIG at 6 o'clock	MIG pulls to inside then slips to outside M2 firing on B4. MIG overshoots from 5 to 7 o'clock	
NOTE: Since B3 and B4 split from this point on, the time marks for B3 and B4 are not synchronized.						
Action Aircraft BLUE 3 only						
T5A	B3 one g	B3 unloads, continues dive and passes a mountain. Also loses sight of MIG				
T6A	1.2 Mach, 4000 ft in AB	Pulls straight up and over to the right to heading of NW in a modified Immelman. Tops out at 14,000-15,000 ft				
T7A	14,000-15,000 ft	Comes out of AB.				

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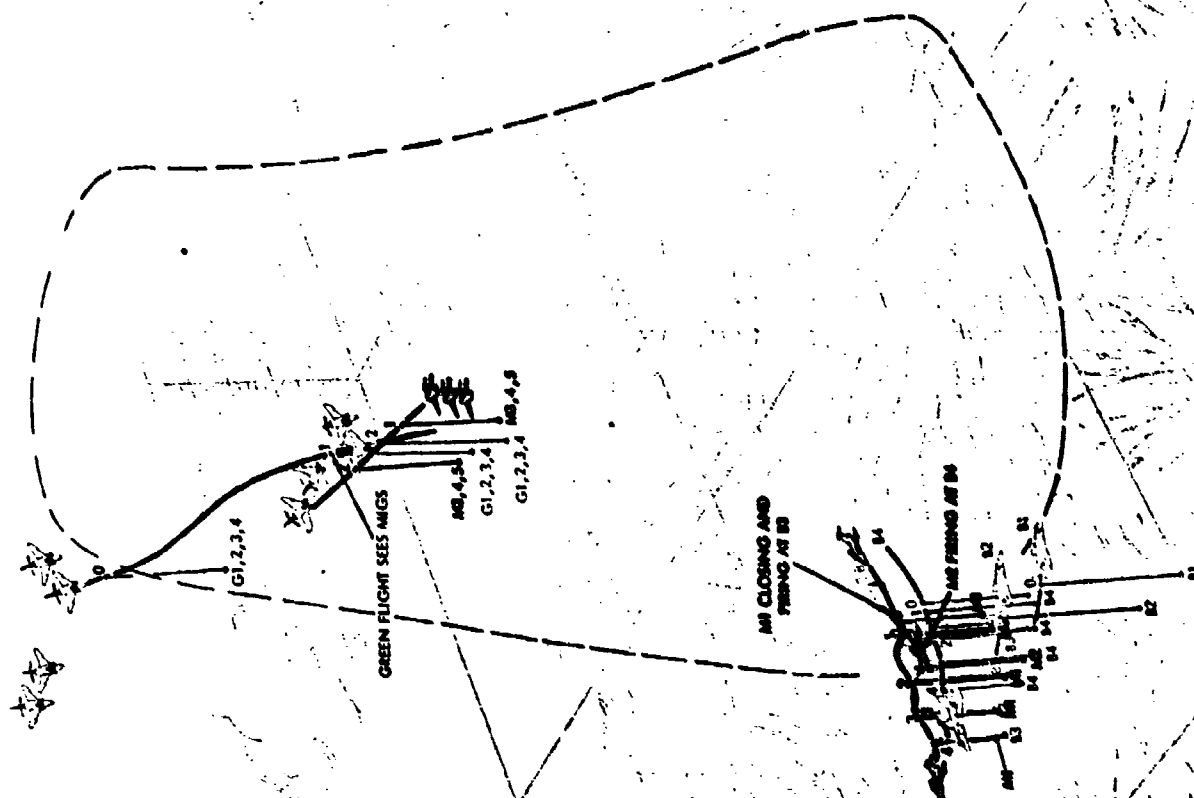
EVENT I-18 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
Action Aircraft BLUE 4 only						
T 5A	B4 in left break in AB	Unloads			MIG slides outside to 5 o'clock low	
T 6A		Heads for deck			MIG falls behind	
T 7A	Heading E-NE	Reverses to right turn, comes out on top of mountain				
T 8A		Turns south				
T 9A	Heading south 15,000 ft, 5000 lb of fuel	Sees MIG at 6 o'clock low, breaks hard left, unloads and accelerates to Mach 1.3			MIG goes down and away	
T 10A		Reverses over the top' in a climb				
T 11A		Turns south and goes home				

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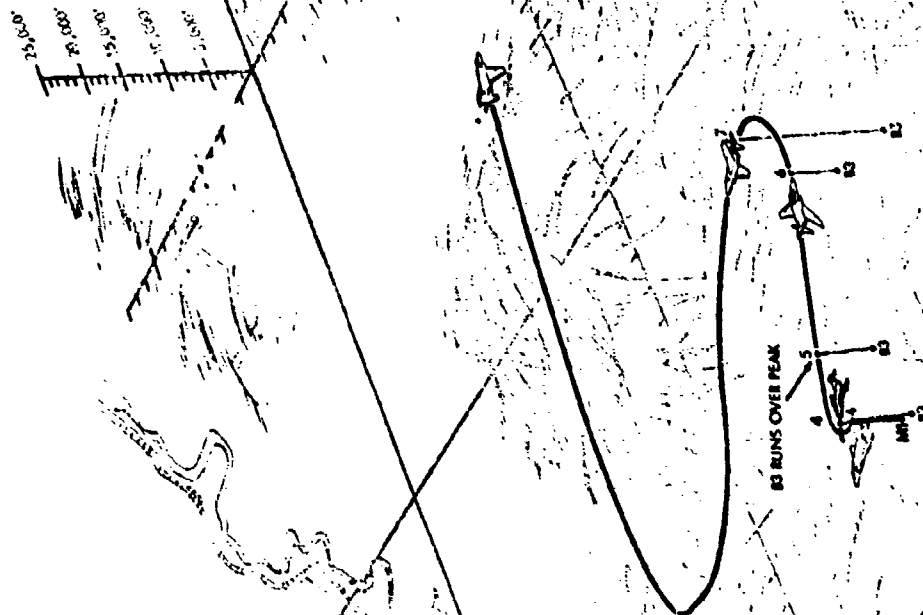
EVENT 1-18



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EVENT I-18



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EVENT I-18



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EVENT 1-19

Aircraft Involved: Four F-4Cs vs one YAK-25
(possible)

Result: Sighting only

Vicinity of Encounter: 14°33'N/107°10'E
Laos

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 10 Mar 1966/1025H

A flight of four F-4Cs (BLUE flight) on a TIGER HOUND mission against a target at 15°19'20"N/107°06'19"E.

11. DATA SOURCES

CINCPACFLT Staff Study 3-67
2AD 101405Z Mar 66 DOCC-O 14990
2AD 141425Z Mar 66 DIO 28848

12. NARRATIVE DESCRIPTION

BLUE flight came off the target and turned to a heading for Pleiku. The TACAN was determined inaccurate and the flight obtained a radar vector. Immediately after turning to the vector, heading SSW (approximately 200°) near the tip of Cambodia, BLUE 2 spotted a bogey at approximately 10 mi off to the right. The bogey was closing from the west at 28,000 ft, heading 90°, abeam of the flight.

The bogey closed to 1 or 2 mi of the flight before it turned to a heading behind the flight. The speed of the bogey approximated that of the F-4Cs, 510-kt TAS. The duration of visual observation was approximately 1 to 1-1/2 min.

BLUE 3 had radar lock-on to the bogey at the same time and location but could not spot the bogey when BLUE 2 called it out. The bogey broke lock at approximately 2 mi from the flight and disappeared from the scope on a reciprocal heading from BLUE flight.

The bogey was described as white or bright aluminum in color, no markings were observed. The wings were swept back very long and thin at 60°, "not a delta wing." One pod was located on outer third of each wing. Pods were blunt, resembling engine nacelles rather than fuel tanks. The fuselage nose was blunt and rounded and there was a high tail. Bogey was closer in appearance to a YAK-25 than MIG15/17/19, B66 or A-3D, "except nose was less rounded."

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EVENT 1-20

Aircraft Involved: Two F-8Es vs one
unidentified aircraft

Result: Sighting only

Vicinity of Encounter: 20°10'N/108°10'E
Tonkin Gulf

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Apr 1966/0915H

Two F-8Es (BLUE flight) were on a strike against a target located 17°10'N/107°20'E.

11. DATA SOURCES

Message: CTO 77.3 050627Z Apr 66

12. NARRATIVE DESCRIPTION

At about 0115Z from 20°10'N/108°10'E BLUE flight sighted an unidentified silver colored aircraft. BLUE flight was at 32,000 ft, when the bogey passed directly overhead at an estimated altitude of 50,000 to 60,000 ft on a heading of 120°. BLUE flight turned to follow but lost visual and radar contact. Identification not possible due to distance and altitude. BLUE flight continued and delivered their ordnance on the target.

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EVENT 1-21

Aircraft Involved: Two F-4Cs and one U-2

Result: Radar contact only

Vicinity of Encounter: 20°45'N/104°05'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Apr 1966/1232 to 1245H

Two F-4C aircraft were on an escort cover mission for TROJAN HORSE (U-2).

11. DATA SOURCES

Message: 7AF OPREP-4 0-210935Z; DOCCO-0 17970 April 66

12. NARRATIVE DESCRIPTION

A flight of two F-4Cs (BLUE flight) was on an escort cover mission for TROJAN HORSE (GREEN 1) at position 20°45'N/104°05'E. GREEN 1 aborted the mission 4 min after MIG alert for unknown reasons. BLUE flight was heading 021° at 32,000 ft, airspeed 500 kt when it was alerted to the situation of bogeys 60 mi east. They turned right to 060° heading, established a radar contact at 65 mi (direction unknown), started a rapid descent and at 50 mi lost target.

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EVENT 1-22

Aircraft Involved: Two F-4Cs vs One MIG-21

Result: 1 MIG kill, probable

Vicinity of Encounter: 22°00'N/105°50'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 23 Apr 1966/1615H

Two F-4C airplanes (BLUE flight) escorting one EB-66 (GREEN flight). The EB-66, with escort, was orbiting in the vicinity of 22°00'N/106°00'E in support of strikes being conducted in the general area. The mission of the F-4Cs was to protect the EB-66.

2. MISSION ROUTE

Four F-4Cs departed Danang and proceeded into Thailand for aerial refueling. The flight then proceeded northerly and joined two EB-66s. At the Red River, while heading northeasterly, the two EB-66s split and proceeded to assigned orbit areas with escorts.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

- 4 - SPARROW (AIM-7E)
- 4 - SIDEWINDER (AIM-9B)
- 1 - 600-gal centerline tank
- 2 - 370-gal wing tanks

No discrepancies with avionics at beginning of flight.

Airplanes camouflaged with white underside and green/brown top surface.

EB-66 GREEN 1

Unknown

MIG-21 MIG 1

Not determined.
Silver color.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Haze layer began at about 10,000 ft and reduced visibility to 1-1/2 to 2 mi below that altitude. Sky clear with unrestricted visibility above the haze.

	<u>BLUE</u>	<u>GREEN</u>
	1 2	1
<u>Altitude:</u>	On direction of GREEN 1 all airplanes were jinking in altitude while evading possible SAM launches. Altitude varied between 20,000 and 30,000 ft.	
<u>Heading:</u>	Completed a 180° left turn, rolled out on a northwesterly heading.	
<u>Speed:</u>	0.82-0.88 Mach	
<u>Fuel State:</u>	Full internal plus unknown in external.	Unknown.
<u>Flight Formation:</u>	F-4Cs were on each wing of the EB-66 about 1/2 mi wide and 30° aft of the beam.	

5. INITIAL DETECTION

BLUE 1 sighted four MIG-17s in formation, very low, headed north. Almost immediately BLUE 1 sighted a single airplane at his 6 o'clock, 4-6 mi and closing. This airplane was later identified as a MIG-21. Silver color made it stand out as enemy.

6. ACTION INITIATED

BLUE flight jettisoned external tanks. BLUE 1 lit afterburners and broke right into the MIG. BLUE 2 remained with GREEN 1. When the MIG followed BLUE 1, GREEN 1 turned left and departed the area. BLUE 1 turned hard right in pursuit of the MIG.

7. SITUATION DEVELOPMENT

After about 180° of turn BLUE 2 sighted two targets at about 6 mi. Back-seat pilot obtained radar lock. Uncertain whether BLUE 1 or MIG. Closed range in afterburner accelerating to about 1.7 Mach. Identified target as MIG-21. BLUE 2 maneuvered to gain separation. Attempted to fire two SPARROW missiles, no launch. Switched to HEAT and fired two SIDEWINDER missiles. No hit. Overran MIG again, so maneuvered for separation. Fired two SIDEWINDER missiles. No hit. Disengaged in a right diving turn and departed the area.

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EVENT 1-22

8. ORDNANCE

(No. fired/No. hits)

	<u>SPARROW</u> <u>AIM-7E</u>	<u>SIDEWINDER</u> <u>AIM-9B</u>	<u>Remarks</u>
BLUE 1			Did not shoot.
BLUE 2	2/0	4/0	SPARROWS did not leave the airplane. SIDEWINDERS were not observed by BLUE 2.
MIG 1			Did not shoot.

9. EQUIPMENT PROBLEMS

BLUE 2 had radio (UHF) and intercom difficulties after encounter started. Was unable to communicate with BLUE 1 and back-seat pilot.

BLUE 2 had attempted to launch two SPARROW missiles. Missiles failed to eject due to a maintenance error.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	3500	300		T-33, F-84 experience. Had completed fighter weapon school. Had never fired SPARROW. Had fired one SIDEWINDER.
Back				Not interviewed
<u>BLUE 2</u>				
Front		500		Very experienced in fighters. Combat experience in Korea and Vietnam.
Back	500	250	50	Had never fired a missile, was never in an F-4 when a missile was fired.

GREEN 1 Not interviewed

Comments on this Encounter

BLUE 1 (Front)

F-4 is a good airplane. Believed MIG-21 pilot was surprised by performance of F-4. Knowledge of the SPARROW weapon system weak, therefore limited confidence in weapon.

BLUE 2 (Front)

Evaluated F-4 as superior to the MIG-21. Pilot visibility from the cockpit of the MIG-21 very limited, structural restrictions to rearward visibility and to the down-looking field of view. Thought MIG pilot was also inferior.

BLUE 2 (Back)

Shortly after breakaway from GREEN 1 communication between cockpits in BLUE 2 was lost. Back-seat pilot was not contributing anything to the engagement and did not know next action planned by front-seat pilot.

Comments from Overall Experience

BLUE 1 (Front)

A gun would be useful for close-in situation. Pilots may misjudge the range to target and launch missile when not within missile envelope.

BLUE 2 (Front)

Did not like "hot mike" intercom in F-4. Used camouflage color pattern to assist in judging distance from other F-4. Did not like location of missile/ordnance control panel in F-4. Improve the performance of the AAM, and gun will not be needed. Two-place airplanes and two pilots a good configuration. Training safety restrictions severely limited air-combat-tactics training prior to deployment to the combat area. Recommended an optical aid for the back-seat for road recon or air to ground. Optical sight in F-4 was poorly located.

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EVENT I-22

11. DATA SOURCES

Project Interviews:

BLUE 1(Lead) - Front, 23 Jan 67
BLUE 2 - Front, 13 Mar 67
- Back, 10 Jan 67

Messages, Reports:

OPREP-3 7AF, 230851Z Apr 66,
DODO-0 18133

7AF, 232223Z Apr 66
DODO-0 18186

DIA Msg. DIAAP-2 9208 Apr 66 Sec 3
250420Z Apr 66

USAF Fighter Weapons School Bulletin-4

12. NARRATIVE DESCRIPTION

Four F-4Cs (BLUE flight) departed Danang to escort an EB-66 (GREEN flight) in support of strike operations in the area north of Hanoi. After flight refueling, the fighters rendezvoused with the EB-66 in the vicinity of 20°00'N/103°30'E. The flight proceeded northeasterly to the Red River where the EB-66s split into two flights and proceeded independently, each with two F-4C escorts. GREEN 1, with BLUE 1 and 2, established an E-W race-track orbit near 22°00'N/106°00'E. While orbiting, several SAM evasive maneuvers were executed in response to warnings from GREEN 1.

T₀ As the flight was turning through a northerly heading at the eastern end of the orbit at an altitude of about 28,000 ft, BLUE 1 sighted four MIG-17s in formation, very low, heading north. Almost immediately BLUE 1 saw a single airplane at 6 o'clock, climbing, at a range of 3-4 mi. The bogey was identified as a MIG and BLUE 1 called the TALLY HO.

T₁ BLUE 1 jettisoned his external tanks, engaged afterburner and broke right into the MIG when the MIG was about 1-1/2 mi astern. BLUE 2 stayed with GREEN 1 to be sure there were no other MIGs in the area. The MIG turned to chase BLUE 1.

T₂ BLUE 2 then told GREEN 1 to depart the area. BLUE 2 engaged afterburner, turned hard right and jettisoned his external fuel tanks. The MIG was pursuing BLUE 1 but was unable to stay inside the turn and was slipping to the outside.

T₃ BLUE 1 saw this and reversed to the left. BLUE 2 saw two targets ahead at about 6 mi as he was rolling out on a southeasterly heading. Because of the distance he did not know which was the MIG and which was BLUE 1. BLUE 2 chose to chase the airplane that had not turned. This turned out to be the MIG.

T₄ BLUE 2 was unable to contact BLUE 1. BLUE 2 accelerated to Mach 1.5-1.7 as he closed on his target.

T₅ His back-seat pilot had a radar lock-on but because of uncertainty of identification, BLUE 2 continued to close the target.

T₆ BLUE 2 joined with the target at close range. The target was identified as a MIG-21. BLUE 2 executed a high-g barrel roll to gain separation.

T₇ From a position between 1/2 mi and 1 mi BLUE 2 tried to launch two SPARROWS. The missiles did not leave the airplane due to a maintenance error. The missile ejector mechanism was not properly connected. Communication between cockpits was lost.

T₈ BLUE 2 switched to HEAT and launched two SIDEWINDERS. Neither pilot saw the missiles in the air but the back-seat pilot felt them leave the airplane. BLUE 2 executed another barrel roll to keep from overrunning the MIG. Again in a position astern of the MIG two more SIDEWINDERS were launched. Again neither pilot saw the missiles in the air but the back-seat pilot felt them launch.

T₉ BLUE 2 was below BINOC fuel so he disengaged and departed the area. In exiting the area he accelerated to supersonic speed for about 15 mi and landed at Udon instead of Danang due to low fuel, 600 lb. BLUE 1 landed at Udon about 15 min later.

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EVENT I-22 SUMMARY

Time Mark	Action Aircraft (BLUE 1,2)		Other Friendlies (GREEN 1)	Communications	Enemy Actions (MIG 1)	Remarks
	Status	Action				
T ₀	B1 and B2 4SPARROW 28,000 ft Mach 0.82-0.88 Full internal fuel	B1 sighted four MIG-17s low on the deck headed N. B1 sighted MIG-21. B1 jettisoned external fuel tanks.	G1 heading NW.	B1 alerted flight of presence of MIGs.	M1 commencing attack on G1. B1&2.	B1&2 escorting G1.
T ₁		B1 into hard right turn and engaged AB.	B2 continued with G1.	B1 called "Break." B2 stated he was staying with G1.	M1 chasing B1.	
T ₂	B2 accelerating.	B2 engaged AB, turned hard right, jettisoned external fuel tanks. G1 into diving left turn to clear the area	B1 attempting to disengage from M1.		M1 chasing B1, unable to stay inside the turn.	B2 advised G1 to clear the area.
T ₃		B2 sighted two airplanes out in front. B1 broke left as M1 slipped to 6 o'clock.			M1 did not attempt to follow B1 in left break.	
T ₄	B2 accelerated to Mach 1.5-1.7	B2 chasing M1.		B2 unable to contact B1	M1 heading SE at high speed	B2 accelerated to V _{max} out of turn.
T ₅		B2 gaining rapidly on M1. Obtained radar lock-on.		No contact with B1.	M1 departing area at high speed.	

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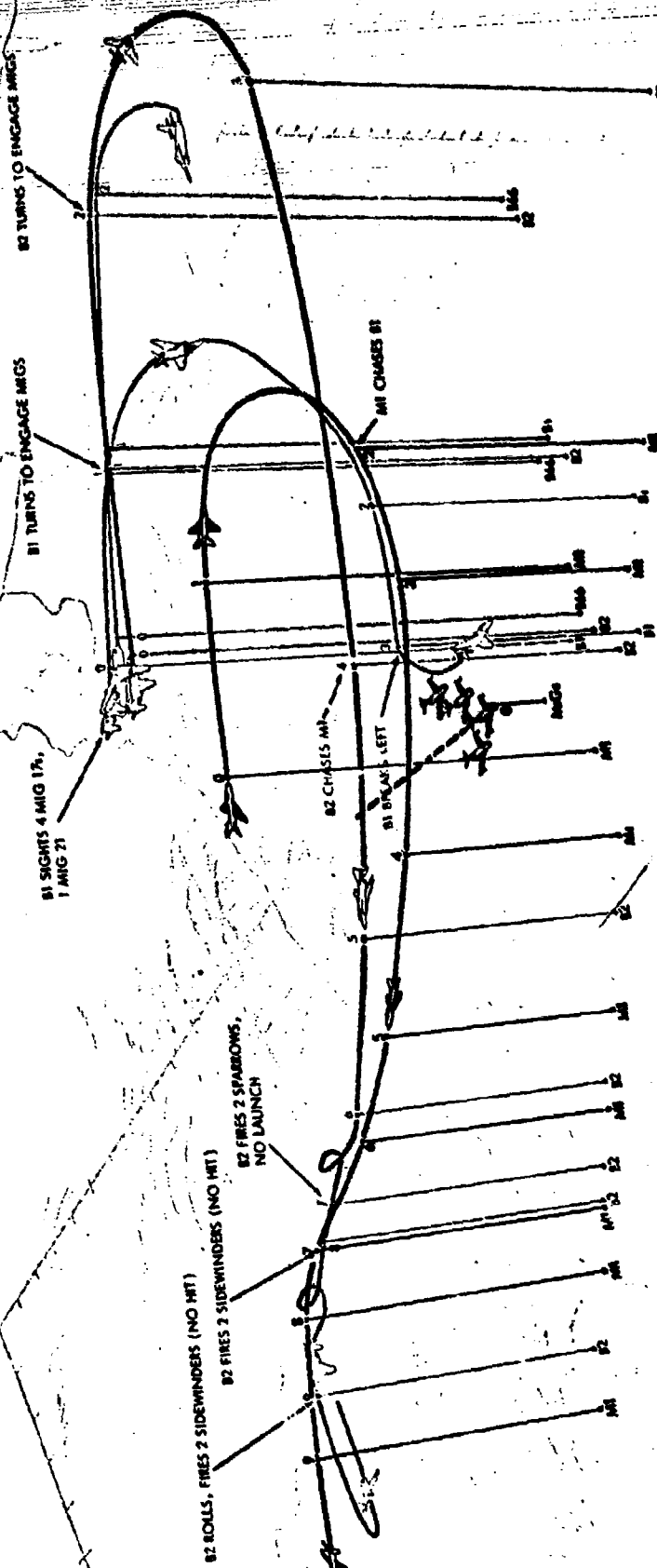
EVENT I-22 SUMMARY (Continued)

Mark Time	Action Aircraft (BLUE 1,2)		Other Friendlies (GREEN 1)	Communications	Enemy Actions (MIG 1)	Remarks
	Status	Action				
T ₆		B2 joined M1 at close range. B2 executed high-g barrel roll for separation.			No evasive action	B2 identified target as MIG-21.
T ₇		B2 in position to launch missiles. Attempted to launch two SPARROW missiles. No launch		Lost communication with pilot in rear cockpit.	Engaged AB and attempted to get away.	Back-seat pilot had radar lock-on and called "Shoot" before ICS failed.
T ₈		B2 launched two SIDEWINDER missiles. Did not see missiles in flight. Executed another high-g barrel roll to keep from over-running M1. Launched two more SIDEWINDER missiles. Did not see missiles.				
T ₉		B2 disengaged in diving flight turn in AB.		Regained communication with back-seat pilot.	Departed area.	B2 landed at emergency divert field -- very low fuel state -- 600 lb.

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EVENT 1-22



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EVENT 1-23

Aircraft Involved: Four F-4Cs vs four MIG-17s
Result: Two MIG-17s destroyed
Vicinity of Encounter: 22°N/106°E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 23 Apr 1966/1421H

MIG screen for support F-105 strikes on JCS target 18.23 (Bac Giang Hwy/RR Bridge).
Planned to orbit east-west between altitudes 12,000-18,000 ft in vicinity 22°N/106°E.
RB-66 with F-4C escort on station north of MIG screen orbit point.

2. MISSION ROUTE

Flew generally direct route from Udorn to west of planned orbit area. Refueled from KC-135 on RED TRACK at 28,000-ft altitude.

3. AIRCRAFT CONFIGURATION

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7D)

4 - SIDEWINDER (AIM-9B)

2 - 370-gal external fuel tanks

(1 - 600-gal centerline tank was dropped when empty prior to reaching orbit point)

MIG-17 MIG 1, 2, 3, 4

External tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Thin scattered clouds, visibility 10 to 15 mi

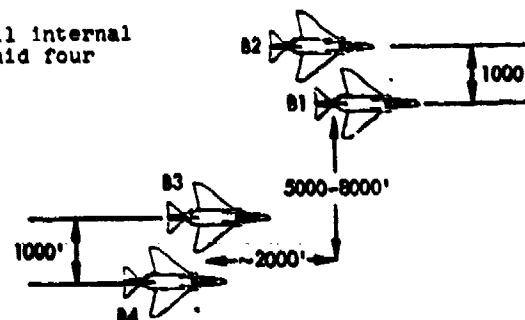
Altitude: Flight lead descending through about 15,000 ft

Heading: 090°

Speed: 480-kt TAS

Fuel State: Full internal

Flight Formation: Fluid four



5. INITIAL DETECTION

One of the F-4Cs picked up and reported radar contact about 15 mi, 45° left of flight. Other three F-4Cs then made almost simultaneous radar contact, 1421 local time. (Not known which aircraft made original radar contact.) BLUE 1 (Front) made visual contact at 8 mi, and ID at 6 to 7 mi.

6. ACTION INITIATED

BLUE 1 (L) made interception turn to left for identification pass and directed BLUE 3 to take up spacing to fire missiles after ID made. BLUE 3 and 4 dropped external tanks.

7. SITUATION DEVELOPMENT

BLUE flight met MIG flight in near head-on pass. BLUE 1 and 2 each fired one SPARROW and BLUE 3 fired a SIDEWINDER on this initial head-on contact.

Left turning engagement (Lufbery type) between altitudes 10,000 and 18,000 ft developed. Three MIGs gained position on tail of BLUE 2. MIG 1 fired at BLUE 2 but did not hit.

BLUE 3 and 4 maneuvered to attack three MIGs on BLUE 2's tail. MIG 3 broke into BLUE 3. BLUE 3 destroyed MIG 2 with one SIDEWINDER. MIG 1 disengaged by going to the deck.

MIG 3 approaching firing position on BLUE 3 and 4, shortly after MIG 2 was hit, could not follow the F-4 climbing separation maneuver and rolled down to the right. BLUE 4 followed MIG 3 and fired three SPARROW missiles, one of which hit and downed MIG 3.

Engagement lasted for approximately 10 min (1421-1431 local time).

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EVENT 1-23

8. ORDNANCE

	(No. fired/No. hits)		
	SPARROW AIM-7D	SIDEWINDER AIM-9B	Remarks
BLUE 1	1/0	0/0	Fired inside min range. Aim dot outside circle.
BLUE 2	1/0	0/0	No motor ignition.
BLUE 3	0/0	2/1	One forward hemisphere shot, no hit. Second hit and downed MIG 2.
BLUE 4	3/1	0/0	One guided but missed. One no motor ignition. One hit and downed MIG 3.
Total	5/1	2/1	

MIG 1 fired 37mm cannon. No hits.

9. EQUIPMENT PROBLEMS

BLUE 4 (Front) was unable to unlock his shoulder restraint to reach the HEAT switch when he desired to switch from SPARROW to SIDEWINDER while on MIG 3's tail.

10. AIRCREW COMMENTS¹

Comments on this Encounter

The flight had prebriefed to fire missiles on the identification pass even though there was little probability of aircraft making the identification getting a hit. Past history had been that MIGs were always on the offensive, and any action that could be taken to put them on the defensive would be beneficial to the F-4C flight.

MIG pilots were extremely aggressive and capable in their handling of the MIG-17.

MIG-17 could easily out turn the F-4C, but the power and speed of the F-4C more than made up for this disadvantage.

BLUE 4 (Front) is quoted as follows: "When the MIG aircraft selected afterburner after my first missile firing, I attempted to select HEAT on my missile panel to fire an AIM-9B SIDEWINDER. My inertial reel was locked and I had difficulty releasing the inertial lock so I could reach the panel and change the switch. Since the MIG was starting to evade, I elected to remain in the radar position and fire another AIM-7D SPARROW."

Engagement took place in a manner very similar to that for which they had planned briefed. None of the tactics utilized or required were of an extreme or unusual nature.

Comments from Overall Experience

BLUE 1 (Front) The need for F-4 gun is overstated, although it would be of value if it could be obtained without hurting current radar and other systems performance. If you are in a position to fire gun, you have made some mistake. Why, after a mistake, would a gun solve all problems? Also having a gun would require proficiency at firing, extra training, etc. Have enough problems staying proficient in current systems. If the F-4 had guns, we would have lost a lot more, since once a gun duel starts the F-4 is at a disadvantage against the MIG.

Need an identification system that will eliminate visual identification requirement.

BLUE 2 (Front) felt that he had very poor air-combat-tactics background. Prior background was bomber and other multi-engine. Transition to F-4 oriented toward upgrading a qualified fighter pilot rather than training a pilot with no fighter background.

11. DATA SOURCES

7th AF OPREP-3 240024Z April 1966 DOCO 18171

Interview, BLUE 1, Front, 13 Dec 66
Interview, BLUE 2, Front, 12 Dec 66
Interview, BLUE 2, Back, 14 Mar 67
Interview, BLUE 4, Front, 9 Mar 67
Letter, BLUE 3, Front, 31 Jan 67
Interview, BLUE 3, Back, 14 Mar 67
Letter, BLUE 4, Front, undated

¹Only aircrew experience data obtained was for BLUE 1 (Front): 2500 total flight hours, 650 F-4 hours, 30 combat missions.

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12. NARRATIVE DESCRIPTION

EVENT 1-23

BLUE flight of four F-4Cs was approaching MIG screen orbit point approximately 22°N/106°E. Mission was to cover F-105a striking JCS Target 18.23 (Bao Giang Hwy/RR Bridge). Flight was descending through 14,000-18,000 ft, heading 90°, speed 480-500 kt TAS, formation fluid four with second element (BLUE 3 and 4) flying 2000-3000 ft high, to the right 3000-8000 ft and about 2000 ft behind the lead element (BLUE 1(L) and 2). Centerline external fuel tanks had been dropped when empty, prior to this time.

T₀ At 1421 local time a member of the flight reported radar contact 45° left 15 mi. All aircraft in the flight picked up the radar contact almost simultaneously. BLUE 1(L) commenced turn to left to make positive identification of the bogeys and advised BLUE 3 to pick up spacing to get into firing position. BLUE 3 and 4 dropped wing external fuel tanks (two 370-gal tanks per aircraft). The flight accelerated and SPARROW missiles were returned.

T₁ At approximately 8 mi, BLUE 1 reported visual contact but still did not have positive identification.

T₂ At 6 to 7 mi BLUE 1 had positive identification of the bogeys as MIGs, by their silver wings and the shape of the vertical stabilizers. BLUE 1 and 2 jettisoned wing tanks. MIGs jettisoned wing tanks at about this time revealing to the F-4 flight that they were not carrying air-to-air missiles.

T₃ BLUE 1 had radar lock-on and fired SPARROW missile at 4 mi, just after getting minimum-range indication. The aiming dot was outside the ASE circle. The SPARROW did not appear to guide and passed 2000 to 3000 ft behind the MIG flight. BLUE 1(Front) knew the SPARROW would not hit but fired in hopes the action would put the MIGs on the defensive, which was the planned tactic.

T₄ BLUE 2 fired SPARROW in boresight mode at about 3-mi range. The missile motor did not ignite. Shot was made from 90° beam and parameters were not met.

T₅ BLUE 3, about 2 mi behind the lead element, could not hold radar lock-on for SPARROW shot so selected and fired a SIDEWINDER almost head-on to the MIGs, knowing there was little or no chance for a hit. BLUE 4 was maintaining a fighting wing position on BLUE 3.

By this time the MIG flight had broken left into the F-4 flight and the engagement was developing as a left-hand Lufbery-type dogfight (i.e., two or more aircraft follow one another in circle or spiral).

BLUE 1 and 2, after each had fired one SPARROW, descended slightly to accelerate and pulled up into a sharp climbing left turn.

The second element (BLUE 3 and 4) pulled up and entered into the left-hand Lufbery circle. BLUE 3 spotted a MIG getting into firing position on his element and immediately went to afterburner and started a steep left climbing turn to separate from the MIG. The MIG was unable to follow and broke down to the left.

During this time BLUE 4 observed four more MIGs (RED flight) approaching the area. They did not engage and departed to the south.

Several 360° turns were made during the engagement. The exact number of turns could not be determined.

BLUE 2 apparently dropped farther behind BLUE 1 than the normal fighting wing position during this period as he was scanning the cockpit in an effort to determine the reason for the missile motor ignition failure on his SPARROW firing. However, BLUE 2 still had BLUE 1 in sight.

T₆ BLUE 1(L) switched to HEAT (SIDEWINDER) mode and maneuvered to 6 o'clock on a MIG in a hard left turn. BLUE 1 was unable to fire due to high-g forces (approximately 5 g's). In this high-g turn, BLUE 1 observed his Mach was falling off and he was losing altitude; therefore, he eased the g loading to about 2 g's and slid to the outside of the MIG.

T₇ BLUE 3 observed and transmitted that BLUE 2 (in BLUE 3's 8 o'clock position) had three MIGs on his tail with MIG 1 in firing position. BLUE 3 accelerated and maneuvered his element to get in firing position on the three MIGs on BLUE 2's tail. (BLUE 1 observed BLUE 2 way back and turning to the inside of BLUE 1.)

T₈ BLUE 3 transmitted that MIG 1 was firing on BLUE 2. BLUE 2 on debrief reported that the MIGs were actually in his 8 o'clock position 1500 to 2000 ft behind and 200 ft lower, not closing. BLUE 2 could see the tops of the MIGs wings and felt they were not getting required lead. BLUE 2 saw MIG firing.

BLUE 1 directed BLUE 2 to unload and depart to the west. BLUE 2 went to AE, felt a jolt and reported he was hit. As BLUE 2 accelerated, the three MIGs continued to follow, but gradually lost ground. BLUE 1 after the "have been hit" transmission was concentrating on locating BLUE 2 and providing assistance.

T₉ As BLUE 3 and 4 approached firing position on the three MIGs, MIG 3 saw them and broke left, passing about 1500 ft in front of BLUE 3, and then maneuvered to get 6 o'clock on BLUE 3 and 4.

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EVENT I-23

T10. MIGs 1 and 2 apparently did not see the two F-4s closing on them and continued the leading chase after BLUE 2. BLUE 3 fired a SIDEWINDER and hit MIG 2. The missile was fired at approximately 4000-ft range, 450-kt TAS, 10° bank and 2 g's. Both BLUE 3 and 4 observed MIG 2 smoke and pieces fall off as it rolled, to right, apparently out of control, into a nearly vertical dive. MIG 2 broke to the left and down to depart the area.

T11. After firing the SIDEWINDER, BLUE 3 rolled to the left to clear his tail and observed MIG 3, which had earlier broken in front of him, coming into firing position. BLUE 4 back seat had been watching MIG 3 maneuver into firing position and had alerted his front seat-er. BLUE 3 and 4 engaged afterburner and commenced steep left climbing separation maneuver. MIG 3 was unable to follow and rolled off to the right.

T12. BLUE 4 (3000 to 4000 ft behind and to the right of BLUE 3) observed MIG 3 roll off to the right and transmitted to BLUE 3 that he was in position to attack. BLUE 3 continued his roll in the direction of MIG 3; had pipper on the MIG and told back seat to lock on. After getting good lock-on and proper missile indications, BLUE 4 fired a SPARROW as he passed through 16,000 to 17,000 ft rolling into a downward maneuver. The SPARROW appeared to guide properly, but there was a great amount of side-slip in the launch aircraft's flight path and the SPARROW passed by the left wing of MIG 3.

T13. MIG 3 selected afterburner and BLUE 4 attempted to switch to SIDEWINDER mode, but was unable to unlock his shoulder restraint to reach the switch. BLUE 4 fired second and third SPARROW while passing through 13,000-ft altitude in a near vertical dive. One SPARROW hit MIG 3, and BLUE 4 observed thick grey and white smoke trailing the MIG as it continued its near vertical dive. The other SPARROW was not seen. Apparently no motor ignition. BLUE 4 leveled at 8000 ft, rejoining BLUE 3 and departed the area.

In the meantime, BLUE 1 had rejoined on BLUE 2 and after a look at the aircraft reported unable to locate any damage. BLUE 1 directed BLUE 2 to commence climb for return to base.

BLUE 2(Front) later, on the ground, reported that he had found his stability augmentation disengaged shortly after reporting he had been hit. Upon resetting stability augmentation, the system functioned properly. He felt that the jolt, which made him think the aircraft had been hit, was caused by disengagement of the stability augmentation system at the time he went to afterburner to separate from the MIGs on his tail.

Both elements of the flight were joined up shortly after crossing the Red River. All four aircraft were at or above BINGO fuel. The flight returned to base without further encounter. Two MIG-17s had been shot down with no damage to the F-4C flight. Total engagement time approximately 10 min.

The engagement took place between altitudes of 10,000 to 20,000 ft with speeds ranging from 400-kt TAS to 1.2 Mach. Maximum g reported was 5 pulled by BLUE 1. BLUE 4 reported never pulling more than 3 g's.

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EVENT 1-23 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendlies	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₀	480 to 500-kt TAS descending 14,000-18,000 ft	Commenced left turn for 10 pass, accelerated slightly. B384 jettisoned wing tanks and widened turn for spacing		Radar contact called out. B1 stated his element would make 10 pass. B1 directed B384 to get spacing to be in firing position.	On course about 245°. Continued this heading.	One of the F-4s reported radar contact 45° left about 15 mi. Other aircraft had almost simultaneous reading of radar contact rapid overtake.
T ₁	500-kt TAS 15,000 ft	All F-4s working for radar lock-on; SPARROW missiles returned; B384 behind 3000-4000 ft above lead element.		B1(L) called "visual 12 o'clock" then "shiny wings 11 o'clock."	Boeys remain on steady course.	
T ₂	15,000 ft	B12 jettisoned external tanks, armed missiles		B1 called positive 10. B1 rear seater had radar lock-on, advised front seater to fire.	MIGs apparently did not see BLUE flight until after tanks were jettisoned. Still straight and level to that time.	Positive 10 as MIG-17s by shape of vertical stabilizer
T ₃	500+ -kt TAS 15,000 ft	B1 fired SPARROW, locked on from 45° stern in full system, overtake 150 kt. As missile left, break X appeared on scope.		B1 reported he was firing.	MIGs jettisoned tanks and broke left into BLUE flight.	SPARROW fired about 4-mi range. MIG just passed min range and timing dot was not in the ASE circle. MIG he would miss. Missile went 2000-3000 ft behind MIG. Gave no indication of guiding.
T ₄	500+ -kt TAS 15,000 ft	B2 fired SPARROW 3-mi range in boresight mode. B12 went AB, descended slightly to accelerate and then made a hard climbing left turn. B384 about 2 mi behind B1.			MIGs in hard left turn, making gun attack.	SPARROW motor did not ignite although missile left the aircraft. Estimated four MIG-17s in flight. No lock on was achieved.

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EVENT I-23 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendlies	Communications	Enemy Actions MIG 1,2,3,4	Remarks
	Status	Action				
T ₅	500+ -kt TAS 15,000 ft in slight dive	B3 fired SIDEWINDER almost head-on, then made half left turn in attempt to get into firing position on the MIGs. B4 in fighting wing position.			MIGs aggressively maneuvering to get in firing position on BLUE flight.	B3 could not get radar lock-on. Switched to HEAT. Knew he had little chance of getting a hit. SIDEWINDER did not hit.
		The engagement developed into a left Lufbery dogfight. It was not possible to reconstruct the actual number of turns made. Between T ₅ and T ₆ .				
		Sometime during this period B384 evaded a MIG approaching firing position by going AB and making climbing left turn.		B4 reported four additional MIGs approached and departed the area.	MIG at 6 o'clock on B384 could not follow separation maneuver and broke off to the left	
T ₆	Mach 0.92 17,900 ft 5 g's	B1 6 o'clock on a MIG. Attempted to fire a SIDEWINDER. Range 1-1/2 mi. Could not fire due to high g's. Had to unload to 2 g's and reduce angle of attack to avoid losing Mach and altitude. B1 slides to the outside. B2 had his head in the cockpit attempting to locate rear sonar for motor fire on his missile (T ₄). In process fell behind B1 but still has B1 in sight.				
T ₇		B1 observed B2 some distance behind coming to the side. B384 2000-3000 ft above both B2 and the MIGs. B384 accelerated and maneuvered to engage the MIGs on B2's tail.		B3 transmits that 3 MIGs are approaching firing position on B2.	Three MIGs in trail on B2's tail.	B2 later reported closest MIG 1500-2000 ft back, 200 ft low at 8 o'clock. B2 could see tops of wings and knew the MIGs were not pulling lead.

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EVENT 1-23 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendlies	Communications	Enemy Actions (MIG 1,2,3,4)	Results
	Status	Action				
T ₈		B384 closing gap to get in firing position on the MIGs. B2 went to AB, felt jolt, thought he was hit. B2 continued turn to west.		B3 reported lead MIG was firing on B2. B1 directed B2 to unload and depart to the west. B2 reported he was hit.		B2 could still see tops of wings and, although MIG was firing, felt he could not be hit.
T ₉		B2 accelerated and started to pull away from MIGs. B1 to the outside of the other F-4s was concentrating on getting together with B2 since his "I've been hit" report. B384 approaching firing position on the MIGs.			M3 behind M2 saw B384 closing and broke left, passing 1500 ft in front of B3. M3 then maneuvered to get 6 o'clock on B384. M1&2 continued to chase B2, gradually losing ground.	
T ₁₀	450-kt TAS 14,000 ft 2 g's	B3 fired SIDEWINDER at M2. B3 observed M3 moving into firing position on his element. B384 went AB, made steep climbing left separation maneuver.		B3 reported M3 positioned at 6 o'clock.	M1 broke left and down to disengage. Not seen again. M2 smoked, pieces fell off and rolled down out of control (kill). M3 moved into firing position on B384	SIDEWINDER fired at about 4000-ft range. 450-kt TAS. 30° left bank. 2 g's (hit).
T ₁₁	18,000-20,000 ft	B4 rolled to the right in a downward maneuver to follow M3. Got pipper on MIG and had radar lock-on.	B1 joined up with B2 at 12,000 ft. Could not find any damage. Directed B2 to climb and head for home.	B3 reported M3 rolling off and that he could make attack on M3.	M3 attempted to follow B384 in the separation maneuver. Could not follow and rolled off to the right and down.	Made lock on after acquisition in beregsight.

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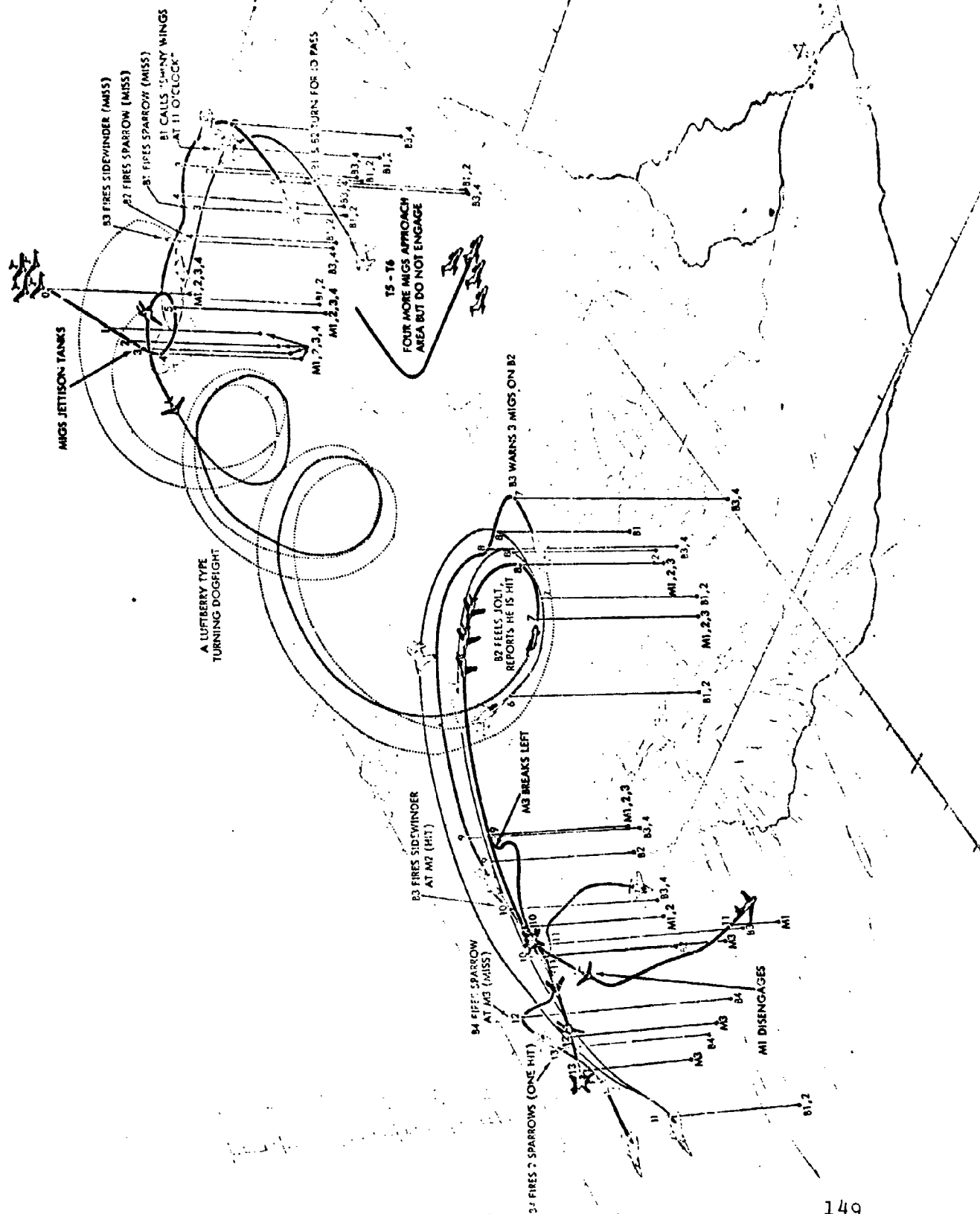
EVENT 1-23 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendlies	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T 12	500-kt TAS 16,000- 17,000 ft AB 40° dive	B3 fired SPARROW at M3. B4 front seater attempted to go HEAT (SIDEMINDER) but could not reach switch due to inability to unlock shoulder restraint. Elected to fire another SPARROW.			M3 went AB and started evasive maneuvering. M3 in near vertical dive.	SPARROW fired while B4 was in sideslip. Passed by left side of M3. Appeared to be guiding.
T 13	Mach 1+ 13,000 ft 8,000 ft	B4 repositioned and fired two more SPARROWS at M3. One SPARROW hit M3. B4 pulled out of dive by 8000 ft and rejoined B3.			After being hit by SPARROW M3 started to smoke and continued to dive.	One SPARROW hit M3. Other SPARROW not seen. Apparently no motor ignition. Apparent long preparation time on second SPARROW fired.
BLUE flight four F-4s joined up shortly after Red River. All aircraft had BINGO fuel or better.						

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EVENT I-23



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EVENT I-24

Aircraft Involved: Two F-4Cs vs two MIG-21s

Result: No damage

Vicinity of Encounter: 22°26'N/104°50'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 25 Apr 1966/1137H

Two F-4Cs (BLUE flight) were escorting a U-2 (GREEN flight) on a TROJAN HORSE mission. Attacks were authorized on any bogeys above 35,000 ft, without positive identification.

2. MISSION ROUTE

BLUE flight departed Udorn to fly a triangular pattern, arriving at the vertices at a prescribed time. The track was to be at approximately 20°00'N/103°40'E at T₀+30 minutes; 22°20'N/105°00'E at T₀+50 minutes; and 22°20'N/103°10'E at T₀+60 minutes. There was no air refueling.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

- 4 - SPARROW (AIM-7D)
- 4 - SIDEWINDER (AIM-9B)
- 2 - 370-gal wing tanks
- 1 - 600-gal centerline tank
- Camouflage paint

MIG-21 MIG 1

Silver color

Presumably missile armed, no positive identification of ordnance

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear; contrail level started approximately 32,000 ft.

	BLUE	GREEN
	1 2	1
Altitude:	30,000 ft	70,000 ft
Heading:	In turn, Hdg SW	W
Speed:	Mach 0.82	-
Fuel State:	Full internal, and some in external tanks	
Flight Formation:	BLUE 1 and 2 in loose formation with BLUE 2 separated about 1/2 mi	

5. INITIAL DETECTION

Visual detection of a contrail by BLUE 1 (Back) at 7 o'clock and about 20-mi range. The contrail was heading 270°. While a silver speck was seen ahead of the contrail, positive identification was not made until B-2 first attacked the MIGs.

6. ACTION INITIATED

BLUE flight dropped tanks, accelerated and turned to intercept the bogey.

7. SITUATION DEVELOPMENT

After instructing the U-2 to withdraw, BLUE 1 made a beam SPARROW attack, then pulled in trail for a SIDEWINDER attack, neither of which was successful. BLUE 2 made three attacks, the first was head on as the MIG attempted a snapup attack on the U-2. After the MIG made a 180° turn back towards Hanoi, BLUE 2 made a SPARROW attack and a SIDEWINDER attack on the MIG. None of BLUE 2's attacks were successful and BLUE flight retired at the detection of a second MIG, because of fuel limitations.

8. ORDNANCE

	No. Fired/No. Hits		
	SPARROW AIM-7D	SIDEWINDER AIM-9B	Remarks
BLUE 1	0/0		A SPARROW firing was attempted but no missiles left the aircraft; one gas generator ignited and burned
		2/0	Fired out of range
BLUE 2	1/0 3/0		Pipper off target during boresight firing
		2/0	Two went ballistic, one appeared to guide through a portion of the flight
MIG 1	No ordnance expended		Both fired out of range

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EVENT 1-24

9. EQUIPMENT PROBLEMS

Exact source of BL's misfire unknown.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1 (Front)	7000	600	≈ 70	
BLUE 2 (Back)	700	500	≈ 70	Some ADC time, fired only 1 SPARROW and no SIDEWINDER. Little ACT.
BLUE 2 (Front)				Extensive ADC experience in F-101.

Comments on this Encounter

BLUE 1 (Front)

Felt the tactical situation was such that the flight was on the defensive and could not use radar adequately, and was unprepared to execute any attack on the MIGs. A better tactic would be to fly opposite the U-2 track so the threat is faced.

- Since BLUE flight was operating in a location where the MIGs were under GCI, two more escort aircraft would increase effectiveness.
- Did not realize how fast things can move when both target and attacker are flying at supersonic speeds.
- Felt that the MIG aircraft knew that there were F-4 escorts and were foolish to attempt an attack.

BLUE 2 (Back)

- Impressed with the heat seeker missile due to its simplicity.
- Disappointed in the performance of the SPARROW since its lack of performance under ideal intercept was not explained.
- All crew members felt initial expenditure of ordnance was an acceptable tactic to protect the U-2 even though missile parameters were not met.

Comments from Overall Experience

BLUE 2 (Back)

- Gun is not particularly desirable, if the performance of the aircraft is degraded by an external installation. Also, one might make the mistake of getting into a turning battle if a gun was available.
- Would like a fighter that could turn better. However, other performance features should not be overly compromised to achieve this, such as acceleration.
- Would like the acceleration of the F-105 at sea level.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front) 13 Dec 1966; BLUE 2 (Back) 14 Mar 1967.

Messages, Reports:

Letter from BLUE 1 (Back)
BLUE 2 (Front)

USAF Fighter Weapons School CAD Bulletin #4, 18 May 1966.

USAF Fighter Weapons School CAD Bulletin #10, 7 Feb 1967.

7AF msg 250613Z Apr 66 DCCO-0 18303

7AF OPREP-3 250933Z Apr 66 DCCO-0 18322

7AF OPREP-4 251112Z Apr 66 DCCO-0 18327

12. NARRATIVE DESCRIPTION

The mission was planned as a U-2 escort, with the requirement to be at a given location at a specified time. The U-2 aircraft had been attacked previously at the turn point of its orbit (see events 17 and 21 for two other recorded events). The documentation establishing the frequency of attacks (5 times) mentioned by BLUE 1 (front) was not found.

Because of the limits imposed by the time-distance points, nonavailability of refueling (which made fuel conservation necessary), and the existence of a contrail layer above 32,000 ft which would disclose its presence, BLUE flight flew at Mach 0.82 and 30,000 ft. Even at these flight conditions a constant weave and orbiting was necessary to stay with the U-2. This flight pattern and speed was felt by BLUE 1 (front) to put the F-4s at a decided disadvantage at the start of any hostilities.

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EVENT 1-24

BLUE 1

To During a turn to the south, as part of the orbit pattern, BLUE 1 (Back) spotted a contrail at 7 o'clock coming from Hanoi area. Since the air space was sterile above 35,000 ft, attacks were authorized on any target above this altitude without the necessity of positive identification.

The BLUE crews had studied the flight profiles of MIG-21 aircraft making GCI attacks on a high-altitude target and had a knowledge of the expected speed and altitude of the bogey. After advising the U-2 to withdraw, BLUE 1 and BLUE 2 dropped tanks and with the bogey now to the rear, BLUE 1 and BLUE 2 entered a diving turn to position and, gained airspeed for an attack. In diving to gain airspeed, BLUE 1 bottomed out at 13,000 ft, necessitating a long climb back to attack altitude. A beam attack resulted in which a SPARROW firing was attempted in boresight mode, pipper on the target and the aircraft in a 100° bank. It had proved impossible to maintain radar lock-on during the turning maneuver. None of the SPARROW missiles left the aircraft although all were triggered. The gas generator on one missile did ignite.

T₃ Due to the altitude and low speed BLUE 1 fell off with the afterburner out. At this time he saw the first missile fired by BLUE 2 pass the MIG.

T₅ BLUE 1 lit his afterburner and rolled out in trail of the MIG and, in desperation, fired two SIDEWINDERS out of range. BLUE 1 had a good tone and low-g load on the airplane. The missiles were observed to track; however, the range was too great and the missiles self destructed behind the MIG.

T₆ Shortly thereafter BLUE 1 came out of afterburner as fuel approached minimum for return; however, he stayed in trail of the MIG and instructed BLUE 2 to make another attack on the MIG. BLUE 1 finished the engagement with 3200 lb of fuel, and with home base 315 mi away he started a climb to best cruise conditions. While going out BLUE 1 saw BLUE 2 about 30 mi to the east making his attack and also saw a contrail making an intercept run on BLUE 2. BLUE 1 informed BLUE 2 of the attack and BLUE 2 broke off the attack and exited.

BLUE 2

T₁-T₂ At the initiation of the action, BLUE 2 accelerated out and turned to position himself for a head-on ID attack. In the dive and turn BLUE 2 went to 25,000 ft, so insufficient airspeed was achieved and since he could not get a radar lock-on he initiated a snap-up attack from 29,000 ft, in boresight.

T₃&T₄ At this time the MIG began a rotation and climb to start a snap-up attack on the U-2. The combination of this and insufficient airspeed precluded keeping the pipper on the target and a SPARROW was launched with the pipper slightly to the rear of the target. The missile, which was observed by BLUE 1 at this time since BLUE 1 was slightly behind BLUE 2, missed the MIG, passing about 100 ft behind.

T₆ The MIG pilot probably observed the missile since he broke off his attack, leveled out and continued on a westerly heading. BLUE 2 rolled out in trail of the MIG and got a radar lock-on. However, the overtake was negative and BLUE 2 decided to descend below contrail level and stay in trail.

T₇ The MIG finally turned 180° through south to east and BLUE 2 turned to set up a front quarter intercept. A descent was made to pick up speed and the afterburner ignited. After accelerating BLUE 2 remained below the contrail level until 11 mi-range was reached, at which time a snap-up attack was made. The radar was locked on to the MIG and the three remaining SPARROWS were set to be fired automatically, interlocks in.

T₁₀ All switch positions were rechecked, including polarization. The first missile was fired immediately as the in-range light came on at 5 mi with an overtake of 1000 knots. After this missile fired, BLUE 2 resqueezed the trigger and fired the remaining two SPARROWS. On each of the firings the steering dot was within the ASE circle. The missiles appeared to go ballistic, and did not track the target. The last missile appeared to make some corrections but it also missed. All switch settings in BLUE 2 aircraft were in the proper positions.

T₁₁ BLUE 2 then rolled out at 3-4 mi in trail with the MIG and fired two SIDEWINDERS. These both appeared to track but the firing was made out of range.

T₁₂ During this attack the MIG proceeded at the same speed and altitude. At this time BLUE 1 called minimum fuel and the attack was terminated. BLUE 2 had about 4000 lb of fuel at this time. After minimum fuel was called a contrail on an intercept course was sighted. BLUE 2 decided to remain in the contrail layer momentarily to draw the MIG, then dove to 10,000 ft in afterburner to obtain separation. At the end BLUE 2 had 3200 lb of fuel. BLUE 2 climbed to best cruise altitude for the return. On landing BLUE 2 had 1200 lb of fuel.

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EVENT 1-24 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendlies (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	B1 Alt - 30,000 ft, Mach 0.82	In left turn to south as part of an orbit in support of G1. B1 sights high-speed con- trail coming from Hanoi area at 7 o'clock, range about 20 mi.	G1 has just turned to the west, alti- tude about 70,000 ft	B1 calls G1 warning of approaching bogey. Received no reply. B1 calls B2 and advised him to accelerate out and attempt a head-on attack.	Alt 46,000 ft, Speed Mach 1.6, Heading 270° making a con- trail which continued through encounter	Clear air space above 35,000 ft. B1 and B2 at 30,000 ft to stay below con layer
	B2 same status Radar on 50-mi scale	In left turn to south as part of orbit		B2 calls that he is going in for the ID		
T ₁	B1 same status as at T ₀	Lights AB, jettisons tanks and dives to accelerate. In bottom of dive goes to 13,000 ft and starts pull-up.			Same	
	B2 same status	Lights AB, accelerates straight out, jetti- sons 3 tanks and descends slightly to 25,000 ft in right turn.				
T ₂	B1 Mach 0.9-1.0 Alt - 38,000 ft 50-60° nose-up 100° bank. range to target 6 mi, target 10 o'clock high	Back cannot get lock- on so goes boresight, trying to follow tar- get with pipper. Attempts to fire 4 SPARROWS. SPARROWS do not fire. Max of 2 g		B1 called to Back to look at 10 o'clock then go boresight	Same	B1 sees silver MIG. The parameters were not met for B1's missile firing, how- ever, it was thought necessary to scare off the MIG. The gas generator ignites on one missile of B1's aircraft but it does not eject. Trig- ger held down 5-7 sec.
	B2 Mach super- sonic. Alt - 29,000 ft level Radar on 25-mi scale	J2 back cannot get lock-on. Starts snap- up maneuver in boresight.				
T ₃	B1 AB off, 10° nose down	B1 falling off			MIG starts snap- up attack on G1	Has good view out the side

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EVENT I-24 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T4	B2 Alt 39,000 ft Speed 150-kt CAS Range - 2 mi 30° nose up, no bank B1 10° nose-down AB off	Fires a SPARROW in bore-sight. Due to insufficient speed, pipper is slightly to rear of target Falling off, lights AB, continues down to 25,000 ft and starts to climb	B1 sees missile pass 100 ft behind MIG	B2 Front calls bogey as MIG-21		No lock-on
T5	B1 Alt 35,000 ft Mach 1.25, Nose up, climbing 10° locked on in full system 10° angle off from MIG	Fires 2 SIDEWINDERS out of range. Good tone. SIDEWINDERS do track. Continues to follow MIG in AB, heading 270°		Little talk between B1 and B2	Alt: 46,000 ft Mach: 1.6 Heading: 270°	SIDEWINDERS self-destruct 3 mi behind MIG fired at 5-7 mi range
T6	B2 Alt 30,000 ft Mach 0.88 Radar on 25-mi scale B1 fuel 3200 lb	Rolls out 15 mi behind MIG. Negative overtake Comes out of AB and starts home				Decision to follow MIG below con layer to see which way he will go.
T7	B2 same Radar on 50-mi scale	Turn after MIG to set up intercept, and dive to accelerate. Goes to 20,000 ft and heading 220°. Lights AB.			MIG starts turn to south.	Judgment is that MIG will turn 180° and head home.
T8	B2 Mach 1.4 ind. Alt 30,000 ft in AB Heading 220° Radar on 25-mi scale	MIG at 25° to left on intercept course. Range 30 mi. Dot coming down the scope.			Coming out of turn heading 090° Alt: 46,000 Mach: 1.6	
T9	B2 Mach 1.4 ind. Alt 30,000 ft in AB	Range to MIG 12 n mi. Starts snap-up SPARROW attack, interlocks in.			Alt: 46,000 ft Mach: 1.6 Heading: 90°	

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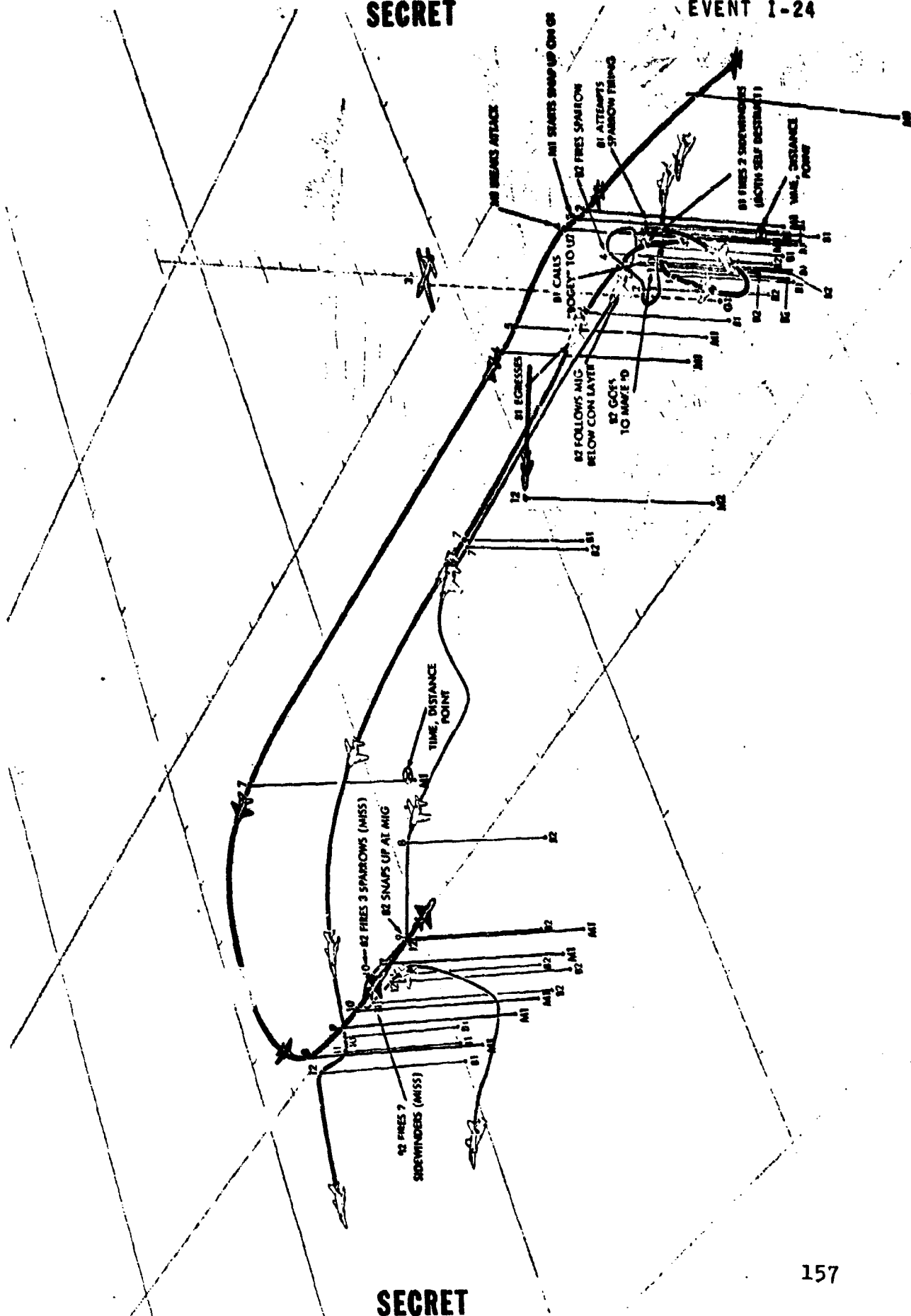
EVENT I-24 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T10	B2 Mach 1.3 34,000 ft B1 out of AB at 30,000 ft	Computer fires first missile at 5 mi Vc = 1000. Remaining missiles fired at 4.5 and 4 mi. Steering dot in ASE circle. Sees SPARROW missiles miss				First missile fails to guide. Second missile fails to guide. Third mis- sile tries to guide but cannot make the intercept.
T11	B2 Alt 46,000 ft Mach 1.2 indicated in AB	Rolls out in trail of MIG at 3-4 mi and fires 2 SIDEWINDERS out of range. 10-15° stern aspect. B1 exiting				SIDEWINDERS explode 1 mi behind MIG
T12	B1 best cruise conditions B2 Mach 1.2 Alt 45,000 ft Fuel 4000 lb	Descends to pick up speed and separation. then climbs to best cruise altitude and exits		B1 calls B2 that there is a contrail on an intercept course on B2	MIG continues. Second MIG contrail seen on intercept to B2.	

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EVENT 1-24



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EVENT 1-28

Aircraft Involved: Four F-4Cs vs two MIG-21s

Result: No damage

Vicinity of Encounter: 21°50'N/104°40'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 25 Apr 1966/mid-afternoon

Four F-4C (BLUE flight) escort for EB-66 (GREEN flight) ECM mission northwest of Hanoi in the vicinity of Yen Bai. Mission was to protect EB-66 and to attack MIGs only if the EB-66 was threatened. EB-66 was providing ECM support for F-105 strikes in vicinity of Yen Bai.

2. MISSION ROUTE

Udorn to RED ANCHOR for refueling to 21°45'N/104°30'E to enter NE-SW orbit north of Yen Bai.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7D)
4 - SIDEWINDER (AIM-9B)
1 - 600-gal external tank (centerline)
2 - 370-gal external tanks
Radar on, TACAN off
Camouflage paint

EB-66 GREEN 1

Not given

MIG-21 MIG 1, 2

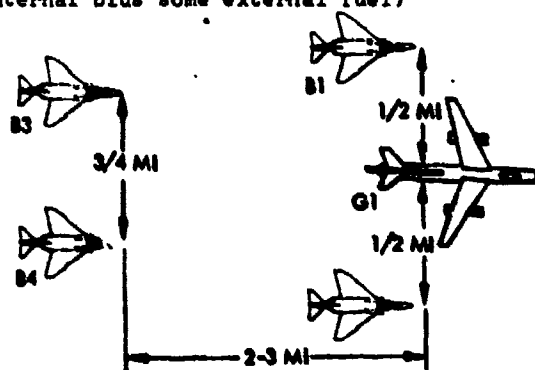
Not known
Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Thunderstorm buildups to about 40,000 ft over mountains to the west. Some lower clouds with tops about 15,000 ft. Visibility 10-15 mi, no clouds in the area and altitude of the engagement.

	BLUE				GREEN
	1	2	3	4	1
Altitude:	30,000 ft	30,000 ft	32,000 ft	32,000 ft	30,000 ft
Heading:	045°				045°
Speed:	Mach 0.82 (S-turning to stay with GREEN 1)				Mach 0.76
Fuel State:	16,000-18,000 lb				Unknown
	(full internal plus some external fuel)				

Flight Formation:



5. INITIAL DETECTION

No MIG warnings had been received. BLUE 3 (Back) spotted two silver glints 3 o'clock high, 6-7 mi on reciprocal course. Advised Front and observed one of bogeys enter contrail level at about 5 o'clock position and start right turn toward 6 o'clock on BLUE flight.

6. ACTION INITIATED

BLUE 3 called bogeys, jettisoned external fuel tanks and made hard right descending 135° bank turn to identify the bogeys. BLUE 4 jettisoned tanks and followed to be in firing position after ID. BLUE 1 and 2 remained with GREEN 1 who broke left and down.

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EVENT 1-28

7. SITUATION DEVELOPMENT

GREEN 1 escorted by BLUE 1 and 2 descended to about 7000 ft heading 220°. Bogeys were not seen by any of these aircraft after the left break.

BLUE 3 made head-on pass with first bogey, passed about 50 ft below and identified as a MIG-21. MIG 1 was in 70° banked left turn. BLUE 3 attempted to reengage but could not relocate MIG 1.

MIG 2 made right turn. BLUE 4 fired four SPARROW missiles at MIG 2 from aspects varying from head-on to 45° tail-on. No hits. MIG 2 in about 20° descent and BLUE 4 in 15-20° climb.

8. ORDNANCE

	(No. fired/No. hits)	
	SPARROW AIM-7D	SIDEWINDER AIM-9B
BLUE 1, 2, 3	0/0	0/0
BLUE 4	4/0	

Remarks

(1) No motor ignition. (2) Fired boresight 6 to 8 mi, 45° head-on aspect. Did not appear to guide, passed behind MIG 2. (3) No motor ignition; (4) Fired with lock on aiming dot in circle. Had in-range light 4-mi range 45° tail-on aspect. Did not appear to guide, passed behind MIG 2. (May not have had sufficient overtake and may have broken lock during the run.)

MIG 1, 2 No firing observed

9. EQUIPMENT PROBLEMS

BLUE 1, 2, 3 - None reported

BLUE 4 Back

Reported that, while trying to find the tanker in the scope the radar went out. It did not go out completely but "there was something wrong with the tracking. The dot was not functioning properly. There was no problem with the scope as such, but there was a malfunction of some of its properties." After completion of refueling the radar set was turned to "standby" for a few minutes. When turned back, on the Back was able to lock on to some F-105s coming back from a strike and the radar worked perfectly, getting lock-ons with the lock-ons coming down the scope properly and with the dot in its proper position. It seemed to have corrected itself after the short period in "standby". Radar worked satisfactorily when checked during the return flight to the base.

See BLUE 4 Front and Back comments on the SPARROW missiles in Paragraph 10 (below).

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
<u>BLUE 1</u> - Front	1900	450	--	All TAC fighter background and two 8 month TDY tours in air defense assignments.
Back	Not obtained			
<u>BLUE 2</u> - Front	Not obtained			
Back	300			
<u>BLUE 3</u> - Front	2200	600-650	40-50	Fighter background, no formal ACT training. Fired one SPARROW and one SIDEWINDER in training.
Back	350	175-200	~50	
<u>BLUE 4</u> - Front	800	650	~30	Fired one SPARROW in training
Back	450	300	40-50	

Comments on this Encounter

BLUE 3 - Front

Had studied Russian training manuals published by DOD concerning MIG tactics. Recognized MIG tactics of this encounter as those he had read about.

Was certain the bogeys were MIG-21s but hesitated to fire because he had previously been jumped by F-105s.

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EVENT 1-25

MIGs appeared to be under GCI control. (All the contacts he had heard of, except one, had appeared to be under GCI control.)

BLUE 3 - Back

Felt bogeys had indicated sufficient hostile intent to identify themselves as MIGs, and therefore should have been fired upon during the ID pass.

BLUE 4 - Front

Relative to possible causes of missile malfunctions, it was found that the squadron did not have the particular test equipment that was needed to check out the rails on the airplane. At first, it was assumed that it was bad missiles, and then other considerations it was thought that it might be the radar or inputs to the missiles. [There was another one that morning on a U-2 escort where a guy fired four missiles (SPARROW). The first one fired boresight looked good, but it fell out of the air before it impacted. He fired three more on a head-on 35° snap-up and everything was just beautiful, school solution, interlocks in, just beautiful and none of them guided. They looked at this one also and seemed to think that it was possibly a stuck polarization switch, but the thing had been changed by the time they got the test equipment there to check this airplane. See Event 1-24.] Never did get any results on his missile.

BLUE 4 - Back

The SPARROW (AIM-7D) missiles used in this mission were deployed with the squadron from Okinawa and were some of the oldest missiles which had been received from the Navy. These same missiles had been heat and cold soaked many times by being flown to altitude three or four times a week for over a year. The reliability of these missiles was considered very low.

Comments from Overall Experience

BLUE 1 - Front

Need short-range missile with high-g capability.

Felt that reliability of SPARROW missiles was questionable due to the fact that they had been flown frequently over the previous year.

Back seat pilot is a valuable assist, particularly to the flight leader. Pilot is much more effective than an RO (radar observer). Pilot knows what you are looking for in the front seat. Front and back seater need time together for most effective team work.

BLUE 3 - Front

There is a definite advantage to having crew of two whether back seater is a pilot or RO, particularly for night intercepts or ground attacks.

Would like to be able to pull g's at altitude comparable to F-104 or better.

SPARROW is an excellent missile for use in non-visual ID environment, but is difficult to employ when visual ID is required.

MIG-21 can whip F-4 at altitude. Need to get MIG-21 at lower altitude where F-4 can utilize its excess thrust to better advantage.

Having to fight with two missile envelopes (SIDEWINDER and SPARROW) complicates the fighter pilot's problems. A good fighter pilot thinks in terms of available envelopes. The addition of guns, a third envelope, without sacrificing other capabilities could be advantageous. However, the gun is not so important that radar and missile capability should be compromised. A well-piloted F-4 with the current missile systems could beat an F-4 with guns.

Need forward hemisphere ID capability. Transponder triggered by radar beam or other system to identify friendlies.

BLUE 3 - Back

In many air-to-air engagements and in the normal air defense role as an interceptor, an RO (radar observer) could do the job a lot better than a pilot because of his training. The little taste of ECM in Okinawa showed that a good RO can practically turn an inexperienced guy every way he wants to. Training in the ECM environment is sadly lacking. I never ran into an ECM environment in Vietnam except for the time the 66's were dropping chaff.

BLUE 4 - Front

Capability of the F-4 is being wasted by having a pilot in the back seat. The pilot is not adequately trained as a radar observer. Need a radar expert in the back seat. The pilot back seater's primary goal is to be up graded to the front seat (aircraft commander) rather than master the radar.

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EVENT 1-28

F-4 is an outstanding aircraft even with multimission requirements. However, would prefer air superiority and ground attack roles be accomplished by airplanes optimally designed for each mission rather than having a single multimission airplane which compromises each capability.

Need a simple air superiority weapon system utilizing a visually fired all aspect weapon with no lock-on or tail chase requirement.

Need more maneuverability and smaller turn radius than the F-4.

11. DATA SOURCES

Project Interviews:

BLUE 1 - Front, 29 Dec 1966; Back - 13 Mar 1967
BLUE 2 - Front, 13 Dec 1966; Back - 13 Mar 1967
BLUE 3 - Front, 27 Jan 1967; Back - 19 Mar 1967
BLUE 4 - Front, 27 Jan 1967; Back - 17 Mar 1967

Messages, Reports:

7AF OPREP-3 251332Z April 1966 DOCO-0 18334

USAF Tactical Fighter Weapons School Combat Analysis Division Bulletin #4, 1966.

12. NARRATIVE DESCRIPTION

T₀ On the afternoon 25 April 1966 four F-4Cs (BLUE 1, 2, 3, 4) were escorting an EB-66 (GREEN 1) at an altitude of 30,000 ft in a NE-SW orbit generally north of Yen Bai. GREEN 1 was providing ECM support for F-105 strikes in the vicinity of Yen Bai. On a heading of 045°, in the third or fourth orbit, BLUE 3 Back observed two bogeys at 3 o'clock high, 6 to 7 mi. BLUE 3 Back advised that there might be something at 3 o'clock on opposite course. As he continued to observe, BLUE 3 Back detected silver glints and then as the bogeys approached the 5 o'clock position, still on opposite course, one of them entered the contrail level and started a right turn toward 6 o'clock on BLUE flight.

T₁ BLUE 3 front advised BLUE 1(L) of bogeys approaching 6 o'clock and that his element (BLUE 3,4) would make an ID pass. BLUE 1 stated that he and BLUE 2 would stay with GREEN 1 and requested GREEN 1 to break left and down to clear the area.

Just before GREEN 1 broke left, BLUE 3 jettisoned external tanks and made hard right descending turn with an initial bank of about 135°. BLUE 3 stated he would make ID and directed BLUE 4 to take spacing to fire if bogeys turned out to be MIGs. BLUE 4 also jettisoned external tanks and made hard right descending turn into the bogeys. BLUE 4 lost BLUE 3 when BLUE 3 made hard turn into him.

T₂, T₃, T₄ BLUE 3 in afterburner armed SPARROW missiles and had four select lights. As he accelerated through Mach 1 at about 25,000 ft, he spotted bogey approaching head-on and descending from higher altitude. BLUE 3 could not get radar lock on, switched to boresight mode, pulled up head on to the bogey, and got lock on at eight miles. BLUE 3 Front lost visual contact upon checking his scope for lock on and did not regain visual until about two miles, but still did not have positive ID. The bogey was difficult to see against the thunderstorms in the background. BLUE 3, in 15° left bank, identified and Front called "MIG" as MIG 1 passed about fifty feet above him in a 70° left bank turn. BLUE 3 observed MIG 2 turning out to the right. BLUE 3 made a descending hard right turn to clear area so that BLUE 4 could fire, after which he attempted to relocate MIG 1. A three to four minute visual and radar search was unsuccessful.

BLUE 4 after jettisoning external tanks, made hard right 135° banked descending turn to follow BLUE 3 who was making the ID pass. SPARROW missiles were armed and four select lights obtained. BLUE 4 did not have BLUE 3 in sight. After about 160-170° of turn BLUE 4 observed bogey at 12 o'clock high descending at about a 20° angle. BLUE 4, in afterburner since the initial turn, pulled up to a 15-20° climb head-on toward the bogey, speed slightly less than Mach 1.0. Initial visual contact was between 10-15 mi.

T₅, T₆, T₇, T₈ BLUE 4 unable to get radar lock on, went boresight and fired the first SPARROW at a range of 8-9 mi. The missile motor did not ignite. At this time MIG 2 started a right turn which BLUE 4 was able to follow with an easy left turn. BLUE 4 fired second SPARROW in boresight at about 45° head-on aspect to MIG 2 at 6-7 mi-range. The missile did not appear to guide and passed behind MIG 2. BLUE 4 continued to follow in his easy left turn and fired a third SPARROW in boresight. The missile motor did not ignite. BLUE 4 Back called "locked on" and the front seater after observing aim dot in the ASE circle with an "in range" light fired his fourth SPARROW at 45° tail-on aspect 3-4-mi range. The missile did not appear to guide and passed behind MIG 2. BLUE 4 Front was not certain that he had sufficient overtake for this aspect. Back later reported that he thought the radar had broken lock during the run.

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EVENT 1-25

After firing the fourth SPARROW, BLUE 4 was in about a three mile trail behind MIG 2. However, MIG 2 had an estimated 0.5 Mach speed advantage and separated rapidly. BLUE 4 had been climbing 15-20° angle and was still below Mach 1 and MIG 2 was estimated to be at about Mach 1.5. BLUE 4 did not attempt to fire a SIDEWINDER because of the separation speed and did not follow MIG 2 which was entering the SAM defended area northwest of Hanoi.

BLUE 3 and 4 ended up within one mile of each other and quickly located and rejoined GREEN 1 and BLUE 1 and 2. The flight departed the area after determining that the last F-105 strike had left the target.

Neither MIG-21 was observed to fire cannon or missiles. No hits were scored on the MIGs by the four SPARROW missiles fired. No damage to either side; however, the MIGs had disrupted the ECM coverage by causing GREEN 1 to leave his station to evade.

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EVENT I-25 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	G1, 30,000 ft Mach 0.76 B1 and 2, 30,000 ft Mach 0.80 B3 and 4, 32,000 ft Mach 0.82	Individual members of BLUE flight S-turning to maintain Mach and stay with GREEN 1 (EB-66)		B3 Back advised Front he thought there was something at 3 o'clock 6-7 miles	Two bogeys on reciprocal heading High-40,000-45,000 ft	
T ₁	B3 in 48	B3 hard right descending turn into B4. Initially 155° bank, armed SPARROW missiles B4 jettisoned tanks followed in AR		B3 Back advised Front one of bogeys starting right interception turn B3 Front advised B1(L) has two bogeys high turning to 6 o'clock on BLUE flight B3 called right turn to ID, directed B4 to take up spacing to fire if bogeys IDed as MIGs B1 indicated he and B2 would stay with B1 break left and down	Bogeys continue turn to 6 o'clock on BLUE flight	B4 lost sight B3 when B3 turned into him
T ₂	B3, 24,000-25,000 ft ~1.1 Mach	B3 got lock on at about 8 mi as he pulled up in head on with bogey. Had visual but still no ID. Lost visual when he looked down at radar scope to check for lock on			Bogeys descending about 20° in head on pass.	

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EVENT I-25 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₃	B3, 24,000-25,000 ft, Mach 1.2	B3 regained visual contact at 2 mi in slight left turn 10-15°. Still no ID			Bogey in left turn	
T ₄	30,000 ft 1.4 Mach	B3 passed beneath M1 who was in 70° bank left turn. B3 broke right and down to clear area so B4 could fire. Observed M2 start right turn B4 descended to about 26,000 ft after hard right turn. Pulled up 10-15° climb to head on with M2 in 20° descent. Could not get radar lock on, went boresight			M1 apparently departed the area to southeast M2 20° descent head-on toward B4.	B3 searched toward (G) in attempt to relocate M1. 3-4 min visual and radar search unsuccessful
T ₅	B4 30,000 ft 0.92 Mach 10-15° climb	B4 fired first SPARROW in boresight 8-9 mi, no missile motor ignition.			M2 started easy right turn. Mach 1.0, still descending	Had partial lock-on. Missile fell off aircraft
T ₆	B3, 31,000 ft 0.95 Mach <1 g	B4 fired second SPARROW 6-7 mi range, 45° head on aspect angle while in easy left turn to follow M2			M2 still in easy right turn	SPARROW did not appear to guide passed behind MIG 2
T ₇	B4, 32,000	B4 fired third SPARROW 4 mi, no missile motor ignition.		B4 Back reported he had radar lock on	Continuing right turn	Missile fell off the aircraft

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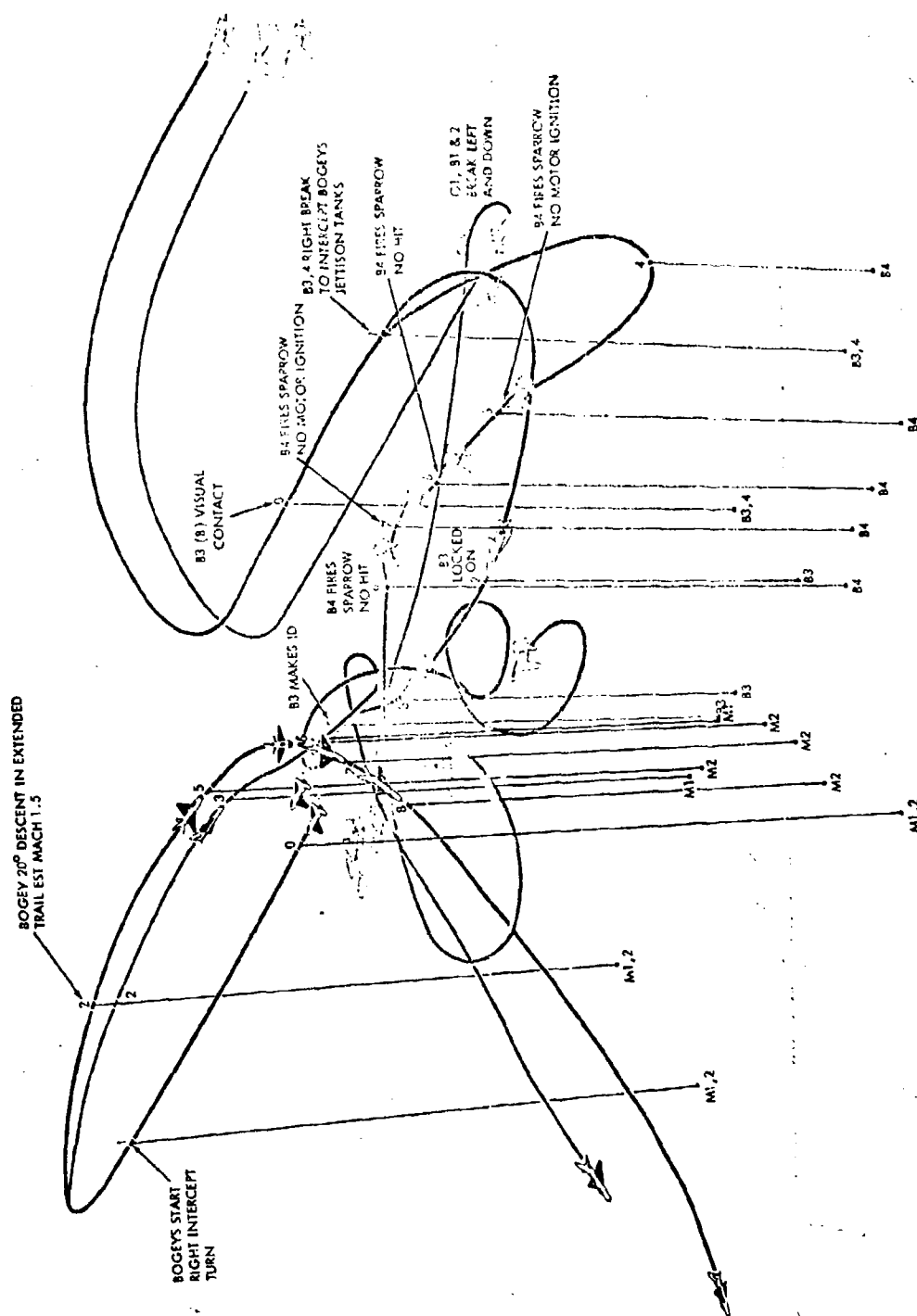
EVENT I-25 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T 8	B4, 32,000 ft < Mach 1.0	<p>B4 fired fourth SPARROW about 4-mi range. Had interlocks full system. 45° tail-on aspect angle. Missile passed behind M2, did not appear to guide.</p> <p>B4 turned left to avoid getting into the SAM defended area, rejoined B3 who ended up within one mile of B4 at end of engagement. B3 and 4 rejoined G1, B1 and 2 and returned to home base.</p>			<p>M2 headed south-east over Yen Bai, approx Mach 1.5 rapidly separating with his 0.5 Mach advantage</p>	<p>B4 front was not certain he had enough closure rate. B4 back reported radar broke lock during the run</p>

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EVENT I-25



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EVENT I-26

Aircraft Involved: Two F-4Cs and one RB-66 vs
two or three MIG-21s

Result: One MIG destroyed

Vicinity of Encounter: 21°55'N/106°15'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 26 Apr 1966/1520H

Three of four scheduled F-4Cs were available for escort of two RB-66s. The RB-66s separated over North Vietnam. The lead F-4C accompanied one, the second and third F-4C (BLUE flight) accompanied the other. The RB-66 escorted by BLUE flight established a racetrack east-west orbit at approximately 22°N/106°E.

2. MISSION ROUTE

Three F-4Cs launched from Danang, rendezvoused with two RB-66s and proceeded north to the Red River. BLUE flight of two F-4Cs then departed with one RB-66 (GREEN flight) to proceed to its orbit northeast of Hanoi while one F-4C remained with the other RB-66 in its orbit northwest of Hanoi.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

- 4 - SPARROW (AIM-7E)
- 4 - SIDEWINDER (AIM-9B)
- 2 - 370-gal wing tanks
- 1 - 600-gal centerline tank
- IFF and TACAN operating, camouflage paint.

RB-66 GREEN 1

Unknown

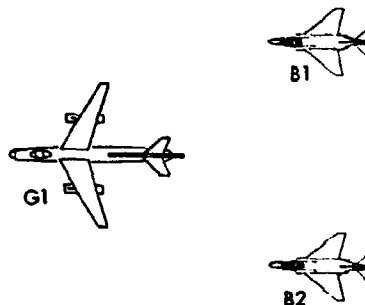
MIG-21 MIG 1, 2 (3)

- 2 - AAM
- Silver color, very bright

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered, very low layer; clear, visibility unlimited elsewhere.

	BLUE		GREEN
	1	2	1
<u>Altitude</u> :	31,000 ft	31,000 ft	30,000 ft
<u>Heading</u> :	270°	270°	270°
<u>Speed</u> :	-----approximately 0.8 Mach-----		
<u>Fuel State</u> :	Full internal, empty external tanks		Unknown
<u>Flight Formation</u> :			



5. INITIAL DETECTION

MIG warnings were received on Guard Channel, 10-15 min prior to BLUE flight reaching the orbit point. Flight was level, heading 270°, after completing a 180° right turn. BLUE 1 (Back) sighted two MIG-21s at 2 o'clock, high, descending, closing rapidly (estimated high supersonic).

6. ACTION INITIATED

BLUE 1 and 2 jettisoned external tanks, lit afterburners, and broke into a hard left descending turn. GREEN 1 was told to depart the area.

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EVENT 1-26

7. SITUATION DEVELOPMENT

The MIGs reversed their heading in a hard left turn and climbed out to the northwest. BLUE 1 and 2 pulled up behind them, lost sight of one, and closed rapidly on the other. BLUE 1 fired three SIDEWINDERS at very close range. Unknown to BLUE 1, his first missile passed the MIG without detonation and the pilot ejected. The third missile exploded in the tail pipe of the MIG which fell straight down. While following the debris down, BLUE 2 was attacked at his 6 o'clock by another MIG-21. BLUE 1 and 2 split, the MIG climbed away, and from 500 ft BLUE 1 fired his last SIDEWINDER at him. The missile missed. BLUE 1 and 2 departed the area. No firings of any kind were seen from any of the MIGs.

8. ORDNANCE

(No. Fired/No. Hit)

SIDEWINDER
AIM-9B

Remarks

BLUE 1

4/1

MIG pilot ejected after first missile, second ballistic, third a direct hit, and fourth passed close but did not explode.

BLUE 2

0/0

MIG 1, 2 (3)

No firing

9. EQUIPMENT PROBLEMS

BLUE 1 - None

BLUE 2 - Mike cord disconnected after first missile fired.

GREEN 1 - Unknown

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
BLUE 1				
Back	~450	~300	~30	Had never fired a missile, only minimal ACT.

Comments on this Encounter

BLUE 1

Front - Believes MIGs were being vectored into stern attack and did not detect the 180° turn just completed by GREEN and BLUE flights. Would like to have had internal guns.

Back - Would like to have had a gun. Would like better performance at high altitude. Didn't think he had proper ACT in training. Thought MIG 2 may have flamed out in his original hard turn.

BLUE 2 - Not interviewed.

Comments from Overall Experience

None

11. DATA SOURCES

Project Interviews: BLUE 1-Back 10 Jan 67; back seat of single F-4 which escorted other B-66, 16 Mar 67

Messages, Reports:

Letter from BLUE 1-Front
7AF MSG 021443Z May 1966 DIO29444
35TFW MSG 261050Z Apr 1966 FASTEL 572
CINCPACAF MSG 052258Z May 1966
7AF OPREP-3 261348Z Apr 1966 DOCO-0 18430

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EVENT 1-26

12. NARRATIVE DESCRIPTION

Two RB-66s and three F-4Cs (from Danang) proceeded north to the Red River near Yer Bay. One RB-66 and one F-4C remained in the area while the other three aircraft (BLUE 1 and 2 and GREEN 1) continued on to an orbit point about 60 mi NE of Hanoi. BLUE 1 and 2 were flying slightly above and 3 mi in trail of GREEN 1 at 30,000 ft. GREEN 1 had just completed a 180° turn and was heading 270° at 0.8 Mach. BLUE 1 Back was dividing his time 25 percent on radar and 75 percent on visual outside scanning.

BLUE 1, on the right side of GREEN 1, sighted two MIG-21s descending on them at 2 o'clock high, at high supersonic speed. BLUE 1 (Back) called them out to the front and to BLUE 2. The MIGs were in a gentle right bank as they crossed over the flight and then they reversed hard to the left, level with BLUE flight. BLUE 1 called GREEN 1 to depart and simultaneously with BLUE 2 jettisoned tanks, went into afterburner, and made a hard left diving turn into the MIGs. BLUE 1 pulled out of his vertical reversal at approximately 12,000 ft, Mach 1.6 and 5-6 g's, with BLUE 2 flying a tight wing position. He pulled up after the MIGs who were in afterburner heading NW at about 30,000 ft. MIG 2 was then seen to be going very slowly, descending, trailing white vapor toward the east. BLUE 1 and 2 lost sight of MIG 2 and continued to close rapidly on MIG 1, who was making gentle clearing turns as he climbed away. BLUE 1 achieved several boresight lock-ons but closed inside range for a SPARROW shot. At approximately 3000-ft range, nose high, BLUE 1 fired one SIDEWINDER with a good tone. BLUE 1 then did a high-g roll to the left to gain more separation and did not observe the missile track. BLUE 2 still on BLUE 1's wing, observed the missile hit or almost hit (no explosion) the MIG and the pilot eject; however, BLUE 2 had radio difficulties and could not inform BLUE 1 of his kill. BLUE 1 then pulled up behind MIG 1 again, at 800 ft, and fired another SIDEWINDER with no discernible tone that went ballistic. He again rolled to the left, pulled up and fired another SIDEWINDER at 3000 ft, good tone, which guided right up the tail pipe of the MIG which was now descending through 20,000 ft. The MIG exploded into many pieces and fell straight down.

BLUE 1 and 2 then descended around the debris to watch it impact in the ground. At 10,000 ft, as BLUE 1 commenced his pull-up, he looked back at his wingman and saw another MIG-21 tracking him. (It is not known if this was the original MIG 1 or another one) BLUE 1 called for a defensive split and broke down to the left, BLUE 2 breaking up and right. As BLUE 1 came out of his roll to the left he sighted the MIG ahead in afterburner climbing away, making gentle clearing turns. He rolled in behind him and climbed in afterburner. He continued a very steep climb and ended up directly behind the MIG at 500 ft, 200 knots, very nose high at approximately 22,000 ft. He then fired his last SIDEWINDER which passed directly over the left wing of the MIG who then broke right. BLUE 1 broke left, dived for the deck and egressed due to low fuel state (4500 lb).

BLUE 1 and 2 became separated on the defensive split and BLUE 2 did not chase the last MIG that BLUE 1 fired on. No firings of any kind were observed from the MIGs although all MIGs carried 2 missiles. The downed MIG was believed to be a MIG-21C. All MIGs had distinct Chinese Communist markings.

The time from initial MIG sighting to MIG explosion was 1 min 29 sec (from tape carried in the flight).

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EVENT 1-26 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly GREEN 1	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	Heading 270° 31,000 ft. Mach 0.8 fuel internal	B1 Back sights 2 MIG-21's at 2 o'clock, high	Heading 270°, 30,000 ft. Mach 0.8	B1 Back calls out MIGs	2 MIG-21's (M1,2) closing rapidly at high supersonic speed, in very easy right turn	
T ₁		B1 and 2 jettison tanks, go afterburner breakdown hard to the left	G1 departs the area when told by B1	B1 tells G1 to depart	M1 and M2 reverse their turn hard left, make level turn at 30,000 ft	
T ₂	Steep dive 12,000 kt. Mach 1.6 5-6 g's	B1 and 2 pulling out of vertical reversal.	G1 no longer in the area	B1 calls out position of MIGs	M1 climbing away M2 in afterburner. M2 descending slightly trailing white vapor, heading east	It is unknown what happened to M2. White vapor could be fuel from a flame during high g turn, or contrails, although contrail level not at MIG's altitude this day.
T ₃	325 kt B2 on B1's wing	B1 pulling up right behind MIG, closing. M2 is lost from visual sight. B1 obtains boresight lock on but too close for SPARROW shot.		B2 calls out to B1 that his tail is clear. B2 loses radio about here.	M1 is climbing away making gentle clearing turns all the while, about 20° of bank	
T ₄	325 kt about 30,000 ft	B1 fires 1 SIDEWINDER at 3,000 ft aft, good tone. B1 then does an immediate roll to the left to gain separation		B2 unable to communicate to B1	M1 pilot ejects	B2 observes missile hit or almost hit M1 (no explosion). and pilot eject. B1 does not observe missile track.

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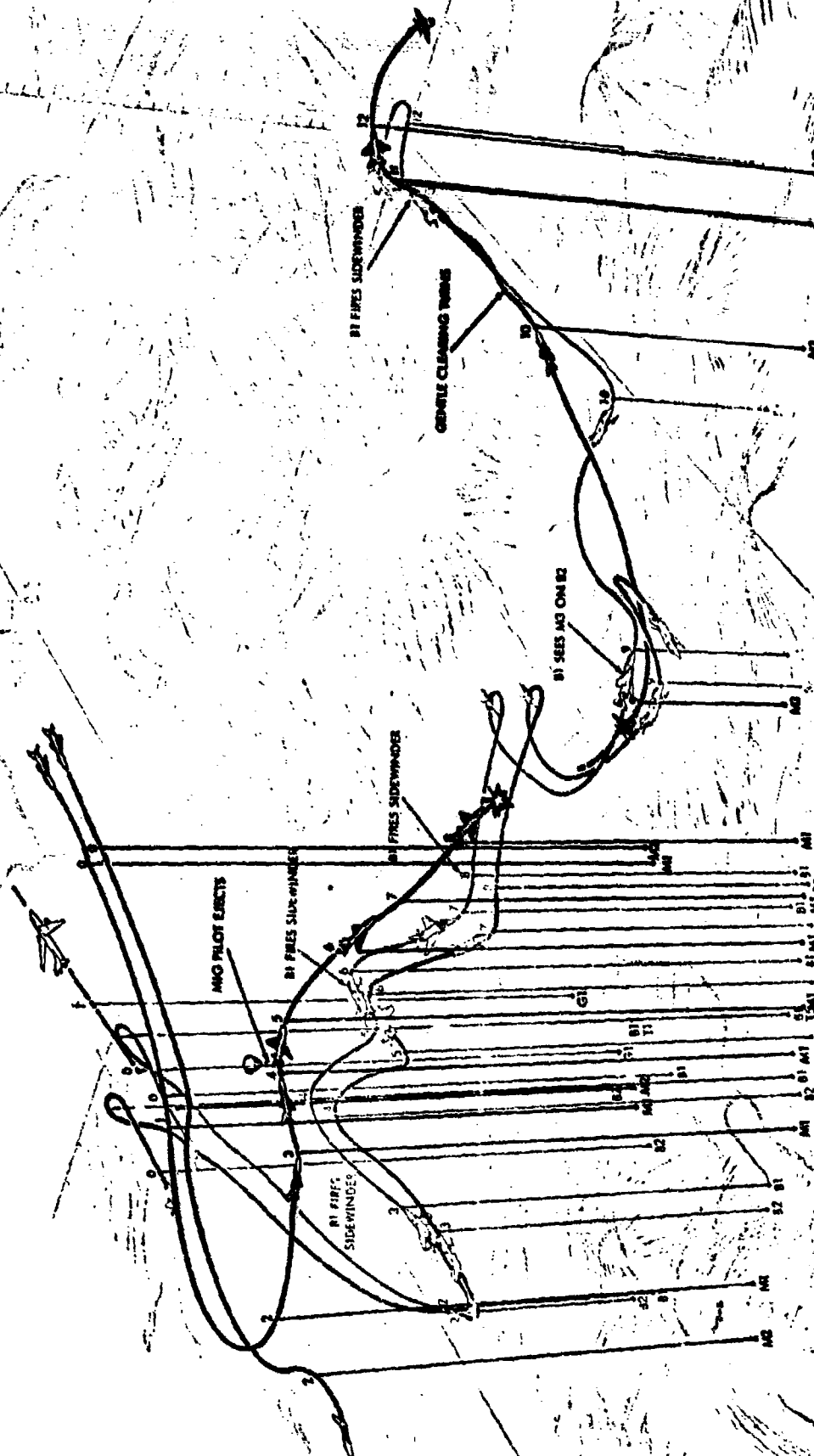
EVENT 1-26 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly GREEN 1	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T5	400 kt 4 g's, 25,000 ft	B1 pulls up from roll, closes M1 again			M1 levels off, starts gentle descent	
T6	300 kt	B1 fires another SIDEWINDER at 800 ft aft, no discernible tone. Missile goes ballistic. B1 starts roll to the left again.				
T7	375 kt, 20,000 ft	B1 pulls up from roll, closes M1 again			M1 still descending	
T8	325 kt, 20,000 ft	B1 fires third SIDEWINDER at 3,000 ft aft. Missile flies up tailpipe of M1. Good tone		B1 calls out "We got him."	M1 explodes into many pieces, falls down	B1 has to dive to escape the debris
T9	10,000 ft nose low	B1 following M1 down sees MIG-21 behind B2. B1 does tight outside roll		B1 calls out MIG, calls for defensive split	MIG-21 tracking B2	It is unknown if this is M2 or new MIG
T10		B1 pulls out behind MIG who is very high, pulls up in steep climb. Has boresight lock-on			MIG is in afterburner climbing away, making gentle clearing turns about 20° of bank	MIG does not press attack, simply flies away. Seen about 20° of MIG to right of sun
T11	25,000 ft 200 kt nose high	B1 fires last SIDEWINDER at MIG at less than 1,000 ft aft. Missile passes over left wing of MIG			MIG still making gentle clearing turn	Good tone

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EVENT 1-27

Aircraft Involved: Four F-4Cs vs one MIG-21
and four or more MIG-17s
Result: One F-4C damaged, ground fire
Vicinity of Encounter: 22°45'N/106°00'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 26 Apr 1966/1425H

Four F-4C airplanes (BLUE flight) were performing a MIGCAP for three flights of strike airplanes. BLUE flight had briefed to fly a fluid-four formation and to have one section make the ID pass while the other maneuvered into position to launch missiles.

2. MISSION ROUTE

Departed Udorn on a northerly heading to the Red River at a point about 30 mi south-east of Lao Cai. Then headed easterly and southeasterly into the CAP area. Proceeded in at an altitude of about 20,000 ft. Descended into the orbit area and maintained an altitude of 10,000 to 15,000 ft. Airborne refueling was conducted en route prior to reaching the NVN border. The centerline tanks were jettisoned at the Red River.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7D)
4 - SIDEWINDER (AIM-9B)
2 - 370-gal external wing tanks
1 - 600-gal external centerline tank
IFF, TACAN and UHF normal and operating. Camouflage paint, green and brown.

MIG-21 MIG 1

Object sighted under the wing. Not identified as AAM or external tank. Silver.

MIG-17 MIG 2, 3, 4, 5

2 - 23mm guns
1 - 37mm gun
At least one olive drab color, others were silver.

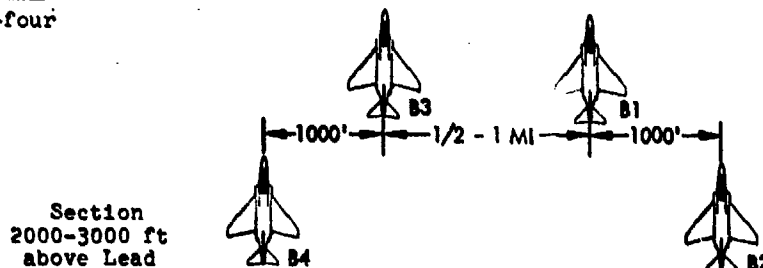
4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Generally good visibility with haze below 8,000 to 10,000 ft which reduced visibility to 5 mi. Scattered, small cumulus clouds.

	BLUE
	1 2 3 4
<u>Altitude:</u>	-----12,000 ft----
<u>Heading:</u>	-----100°-----
<u>Speed:</u>	Approximately 500-kt TAS
<u>Fuel State:</u>	Full internal plus some fuel in external wing tanks. Centerline external tank had been jettisoned at Red River.

Flight Formation:

Fluid-four



5. INITIAL DETECTION

MIG warning had been received. BLUE 3 first detected MIG 1 as a radar contact at 12 o'clock, 35 mi, high (estimated above 30,000 ft), closing rapidly. MIGs 2, 3, 4 and 5 were later detected visually while making an attack on BLUE 1 and BLUE 2.

6. ACTION INITIATED

BLUE 1 passed tactical lead to Blue 3. Blue 1 and 4 jettisoned wing tanks as the flight lit afterburners and commenced an intercept. BLUE 3 took the lead and started a climbing right turn. BLUE 1 obtained a radar lock-on and called he was taking back the lead.

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7. SITUATION DEVELOPMENT

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BLUE 3 and 4 lost sight of BLUE 1 and 2 as BLUE 1 resumed the tactical lead of the flight. The intercept of MIG 1 was discontinued as the MIG approached the SAM ring around Hanoi. BLUE flight returned to the orbit area with each element at opposite ends of the race-track pattern and not within visual range of each other. BLUE 2 was hit by ground fire. BLUE 1 and 2 began jinking. Both sighted two MIG-17s closing from the rear and firing. BLUE 2 broke hard left in a diving turn and disengaged from MIG 2 using afterburner and accelerating. BLUE 1 engaged afterburner and took MIG 3 into a high yo-yo and disengaged as the MIG ran out of airspeed. BLUE 1 observed MIG 4 chasing BLUE 2 and launched two SIDEWINDER missiles out of range. While maneuvering to prevent overrunning MIG 4, BLUE 1 saw two more MIG-17s making a run on him from the left rear quarter. BLUE 1 continued in a split-S-type maneuver and disengaged. BLUE 3 and 4 remained in the race-track orbit until reaching BINGO fuel and then returned to base.

8. ORDNANCE

	(No. fired/No. hits)		
	SPARROW AIM-7D	SIDEWINDER AIM-9B	Remarks
BLUE 1	0/0	2/0	Missiles launched out of range.
BLUE 2, 3, 4	0/0	0/0	
MIGS			Fired guns. No hits.

9. EQUIPMENT PROBLEMS

BLUE 2 was unable to jettison external wing tanks after being hit by flak. BLUE 3 had two SPARROW missiles detune en route to the orbit area. Remaining two missiles detuned during intercept of MIG 1. Was unable to jettison external wing tanks.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
<u>BLUE 1</u>				
Front	Not in the data available.			
Back		500	23	Participated in one SPARROW and one SIDEWINDER launch during training.
<u>BLUE 2</u>				
Front	2700	800	6	Has been F-4 instructor pilot.
Back	Not interviewed.			
<u>BLUE 3</u>				
Front	2000	500	30	Participated in one SPARROW launch during training. Launched one SPARROW and one SIDEWINDER in training as aircraft commander. Very little ACT in training.
Back	500	300	30	
<u>BLUE 4</u>				
Front	Not interviewed.			
Back	Not with data obtained by letter.			

Comments on This Encounter

BLUE 1 (Front) As a result of BLUE 1 resuming the lead after BLUE 3 had started the intercept, the two elements became separated. Just before breaking off the intercept, BLUE 1 may have been within range to launch an AIM-7E, but he had only AIM-7D missiles. Later, BLUE 1 knowingly launched two SIDEWINDER missiles out of range.

BLUE 1 (Back) The two-man crew in tandem was good. The back seat pilot provided lookout to the rear. He considered minimum range of the SPARROW to be excessive. The F-4 had acceleration and thrust advantage over MIG-17. He had never observed aircraft make a gun type attack against him.

BLUE 2 (Front) Confusion developed on egress from numerous search and rescue facilities transmitting simultaneously on guard frequency and rescue frequency while attempting to expedite rendezvous with a tanker.

BLUE 3 (Front) Radio voice channels very cluttered. During the first intercept, he would have been in range in another 30 sec but broke off because they were approaching a SAM defense ring. The requirement to make an ID pass altered the intercept to a rear quarter attack.

BLUE 3 (Back) The target was sighted visually because of contrails.

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Comments on this Encounter (Continued)

EVENT 1-27

BLUE 4 (Back) It appeared that MIG 1 was trying to lure BLUE flight into the SAM area.

Comments from Overall Experience

BLUE 1 (Back) Stated he did not trust the SPARROW missile. Would prefer to be able to disengage and reattack rather than fight a close-in turning encounter. Improved visibility to the rear was needed. Combination of no close-in weapon and restraint of a positive ID imposed undesirable tactics.

BLUE 3 (Front) Restraint of the visual ID was the biggest problem. Feels a good airplane should have a crew of two in tandem, twin engine, backup flight control system, emergency electrical power to touch down, airborne interrogation of IFF/SIF and improved radio and ICS. Against an airplane such as the MIG-17/19 not sure a gun would be useful because of the difficulty of attaining a gun-firing position — if the MIG maneuvered to evade. Would have liked a longer range missile. Very important to maintain flight integrity.

BLUE 3 (Back) Could not rely entirely on radar to detect targets, visual search was very important. Important for flight crews to fly as a team. Inertial navigation system very important.

11. DATA SOURCES

Project Interviews:

BLUE 1 (Lead) (Front)	14 Dec 1966
BLUE 1 (Back)	15 Mar 1967
BLUE 2 (Front)	9 Mar 1967
BLUE 3 (Front)	25 Jan 1967
BLUE 3 (Back)	8 Mar 1967
BLUE 4 (Back)	Letter of 28 Mar 1967

Message Reports:

7AF OPREP-3 261348Z Apr 66, DOCO-0 18429
35 TAC FTR WG OPREP-3 261030Z April 66, DOI FASTEL 571,
USAF Fighter Weapons School Bulletin-4

12. NARRATIVE DESCRIPTION

T₀ As BLUE flight approached the area where they were to establish a MIGCAP, a MIG alert was received. The flight was on an easterly heading. BLUE 3 detected several radar targets and obtained a lock-on. The radar indicated a very high V_c (approx 1800 kt) which showed the target to be approaching almost head-on. When BLUE 3 reported the contact BLUE 1(L) passed the tactical lead to BLUE 3. BLUE 3 attempted to jettison his wing tanks. BLUE 1 and BLUE 4 jettisoned wing tanks. BLUE 2 retained his tanks. BLUE flight engaged afterburner and commenced an intercept for an ID pass.

T₁ BLUE 1 acquired the target and resumed the lead. The two elements of BLUE flight lost visual contact with each other. The target was sighted visually and identified as a MIG-21. BLUE flight saw the smoke puffs as the MIG lit afterburner.

T₂ BLUE flight commenced a snap-up attack. The SPARROW missiles on BLUE 3 detuned. As BLUE flight decelerated, the V_c changed to a negative value indicating the range to the target was increasing.

T₃ The intercept was discontinued because the intercept had developed into a tail chase and the MIG was leading the flight into the SAM ring to the south.

BLUE flight returned to the orbit area with BLUE 1 and 2 in the southern portion while BLUE 3 and 4 proceeded to the northern end of the area.

T₄ As BLUE 1 and 2 rolled out on a ESE heading to recheck their position, BLUE 2 was hit by flak which was later evaluated to be 57mm. BLUE 1 and 2 commenced an immediate jink to the left.

T₅ As they rolled left into a diving turn BLUE 1 observed a burst of tracers pass close aboard and saw a MIG at 3 o'clock as well as one at 7:30 o'clock. BLUE 2 rolled out on a heading of 100° and accelerated in afterburner going to the deck. BLUE 1 observed MIG 3 starting to slide to the outside so reversed his turn, engaged afterburner, and pulled up into a steep high yo-yo.

T₆ MIG 3 followed BLUE 1 and opened fire near the top of the yo-yo as he ran out of airspeed and fell off into a dive.

T₇ BLUE 1 checked the area for more MIGs and saw BLUE 2 low at 10 o'clock with a MIG in trail. BLUE 1 rolled into a dive, selected HEAT and launched two SIDEWINDER missiles out of range hoping to scare off MIG 4. BLUE 1 did not launch SPARROWS at the MIG because he felt BLUE 2 might also be in range. He knew the MIG was out of range for the SIDEWINDER. BLUE 1 accelerated rapidly in afterburner diving toward MIG 4.

T₈ BLUE 1 commenced a high-g barrel roll to prevent overrunning MIG 4. As he started up into the maneuver the Back looked out at 7 o'clock and saw one or more MIGs in a run on them. Back told the Front to keep the turn in. They continued around in a rolling

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-27

split-S maneuver. When they came out of the maneuver, no MIGs were in sight and BLUE 2 was gone also.

To BLUE 1 headed for the coast and commenced a gentle climb to conserve fuel. When he reached 20,000 ft he saw a contrail high at 6 o'clock, 10 mi, and assumed this was a MIG-21; therefore, he dove to the deck and continued outbound. The wing pylons and remaining SIDEWINDERS were jettisoned to reduce drag. BLUE 1 landed at Danang with 250 lb of fuel remaining. An attempt was made to rendezvous him with a Navy tanker, but he could not use the drogue type refueler.

BLUE 2 secured the damaged right engine when over the water. He was unable to jettison the wing tanks. After rendezvousing with an airborne tanker, he refueled with only 50 lb of fuel indicated remaining in his tanks.

All pilots stated there was confusion in radio transmissions and in instructions given to effect rendezvous with the tankers.

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EVENT I-27 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4,5)	Remarks
	Status	Action				
T ₀	BLUE flight 12,000 ft 450-500-kt CAS 4 - SPARROWS AIM-7D 4 - SIDEWINDERS AIM-9B 2 - Wing tanks	B3 has radar contact on M1. B1(L) gives lead to B3. B3 attempts to jettison tanks. B1 and B4 jettisons tanks. B3 and B4 into AB and commence intercept for ID.		B1(L) passes tactical lead to B3.	M1 high heading westerly, commencing a turn to the S.	BLUE flight en route to orbit area NW of MIGCAP. Fluid-four formation.
T ₁		B1 acquires radar contact, B1 and B2 into AB.		B1 calls he is taking back the lead.	M1 into AB.	B3 and B4 do not have B1 and B2 in sight. M1 sighted visually and identified as MIG-21.
T ₂	18,000 ft Mach 1.2	B1 and B2 commence snap-up.	B3 and B4 do not have B1 and B2 in sight.		M1 continuing S.	
T ₃		B1 and B2 decelerated in climb. M1 starts to pull away.				BLUE flight discontinued intercept because M1 was proceeding into area heavily defended by SAMs. MIG heading S at very high speed.
BLUE flight returned to the orbit area with B1 and B2 in the southern portion while B3 and B4 proceeded to the northern portion of the area. They orbited in the area for one or more counter-clockwise turns.						
T ₄	8000 ft Hdg 100° 350 kt CAS	B1 and B2 in southern end of orbit area. B2 hit by flak. B1 and B2 jink left.	B3 and B4 in northern end of orbit area. No longer in the action.	Unable to contact B3 and B4. Excessive chatter on radio.		
T ₅		B1 and B2 in left turn. B1 saw M2 at 3 o'clock. B2 into AB exiting. B1 saw tracer pass close aboard. B1 lit AB and reversed turn to the right.			M2 sighted. M3 fired at B1.	

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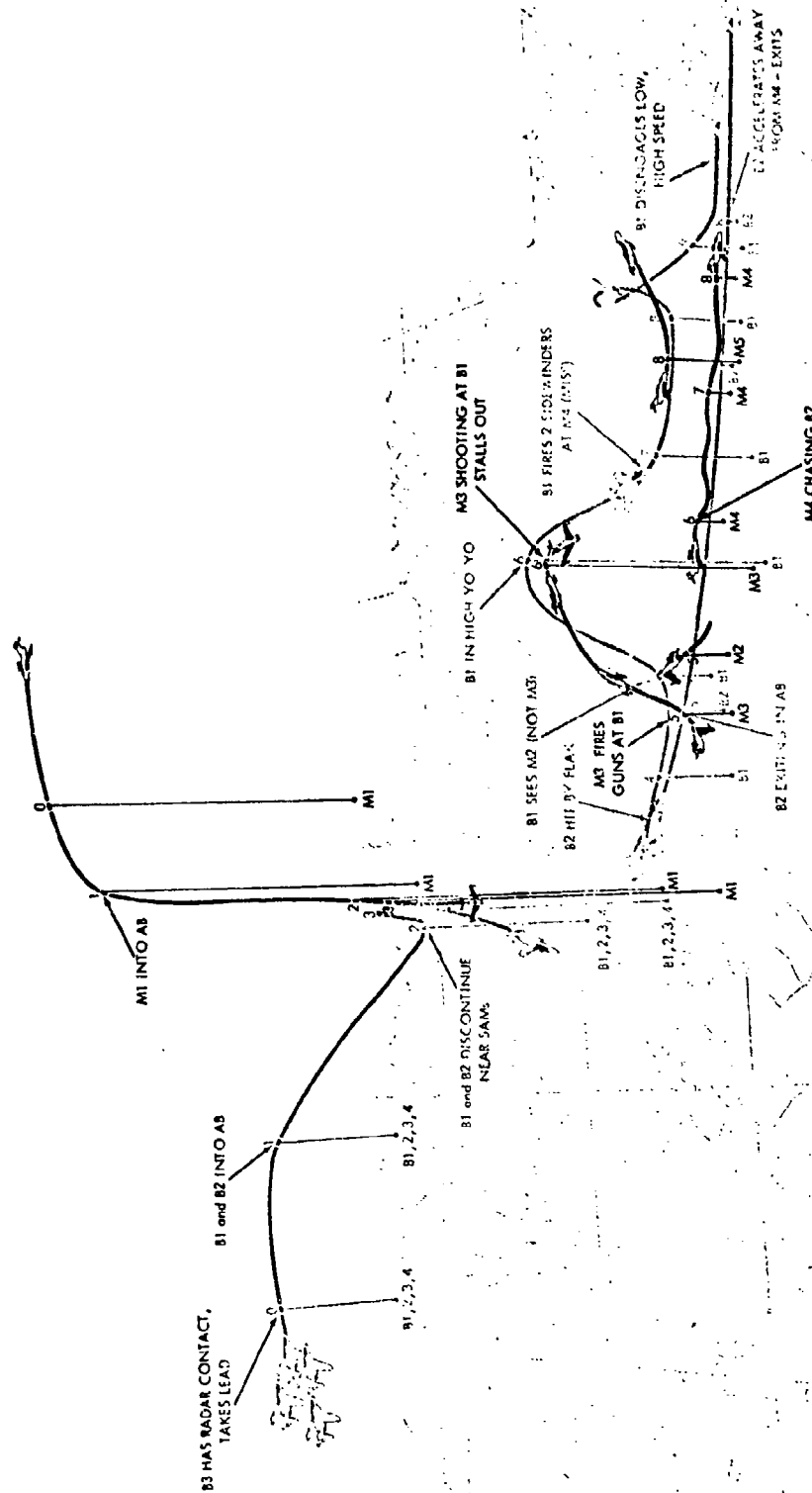
EVENT I-27 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4,5)	Remarks
	Status	Action				
T ₆		B2 exiting area, low, high speed. M4 chasing B2. B1 took M3 into high yo-yo. M3 stalled out.			M3 shooting at B1 just before he stalled.	
T ₇	30° Dive Mach .8	B1 fired two SIDEWINDERS to scare off M4. B1 pursuing M4. Firing geometry 10-15 off the stern. Range 2-3 mi. Fired for scare only.			M4 is 1000 ft in trail of B2. Breaks off attack on missile firing.	B1 launched SIDEWINDER rather than SPARROW because of possibility of SPARROW guiding on B2 instead of M4. M4 was beyond SIDEWINDER range.
T ₈		B1 into high-g barrel roll to reduce overtake. Saw one or two MIGs on tail. Continued climbing left turn into modified split-S. Disengaged at low altitude, very high speed.	B2 accelerated away from M4 and exited over water.			
T ₉		B1 heading out of area.				

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EVENT 1-27



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EVENT I-28

Aircraft Involved: Four F-4Cs vs four MIG-17s

Result: Two MIGs destroyed

Vicinity of Encounter: 21°50'N/106°07'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 29 Apr 1966/midafternoon

A flight of four F-4Cs (BLUE fleet) encountered a flight of four MIG-17s while flying MIGCAP for a 12-plane F-105 strike against the Bac Giang bridge, some 25 mi NE of Hanoi. Orbit areas for the F-4 flight was north of the strike area. It is believed that another flight of F-4Cs was simultaneously orbiting as MIGCAP east of the target area, that two EB-66s were airborne north of the target to give SAM warnings, and that BIG EYE was over the Tonkin Gulf. Other F-4Cs were some 20 min behind this mission, also covering F-105s on what was believed to have been a different target.

2. MISSION ROUTE

BLUE flight departed from Udorn. They refueled on Red track, leaving the tanker about latitude 19°30'N, then proceeding NNE, at about 21,000 ft and 250-kt IAS to a turning point approximately on the Red River, out of the SAM area. They turned east and commenced descent to about 10,000 ft, dropping empty centerline tanks at about the turning point, later turning SE toward the target area. Enroute, the F-4s flew generally above and behind the F-105s, maintaining radar and visual contact with them, breaking off and going into their orbit area well before reaching the target.

3. AIRCRAFT CONFIGURATION

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7D), fuselage
4 - SIDEWINDER (AIM-9B), inboard wing stations
2 - 370-gal wing tanks, outboard stations
1 - 600-gal centerline tank (jettisoned enroute to mission area)
Avionics - Normally TACAN utilized early in the flight and then turned to standby; radar always on; IFF was optional at this time and was frequently left off over NVN.
Camouflaged

MIG-17 MIG 1,2,3,4

Silver color
Wing tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered cumulus, about 2/10 coverage, visibility good except somewhat reduced in haze below about 10,000 ft.

	BLUE			
	1	2	3	4
<u>Altitude:</u>	8000 ft	8000 ft	12,000 ft	12,000 ft
<u>Heading:</u>	----- generally SE -----			
<u>Speed:</u>	----- 400-kt IAS -----			
<u>Flight Formation:</u>	Elements operating separately, generally on opposite sides of orbit; one element high, one low; weaving and varying altitude.			

5. INITIAL DETECTION

Various MIG warnings were heard while enroute to orbit area, including report from EB-66: "MIGs airborne at Phuc Yen." Initially BLUE 2 aircraft commander detected and called a MIG at 9 o'clock low. Immediately thereafter, various members of the flight observed a total of four aircraft below, quickly identified as MIGs -- primarily by their silver color. Flight members recalled no warning which alerted them to this specific group of MIGs. Initial detection distance probably less than 2 mi.

6. ACTION INITIATED

All jettisoned tanks; BLUE 1 turned left to engage, observed three other MIGs below in staggered trail and told flight to go after the group of three; BLUE 3 pulled nose up then rolled to right, going into AB to maintain speed; wingmen maintained position on their element leaders.

7. SITUATION DEVELOPMENT

BLUE 3 made a single quick pass at the MIGs from above, fired one SIDEWINDER, which downed a MIG, and pulled off. BLUE 1, during his initial turn, observed BLUE 3 and 4 rolling into the MIGs and had to break off in the opposite direction. He observed a MIG getting into an attack position on BLUE 3 and quickly fired a SIDEWINDER to attract the

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EVENT I-28

MIGs attention. This MIG then went into extreme evasive maneuvers with BLUE 1 pursuing, which culminated in the MIG's colliding with the ground. The F-4s then departed the area due to low fuel state, BLUE 3 making a quick pass and rapidly firing two SIDEWINDERS (out of parameter) at two more MIGs which passed nearby during his egress.

The MIGs initially encountered were flying straight and level, not very fast, at low altitude when encountered. They apparently were not aware of the F-4s or else had no intention of engaging them. They jettisoned tanks and commenced maneuvers only after the F-4s made hostile maneuvers.

8. ORDNANCE

	(No. fired/No. hits)		
	SPARROW AIM-7D	SIDEWINDER AIM-9B	Remarks
BLUE 1	0/0	1/0	Fired hurriedly without tone to attract attention of MIG on BLUE 3's tail. Missile attempted to track but could not follow.
BLUE 2 and 4	0/0	0/0	
BLUE 3	0/0	3/1	First missile fired with tone in parameters, went up tail of MIG, exploded, pilot ejected with aircraft on fire and corkscrewing. Other two missiles fired hurriedly with tone but high g and long range -- no hit observed.

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
<u>BLUE 1</u> Front	2600	?	45 total, 10 "counters"	Had little or no air-air maneuvering training; this was only air-air encounter experienced. Noted that all members of flight had about same combat experience level at this time.
Back	--- Not interviewed ---			
<u>BLUE 2</u> Front	1500	500	?	Had no ACM training; this was first ACM practice and first and only air-air combat encounter.
Back	700+ basic pilot training	700 all back seat	?	Had gone from pilot training to F-4 CCTS, to a squadron -- all time after pilot training was in F-4. Had experienced one SIDEWINDER and one SPARROW practice firing -- both against nonmaneuvering target.
<u>BLUE 3</u> Front	?	500+	?	Had flown heavy bombers, then into F-84s and F-4s. Had fired 2 SIDEWINDERS in training.
Back	---	Unknown	---	Was 1st Lt at time of this encounter.
<u>BLUE 4</u> Front	---	Unknown	---	Was Captain at time of this encounter.
Back	---	Unknown	---	Was 1st Lt at time of this encounter.

Comments on this Encounter

BLUE 1 Front

At one point in the encounter he could have fired a SPARROW and probably gotten a MIG if his state of training had been higher.

BLUE 2 Front

Had flown with Lead and knew his characteristics so well that he could respond almost automatically.

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He was completely disoriented during the various maneuvers and concentrated on staying on Lead's wing.

BLUE 2 Back

Unsure of what occurred during parts of the engagement -- much of the time was spent looking out for the rest of the flight to make sure they didn't get a MIG at 6 o'clock.

MIGs did not seem to react in a very capable manner.

While on MIGCAP he spent about 90 percent of his time looking outside and 10 percent of time looking at radar. Reason for this was that MIGs probably were going to come in low and you wouldn't detect them on radar. In this situation where they were low, could never have been caught on radar.

Didn't think SPARROW could ever have been used in this encounter because all attacks were diving at the ground and were never in the proper range band. SIDEWINDER was quite a bit more convenient in this encounter.

Experienced light buffeting at times during the encounter.

A gun would have been useful -- could have gotten into gun range.

BLUE 3 Front

At this period there seemed to be no SAMs fired when the MIGs were airborne.

BLUE 3 Back

After the initial attack BLUE 3 was never able to achieve the necessary conditions for an ideal missile attack. The nearness to the ground negated much of the missile effectiveness.

An internal gun could have been used very effectively in this environment.

The radio calls during the encounter were minimal. The only other call after the initial sighting was: "We got one."

BLUE 4 Back

BLUE 4 did not initiate any attacks during the engagement because of the need for element integrity. BLUE 4 could have successfully engaged a MIG on the first pass.

Comments from Overall Experience

BLUE 2 Back

It was not necessary to have a pilot in the back seat of the F-4 except during night air-ground missions when a pilot may more capably advise the aircraft commander. Actually, a radar officer would be more interested in the back seat operations than a pilot would be.

BLUE 3 Front

It would be undesirable and possibly fatal for an F-4 to use a gun in fighting with a MIG because the MIG is built to fight with guns and the F-4 is not.

As a last resort to kill a MIG's tracking solution on you, you can go into a nose high rudder roll.

We need a capability to fire missiles at higher g.

It is best to fight the MIG in the vertical.

BLUE 4 Back

The Back is very limited in helping the aircraft commander during a close-in engagement. His responsibility in such case should be to look for enemy aircraft in the 6 o'clock area.

11. DATA SOURCES

Project Interviews: BLUE 1 Front (12/1/66), BLUE 2 Front (12/13/66), and Back (12/13/66), BLUE 3 Front (12/13/66), BLUE 4 Front (12/13/66).

Letter Accounts from: BLUE 3 Back, BLUE 4 Back.

Messages:

7AF OPREP-3 291110Z Apr 66, DOCO-0 18638
7AF OPREP-3 292155Z Apr 66, DOCO-0 18650

Other:

USAF Tactical Fighter Weapons School Combat Analysis Division (CAD) Bulletin 4, 1966.

12. NARRATIVE DESCRIPTION

BLUE flight had been on MIGCAP station for about 15 to 20 min when they encountered four MIG-17s. (BLUE 2 and BLUE 4 flew a close combat wing on Lead and BLUE 3 throughout

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EVENT I-28

the engagement. Two aircraft employed in this manner are tactically treated as one unit and in the following discussion will be referred to as BLUE Lead (1 and 2) and BLUE Wing (3 and 4)).

T₀ Initially, BLUE 2 sighted and reported, "MIG 9 o'clock low." All aircraft in BLUE flight jettisoned their tanks. BLUE Lead turned hard left to engage and saw three other MIGs in loose trail with a single MIG at Lead's 11 o'clock headed in a different direction. As BLUE Lead attacked, the single MIG was observed to jettison his tanks. BLUE Wing sighted the three MIGs in trail low and passing left to right. Wing maneuvered nose high, rolling right, using afterburner, and initiated a diving attack on the flight of three.

T₁ BLUE Lead sighted his Wing attacking the MIG formation of three and broke off his attack with a hard reverse and high-g barrel roll to the right, using afterburner to maintain air speed. The single MIG was not observed by any member of the flight after BLUE Lead broke right. The MIGs jettisoned tanks and went into an easy right turn. At least one MIG went into afterburner.

T₂ BLUE Wing continued his attack and downed one of the lead MIGs with a single SIDEWINDER. To prevent an overshoot due to closure rate BLUE Wing had performed a high-speed yo-yo in his attack. Following missile release he pulled up hard, in AB, to a 50-60° climb. BLUE Lead's barrel roll to the outside permitted him to observe BLUE Wing's kill. As BLUE Wing pulled up BLUE Lead observed the MIG 3 trying to position himself for an attack on BLUE Wing. BLUE Lead continued the roll, going into a descending turn.

T₃ BLUE Lead fired a SIDEWINDER without a tone and out of the missile's envelope. MIG 3 apparently observed the SIDEWINDER leave BLUE Lead's aircraft and went into a maximum performance turn to the left and into Lead, forcing the missile to miss.

T₄ BLUE Lead then passed "canopy-to-canopy" with MIG 3 and BLUE Lead pulled up hard and started over the top in a barrel-roll-type maneuver while the MIG continued turning in a shallow descent.

T₅ BLUE Lead went into split-S and a steep descent from about 12,000 ft in full AB toward the MIG. The MIG observing BLUE Lead closing at 6 o'clock made several hard nose-down turns and reversals.

T₆ With Lead at 6000 ft, chasing the MIG and just beginning to get SIDEWINDER tone, the MIG rolled inverted to the left with an altitude of about 2500 ft and crashed. The MIG either lost control of the aircraft or attempted a split-S with insufficient altitude. One member of BLUE flight declared BINGO fuel and the flight departed the area. MIG 2 in the group of three had been sighted only intermittently during the encounter and then doing little or no maneuvering.

T₇ The flight rejoined and was egressing when BLUE 3 observed two MIGs at low altitude going away.

T₈ BLUE 3 made one high-angle, max-g turning pass, fired 2 SIDEWINDERS, then rejoined. No hits were observed.

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EVENT 1-26 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T0	Fuel - about 9000 lb Speed - 400+ knots Weaving and varying altitude B1 - ~8000 ft B3 - 12,000 ft	B1 (with B2 on wing) turns left to engage MIG 1b and observes 3 other MIGs below. B3 (with B4 on wing) pulls nose up and rolls to right to engage. All jettison empty wing tanks. (See remarks re B2 and B4)		B2 reports MIG at 9 o'clock low. Lead calls to engage MIGs.	Single MIG (M4) flying straight and level. Three other straight and level in staggered trail. 500 to 1000 ft apart. at low speed. B2 and B4 maintain wing position on M1, 2, 3 at ~5000 ft. M4 ~4000 ft.	F-4s had been on CAP station some 15 min when MIGs were sighted. Various flight members saw MIGs just after initial call. B2 and B4 maintain wing position on their element leads throughout the encounter.
T1	B1 up to 450-kt IAS accelerating to 6.5 g. B1B3 - ~8000 ft	B1 sights B3B4 rolling in and has to break off, reversing hard to the right, going into AB and then into a high-g roll. B3 continues maneuver, coming almost canopy to canopy with M3, levels wings and goes into high-speed yo-yo.			Flight of three jettisons tanks and commences shallow right turn still in trail. Lead MIG initially broke hard right but then fell off. At least one MIG observed to go into AB. No change in altitude.	Movements of single MIG initially detected not known after flight of three detected.
T2	B1 upside down at instant T2, in high-g barrel roll. B3 in right turn, steep bank, nose down, 1500-kt IAS B1 - ~11,000 ft B3 - 7000 ft	B1 continues barrel roll, rolls out and starts descending. B3 fires one SIDEWINDER in this attitude and then pulls off and goes into steep climb, in AB. B1 observes M2 in attack position on B3 and initiates attack on M3.			Lead MIG in right turn is hit by missile, goes into corkscrew roll to ground; pilot ejects with good chute. M3 pulls in behind B3 and 4.	B3 had missile tone, fired at about 1-mi range. Missile went up tail pipe and exploded. MIG on fire and trailing white smoke. MIG pilot chute orange in color, square, with four risers - one to each corner.

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EVENT 1-28 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T ₃	B1 750-kt IAS, in hard, diving turn to right, 6 g. in AB. B3 in 50°-60° climb in AB. B1 ~8000 ft B3 ~10,000 ft	B1 fires SIDEWINDER at M3 (no tone) from this attitude; reverses to left, still descending.			M3 apparently observes B1's missile and breaks hard left (streamers from wing root out). M2 apparently taking no hostile or evasive action. M3 ~7000 ft.	B1 fired SIDEWINDER to divert MIG from attack on B3 and 4 even though there was no tone and missile was not within parameters. Missile attempted to track but got nowhere near MIG. Track of B3 uncertain after this point until T ₆ .
T ₄	B1 700 to 750-kt IAS	After B1 and M3 pass canopy to canopy, B1 commences hard (max performance) pull up.			M3 in hard turn, shallow nose-down, 8000 ft.	Location and action of M2 no longer known
T ₅	B1 "on top" and unloading at 12,000 ft	B1 follows through to get on top of MIG. Split-S down to about 8000 ft.			M3 about 5000 ft still descending and turning toward B1. Continues shallow descent, comes out of turn, weaving left and right.	B1 feels he might have gotten off a SPARROW about this time if he had been in a higher state of training.
T ₆	B1 500-kt IAS, 6000 ft still in AB, 60° pitch.	Following MIG collision with ground, B1 pulls up and comes to SW heading. B3 and 4 follow movements of B1 and B2.		An aircraft in the flight calls BINGO. B1 calls for flight to rejoin and egress.	Alternates between left and right turn then goes into split-S from about 2500 ft. Collides with ground.	B1 almost on top of MIG and closing range; has SIDEWINDER tone. F-105s have completed attacks and are egressing.

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EVENT I-28 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T ₇	B3 - ~12,000 ft	B3 turns and descends toward new MIGs. B1 and B2 continue egress. B3 sees two MIGs.			Two MIGs flying straight and level low altitude, going away.	
T ₈	B3 +600-kt IAS, 70° nose down, in 4-5 g turn; below BINGO fuel.	B3 fires two SIDEWINDERS in this attitude; then pulls off and continues egress. Missiles fired out of range. Flight continues egress.				B3 has SIDEWINDER tone and slight lead on MIGs, but is at extreme range and high g. Fired knowingly out of parameters but felt he could not afford fuel required to get into better position. Did not observe missiles in flight or explosion.

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EVENT 1-29

Aircraft Involved: Two F-4Cs vs four MIG-17s

Result: One MIG destroyed

Vicinity of Encounter: 21°25'N/104°20'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 30 Apr 1966/0900H

An element of two F-4Cs (BLUE 3 and 4) were alternating with F-4Cs BLUE 1 and 2 in air refueling and providing RESCAP for an attempt to recover two downed pilots. BLUE 3 and 4 were withdrawing from the RESCAP area and BLUE 1 and 2 were returning when BLUE 3 and 4 sighted four aircraft, subsequently identified as MIG-17s, closing them. It is believed that the only other U.S. aircraft over NVN at this time were two A-1s searching for the pilots, possibly a helicopter or two engaged in the search, and possibly a normal ECM intelligence aircraft.

2. MISSION ROUTE

BLUE 3 and 4 had been scrambled from Udorn for RESCAP, had refueled after takeoff, proceeded to their assigned area, and had been on station for about an hour when the encounter took place.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 3, 4

4 - SPARROW (AIM-7D) fuselage
4 - SIDEWINDER (AIM-9B) inboard wing station
2 - 370-gal wing tanks outboard wing station
1 - 600-gal centerline tank
IFF, TACAN and radar operating
Camouflaged

MIG-17 MIG 1, 2, 3, 4

Silver color
Wing tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: High cirrus clouds; visibility much reduced in thick haze below about 15,000 ft.

BLUE
3 4

Altitude:	--15,000 ft--
Heading:	-----SW-----
Speed:	300 to 350-kt IAS
Fuel State:	Approximately 5000 lb
Flight Formation:	Co-altitude, BLUE 4 behind and to the right of BLUE 3

5. INITIAL DETECTION

BLUE 3 (Front) sighted four aircraft at 9 o'clock, level, about 5 mi, closing, coming out of the sun. BLUE 3 (Back) may have seen them at about the same instant. They were not immediately identified and an ID pass was initiated. They were identified as MIG-17s at about 1.5 mi. There had been some MIG warnings earlier. There was no warning of this specific encounter.

6. ACTION INITIATED

BLUE element broke left into the flight of four aircraft for an ID pass, jettisoning fuel tanks.

7. SITUATION DEVELOPMENT

Following the F-4s' pass through the MIG formation, they commenced a climbing turn to engage. When they had completed about 150° of the turn, MIGs were observed closing from the rear hemisphere, firing guns, but with apparently insufficient lead and out of range. The F-4s commenced climbing in afterburner with apparently two MIGs following. Both MIGs fell off in the climb. BLUE 4 then went into a dive, leveling out on the tail of a MIG, and downing the MIG with one SIDEWINDER. BLUE element then departed the area due to low fuel.

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8. ORDNANCE

EVENT 1-29

	<u>SIDEWINDER AIM-9B</u>	<u>SPARROW AIM-7D</u>	<u>Remarks</u>
BLUE 3	0/0	0/0	
BLUE 4	1/1	0/0	Missile guided up the tail pipe and exploded.

9. EQUIPMENT PROBLEMS

BLUE 4

Following engagement, and while trying to rendezvous with tanker, radar became inoperative. Steering dot was out of position in back seat, causing Back to give erroneous steering information while tracking MIG.

Guard frequency receiver inoperative, discovered only after return to base.

10. AIRCREW COMMENTS

<u>Experience</u>	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 3</u>				
Front	-----	Unknown	-----	Considerable ADC experience.
Back	700	500	?	Had commenced his combat tour at Udorn in Feb 1966. Had observed one SIDEWINDER firing in training. No air-air gun experience.
<u>BLUE 4</u>				
Front	--- Not interviewed ---			
Back	500	250	?	Had commenced combat tour at Udorn in Feb 1966. All F-4 time in back seat. No air-air gun or missile experience.

Comments on this Encounter

BLUE 3 Back

The action was carried out as planned, i.e., in an engagement, outclimb the MIG-17.

BLUE 4 Back

If you get into a turning or up and down fight, the only thing to do is go "boresight" and keep your head out of the cockpit. In extreme maneuvers there is nothing you can do in search mode.

Confidence in SPARROW was low at this point; there had been 13 firings with no hits in the previous week.

While on RESCAP had radar on 25-mi scale, spent 20 to 30 percent of time or less looking at radar. Rest of the time looking outside.

MIGs were apparently ground controlled: (1) came out of the sun; (2) waited until F-4s low on fuel before closing; (3) were coming right toward the F-4s but apparently didn't see them until they were very close.

F-4s did not maintain flight integrity during the hassle. Probably would not have gotten the kill if integrity had been maintained.

Training was not really adequate for this engagement, didn't know what the Back should do in a hassle such as this.

Would have liked to have been able to identify the MIGs earlier, in time to make a head-on SPARROW attack.

Enemy pilots in this encounter did not seem too good: (1) when F-4s flew through them they scattered; (2) they made one pass and started firing out of range and out of angle; (3) made the mistake of trying to climb with the F-4s.

Comments from Overall Experience

BLUE 3 Back

Does not have confidence in radar-guided air-air missiles.

The two-man crew and extra eyes are an asset in an area where you must look out for SAMs.

It is desirable to have SAM warning equipment on a fighter.

BLUE 4 Back

The 100-mi scale on the radar scope is of no value in air-air combat. A MIG-21 may give you a good painting out to 35 mi. You might want a longer scale to find a tanker.

There is no need for a pilot in the back seat of an F-4.

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Comments from Overall Experience (Continued)

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BLUE 4 Back

It is a fallacy to say that you can bring the F-4C home and land it solely from the back seat. You've got to blow the gear down and then there is no antiskid system; there is no drag chute handle; there are no fuel gauges or switches; you may be limited to using internal fuel; you can't dump fuel or can't jettison tanks; you can't go into or out of AB.

A gun would be nice in an F-4C as long as it was clearly understood that it was only a weapon of last resort. Soviet fighters are more capable than U.S. aircraft inside gun range.

11. DATA SOURCES

Project Interviews: BLUE 3, (Back) (3/11/67); BLUE 4, (Back) (3/17/67); BLUE 1, (Front) (3/9/67).

Letter Account: BLUE 3, (Front) (3/67)

Messages:

7AF OPREP-3 300614Z Apr 66, DOCCO-0 18703

7AF OPREP-4 300800Z Apr 66, DOCCO-0 18708

7AF OPREP-3 301121Z Apr 66, DOCCO-0 18710

CINCPACAF Intelligence Summary 302104Z, DIE 20530 Apr 66.

Other: USAF Fighter Weapon School Combat Analysis Division (CAD) Bulletin #4, 1966.

12. NARRATIVE DESCRIPTION

T₀ - BLUE flight, consisting of BLUE 3 and 4, had been on a RESCAP station for about an hour when a flight of unidentified aircraft was sighted at 9 o'clock almost simultaneously by BLUE 3's Front and Back. They bogeys were up-sun, approximately 5 mi, level, and could not be identified at that range.

BLUE flight jettisoned their tanks and went into a hard left turn, using afterburner, to make a head-on ID pass.

T₁ - BLUE flight identified the aircraft as MIG-17s at about 1.5 mi, as they steadied out of their turn.

T₂ - BLUE flight passed directly through and close aboard the flight of four MIGs, at approximately 15,000-ft altitude, and then started a 40° bank, easy-climbing left turn, possibly using afterburner, with BLUE 4 maintaining a close combat wing on BLUE 3.

Two of the MIGs then apparently turned hard and followed in an attempt to execute a gun attack. Action of the other two MIGs was not observed again.

T₃ - BLUE flight had turned approximately 150° when BLUE 3 sighted two MIGs, pursuing them at 7 or 8 o'clock. BLUE 3 and 4 then leveled their wings and continued their steep climb, now in afterburner.

T₄ - The lead MIG was observed to be firing at BLUE 4, but apparently out of range and angle. There were no hits. BLUE 4 then, continuing his climb, went into a left turn. BLUE 3, in an attempt to get behind the near MIG, went into a high-g barrel roll. With BLUE 3 and 4 pulling away from the enemy, the second MIG was observed to fall off about this time.

T₅ - During the barrel roll BLUE 3 realized if he continued the roll he would be in front of the lead MIG at decreased range and elected to level his wings and continue the afterburner climb. BLUE 4 rolled almost inverted to the right pulling the nose well below the horizon in afterburner as he observed the lead MIG fall off straight ahead and then roll right.

T₆ - BLUE 4 lost sight of the leading MIG but as BLUE 4 descended he observed one of the MIGs crossing right to left, in a shallow climb, in front of him. He went into a hard left, nose-low turn attempting to get around the MIG.

T₇ - In his turn, and bottoming out, BLUE 4 sighted another MIG at his 10 o'clock, about 3 mi, slightly high, opening, traveling straight and level. He continued his turn to pursue this MIG.

T₈ - A boresight radar lock-on was acquired and BLUE 4 continued to track the MIG with the pipper for several seconds closing as Back gave him range information.

T₉ - BLUE 4 fired a single SIDEWINDER with a good tone well within the SIDEWINDER envelope, in very near 1-g flight. It guided to a direct hit. The MIG was observed to break in two and crash as BLUE 4 egressed the area due to low fuel state (about 3500 lb). The MIG pilot was observed to eject with a good chute.

BLUE 3 and 4 did not rejoin but egressed individually. BLUE 4 attempted rendezvous with a tanker but his radar went out in reduced visibility. When 56 mi from Udorn, at 26,000 ft, 800 lb of fuel, BLUE 4 elected to return to base without attempted refueling. He shut down at Udorn with 400 lb of fuel.

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EVENT I-29 SUMMARY

Time Mark	Action Aircraft (BLUE 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T0	320-kt IAS 5000 lb fuel 15,000-ft altitude	Element breaks left into bogeys, Jettisons tanks. B4 takes position in fighting wing. Increases speed (possibly into AB)		B3 called bogeys at 9 o'clock	Level, no precise formation, roughly line abreast	B3 observed 4 aircraft closing from 9 o'clock level, about 5 mi, coming out of sun
T1	B3 and B4 steady up from turn, same altitude			B3 calls "They're MIGs"	Straight and level in extended root formation	Distance to MIGs about 1.5 mi. MIGs are silver with red stars, readily identified as MIG-17s
T2		B3 and B4 pass through MIG formation and go into medium left climbing turn in AB or at least full military power.			Continue straight and level	
T3	In AB, at 18,000 ft	B3 and B4 steady out of turn and increase rate of climb.			2 MIGs follow F-4s at ~16,000 ft and climbing	B3 sights 2 MIGs closing at 7-8 o'clock
T4	B3 and B4 in AB. at 22,000 ft	B3 and B4 continue climb with B4 going into left turn. Then B3 goes into barrel roll			M1 firing at B4. M2 falls off, about 19,000 ft	MIG apparently out of range and angle for firing.
T5	B3 in barrel roll, in and out of AB. B4 in AB at about 25,000 ft	B3 part way thru, comes out of barrel roll and continues climb. B4 goes into hard diving turn to right.			M1 falls off straight ahead and rolls right from about 22,000 ft	B3 did not complete barrel roll because he would have rolled out in front of MIG
T6	B4 in AB, descending, probably supersonic at about 19,000 ft	B4 goes into hard left turn (6 or 7 g)				B4 sees MIG in shallow climb, ahead at 2 mi. Movements of B3 unclear from this point on.

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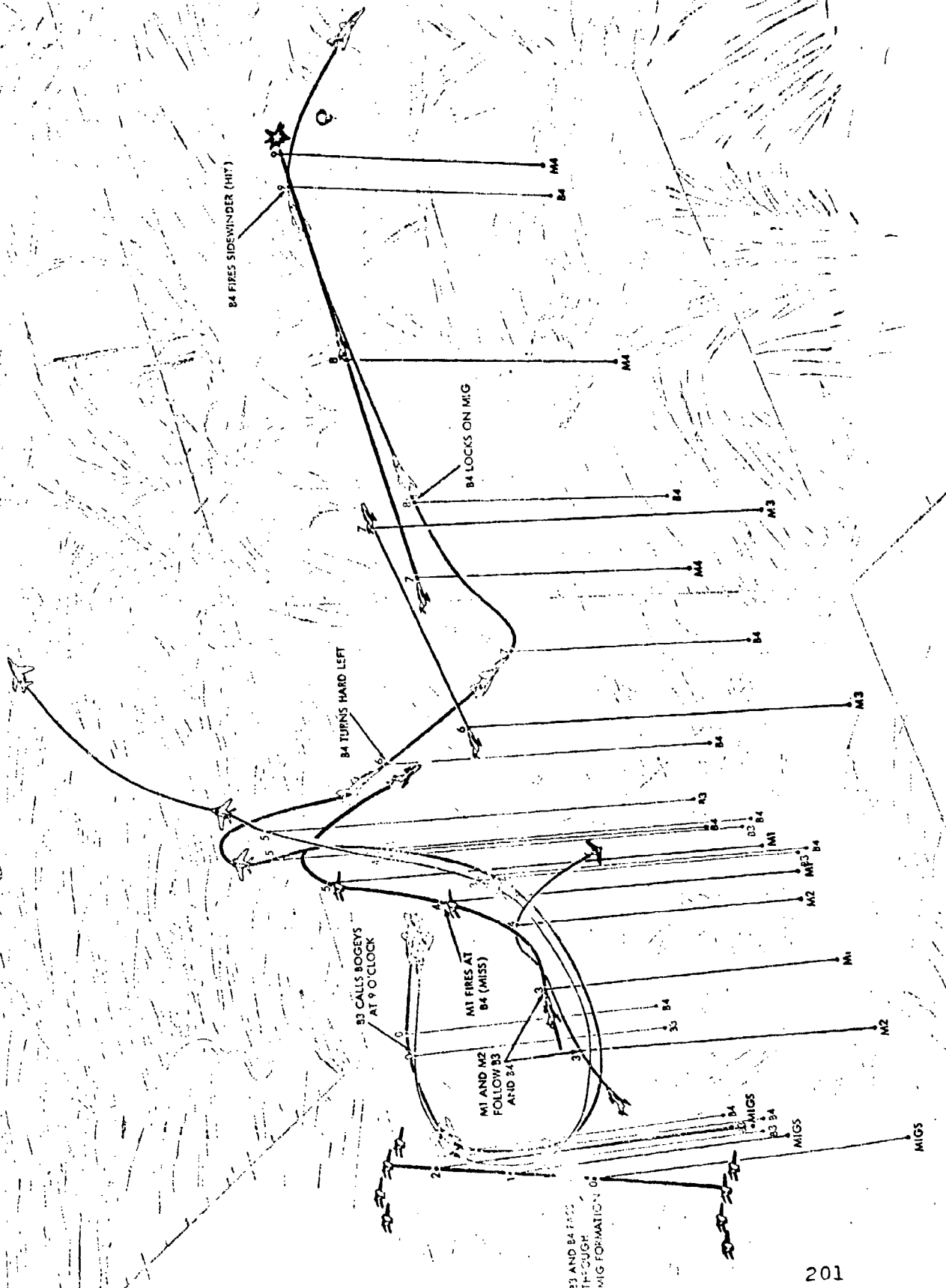
EVENT 1-29 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T7	B4 bottoming out, supersonic, at about 14,000 ft			B4 Front tells Back to "Go boresight and lock on"		B4 sees another MIG at 10 o'clock, up 2000 ft straight and level at 3 mi. opening. Decided to go after MIG.
T8	B4 in AB Mach 0.9, 16,000 ft	B4 pulls in behind MIG. Locks on in boresight. Comes out of AB		B4 Back calling ranges to target and calling "Steer left, steer left"	Straight and level	B4 Front did not steer left in response to Back. Later discovered that steering dot in error
T9	Mach 0.9, 19	B4 fires one SIDEWINDER		B4 "I got one with a SIDEWINDER"		Range to target at firing is 1 to 1-1/2 mi. Missile guides up tail pipe and explodes; MIG breaks in two behind cockpit; pilot ejects with good chute
	B4 fuel 3500 lb	B3 and B4 depart the area				

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EVENT 1-30

Aircraft Involved: Four F-4Cs vs three unidentified aircraft, possible MIGs

Result: Sighting only

Vicinity of Encounter: Two sightings:
21°30'N/106°35'E, and
21°10'N/107°22'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 8 May 1966/1615H

A flight of four F-4Cs (BLUE flight) on a MIGCAP mission, escorting F-105 flights which were striking JCS Target 18.23 or .24 (bridges along the Northeast Railroad) vicinity of 21°30'N/106°35'E. BLUE flight was in a NW/SE racetrack orbit over the above coordinates at 15,000 ft.

2. MISSION ROUTE

BLUE flight departed Danang and rendezvoused over the Gulf of Tonkin for refueling and join up with the F-105 strike flights. After refueling, the F-4s followed the strike flights west to the target area north of Haiphong at approximate coordinates 21°31'N/106°35'E. After a midair collision, the flight proceeded due east to the Gulf then south over the water to recover at Danang.

3. AIRCRAFT CONFIGURATIONS

F-4C (PHANTOM) BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7)

4 - SIDEWINDER (AIM-9B)

3 - External fuel tanks (one 600-gal centerline tank and two 370-gal wing tanks)

All aircraft camouflage paint

Unidentified Aircraft (possible MIGs)

Silver color (no markings observed)

Swept wings

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Low-level scattered to broken clouds, tops 2000-3000 ft with several thin layers at 10,000 and 20,000 ft, and some high thin cirrus.

(First Sighting)

BLUE
1 2 3 4

Altitude: -----15,000 ft-----
Heading: Approximately 145° in a left turn
Speed: ---Mach 0.8-0.85---
Fuel State: -----Unknown-----
Flight Formation: ----Fluid Four-----
(relationship of 3
to 1 not specifically
known)

(Second Sighting)

BLUE
1 2 3 4

Altitude: -----19,000 ft-----
Heading: Approximately 090°
Speed: -----Unknown-----
Fuel State: -----Unknown-----
Flight Formation: 3&4 had separated;
1&2 close to each other,
but not actually in
formation as they were
attempting to join
separately--one on 3
and the other on 4

5. INITIAL DETECTION

First sighting: BLUE flight was about to roll out of a left turn on a heading of 145° in their MIGCAP orbit when BLUE 4 looked down through the cloud layers and saw two unidentified swept-wing silver colored aircraft flying very low on an approximate reciprocal heading of 320°. These aircraft were headed in the general direction of the strike aircraft, and since all mission aircraft were known to be camouflaged, BLUE 4 called out, "MIGs below." Both front and back seat BLUE 4 observed the unidentified aircraft.

Second sighting: As BLUE 1 and 2 were approaching the coast line on an easterly heading to join and escort their damaged element back to Danang, BLUE 1 (Back) looked back and sighted an unidentified silver aircraft, co-altitude, and 2000-3000 ft in trail with BLUE 2. BLUE 1 could see no markings as he observed the unidentified aircraft making a turn away toward the north, apparently without firing.

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6. ACTION INITIATED

EVENT 1-30

First sighting: BLUE flight was already jinking against AA fire, but initiated a left descending turn back in the direction of the two unidentified aircraft.

Second sighting: BLUE 1 and 2 broke left toward the unidentified aircraft, however BLUE 2 never saw him and BLUE 1 lost visual contact during the break.

7. SITUATION DEVELOPMENT

BLUE 4 (Front and Back) made the initial sighting during second orbit on CAP. As the flight turned back toward the sighting, BLUE 3 and 4 had a midair collision. The damaged aircraft (BLUE 3 and 4) separated and headed east for the Gulf. BLUE 1 and 2 followed to escort BLUE 3 and 4, and the second sighting by BLUE 1 (Back) was made as their element neared the coast during egression.

8. ORDNANCE

No ordnance was fired by any aircraft concerned.

9. EQUIPMENT PROBLEMS

None mentioned except for damages received as a result of the midair collision.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>	-----	Unknown-----	-----	
<u>BLUE 2</u>	-----	Unknown-----	-----	
<u>BLUE 3</u>	-----	Unknown-----	-----	
<u>BLUE 4</u>				
Front	1950	475	80	No missile firing experience at time of encounter.
Back	-----	Not interviewed-----	-----	

Comments on this Encounter

BLUE 4 (Back) - Excessive chatter on radio circuit saturated the net to the point that BLUE 2 did not respond to second MIG call until repeated several times.

Comments from Overall Experience

BLUE 4 (Front) - Aircraft should be designed and outfitted for a singular mission. Should not have one aircraft to be used for both interceptor and strike missions. For air-to-air role the F-4 needs radar, internal gun, plus missile capability. The back seat should be occupied by a professional Radar Intercept Officer (RIO) and not a pilot. Present back seaters spend too much time trying to get to the front seat, and not enough becoming truly proficient with the fire control system. Further, without back seat controls, the equipment layout is better. Pilot feels an urgent need for a reliable and positive IFF/SIF system for ID purposes. He feels the SPARROW is next to useless because a visual ID must usually be made before missile can be fired. He had an experience of receiving "missile free" on a bogey approaching EC-121, but he restrained to visually identify and found it to be a friendly A-3.

11. DATA SOURCES

Project Interviews:

BLUE 1 (Front) was contacted 9 Jan 67, but no formal interview; BLUE 2 (Front) 18 Jan 67; BLUE 3 (Back) 16 Mar 67; and BLUE 4 (Front) 24 Jan 67.

Messages, Reports:

35 TFW OPREP-3 FASTEL 196, 8 May 66

12. NARRATIVE DESCRIPTION

The initial sighting was made by BLUE 4 during the last 20° of a left 180° turn during the flight's second orbit on their CAP position. The flight was in fluid-four formation jinking against radar AA fire which was detonating at their altitude and in their vicinity. After the sighting of silver aircraft, the flight initiated a left descending turn toward the position of the unidentified aircraft. During this turn a "missiles away" call was given, probably by an IRON HAND flight in the target area. BLUE 4 was flying BLUE 3's wing in tactical formation holding him at the low 10-11 o'clock position 500-1000 ft. BLUE 4 elected to roll right and check for SAMs; he did so, and as he rolled back left, still in approximately 45° of the right bank, his aircraft collided with BLUE 3 belly to belly. BLUE 3 (back) observed the two aircraft approaching a collision situation, but assumed the aircraft would roll out safely. At the last minute he took control, calling the aircraft commander's attention to the danger. Both aircraft were damaged and placed momentarily out of control, but they recovered separately and

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-30

turned east to get out over the water. BLUE 1 and 2 followed to join and escort the crippled aircraft. Approximately 15 mi west of the coast, BLUE 1 (Back) noticed another unidentified aircraft in BLUE 2's 6 o'clock position, level, at approximately 3000-ft range. BLUE 1 called, "There's a MIG on your tail," but at this time the unidentified aircraft was making a turn away to the north without firing. Both BLUE 1 and 2 broke left, however visual contact was lost during the turn. BLUE 1 and 2 turned back east, reforming by DP bearing on BLUE 3 and 4, and continued the escort to Danang. All aircraft landed safely though both BLUE 3 and 4 were badly damaged.

The backseaters were looking at the radar scope about one-fourth to one-third of the time.

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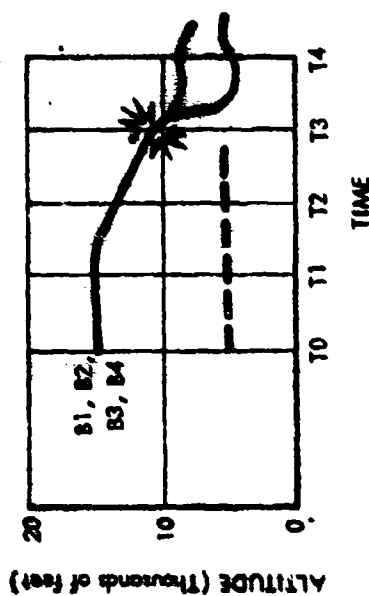
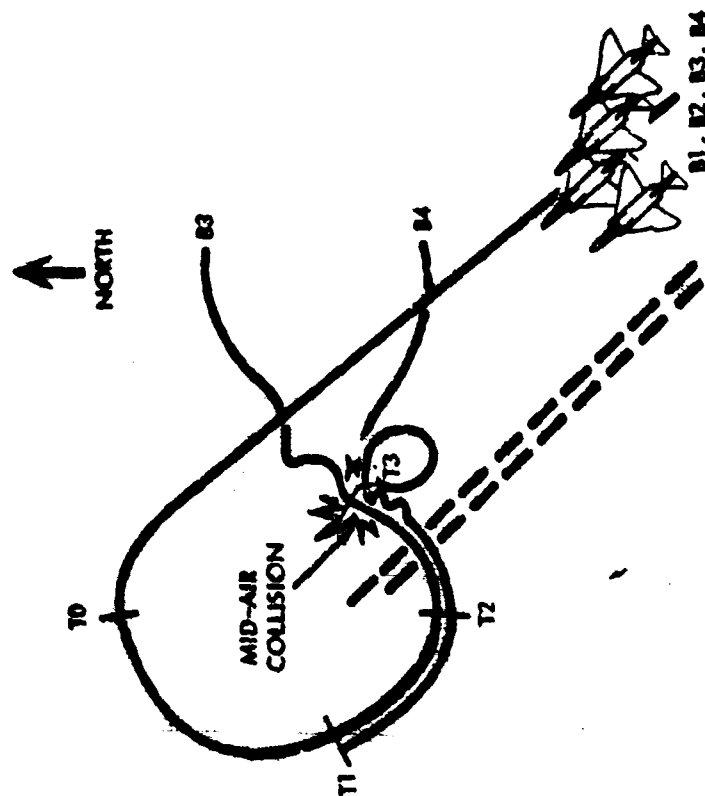
EVENT I-30 SUMMARY (First Sighting)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (Possible MIG 1, 2, 3)	Remarks
	Status	Action				
T ₀	Left 180° turn 15,000 ft Mach 0.8-0.85	MIGCAP orbit	BLUE flight in fluid-four formation			
T ₁	Left 180° turn heading 145° 15,000 ft Mach 0.8-0.85	MIGCAP orbit -- B4 sights two unidentified silver aircraft low on almost reciprocal heading.	Fluid-four formation	B4 calls, "MIGs below."		
T ₂	BLUE flight in left descending turn	BLUE flight initiates a left descending turn toward unidentified aircraft.	Fluid-four formation	IRON HAND flight calls, "Missiles away."		
T ₃	Left descending turn	B4 rolls aircraft 90° right to check for SAMs; then rolls back left and at 45° right bank saw B3 closing. B4 tried to bank back to right but collided belly to belly with B3.	B3B4 midair collision right wing to right wing. belly to belly. B3B2 not involved	B3B4 each call being hit		Both B3B4 are damaged and momentarily lose control -- they regain control and egress separately to the E.

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EVENT 1-30



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EVENT 1-31

Aircraft Involved: Four F-4Cs vs three MIG-17s

Result: No damage

Vicinity of Encounter: 21°28'N/104°38'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 10 May 1966/1810H

BLUE flight (F-4Cs) was on a MIGCAP 75 mi NW of Hanoi. GREEN flight (two A-1s and two CH-3s) were on a rescue mission and had just picked up a downed pilot. A C-130 (CROWN) acting as Airborne Air/Sea Rescue Control was in the area.

2. MISSION ROUTE

BLUE flight refueled and returned to an orbit point on the Red River north of Yen Bai. GREEN had made the rescue and was heading 190°, 13,000 ft.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7)
4 - SIDEWINDER (AIM-9)
2 - 370-gal wing tanks

A-1 and CH-3 GREEN 1, 2, 3, 4

Unknown

MIG-17 MIG 1, 2, 3

Air-to-air rockets or missiles

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Broken to overcast, 4/8 to 7/8, with 10,000-ft tops.

BLUE flight in orbit at 25,000 to 30,000 ft. Fuel state was described as "very good."

GREEN flight had completed a rescue pickup and was heading 190°, 13,000 ft about 30-35 mi south of BLUE flight.

5. INITIAL DETECTION

GREEN flight saw three MIG-17s on a parallel course 6000 ft above.

6. ACTION INITIATED

GREEN flight called the rescue force commander (CROWN) which called BLUE flight.

7. SITUATION DEVELOPMENT

BLUE flight, after some communication difficulty headed south to intercept the MIGs. MIGs fired one or two rockets or missiles at GREEN 1 and BLUE flight chased the MIGs from the area. BLUE flight followed the direction they thought the MIGs went, but MIGs were not seen again by BLUE flight. BLUE and GREEN flights were on different frequencies.

8. ORDNANCE

One rocket or missile fired from a MIG. It is unknown whether it was guided or not.

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>
BLUE 1	3500	600	50
BLUE 3		400-500	30-40

Comments on this Encounter

BLUE flight expressed concern over 3 to 4 min wasted in getting position of GREEN flight from CROWN. CROWN was slow answering requests from BLUE flight. GREEN flight split into two sections which was not known by BLUE flight.

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EVENT 1-31

11. DATA SOURCES

Project Interviews: BLUE 1(L) - Front, 26 Jan 67
BLUE 2 - Back, 10 Mar 67
BLUE 3 - Front, 9 Mar 67
BLUE 4 - Front, 13 Dec 66

Messages, Reports:

7AF OPREP-3 102025L DOCO-0 19246 May 66
7AF OPREP-4 101654Z DOCO-0 19235 May 66
DIA INTSUM 10 May 66

12. NARRATIVE DESCRIPTION

BLUE flight had been on station, 75 mi NW of Hanoi. They had just finished air refueling and were back in their MIGCAP orbit. During this time GREEN flight had successfully completed the rescue and had started back. After about 20 min in the orbit for the second time, BLUE flight received a call from control advising that GREEN flight had been intercepted by MIG aircraft.

GREEN flight was heading 190° at 21°28'N/104°38'E about 13,000 ft when three MIG-17s were sighted 6000 ft above on a parallel course. The MIGs then made three descending turns over GREEN flight coming as close as 2 mi and 1000 ft high. GREEN flight did not observe a firing pass. During the attack GREEN flight descended rapidly exiting towards low clouds.

BLUE flight was on one communication channel with CROWN and GREEN flight was on a different channel. It took BLUE three to four minutes to get GREEN's position via CROWN. BLUE flight finally was able to estimate that GREEN flight was approximately 45 mi south of the pickup point, and BLUE flight headed south.

The weather under and immediately south of the CAP orbit was about 7/8's broken clouds which were close to the tops of 10,000-ft mountains, consequently BLUE flight terminated the let down above this cloud deck at approximately 12,000 ft. BLUE 2, 3 and 4 at this time got a radar contact at 12 o'clock, at between 15 to 20 mi. BLUE 1 and BLUE 2 were in the lead with BLUE 2 about 200 ft back and to the right of BLUE 1, BLUE 3 and BLUE 4 were back in tactical formation about 3000 ft behind the lead element left and slightly higher. BLUE 1 was searching low in one-bar scan (MAP-B mode) with a range setting of 25 mi. Since BLUE 1 did not have a contact, BLUE 2 was given the lead.

As the flight continued south, closing on the radar contact, all missiles were tuned. At a range of 10 mi from the radar targets the flight jettisoned external tanks. By this time the cloud cover had improved to 4/8 to 5/8 with holes, with BLUE flight above the cloud deck. Unknown to BLUE flight, the rescue force had split into two groups, with the MIGs circling the trailing element. The forward element was separated by several miles. BLUE apparently had radar contact with the forward element and on overflying the trailing element dropped the tanks between the MIGs and the second element by sheer coincidence.

BLUE flight's descent was continued to about 8000 ft. At this time BLUE 1 and BLUE 2 (L) saw an A-1 at 12 o'clock low running underneath the clouds at about 5000 to 6000 ft. BLUE 1 resumed the lead and BLUE 1(L) and BLUE 2 made a hard left-hand turn (5-6g) and descent in order to reduce speed and reidentify the A-1. During the turn radar contact was lost. At 3000 to 4000 ft all visual contact with the bogeys was lost.

As BLUE 1 and BLUE 2 flew over the rescue forces and turned, BLUE 3 and 4 arrived in the area and BLUE 3 saw two A-1s and a helicopter below to the right. As he was looking down through a break in the clouds, BLUE 3 noticed a smoke trail from what he thought was a missile (described as SIDEWINDER-type trail) or a rocket. As BLUE 3 was ready to roll down through the clouds, BLUE 4 called "SAM break left," thinking the missile trails were SAMs meant for BLUE flight. After breaking left BLUE 3 and BLUE 4 continued down through the cloud layer and again picked up blips at 10 to 15 mi heading away. BLUE 3 accelerated but both BLUE 3 and BLUE 4 were low on fuel, so the decision was made to break off and return. It was reported that BLUE 4 (Back) saw one aircraft that "looked like a MIG."

BLUE 1 and 2, after losing contact continued on a basic heading of 060° in an attempt to pick up the MIGs if they were heading back to Hanoi. They searched until they reached the proximity of the SAM defenses and low fuel state (7500 to 8500 lb for BLUE 1).

On return to the original area not more than 3 min later, BLUE 1 also saw the smoke trails but was unable to identify them. BLUE flight observed the two smoke trails at 21°15'N/104°20'E.

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EVENT 1-32

Aircraft Involved: Three F-4Cs and one RB-66 vs four MIG-17Ds

Result: One MIG-17 destroyed

Vicinity of Encounter: 22°01'N/104°15'E,
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 12 May 1966/1622H

Three F-4C aircraft (BLUE flight) escorted an EB-66 aircraft (GREEN flight). The EB-66 mission was to provide active/passive ECM support for armed reconnaissance and IRON HAND aircraft. No BIG EYE (EC-121) was on station.

2. MISSION ROUTE

The EB-66 flew from Takhlī to 18°02'N/103°01'E to rendezvous point (19°30'N/103°40'E) then to IP at 21°40'N/104°25'E for a N-S orbit. The F-4C flight (three F-4Cs; the fourth aircraft did not launch due to maintenance nondelivery) flew from Danang to the WHITE ANCHOR air-refueling track (17°43'N/104°03'E) to drop off at 19°00'N to the rendezvous joining with the RB-66 and then to the orbit area. Flight altitude in the orbit area was 28,000 ft.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3

- 4 - SPARROW (AIM-7E)
- 4 - SIDEWINDER (AIM-9B)
- 2 - 370-gal outboard wing tanks
- 1 - 600-gal centerline tank
- All radars operating, TACAN off and IFF off
- Camouflage paint

EB-66 GREEN 1

- Believed not camouflaged
- Various active and passive ECM gear operating including chaff

MIG-17D MIG 1, 2, 3, 4

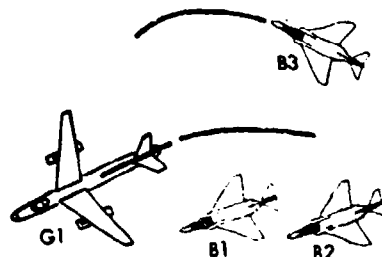
- Guns and cannon
- Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Very good, visibility was exceptional (75+ mi)

	BLUE	GREEN
	1 2 3	1
<u>Altitude:</u>	--28,000 ft--	28,000 ft
<u>Heading:</u>	230° (in process of completing left turn)	
<u>Speed:</u>	0.82-0.86 Mach	0.72-0.80 Mach
<u>Fuel State:</u>	9500-10,000 lb	

Flight Formation:



5. INITIAL DETECTION

Visual sighting of three MIGs by BLUE 3 (both crew members) at 9 to 10 o'clock to BLUE 3 and about 1 to 2 o'clock to GREEN 1 and BLUE 1 and 2. BLUE 3 called out MIGs to his flight. At approximately this same time GREEN 1 called that someone had fired on him.

6. ACTION INITIATED

After passing GREEN 1 and BLUE 1 and 2, the MIGs sharply turned to their right, climbing and reversing their direction to reattack. BLUE 3 called for all to jettison tanks and for GREEN 1 and BLUE 1 and 2 to break right. BLUE 3 started a left turn toward the MIGs.

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7. SITUATION DEVELOPMENT

(EVENT 1-32)

The lead MIG passed BLUE 1 and 2 and continued after GREEN 1 who had turned back to the left and was proceeding out of the area. BLUE 3 pursued MIG 1 and destroyed him with a SIDEWINDER. BLUE 1 and 2 meanwhile were attacked by MIGs 2 and 3, continued turning and eventually disengaged.

8. ORDNANCE

	(No. Fired/No. Hits)			
	SPARROW AIM-7	SIDEWINDER AIM-9	CANNON	Remarks
BLUE 1, 2	0/0	0/0		
BLUE 3	0/0	2/1		One fired as MIG did a split-S, missed. Second guided up tail pipe.
MIG 2, 4			Fired/0	
MIG 1, 3				Not observed firing.

9. EQUIPMENT PROBLEMS

BLUE 2 - Centerline tanks did not jettison from aircraft.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
<u>BLUE 1</u>				
Front	3600	600	60	
Back	-----Unknown-----			
<u>BLUE 2</u>				
Front	4000	325	30	
Back	600	400	80	
<u>BLUE 3</u>				
Front	-----Unknown-----			
Back	750	500	95	

Comments on this Encounter

BLUE 1 (Front) - Prebriefed information on MIG-17 performance and methods of engaging them was accurate; they turned very well, but there was no trouble obtaining vertical separation or out-accelerating them. An internal gun might have provided an opportunity to take some shots at two different MIGs during the encounter when aircraft were too close for missile firing. A shorter range missile would also have helped. Impression was that the MIGs were being vectored (GCI) into a 6 o'clock position and that the orbit turn resulted in the head-on pass that initiated the engagement.

Comments from Overall Experience

BLUE 1 (Front) - In spite of the fact that the single ship destroyed a MIG, it is difficult to operate with an odd man on an escort flight.

11. DATA SOURCES

Project Interviews:

BLUE I (Front) - 8 Mar 67
 (Back) - Mar 67
 BLUE II (Front) - 18 Jan 67
 (Back) - 7 Mar 67
 BLUE III (Front) - 2 Nov 66
 (Back) - 3 Mar 67

Messages, Reports:

41TRS OPREP-4 41TRS FASTEL 082 May 66
 7AF OPREP-3 DOCCO-0 19369 May 66
 7AF OPREP-3 FASTEL DOCCO-0 107 May 66
 7AF OPREP-3 FASTEL DOCCO-0 108 May 66
 USAF Tactical Fighter Weapons Center, CAD Bulletin #7, 12 May 66

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12. NARRATIVE DESCRIPTION

EVENT 1-32

GREEN 1 had just rolled out of a left turn at the north end of his orbit on a heading of 210°. BLUE 1 and 2 were in the process of crossing from the outside to the inside of the turn (right to left). BLUE 3 was on the outside of the turn approximately 2 mi and slightly back. BLUE 3 sighted three aircraft in a loose left-echelon in a slight climb at his 10 o'clock position. BLUE 3 called out the bogeys, then a few seconds later identified them as MIGs. The three MIG-17s were heading 050°, almost on a reciprocal heading to BLUE flight. GREEN 1 called that he had been fired at. As the MIGs passed the GREEN and BLUE flights, they pulled up in a right chandelle, dropping in trail as they made a right diving attack on GREEN 1 and BLUE 1 and 2. BLUE 3 called for a right break and to jettison tanks. BLUE 3 started an easy left turn toward the MIGs.

BLUE 1 in his right turn saw two MIGs (MIG 1 and 2) overshoot. The MIGs, after overshooting, did a defensive split; MIG 1 going high and MIG 2 going low, turning to the left. BLUE 1 maneuvered behind MIG 1. BLUE 2 called at this time that BLUE 1 was being fired on and to break right, which BLUE 1 and 2 did. BLUE 1 saw MIG 1 turn left toward GREEN 1, who after the initial right break turned back left and was descending, making 8-turns. BLUE 1 saw BLUE 3 pass overhead after MIG 1 as he broke right.

MIG 1 being high and at 6 o'clock to GREEN 1 rolled inverted. BLUE 3 launched a SIDEWINDER at the MIG just as the MIG began descending in what appeared to be a split-S. The MIG pulled down close to GREEN 1's altitude and rolled out. BLUE 3 still behind the MIG, fired the second SIDEWINDER at about the same time the MIG lit afterburner. The MIG took a direct hit and disintegrated. BLUE 3 joined with GREEN 1 and both withdrew from the area.

BLUE 1 and 2 in the meantime were in a right break, with MIG 3 and 4 in pursuit. MIG 3 overshoot and BLUE 1 reversed into him, gaining a 6 o'clock position; too close, however, to fire a missile. BLUE 2 called BLUE 1 that MIG 4 was at BLUE 2's 5 o'clock position and firing. BLUE 2 started a right climbing turn in afterburner, attempting to out-climb and gain separation on the MIG. BLUE 1 broke off his attack on MIG 3 to give assistance to BLUE 2. MIG 3 dropped down and to the left, out of the flight. MIG 4 continued to chase BLUE 2 for approximately 180° of turn firing four bursts of cannon fire. As BLUE 2 gained altitude and separation MIG 4 disengaged down and left. BLUE 1 and 2 unloaded and accelerated then turned back, "after picking up a good head of steam" (1.2-1.5 Mach), but were unable to acquire the MIGs again. BLUE 1 and 2 later joined with GREEN 1 and BLUE 3 on the return route. BLUE 1 and 2 recovered, without damage, at Udorn due to minimum fuel. BLUE 3 continued to Danang. GREEN 1 recovered at Takhlī.

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EVENT I-32 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₀	G1 altitude 28,000 ft. 0.72 Mach. 210° B1&2 28,000 ft. 0.85 Mach B3 30,000 ft. 0.85 Mach. 210° Fuel 10,000 lb	B3 sighted three bogeys at his 10 o'clock (1 o'clock to G1 and B1&2)	G1 had just rolled out of a left turn heading 210°	No MIG alert from BIG EYE which aborted due to engine failure. B3 calls out "bogeys" to flight.	Three MIG-17s in loose echelon to the left, making a head-on pass on G1	B1&2 crossing behind G1 to the inside of the turn B3 2 mi out on the right slightly back B1&2 fuel 9500 lb B3 in HEAT mode, radar on, armed in 3-bar scan. B1 & 2 25-mi scan, radar on, armed.
T ₁		B3 identifies the bogeys as MIGs. G1, B1&2 break right.	G1 is fired at by MIGs in head-on pass. G1 right turn	G1 calls that he has been fired at. B3 calls that the bogeys are MIGs and for B1&2 and G1 to break right.	MIGs fire at G1 as they pass. Pull up on centerline in right chandelle going to an in-trail formation	B2 unable to jettison centerline tank
T ₂	G1, B1&2 in right turn 28,000 ft B3 in slight left turn	M1&2 overshoot B1&2 MIGs split, M1 high, M2 low. B1 reverses in behind M1 (B1 is very close 1500-2000 ft).	G1 turns back to the left and starts a series of descending S-turns	B2 asked B3 where the MIGs were. B3 did not reply	MIGs in right diving turn attack B1&2. M1&2 overshoot B1&2 in the break. M1 goes high and in front of B1 reversing turn to the left.	B3 preoccupied in his attack did not reply to B2 call on MIG position B1 is too close to fire missiles and attempts to get spacing. B1 switches to HEAT mode.

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EVENT I-32 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₃	G1 S-turning and descending (B1&2 behind M1) B3 attacking M1	B2 advises B1 he is being fired at and to break right B3 attacking M1 as it turns left after G1. B1&2 break right.	S-turning descending and heading in a SW direction out of the area.	B2 calls B1 that a MIG is shooting at B1	M1&2 turn left to attack G1. M3 firing at B1	M2 is quite low and is probably not seen by B3. B2 did not see MIGs until they were at 7 o'clock. B2 sees MIGs Jettison wing tanks.
		NOTE: At this point the	flight splits -- G1	& B3 vs M1, B1&2 vs	M3&4.	
T _{4A}	G1 continuing to S-turn and descend B3 attacking M1 1-1/2 mi in trail (B1&2)	M1 split-S diving after G1. B3 fires SIDEWINDER just as MIG does split-S. SIDEWINDER misses	S-turning and descending heading SW		Split-S dive after G1	B3 does not believe that the MIG knew he was behind him that the split-S was not a defensive maneuver but just a dive after G1
T _{5A}	(B1&2)	B3 fires second SIDEWINDER. Just as M1 lights AB. Missile hits M1 in the tail and the MIG disintegrates. B3 joins G1 and escorts him out of the area.		B3 calls he got the MIG. Note G1 did not hear any conversation until B3 re-joined after the MIG kill.	MIG closing on G1. Lights his AB	MIG 1 lit AB, apparently to close into a better gun-firing range.

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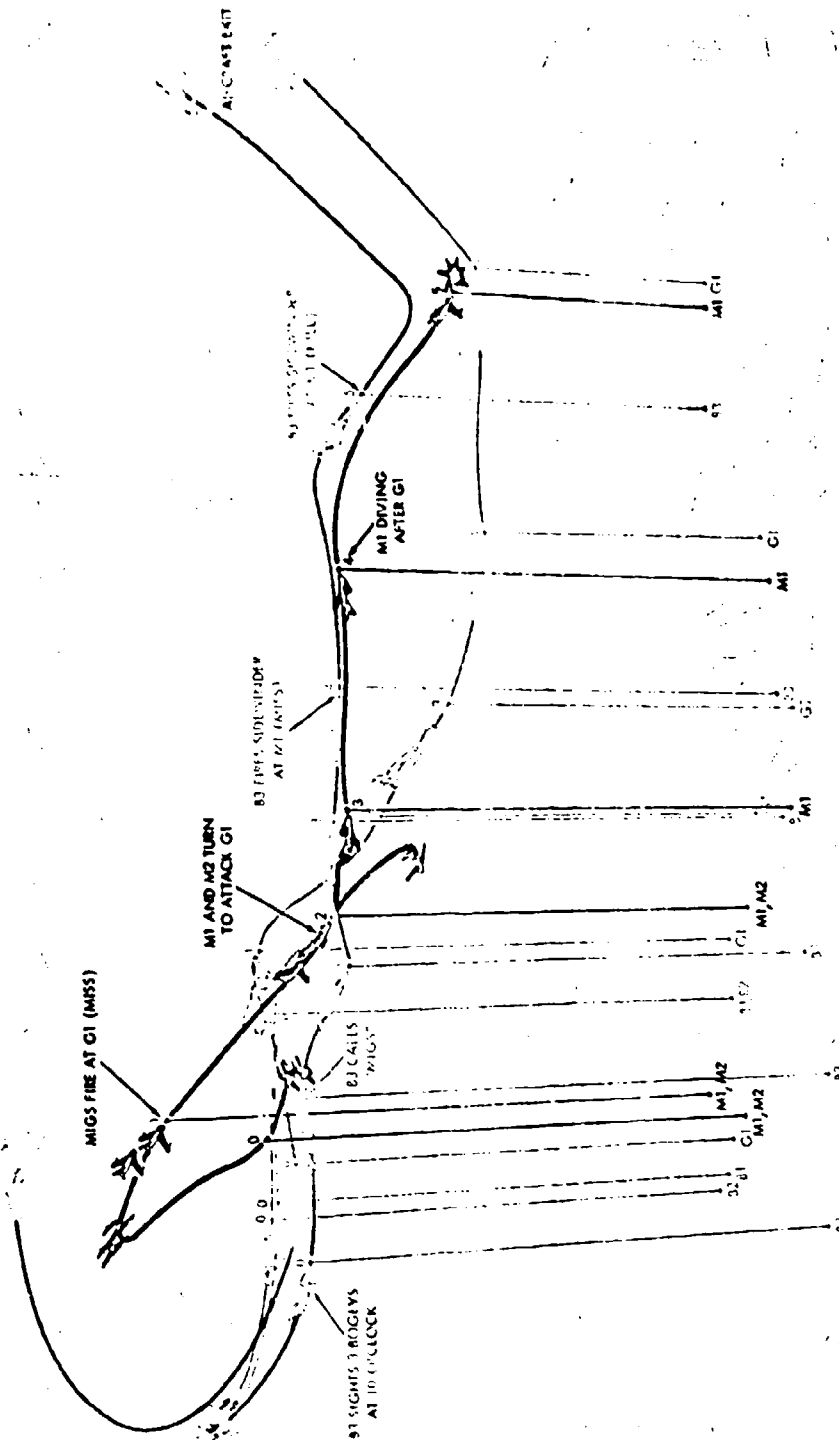
EVENT I-32 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T ₄₈	Bl&2 in right break as M3 overshoots. M3 goes high, M4 low in a vertical split. (Bl&2)	Bl maneuvers behind M3 after overshoot. M4 drops behind G7 and starts to fire at B2.			M3 overshoots Bl. M4 drops behind B2 and fires.	B1 is too close to M3 to fire a missile. B1 is attempting to drop back into firing position.
T ₅₈	Bl&2 in right climbing turn, AB on. (Bl&2)	B2 has a MIG at 6 o'clock firing. B2 starts a right, climbing turn, outclimbing the MIG. B1 turns right breaking off his attack on M3, engages AB and attempts to assist B2.		B2 advised Bl that B2 is receiving fire from MIG at 6 o'clock. B1 tells B2 to take the lead.	M3 falls back and left. M3 turning inside of B2's turn but dropping back.	M4 made four separate bursts at B2. Did not hit. After the right break, B2 does not think M4 was able to pull lead.
T ₆₈	Bl&2 right climbing turn, altitude 35,000 ft; air speed 220-kt IAS	M4 drops down and behind B2 turning left disengaging. B2 does right barrel roll as MIG drops back. Bl&2 descend and accelerate to 1.2 Mach.			M4 drops back and down to the left, disengaging	B2 turned back to the W after egressing the immediate area but did not see the MIGs again. B2 in making a right, high-g barrel roll at low speed was attempting to get the MIG to spin out. The MIG broke off however, probably just prior to the roll.
	NOTE: There is discrepancy as to whether there were three or four MIGs. M2 was lost sight of as he went the first overshoot. He may have moved back in. When M4 is mentioned this may have been M2.					

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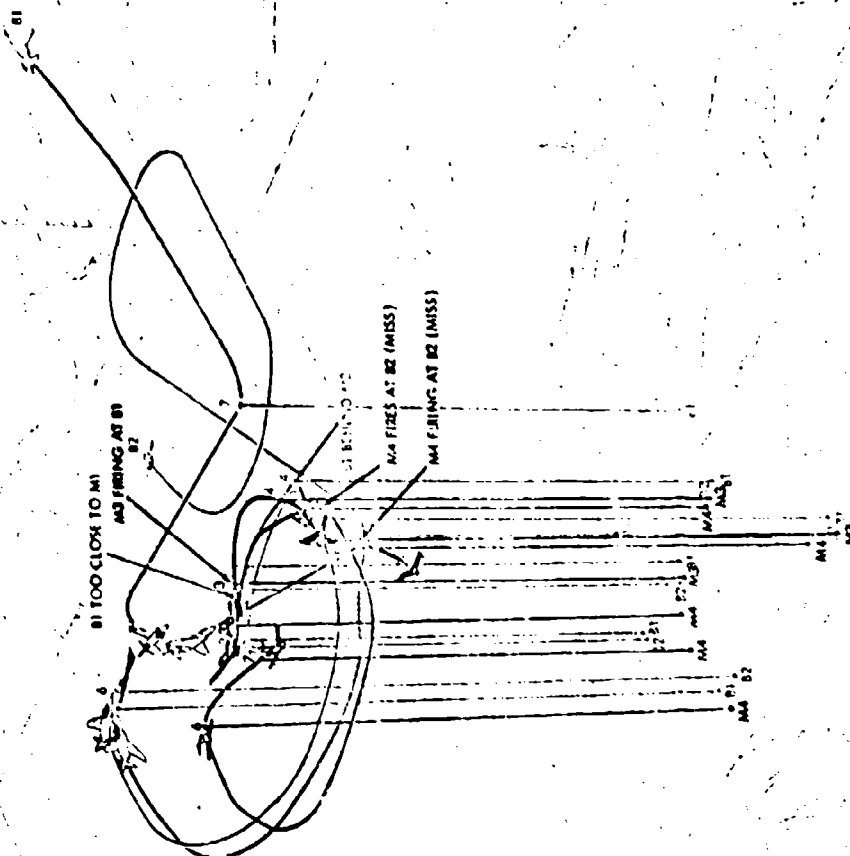
EVENT 1-32



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EVENT 1-32



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EVENT 1-33

Aircraft Involved: Two F-4Cs vs four MIG-17s

Result: lighting only

Vicinity of Encounter: 21°50'N/104°00'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 30 May 1966/1750H

F-4Cs (BLUE flight) escorting two SAR helicopters.

11. DATA SOURCES

Message, Report:

7AF MSG 302319Z May 66

CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

BLUE flight sighted four aircraft believed to be MIG-17s. The MIGs were at 22,000 ft heading 035°. BLUE flight was at 13,000 ft, heading north. BLUE flight turned and obtained lock-on. There was no overtake and since MIGs were going away BLUE flight continued with RESCAP escort.

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EVENT 1-34

Aircraft Involved: Two F-8Es plus two F-8Cs vs
four MIG-17s

Result: 1 MIG destroyed; 1 MIG destroyed, probable

Vicinity of Encounter: 21°20'N/106°30'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 12 Jun 1966/1446H

Two F-8E (BLUE 1 and 2) plus two F-8C (BLUE 3 and 4) aircraft acting as TARCAP for an A-4 strike against the Dai Tan Military Area northwest of Haiphong. Support aircraft, BIG EYE/BIG LOOK, were also airborne.

2. MISSION ROUTE

Departed aircraft carrier in Tonkin Gulf about 1400H in company with A-4 strike force on an approximate heading of 350° (magnetic), climbing to an altitude of 20,000 ft. In the vicinity of Bac Long Island, the flight turned to a northwesterly heading toward a coast-in point near Cam Pha, and descended to an altitude of 2500 ft. From Cam Pha, the flight proceeded to assigned target area at low altitude. TARCAP F-8s orbited to a point 5 mi northeast of the target while the A-4s completed the attack.

3. AIRCRAFT CONFIGURATIONS

F-8E, C BLUE 1, 2, 3, 4

2 - SIDEWINDER (AIM-9C)

IFF and TACAN (unknown); grey/white paint

20mm guns

MIG-17 MIG 1, 2, 3, 4

No external tanks or ordnance

Color: 2 - grey; 1 - silver; 1 - brown

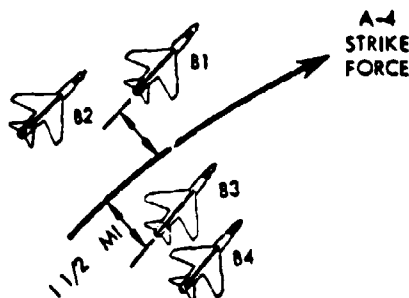
4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered clouds at about 3500 ft with another cloud layer at a much higher altitude; visibility was 5 to 7 mi in haze. Sunlight penetrated the cloud layers.

	1	2	3	4
Altitude:	2500 ft	2500 ft	3000 ft	3000 ft
Heading:	North-northeast (in slow left turn)			
Speed:	----- about 400 kt -----			
Fuel State:	Estimated 4500 lb.			

Flight Formation:

BLUE 1 and 2 were on the left side and above the retiring strike force, and BLUE 3 and 4 were on the right side of the strike force, slightly behind BLUE 1 and 500 ft higher.



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5. INITIAL DETECTION

BLUE 3 heard MIG warning from BIG EYE/BIG LOOK about 15 sec before MIGs were sighted visually. BLUE 1, 2, and 4 received no MIG warning and BLUE 3 did not have time to warn them before MIGs were sighted. BLUE flight was in a slow left turn following the A-4 strike force. The flight had just passed through a heading of 360° when MIGs 1 and 2 were sighted by BLUE 2 at 10 o'clock, co-altitude.

6. ACTION INITIATED

BLUE 2 called out MIGs to flight. BLUE flight broke left and simultaneously lit afterburners. BLUE 2 assumed flight lead since BLUE 1 had not sighted MIGs. BLUE flight met MIG flight head-on and began a series of individual attacks on MIGs 1 and 2. MIGs 3 and 4 were sighted and attacked, after the initial encounter, by individual members of BLUE flight.

7. SITUATION DEVELOPMENT

During the initial series of turns after the MIG sighting, the engagement became a "one-on-one" situation with no flight integrity. On the initial head-on pass, BLUE 2 fired a few ineffective 20mm rounds at MIG 1. BLUE 3 also fired with no apparent results. After the initial pass, BLUE 1 resumed the lead, with BLUE 2 on his wing, and began a series of sharp scissor maneuvers with MIG 1 who was ultimately destroyed by BLUE 1 using a SIDEWINDER. BLUE 3 and 4 countered MIG 2, who had detached from MIG 1, in an engagement during which three SIDEWINDERS were fired with no favorable results.

Two additional aircraft, MIGs 3 and 4, were seen at irregular intervals, and engaged by individual elements of BLUE flight. BLUE 1 damaged MIG 4 with 20mm cannon fire.

8. ORDNANCE

	(No. fired/No. hits)		Remarks
	SIDEWINDER AIM-9D	Guns 20mm	
BLUE 1	2/1	175 rds	First SIDEWINDER may have guided on false target; missed actual target. Second SIDEWINDER guided and detonated; direct hit. Fired approximately 150 rds of 20mm at fleeting, long-range targets; 25 rds fired behind MIG 4 damaged wing. Both lower 20mm guns inoperative due to electrical malfunction.
BLUE 2	2/0	125 rds	Neither missile guided. Fired approximately 25 rds at fleeting, long-range targets; 100 rds of 20mm fired in two bursts with unknown results before guns jammed.
BLUE 3	2/0	100 rds	Neither missile guided. Fired 100 rds of 20mm at fleeting targets with unknown results.
BLUE 4	2/0	0	First missile guided but fell short of opening target; second missile did not guide. Guns would not fire.
MIG 1, 2, 3, 4			No ordnance expenditure observed; no missiles carried.

9. EQUIPMENT PROBLEMS

BLUE 1, 2, 3, and 4: See Paragraph 8. ORDNANCE

BLUE 2: Gunsight inoperative: No yaw stability: No aileron/rudder interconnect.

10. AIRCREW COMMENTS

Experience	Total Hours	F-8 Hours	Combat Missions	Remarks
BLUE 1	4500	1400	170	
BLUE 2		Not known		
BLUE 3	2300	480		
BLUE 4		Not known		

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Comments on this Encounter

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BLUE 1

F-8 type weapons systems, air-to-air missiles and 20mm cannon, best for air combat maneuvering where visual identification is a preliminary requirement.

SIDEWINDER missile with short range (1000 ft), high-g, and low-altitude capability could have been used to good effect.

BLUE 2

The SIDEWINDER (AIM-9) needs a range indicator.

BLUE 4

"I would have had him if my guns had worked."

The MIGs did not appear to fight well. There was never any F-8 in trouble.

11. DATA SOURCES

Project Interviews:

BLUE 1, 17 January 1967
BLUE 2, 4 November 1966
BLUE 3, 16 March 1967

Messages, Reports:

CTO 77.3 120822Z June 66
CTO 77.3 120933Z June 66
CTO 77.3 121513Z June 66
CTO 77.3 121733Z June 66
USS HANCOCK 161800Z June 66

Other:

USAF Fighter Weapons Center CAD Bulletin No. 7
Air-to-Air Missile Weapon System Flight Report, 12 Jun 66, from USS HANCOCK (CVA-19)
Air Combat Report (OPNAV Form 3840-4) 12 Jun 66, from USS HANCOCK (CVA-19)
OEO Rep. Memo of 16 Jun 66, Analysis of MIG Encounter by USS HANCOCK Aircraft.
CINCPACFLT IBM Report, Southeast Asia Air Incidents
CINCPACFLT Staff Study 11-66
CINCPACFLT Staff Study 13-66

12. NARRATIVE DESCRIPTION

BLUE flight was in a slight left-hand turn following a retiring A-4 strike force that was in a right turn. The strike force was at a very low altitude (approximately 1000 ft) as they approached a heading of north. BLUE 1 and 2 were at 2500 ft on the left of the strike force, and BLUE 3 and 4 were at 3000 ft on the right of the strike force. BLUE 2 sighted a bogey at 3 mi, 10 o'clock, and slightly high (T₀) and called the "tally-ho." BLUE flight broke left and split into two sections. BLUE 2 assumed the lead since BLUE 1 had not sighted the MIGs. BLUE 3 and 4 lit afterburners and the two sections headed into the oncoming aircraft. BLUE 2 and 3 each fired a short 20mm burst at long range at MIG 1, with no visible results (T₁). After the initial pass, BLUE 2 and BLUE 1 broke right to counter MIG 1. In this turn, BLUE 1 resumed the lead. At the same time MIG 2 detached from MIG 1 by performing a maneuver that combined a 225° roll to the left with a split-S type recovery (T₂) and was countered by BLUE 3 and 4. From this point on, BLUE flight lost most of its flight integrity and each member began to maneuver independently. Accordingly, the following section will deal with the encounters separately. Time marks (T) in narrative and pictorial schematic of flight are in sequence for all members of BLUE flight through T₂ only. Subscripted time marks (T₃) B1 indicate action by a special flight member, BLUE 1, 2, 3 or 4, since BLUE flight lost most of its integrity after T₂.

BLUE 1

BLUE 1 sighted MIG 1 as the two flights initially met head-on. MIG 1 continued his left turn and BLUE 1, resuming the lead, broke right to counter (T₂). A series of sharp scissor maneuvers ensued at altitudes up to 4000 ft with BLUE 1 slowly gaining the offensive. During these maneuvers, BLUE 1 fired approximately 150 rounds of 20mm with no observed results. BLUE 1 finally was in position (3/4 mi) behind MIG 1 who was in a right 5° nosedown, 3-g turn at 400 kt. From this position, BLUE 1 fired his first SIDEWINDER which guided temporarily and then fell off to the right without detonating. It is believed that this missile guided on a cloud reflection since it was fired against a scattered cloud background (T₃)B1. MIG 1 then rolled wings level, and BLUE 1 from a position of 1/2 mi behind fired his second SIDEWINDER. This missile detonated at the tail of the MIG and parts of MIG 1's wing and tail were seen to come off before he plunged out of control (T₄)B1. After BLUE 1 had destroyed MIG 1, he noticed MIGs 3 and 4 in an orbit, 9 o'clock high at about 4000 ft (T₅)B1. BLUE 1 had no difficulty in gaining the 6 o'clock position behind MIG 4. From this position BLUE 1 fired 30 rounds of 20mm and inflicted damage (probable kill) to the right wing of MIG 4 before he unexpectedly ran out of ammunition (T₆)B1. An electrical malfunction prevented the lower guns from firing.

BLUE 1 then exited the area and returned to his ship (T₇)B1.

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BLUE 2

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BLUE 2 passed the section lead to BLUE 1 after the initial encounter with MIG 1 and 2 (T₂). As BLUE 1 maneuvered for position on MIG 1, BLUE 2 stayed as wingman until he detached when MIG 3 leveled off at 3000 ft. BLUE 2 attempted to fire a SIDEWINDER from MIG 3's 7 o'clock position, about 500 ft high, and at a range of 3/4 mi. BLUE 2 was in a slight nose-down attitude, with a good tone, and pulling more than 4 gs when he fired at MIG 3. The missile hung. A second missile was immediately selected and fired but it did not guide and went ballistic (T₃)B2.

BLUE 2 then broke right to exit the area but noticed MIG 4 pass his 12 o'clock position, low at 1500 ft. BLUE 2 easily took position behind MIG 4 and fired about 80 rounds of 20mm without the aid of a gunsight. As he continued to close to a range of about 1000 ft behind MIG 4, he opened fire again with 20mm, but his guns failed after 15 rounds (T₄)B2. BLUE 2 retired at high speed (T₅)B2.

BLUE 3

BLUE 3 fired a few ineffective rounds of 20mm at MIG 2 on the initial head-on pass (T₁) at an altitude of 3000 ft. After crossing MIG 2, BLUE 3 began a 3g climbing left turn from which he was able to observe MIG 2 commence his unorthodox rolling split-S maneuver (T₂). As MIG 2 recovered in a high g, low-altitude pullout, with BLUE 4 following, BLUE 3 was able to gain his 5 o'clock position from which he attempted to launch two SIDEWINDER missiles from a distance of about 1500 ft (T₃)B3. The first missile was slow in firing, and the second was then fired in such a way that both missiles left the aircraft at almost the same time. At the instant of firing, MIG 2 was in a hard right turn, pulling about 4gs, and climbing fast. Though BLUE 3 had a tone, both SIDEWINDERS missed. As MIG 2 turned past BLUE 3, BLUE 3 climbed straight ahead, saw MIG 3 (T₄)B3, and maneuvered his airplane into a position from which he was able to fire a few 20mm rounds as MIG 3 ducked into a cloud (T₅)B3. BLUE 3 followed MIG 3 into clouds, but was unable to regain a visual sighting. BLUE 3 then departed the area at high speed (T₆).

BLUE 4

BLUE 4 gained the 6 o'clock position on MIG 2 at 3500 ft of altitude, and closed to within a few hundred feet. He was unable to fire his 20mm due to a malfunction. MIG 2 commenced a 225° roll to the left and recovered in a split-S maneuver. MIG 2 almost collided with the ground. BLUE 4 in following MIG 2 recovered from the dive by pulling in excess of 7g (T₃)B4. On recovering from his pullout, BLUE 4 regained the 6 o'clock position on MIG 2 (after BLUE 3 had fired his missiles at MIG 2) and launched a SIDEWINDER at an altitude of 3000 ft although BLUE 4 was decelerating and range was increasing (T₄)B4. The missile guided well but fell short of the target as MIG 2 passed through a small cloud. BLUE 4 lost sight of MIG 2 and while engaged in evasive clearing turns he observed MIG 4 and launched his second SIDEWINDER, without a missile tone, at an altitude of 3000 ft, 450 kt, at a range of 1-1/2 mi. The missile did not guide. BLUE 4 was in a slight climbing attitude at missile launch (T₅)B4. BLUE 4 retired from the area (T₆)B4.

The A-4 strike force exited the area without being engaged by the MIGs.

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EVENT I-34 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
T0	B1, 2 at 2000 ft B3, 4 at 2500 ft 400-450 kt Fuel 4500 lb	B2 sights MIGs at 10 o'clock. Flight breaks left. Afterburners engaged. B2 assumes lead.	Strike force departing target at 1000 ft	B2 calls MIGs at 10 o'clock, slightly high; calls for left break	MIGs approaching in easy left turn; descending slightly	MIGs appeared to be GCI controlled to a trailing position on BLUE flight
T1	BLUE flight in climbing attitude to engage MIGs	B2, 3 fire 20mm at M1, 2	Strike force continued to exit area		M1 and 2 do not fire	B1 does not see M1 and 2. B2 takes section 3 to engage M1. B3 and 4 engage M2.
T2		B1 and 2 split to engage M1, B3 and 4 counter M2. B1 and 2 start series of scissor maneuvers with M1. Fire 20mm intermittently	Strike force has exited area		M1 and 2 passed under BLUE flight. M1 continues in easy 3g left turn. M2 starts split-S.	M1 is silver. M2 is grey. Neither has external tanks nor ordnance
T3(B1)	2000 ft 350-400 kt Weather: Many scattered clouds in area	B1 gains position on M1 and fires SIDEWINDER	B2 had previously detached to engage M3		M1 then rolls wings level. Appears to be returning to home base	Missile guided improperly. Possibly on a cloud
T4(B1)	2000 ft 350-400 kt	B1 fires second SIDEWINDER at M1. Missile detonated properly and destroyed M1			M1 in level attitude	M1 appears headed for home base at 2000 ft.
T5(B1)	2500 ft Climbing	B1 breaks right after destroying M1 and notices M3 and 4 heading east			M3 and 4 in level formation	Enemy aircraft appear to be in orbit
T6(B1)	4000 ft level 350 kt	B1 gains 6 o'clock position behind M4 and fires 30 rds of 20mm before exhausting ammunition. Right wing of M4 damaged			M4 continues in straight and level attitude	

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EVENT 1-34 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
7(81)	4000 ft 650 ft	B1 exits area at high speed			M3 and 4 continue	No evasive action employed by MIGs
3(82)	3500 ft 400 kt	B2 has detached from B1 on seeing M3. Fires SIDEWINDER from range of 3/4 mi. Missile hung. Second missile immediately selected and fired. Did not guide and goes ballistic			M3 is level at 3000 ft. No evasive maneuvers attempted	M3 is brown in color
4(82)	1500 ft 400 kt approx	On breaking right to exit area B2 notices M4 at 12 o'clock, low. Assumes 6 o'clock position and fires a total of 95 rds of 20mm before guns fail			M4 attempted no evasive maneuvers	M4 was brown or dark gray in color
5(82)	B2 exits area at high speed				No change noted	
3(83)	2500 ft and climbing rapidly 4 g's on aircraft	B3 gained M2's 5 o'clock position as he recovered from his evasive split-S followed by B4. B3 launched two SIDEWINDER missiles that missed the target			M2 was rapidly turning and pulling about 4 g's and climbing fast	
4(83)	3000 ft Climbing straight and level 450 kt	B3 climbed straight ahead and noticed M3			M3 was not maneuvering. 3500 ft at 450-500 kt level flight	Enemy appeared to be in a wide orbit. Gentle left turn
5(83)	B3 gained M3's 6 o'clock position and fired a few 20mm rds without results before M3 ducked into cloud				No change	

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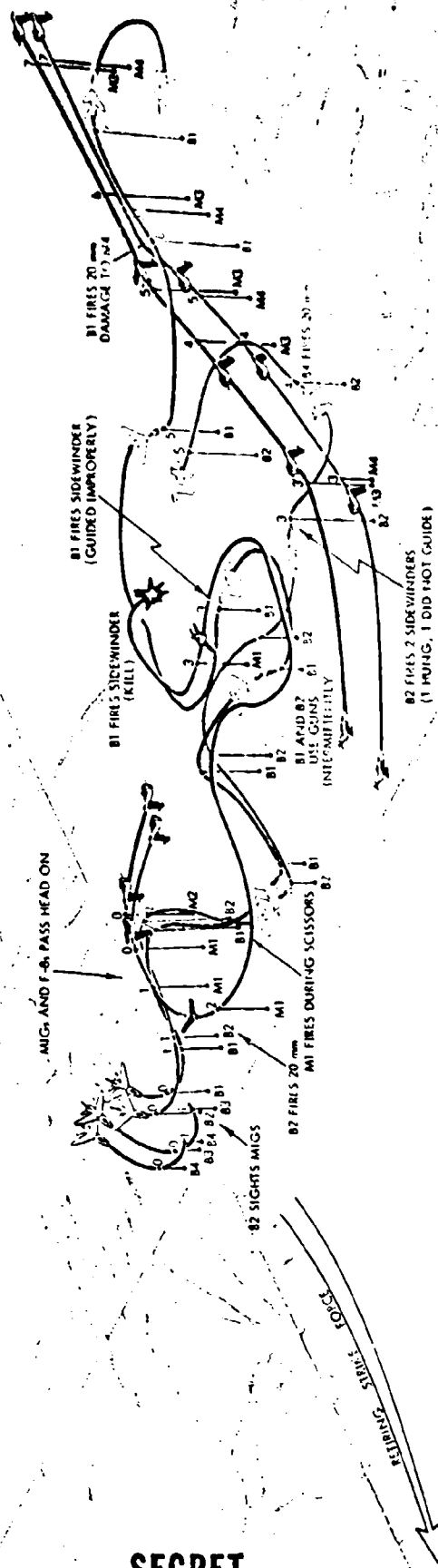
EVENT 1-34 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action				
6(83)		B3 attempted to locate M3 in cloud without results. Departed area at high speed			Unknown	
3(84)	3000 ft in a climbing pullout	B4 gained M2's 6 o'clock position in the split-S dive. Unable to fire 20mm due to malfunction			M2 recovers from dive at high-g and very low altitude	Maneuver by M2 appeared to be for purpose of causing pursuer (B4) to run into ground
4(84)	3800 ft in slight climb	B4 regains M2's 6 o'clock position and fires SIDEWINDER that misguides as M2 goes into cloud			M2 ducks into cloud at high speed, climbing and turning	B2 loses sight of M2 in cloud
5(84)	Slight climbing attitude	B4 while doing evasive turn sees M4 and fires SIDEWINDER without tone. Missile falls short of target			M4 appears, does no maneuver to evade	
5(84)	Fuel 2500 lb	B4 exits area at high speed while going to lower altitude			Unknown	

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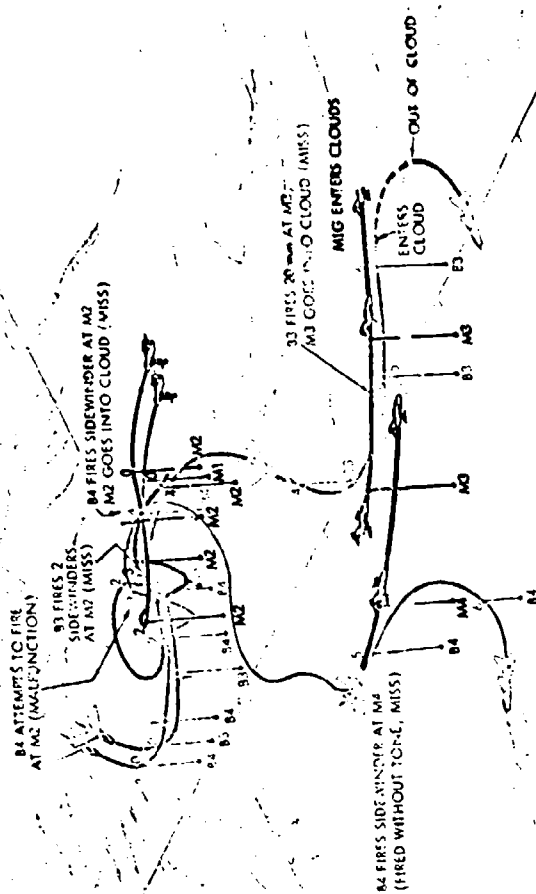
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EVENT 1-35

Aircraft Involved: Two F-4Bs vs slow-speed
prop aircraft (possibly
COLTS)(night engagement)

Result: One enemy aircraft probably
destroyed

Vicinity of Encounter: 20°00'N/106°00'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 14 Jun 1966/0040H

Two F-4B aircraft BLUE 1 and GREEN 1 (the aircraft were from different squadrons) were on Condition 1 deck-alert on the USS RANGER (CVA-61) to be launched when required against air or surface targets. For Condition 1 the aircraft are on the catapults and the pilot and RIO in the cockpits with all preflight checks completed and starting units plugged in to permit launch in minimum time.

2. MISSION ROUTE

Initial GCI vector after launch was 320°, 165 mi from USS RANGER to targets in vicinity of 20°00'N/106°00'E.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1 and GREEN 1

- 2 - SPARROW (AIM-7E)
- 2 - SIDEWINDER (AIM-9B)
- 4 - LAU-3 (2.75" rocket pods)
- 6 - MK-24 illuminating flares
- 1 - 600-gal external fuel tank.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: About 12,000-ft overcast, making it very black.

Aircraft on Condition 1 deck-alert as indicated in paragraph 1

5. INITIAL DETECTION

At 140015H, USS COONTZ on station vicinity 19°30'N/107°00'E reported air radar contact vicinity 20°00'N/106°00'E. At 0027H, contact evaluated as two aircraft below 5000 ft in left orbit. Flares reported in area of contact. Apparently enemy aircraft assisting in attack against friendly surface forces.

6. ACTION INITIATED

Condition 1 deck-alert aboard the USS RANGER (BLUE 1 and GREEN 1) was launched and vectored 320°, 165 mi at 0040H.

7. SITUATION DEVELOPMENT

BLUE 1 and GREEN 1, after clearance to shoot from the USS COONTZ and necessary coordination to ensure against shooting at each other, made separate low-altitude full-radar attacks assisted by the COONTZ. BLUE 1 fired two SPARROW missiles, one of which hit and downed an enemy aircraft. GREEN 1 fired one SPARROW which was observed to explode and probably downed a second enemy aircraft. Later analysis revealed aircraft were probably COLTS.

8. ORDNANCE

(No. fired/No. hits)

	SPARROW AIM-7E	Remarks
BLUE 1	2/1	No motor ignition. Short in umbilical cord.
GREEN 1	1/1	

9. EQUIPMENT PROBLEMS

None (See 8).

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10. AIRCREW COMMENTS

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Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	-----	Not obtained	-----	
Back	-----	Not obtained	-----	
<u>GREEN 1</u>				
Front	3100	1000	90	Had fired approximately 20 AIM missiles (SIDEWINDER and SPARROW).
Back				Had only been with squadron a month. His first tour as RIO.

Comments on this Encounter

BLUE 1 Front

A single-seat aircraft could not have carried out this operation.

More than one friendly aircraft in the area at night or in bad weather complicates the situation. Better if there is only one.

GREEN 1 Front

Control switched from the RANGER to the COONTZ before the attack was made. This was a smooth transition requiring no frequency change; the COONTZ just started to control. The COONTZ tried to run a closed-control GCI, but was having problems due to low altitude of the engagement. Actually ran our own control with the COONTZ providing supplementary vectors.

COONTZ tried to break off the engagement as the target passed over the beach. Since I was rapidly approaching firing position, I pressed on.

Never saw the enemy aircraft. Later analysis indicated they were probably COLTS.

One aircraft would have been better for this particular mission. Should have held one aircraft in reserve to reduce the confusion factor.

Impossible to identify aircraft at night, must have authority to shoot.

Was "squawking" IFF on this mission. Probably of no help to COONTZ because of ground clutter.

Comments from Overall Experience

GREEN 1 Front

Firm believer in two-seater aircraft with two engines. Back seater is a must for intercept missions such as this one and for night attack missions. Feel that many aircraft have been saved by having the extra set of eyes on night missions.

Guns would be most valuable for the RESCAP role but not particularly valuable in the air-to-air role. However, do need a close-in weapon capability in the 2000- to 1000-ft range.

Would like tail warning gear in F-4s for SAMs to tell when they are fired. Feel available SAM radar warning gear of little value because it creates mass confusion and disrupts the mission. Wants to know when the missile is about to be fired or has been fired.

11. DATA SOURCES

Project Interviews: BLUE 1, Front and Back - 3 November 1966
 GREEN 1, Front - 13 January 1967
 GREEN 1, Back - 18 January 1967

Messages, Reports:

CTG 77.4, OPREP 3, 132309Z June 1966

12. NARRATIVE DESCRIPTION

At 140015H, USS COONTZ reported air radar contact vicinity 20°00'N/106°00'E. At 0027H, the contact was evaluated as two aircraft, below 5000 ft in a port orbit dropping flares to support NVN attack on friendly surface forces.

At 0040H, two F-4Bs (BLUE 1 and GREEN 1) were launched from the USS RANGER and vectored to intercept the enemy aircraft 320°/165 mi. GCI control switched to the USS COONTZ located approximately 19°30'N/107°00'E at about 0050H at which time the vector was 315°/65 mi.

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BLUE 1 launched first, followed by GREEN 1. Both aircraft jettisoned LAU-3, 2:75" rocket pods and MK-24 flares after take-off, leaving two SPARROW and two SIDEWINDER in addition to a 600-gal external fuel tank per aircraft.

T₀ The F-4Bs proceeded on course at about 10,000 ft at 600-kt TAS. GREEN 1 was 15-20 mi in trail on BLUE 1.

Both aircraft accomplished radar system checks and tuned SPARROW missiles en route. Clearance to shoot was given by USS COONTZ approximately 40 mi from the target. Missiles were armed at that time. Flares were observed by both F-4Bs.

T₁ BLUE 1 did not have radar contact upon closing with the target and executed a 360° right turn. GREEN 1 had radar contact at approximately 35 n mi. Target was low. The COONTZ indicated the two enemy aircraft were in a left orbit between 500-1500 ft. GREEN 1 reduced altitude to 500 ft, airspeed to 400-kt TAS.

T₂ As GREEN 1 approached firing range, he was not certain of the whereabouts of BLUE 1. GREEN 1 requested BLUE 1 to turn out to the east to clear the area.

T₃ As GREEN 1 came into firing range, the target was turning hard right. GREEN 1 made a 360° right turn at 500-ft altitude approximately 4 g's trying to get into firing position. Had two chances to fire, but did not because of uncertainty as to the location of BLUE 1.

T₄ BLUE 1 and GREEN 1 exchanged position information using the COONTZ TACAN. GREEN 1 requested BLUE 1 come in from the south and he (GREEN 1) would clear area to the east.

T₅ BLUE 1 received vector from COONTZ 290°/18 mi and had radar lock-on at 8 mi. Did not fire SPARROW because his estimate of GREEN 1's position, based upon exchange of TACAN position information, was only 3 mi from the target.

T₆ BLUE 1 got break X (minimum missile firing range) at about 2 mi, saw two red lights, flew toward them.

T₇ BLUE 1 passed within 20 ft of the two enemy aircraft which were recognized by their interior (cockpit) red lights. Aircraft were in a hard left turn toward BLUE 1 at 700 ft. Cockpits were large and rectangular and BLUE 1 judged them to be prop aircraft because of their shape.

T₈ BLUE 1 executed a 360° left turn and received an additional vector from the COONTZ.

T₉ BLUE 1 got radar lock-on heading 300°, 700 ft, 450-kt, head-on aspect slightly nose-up attitude.

T₁₀ At 0116H BLUE 1 fired first SPARROW missile at 4 mi, no motor ignition.

T₁₁ BLUE 1 fired second missile at 3-1/2 mi. Explosion was observed approximately 2 sec later. GREEN 1 heard BLUE 1 call FOX (missile away) and observed the SPARROW flight and explosion. COONTZ reported losing radar contact on one target after this explosion. Approximate time and location of this shoot down was 0116H at 20°09'N/106°17'E.

BLUE 1 called he was breaking out to the east.

T₁₂ GREEN 1 made radar contact at 12 mi, had lock-on at 8 mi as target passed over the beach on a westerly heading and descending.

T₁₃ GREEN 1 doing 400-500 kt with 300 kt overtake.

T₁₄ GREEN 1 climbed to about 3500 ft as he passed over the coastline then fired one SPARROW slightly nose-down, attitude, 2-21/2- to 3-mi range. GREEN 1 saw the SPARROW come off, guide and detonate at the proper time.

T₁₅ The radar broke lock after the explosion. BLUE 1 made a hard left turn after the radar broke lock and proceeded back over water. Approximate time and location was 0118H at 20°05'N/106°14'E.

The COONTZ reported no more contacts. The two F-4Bs were released and recovered aboard the RANGER.

A night low-altitude full radar intercept assisted by the GCI radar aboard the COONTZ, although complicated by coordination problems between the two F-4Bs, resulted in one probable kill.

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EVENT I-35 SUMMARY

EVENT I-35

Time Mark	Action Aircraft (GREEN 1, BLUE 1)		Other Friendlies	Communications	Enemy Actions	Remarks
	Status	Action				
T ₀	10,000 ft 600-kt TAS 315°	G1 in 20-mi trail behind B1 got radar contact at 36 mi. B1 does not yet have radar contact. B1 and G1 descending to low altitude for the intercept and slowing down		USS RANGER provided initial vectors. Function later taken over by USS COONTZ w/o channel change	Two enemy flare drop aircraft in left orbit 500-1500 ft	Enemy aircraft held by USS COONTZ radar. COONTZ was controlling F-48s and had given clearance to fire at 40 mi.
T ₁	500-ft alt ~300-kt TAS 29	B1 did not have radar contact. Made 360° right turn.		B1 advised G1 turning to the right.		
T ₂	500 ft 400-kt TAS	G1 approached SPARROW firing range. Did not fire because he was not certain of B1's position.		G1 asked B1 to break out to the east. B1 acknowledged and complied.	Target aircraft in hard right turn	
T ₃	500 ft 400-kt TAS 49	G1 attempting to position to fire SPARROW. Had two chances to fire but did not due to uncertainty of B1's position.		B1 and G1 exchange position information using the COONTZ TACAN.	In hard right turn	
T ₄		G1 turned to heading 90° to start time pattern to provide separation on B1.		G1 advised B1 to come in from the S and that G1 was clearing to the E.		

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EVENT 1-35 SUMMARY (Continued)

Time Mark	Action Aircraft (GREEN 1, BLUE 1)		Other Friendlies	Communications	Enemy Actions	Remarks
	Status	Action				
T ₅	.	B1 turned to 290° to follow COONTZ vector instruction G1 proceeded to the E.		COONTZ gave B1 vector 290°, 18 mi. B1 and G1 still exchanging position information		
T ₆	700 ft	B1 got lock-on but did not fire because his estimate of G1's position was 3 mi from target. Got break X at T ₆ approximately 2 mi.	.			
T ₇	700 ft 340- to 350-kt TAS	G1 passed within 20 ft of prop-type aircraft in hard left turn. B1 made left turn.			Enemy aircraft in hard left turn	
T ₈		B1 continued left to follow COONTZ vector of 300°		COONTZ gave B1 additional intercept vector.		
T ₉	700 ft 450-kt TAS 300°	B1 radar contact approximately 12 mi			Proceeding overland in apparent effort to evade F-4Bs.	
T ₁₀	750 ft 450-kt TAS 300°	B1 fired one SPARROW at 4 mi. No motor ignition		B1 called FOX (missile away)		

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EVENT I-35 SUMMARY (Continued)

Time Mark	Status	Action	Other Friendlies	Communications	Enemy Actions	Remarks
T ₁₁	750 ft 450-kt TAS 300° Time 0016H	B1 fired second SPARROW at 3-1/2 mi. Missile exploded after about 2 sec. G1 observed SPARROW flight and explosion. B1 right turn to 90° to clear area for G1		COONTZ reported loss of radar target at explosion time. B1 stated he was breaking out to the E.		
T ₁₂	400- to 450-kt TAS	G1 got radar contact at 12 mi.				
T ₁₃	400- to 450-kt TAS	G1 radar lock-on. overtake speed on target approximately 300-kt (from radar)		COONTZ called G1 "You are sp. approaching feet dry, break it off."		G1 continued attack due to ideal conditions and rapid closure rate.
T ₁₄	3000-3500 ft 450-kt TAS Time 0018H	G1 had climbed slightly as he approached beach at 3500 ft, nosed over, had good missile indication (2 lights). Fired on SPARROW in nose-down attitude at 2-1/2- to 3-mi range.			Going for the deck to evade	SPARROW appeared to guide and detonate at an appropriate time. The radar broke lock after the detonation.
T ₁₅		G1 broke left and departed the area. B1 and G1 returned to RANGER.		COONTZ advised no more targets		

EVENT I-35

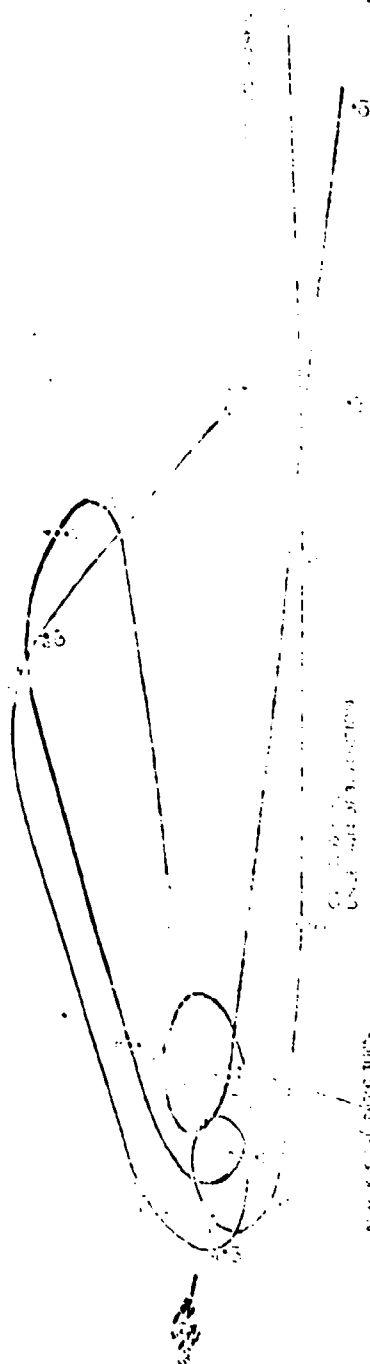
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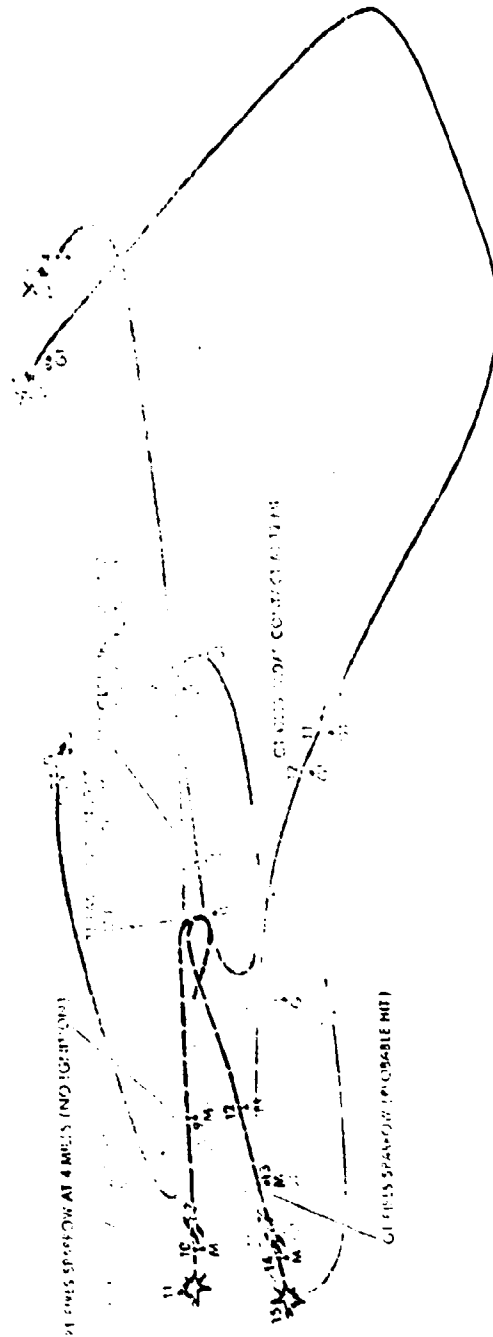
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EVENT I-35



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EVENT 1-36

Aircraft Involved: Four F-8Es vs four possibly five MIG-17s

Result: One F-8E lost, two
MIG-17s destroyed

Vicinity of Encounter: 21°33'N/106°37'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Jun 1966/1535H

One F-8E aircraft (GREEN 1) launched on photo escort mission and became SAR aircraft orbiting over the photo pilot downed by AA at 21°30'30"N/106°35'10"E. Three F-8E (BLUE flight) conducting TARCAP mission in vicinity of 21°30'30"N/106°36'E diverted at completion of mission and joined GREEN 1 in the SAR effort over the downed photo pilot.

2. MISSION ROUTE

GREEN 1 and photo aircraft proceeded from the carrier via unknown route to commence photo reconnaissance of Route 1. Reconnaissance started 3 mi north of the point at which the photo aircraft was ultimately hit. BLUE flight departed the same carrier as GREEN and accompanied the strike group via Bac Long Island to the target (Mesa Bridge 2104/10632) at 2500 ft and assumed TARCAP. At mission completion, BLUE flight proceeded north at low level to rendezvous with GREEN 1.

3. AIRCRAFT CONFIGURATIONS

F-8E BLUE 1, 2, 3 and GREEN 1

2 - SIDEWINDER (AIM-9D)
400 rds 20mm

MIG-17D MIG 1, 2, 3, 4, 5

23/37mm cannon
No external stores
Silver Color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 3500 ft overcast, tops at 5000 ft, visibility 10-15 mi

	BLUE			GREEN
	1	2	3	1
Altitude:	2000 ft	2000 ft	3000 ft	3000 ft
Heading:	-----Unknown-----			Unknown
Speed:	Approximately 400 KIAS			Approx. 400 KIAS
Fuel State:	-----BIN00-----			2800 lb
Flight Formation:				

BLUE 1 and 2 in combat spread formation executing a left turn with BLUE 2 crossing over BLUE 1, left to right, slightly high, abeam and approximately 500 ft away. GREEN 1 and BLUE 3 were returning to coast to refuel, and separated from BLUE 1 and 2.

5. INITIAL DETECTION

BLUE 1 and 2 were in left orbit when BLUE 1 saw a section of MIGs coming out of clouds at 1-2 o'clock position, approximately 1/2 mile away. BLUE 1 transmitted "MIGs." Red MIG warning in BO-4 broadcast during period 1531H-1549H. GREEN 1 and BLUE 3 heard this warning while departing SAR area due to fuel state.

6. ACTION INITIATED

Action of BLUE 1 unknown. BLUE 2 pitched up to engage MIG 2. GREEN 1 and BLUE 3 broke hard port at MRT power to return and engage.

7. SITUATION DEVELOPMENT

The action of BLUE 1 is unknown from the initial MIG sighting until he was observed later by BLUE 3 with a MIG in trail, firing. BLUE 3 then observed BLUE 1 eject and the aircraft crash.

After BLUE 2 pitched up and fired 20mm at MIG-2 resulting in a kill, then he broke hard right and down, received SIDEWINDER tone and fired at MIG 2. SIDEWINDER did not guide. BLUE 2 then initiated a series of high g dives and climbs to keep section of MIGs on tail at high angle off until low fuel state required breaking off and departing area.

GREEN 1 returned to engagement area at low level and saw a section of MIGs coming out of the overcast, diving in AB at his 1-2 o'clock. GREEN 1 turned into leader and fired a short burst of 20mm at high angle off. GREEN 1 disengaged, broke down, checked his tail. When he heard BLUE 3 call, "F-8 you have a MIG on your tail," GREEN 1 then exited area at low fuel state.

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SITUATION DEVELOPMENT (Continued)

EVENT 1-36

BLUE 3 returned behind GREEN 1, saw BLUE 1 and transmitted, "F-8 you have a MIG on your tail." After observing BLUE 1 crash, BLUE 3 then detected MIG on his own tail, within range and firing. He broke into the MIG and realized he could not out-maneuver MIG due to previous AA damage. He then selected afterburner to open on MIG and exited the area. The MIG followed BLUE 3 for a time then disengaged, and turned 180°. BLUE 3 detected MIG in turn, reversed and destroyed MIG with SIDEWINDER. BLUE 3 then exited with extremely low fuel. The four F-8s had used afterburner intermittently.

8. ORDNANCE

(No. fired/No. hits)

	SIDEWINDER AIM-9D	20mm	23mm/47mm	Remarks
BLUE 1	Unknown	Unknown		Suspect BLUE 1 did not fire.
BLUE 2	1/0	75 rds		Hits with 20mm. Missile firing range unknown. Did not guide -- possibly due to abrupt pitch-up by MIG at firing.
BLUE 3	1/1	None		Fired at 3/4 mi. Left missile would not fire. Right missile guided well and exploded by tail of MIG.
GREEN 1	None	20-25 rds		Fired high g, high angle off. No hit observed. Guns jammed.
MIG 1			1/1	Killed BLUE 1.
MIG 2, 3, 4			None	
MIG 5			1/0	Fired at BLUE 3, no hits.

9. EQUIPMENT PROBLEMS

BLUE 1 - None known.
 BLUE 2 - None.
 BLUE 3 - Left missile did not leave launcher when fired.
 GREEN 1 - 20mm quit after 25 rds fired.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-8 Hours	Combat Missions
BLUE 3	1000	800	>50
GREEN 1	1700	1325	about 100

Comments on This Encounter and from Overall Experience

BLUE 3 - F-8 tops as fighter -- needs little improvement. F-8 does need more reliable guns. Do not need second man in a fighter. Acceleration and deceleration capability most important in a fighter.

BLUE 2, 3, 4; GREEN 1 - MIGs tended to make all turns to left.

11. DATA SOURCES

Project Interviews: BLUE 3, 3 Nov 66; GREEN 1, 21 Jan 67

Messages, Reports:

Air Combat Report (OPNAV Form 3450) for BLUE and GREEN
 F-8E Combat Performance Report - CVA-19/03, 3310, Serial: 0034, 25 Jun 66 (OEO Memo analysis of MIG encounter by USS HANCOCK aircraft 21 Jun 66)

CTO 77.3 Msg 212246Z Jun 66
 COMUSMACV Msg 251156Z Aug 66
 CG 1st MAW OPREP-4 211202Z Jun 66
 CTO 77.3 OPREP-3 211002Z Jun 66 Chg 1
 CTO 77.3 OPREP-3 210744Z Jun 66
 CTO 77.3 OPREP-3 210812Z Jun 66
 USS HANCOCK Msg 211454Z Jun 66
 CTO 77.3 OPREP-3 212246Z Jun 66 Chg 3
 CTO 77.3 OPREP-3 211044Z Jun 66 Chg 1
 CTO 77.3 OPREP-3 211226Z Jun 66
 CINCPACFLT Msg 302334Z Jun 66
 USAF Fighter Weapons Center Bulletin #7
 Air-to-Air Missile Weapon System Flight Report 11ND-FXSAEG-8811/4 for BLUE 2 and 3

Statements: BLUE 2, 3 and GREEN 1

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12. NARRATIVE DESCRIPTION

EVENT 1-36

GREEN 1 launched as photo escort with an RF-8 from CVA-19 as photo recon for railway northeast of Hanoi. BLUE flight launched as strike flight escort and TARCAP and proceeded to target (See para 1 and 2).

The photo and escort commenced their run as planned. Approximately 3 mi from the start, the photo plane took an AA hit and caught fire. The pilot turned 180° to exit and had to eject. GREEN 1 observed the crash scene and took up SAR orbit while broadcasting on guard for SAR assistance. BLUE flight, while on TARCAP, heard the escort broadcast. BLUE flight proceeded to the scene (as soon as the strike group exited from the target), with DF from GREEN 1 emergency calls. GREEN 1 joined with BLUE flight as a section leader with BLUE 3 on his wing and both sections took up SAR orbit (1900-2000 ft) looking for the downed pilot.

During the orbit BLUE 3 took an AA hit in his right elevator from intense AA fire located by the railroad just west of the downed pilot. BLUE 3 decided to remain on station. GREEN 1 and BLUE 3 sighted the downed pilot just east of the ridge line which was acknowledged by an orange flare and BLUE 1 and 2 climbed to contact SAR forces. At 6000-7000 ft, BLUE 1 heard SAM warning in his area and descended to below overcast and resumed orbit. BLUE 1 checked flight fuel state and sent GREEN 1 and BLUE 3 home since they were approaching low fuel state. Prior to leaving all BLUE and GREEN crews saw an orange flare.

Shortly thereafter, BLUE 1 called "MIGs," (T₀). As BLUE 2 crossed from BLUE 1's left to right he looked up and saw a section of MIG-17s (MIG 1 and 2) coming out of the clouds 500 ft above, at 1-2 o'clock and 1/4 to 1/2 mi away. BLUE 2 pitched up and fired 75 rds 20mm, close range at MIG 2. As MIG 2 passed, BLUE 2 observed fuel streaming from MIG 2's wing, believed caused by 20mm, and this was credited as a kill. The MIG section split with MIG 2 diving for the deck. BLUE 2 broke left and down, got a harsh SIDEWINDER tone on MIG 2 and fired -- range unknown. MIG 2 pitched up as BLUE 2 fired tail-on and the SIDEWINDER did not guide, due either to excess range or target maneuver.

The action of BLUE 1 and MIG 1 was not observed from the time BLUE 2 pitched up to fire on MIG 2 (T₁) until BLUE 1 was observed by BLUE 3 on fire from a MIG firing in trail (T₄). Suspect MIG 1 followed BLUE 1 undetected by BLUE 1.

At BLUE 1's tally ho, GREEN 1 and BLUE 3 were 2-3 mi to the east 3000 ft exiting area. GREEN 1 and BLUE 3 immediately reversed hard left to return and engage. BLUE 3 could not turn with GREEN 1 due to aircraft damage and followed 1-1/2 mi in trail to GREEN 1. Shortly after GREEN 1 rolled out of his turn, he observed two MIGs (MIG 3, 4) (T₂) diving out of the clouds at 2 o'clock, 200 ft, in a right turn in AB. GREEN 1 pulled hard causing MIG 3 to pass out in front, at high angle off and attempted a 20mm firing pass. The guns jammed after 25 rds.

BLUE 3 returned 1-1/2 mi behind GREEN 1 at 500 ft (T₃) and saw a MIG behind an F-8 on the deck. BLUE 3 transmitted, "F-8 you have a MIG on your tail." He then saw the MIG guns firing, and the F-8 tail burst into flames, after which he observed the F-8 pilot eject. BLUE 3 then checked his own tail and saw a MIG (MIG 5) in range and firing. BLUE 3 broke into the MIG but could not counter due to damage sustained previously by AA. BLUE 3 then disengaged.

As GREEN 1 finished his firing pass on MIG 3, he heard BLUE 3's transmission and disengaged from MIG 3 and 4, selected AB and dived to check his tail. During GREEN 1's maneuvering to clear his tail, he observed a fireball later confirmed to be BLUE 1. GREEN 1 then exited to the east due to low fuel state.

As BLUE 3 departed to the east with MIG in trail opening, he observed a MIG (MIG 5) to break off attack (T₅) and commence an easy left turn. As soon as BLUE 3 ascertained that MIG 5 had disengaged, B3 reversed course to again engage the MIG for a SIDEWINDER shot. As BLUE 3 closed within range on MIG 5 (T₆) in 3/4-mi trail, 3000-ft altitude, slightly high, he attempted to fire his left missile but it did not leave the launcher. BLUE 3 switched to the right missile and fired, the missile detonated at the MIG's tail pipe. BLUE 3 immediately reversed to exit east due to critically low fuel but did observe MIG 5 to roll into steep nose down, right wing down turn and smoking badly. MIG 5 considered destroyed.

From all information available, it is assumed that BLUE 1 fired neither SIDEWINDERS nor cannon. The leader of the first MIG section came from a favorable position directly into firing range on BLUE 1's tail and after a short chase destroyed BLUE 1 with gunfire.

MIGs used afterburner intermittently. All F-8 aircraft tanked on the way back to the carrier.

No radar was used prior to ordering the encounter because of poor low-altitude capability.

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EVENT I-36 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, GREEN 1)		Maneuvers, Ordnance, etc.	Communications	Enemy Actions (MIG 1,2,3,4 possibly 5)	Remarks
	Status	Action				
T ₀	B1&2 in SAR orbit heading south around previously downed photo pilot. 2000 ft. G1 & B3 en route home base in section. 3000 ft. G1 in MIL power	B1 calls, "MIGs." B2 looks up and sees two MIGs (M1&2) slightly high passing right to left. G1 and B3, hearing B1's call, turn hard left to return to area of B1&2.	B1&2 were in loose deuce form. B1,2, 3 & G1 loaded with 2 SIDEWINDERS and 400 rds 20mm. G1 leader of section. B3 finds he cannot turn with G1 due to previous damage to his elevator.	B1 calls, "MIGs."	MIG section (M1&2) sighted coming out of cloud layer at 3500 ft, approximately 400 KIAS	G1 launched as photo escort and joined BLUE flight upon their arrival in area of downed photo pilot. Limited to MIL power due to fuel.
T ₁	B2 splits from B1. B2 at 2000 ft	Upon seeing M1&2, B2 pitches up to engage. B2 fires at M2 range 800-1000 ft, nearly head on, engages AB and breaks down hard left to follow M2.	B2 expended 75 rds of 20mm.		M1&2 passed very close to B1&2. The section then split with M2 diving for the deck at firing. M2 at 2000 ft. M1 not observed from this point but believed to have engaged B1.	B2 observed what he believed to be fuel streaming from M2's wing as he passed. B1's and M1's actions not observed following the split. This MIG (M2) was killed.
T ₂	G1 & B3 returning to area of B1&2. Altitude 2000 ft several g's	G1 sights section of MIGs (M3&4) in diving right turn. G1 pitched up, causing M3 to pass in from high angle off and fired one burst	20-25 rds 20mm expended--guns failed		M3&4 were descending out of overcast in AB. It appeared M3&4 split as G1 engaged. MIG pulling out of diving right turn at firing.	G1 aircraft overstressed in this turn.
T ₃	B2 in trail on M2 Altitude 2000 ft Mach .75	Following break turn heading north, B2 picks up M2, at 1/2-mi range low. B2 acquires harsh SIDEWINDER tone and fires. Range one mile tail on aspect, in push over.	1 SIDEWINDER expended and did not guide.		M2 had descended to the deck during his turn north and pitched up abruptly as B2 fired his SIDEWINDER. Altitude 200 ft. speed Mach 0.75	Missile fired with intermittent tone.

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EVENT I-36 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, GREEN 1)		Maneuvers, Ordnance, etc.	Communications	Enemy Actions (MIG 1, 2, 3, 4 possibly 5)	Remarks
	Status	Action				
T ₄	B3 in approximately 1-1/2-mi trail to G1	B3 sees F-8 with MIG on its tail and firing and transmits same. Determined later to be B1. B3 then checked his tail and saw MIG closing and firing. B3 broke into him. MIG at 7 o'clock, 500 ft		B3 transmits, "F-8 you have a MIG on your tail." A1: F-6s responded to this call except B1.	MIG believed to be M1 shot and downed B1 with guns. Unknown MIG engaged B3 in level flight and effectively countered B3's actions.	B3 was unable to remain with G1 during the 180° turn due to AB damage inflicted during downed photo pilot SAR orbit. Although four MIGs were listed as the number encountered, it is believed the MIG that engaged B3 most probably was M5.
T ₅	B2 recovering from nose down SIDEWINDER firing on M2	B2 hears B3's above transmission and looks back to check tail; and sees two MIGs approaching at 7 o'clock. B2 counters with series of hard turns.	B2's hard turns were sufficient to keep the MIGs at a high angle off and out of a firing position.		MIG section believed to be M384. M384 countered B2 but did not reach a firing position.	M384's flight path from T2 until T5 unknown.
T ₆	G1 finishing high deflection gun shot at M3	G1 hears B3's transmission and disengages from M384, dives for the deck in AB and checks tail for MIGs, comes out of AB, sees fireball of B1 1/2 mi behind shortly thereafter.	G1 fires at almost 90° bank.		Believe M384 rejoined and continued their diving right turn and engaged B2 (see T ₅).	G1 did not observe actions of M384 after his one firing pass.
T ₇	B3 exiting to the east with MIG in trail	B3 determined he cannot counter M5 possibly due to aircraft damage and dives for the deck to open on M5 and to exit the area. B3 also reaching low fuel state.	B3 accelerated to approximately 600 KIAS which was maximum for maintaining aircraft control due to previous damage.		M5 did fire at B3 during their brief encounter but no hits. M5 appeared not to be able to accelerate with B3.	During descent B3 sees crash of F-8 (G1) and pilot's chute.

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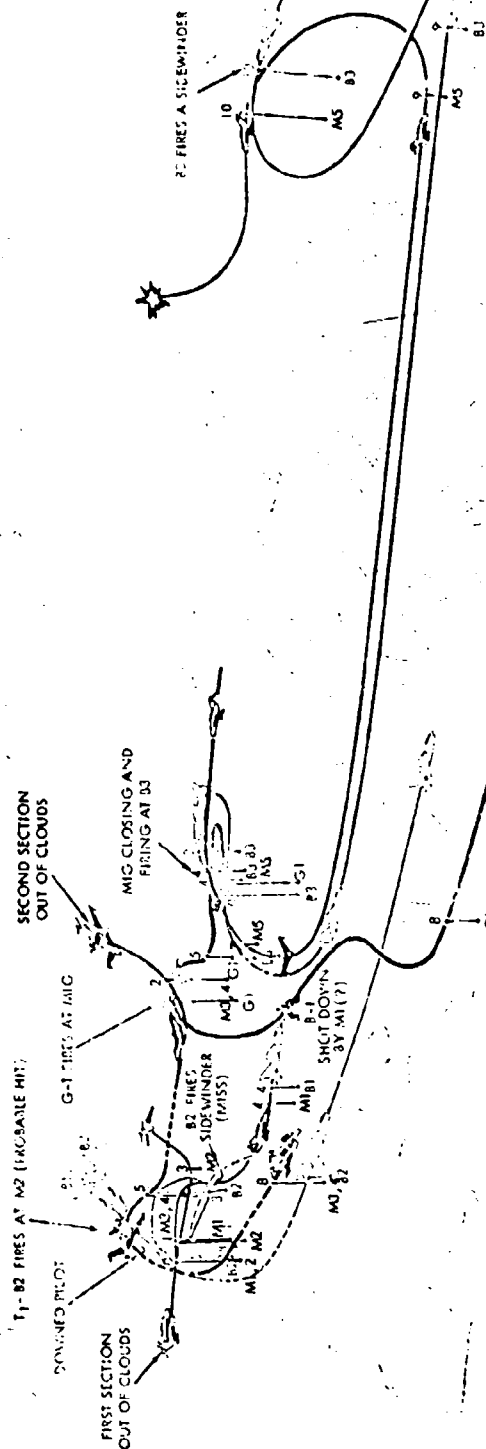
EVENT I-36 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, GREEN 1)		Maneuvers, Ordnance, etc.	Communications	Enemy Actions (MIG 1, 2, 3, 4 possible 5)	Remarks
	Status	Action				
T ₈	G1 determined tail clear of MIGs. B2 maneuvering to counter M3&4.	G1 observes MIG heading up through the clouds. Exits to the east due to low fuel state. B2 breaks off his engagement and exits to the east.		G1 calls leaving the area B2 calls leaving the area	Believe MIG was one of MIG flight engaged earlier Enemy action unknown after B2 disengages	B2 disengaged because of superior airspeed capability B2 observed F-8 tail on fire and pilot in chute during engagement. F-8 determined later to be B1.
T ₉	B3 exiting at maximum speed with M5 on tail. Altitude 3500 ft Mach .80	B3 observes M5 to break off his tail chase and commence a left turn. B3 waits to ensure M5 is reversing and then also reverses to reengage M5.			M5, upon seeing that B3 is opening breaks off pursuit and turns easy left	B3 was able to disengage because of superior airspeed capability
T ₁₀	B3 closes to within SIDEWINDER range to M5 500 KIAS. Mach .85 Altitude 3000 ft 1/2	At 3/4 mi behind, slightly high, B3 fired SIDEWINDER in tail on aspect. Missile exploded at M5's tail pipe. B3 immediately turned left to exit area due to extremely low fuel state. B3 did observe M5 trailing smoke in a right turn and steep dive.	B3 attempted to fire left missile first with weak tone but it would not leave launcher.		M5 was apparently unaware that B3 had reversed and was setting up for SIDEWINDER shot. Altitude 2500 ft Mach .6	Left lower fuselage missile gave tone on deck and in air but it would not leave aircraft on attempted firing good tone on second missile. explosion at 7 o'clock left of tail. Heavy black smoke came from the MIG. MIG goes into 30° nose down 45° right wing down spiral. No pieces observed coming from MIG.

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EVENT I-36



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EVENT 1-37

Aircraft Involved: Four F-4Bs vs six MIG-17s

Result: One MIG-17 destroyed

Vicinity of Encounter: 20°41'N/105°55'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 13 Jul 1966/1102H

Four F-4Bs (BLUE flight) were assigned TARCAP in support of an Alpha strike on the Co Trai Bridge (JCS Target No. 18.22). BLUE flight was briefed to overfly the target area after departure of the strike force to perform preliminary BDA. The strike force consisted of six A-6As, four A-4Cs, and two A-4Es (IRON HAND) aircraft.

2. MISSION ROUTE

Departed Yankee Station on a heading of 310°, making landfall due South of Nam Dinh (at the "Hour Glass" River). The flight popped up to 3500 ft when reaching land and proceeded to the target area (20°41'N/105°55'E) on a heading of 340°. One element of BLUE flight was deployed in trail on each side of the strike force corridor. As the strike group headed back, BLUE flight stayed in the target area to obtain preliminary BDA. The two IRON HAND A-4Es (GREEN 1, 2) were still N of area. BLUE flight started to depart the target area on a heading of 110°.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2, 3, 4

3 - SPARROW (AIM-7E)
1 - SIDEWINDER (AIM-9B) (BLUE 1, 3, 4)
1 - SIDEWINDER (AIM-9D) (BLUE 1, 3, 4)
2 - SIDEWINDER (AIM-9D) (BLUE 2)
1 600-gal centerline tank
APQ-72, APA-157 (inoperative on BLUE 4)
CNR-312 (Little Ears)
TACAN
No camouflage (white and grey)

A-4E GREEN 1, 2 (on IRON HAND Mission)

Dark camouflage

MIG-17C MIG 1, 2, 3, 4, 5, 6

AA rockets
20mm cannon
Color: a dark purple or grey

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered small cumulus clouds with tops to 5000 ft. Visibility 5 to 10 miles.
Haze below 3000 ft.

	BLUE				GREEN	
	1	2	3	4	1	2
<u>Altitude:</u>	----- 3500-4500 ft -----				-- 3000 ft --	
<u>Heading:</u>	110 030				SSE	
<u>Speed:</u>	450 kt 400 kt				Unknown	
<u>Fuel State:</u>	Probably full internal				Unknown	
<u>Flight Formation:</u>						

Elements (i.e., BLUE 1, 2 and BLUE 3, 4) were flying as two sections each in a tactical "loose deuce." Second section perhaps 5 mi off 4 o'clock position of first section in a "loose deuce" of sections.

5. INITIAL DETECTION

This event consisted of several independent encounters and is described in three separate parts. There was no MIG warning from support forces until after start of engagement.

Part A

BLUE 1(L) made visual contacts with two smoke trails in 8 o'clock position. BLUE 2 turned left for ID pass and identified them as A-4s. BLUE 1 stayed in 2-mi trail. BLUE 2 then reversed to rejoin BLUE 1, both dropping behind the A-4s. The A-4s (GREEN 1, 2) then reported they had MIGs at their 6 o'clock position. Two MIGs (MIG 1, 2) were then acquired visually coming in a high gunnery pass from the NW, 1-1/2 mi astern, MIG 1 firing cannon at BLUE 1. A total of four MIGs engaged BLUE 1 and 2.

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Parts B and C

BLUE 3 and 4 heard MIG call from BLUE 1(L) and headed toward the NE, searching for MIGs. Visual detection was hampered by cumulus clouds in the 3000-5000-ft altitude regime. BLUE 3 sighted two MIGs (MIGs 5, 6) at his 10 o'clock position, chasing an A-4 (GREEN 1).

6. ACTION INITIATED

Part A

BLUE 1 and 2 broke hard left into MIGs 1 and 2. They did not drop centerline tanks and did not light afterburners.

Parts B and C

BLUE 3 directed BLUE 4 to go in trail and BLUE 3 headed directly for MIGs 5, 6. MIG 5 ducked into a cloud and BLUE 3 fired a SPARROW into the cloud hoping it would cause the MIG to break off the attack on GREEN 1. MIG 6 broke left and was engaged by BLUE 4.

7. SITUATION DEVELOPMENT

Part A

As BLUE 1, 2 descended to the deck to pick up airspeed the second element of MIGs (MIGs 3, 4) attacked in a high gunnery pass (at 7 o'clock position) as soon as the first section overshot. BLUE 2, 3/4 mi behind BLUE 1, saw two aircraft in the vicinity of BLUE 1 but could not identify them as MIGs. He could not get an ID message from BLUE 1 because of a crowded radio channel. BLUE 1 got separation at low level and lost sight of the MIGs. BLUE 1 then picked up another target, turned towards it but could not get ID. Approaching on a head-on course, BLUE 1 identified the bogey as a MIG (MIG 6) and fired a SPARROW in boresight mode. BLUE 1 was within minimum range and only fired the missile to scare off the MIG. After a close pass, BLUE 1 climbed back up, looked around, saw no more MIGs and departed the area with BLUE 2. Both BLUE 1 and BLUE 2 were at BINGO fuel.

When reaching the coastline BLUE 1 made one more turn and sighted a MIG about 7 mi in trail. The MIG was momentarily acquired on radar but the MIG turned back and the radar broke lock. BLUE 1, 2 could not pursue because of lack of fuel.

Parts B and C

After BLUE 3 fired the SPARROW into the cloud, MIG 5 turned back almost head-on to BLUE 3. BLUE 3 went to full AS and executed a rapid vertical reversal ending up behind MIG 5. BLUE 3 fired a SIDEWINDER at MIG 5 which was still descending. MIG 5 turned hard right; however, the SIDEWINDER guided and detonated near the MIG's tailpipe. MIG 5 rolled into a 120° bank and impacted with the ground. BLUE 4 engaged MIG 6 and met him head-on. BLUE 4 could not fire any SPARROW missiles since the radar was inoperative. BLUE 4 reversed and continued the head-on maneuvers hoping to get separation for a SIDEWINDER attack. MIG 6 was firing both guns and cannon. MIGs 3, 4 were behind and below BLUE 4 firing AA rockets. BLUE 4 sighted a single MIG (MIG 6) tailing BLUE 1 and 2. BLUE 4, in AB, attempted to close on MIG 6 engaging BLUE 1. MIGs 3 and 4, firing AA rockets, were again behind BLUE 4 which he shook off using vertical maneuvering. BLUE 4 broke off because of low fuel state and all aircraft headed back for the coast.

8. ORDNANCE

(No. fired/No. hits)

	SPARROW AIM-7E	SIDEWINDER AIM-9D	Soviet AA Rockets	Remarks
BLUE 1	1/0	0/0		Fired within minimum range, missile did not have time to fuze.
BLUE 2	0/0	0/0		
BLUE 3	1/0	1/1		Radar broke lock. Target within minimum range. MIG destroyed
BLUE 4	0/0	0/0		Radar inoperative after takeoff.
MIG 3, 4			4/0	Went behind BLUE 4.

The other MIGs also fired guns and cannon. Apparently did not have AA missiles.

9. EQUIPMENT PROBLEMS

BLUE 2 - Back

Helmet crept down during high-g maneuvers pulling mask off -- had to keep replacing mask. Opening the visor helped.

BLUE 3

One SIDEWINDER was inoperative -- cause not given.

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EVENT I-37

BLUE 4

Both radars (APC-72 and APA-151) went out on take-off. Thus, BLUE 4 had no SPARROW capability. The radars had been checked prior to take-off and were operating. Later examination showed that the unit had a bad power supply with a blown fuse in the radome, apparently caused by moisture in the system.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
<u>BLUE 1 (L)</u> Front	5000	600	15	Fired seven SPARROWS and five SIDE-WINDERS in training. Leader was squadron CO. First MIG encounter.
<u>BLUE 1</u> Back		130	22	First MIG encounter.
<u>BLUE 2</u> Front	1000	650	20	
Back	500	300		Only had high-altitude ACM training, quite different from low-altitude regime.
<u>BLUE 3</u> Front	data not available			Flown many ACM sorties. Tactics instructor. Aeronautical engineer.
<u>BLUE 3</u> Back		600	25	One MIG encounter.
<u>BLUE 4</u> Front	850	550	25	First MIG encounter. Not much air-air combat training, one direct and seven or eight training missions.

BLUE 4
Back

data not available

Comments on this Encounter

Communications:

Saturation of communication channel was a problem. The radios were cluttered with messages during the entire flight making flight coordination extremely difficult.

Normal radio procedures were ignored during the heat of the engagement; callers were not identifying themselves or specifying whom they were warning. This confusion caused some aircraft to break away to lose a MIG which was not there at all.

Amount of traffic on UHF net also made use of intercom (ICS) very difficult.

BLUE 1 - Back

A close-in head-on weapon would have been useful in this encounter.

BLUE 2 - Front

Visual identification of MIGs presented a problem in this encounter since both MIGs and A-4s were dark and dull in color. When the MIGs are not shiny (as is usually the case) it is easy to mistake MIG 17 for A-4s, particularly at certain aspect angles when the tail surfaces fill in the swept-wing area, making it appear like a delta wing. BLUE 2 felt he could have gotten one or both of the MIGs near BLUE 1, had he known they were MIGs. Again the communication difficulty described above prevented him from obtaining identification information from BLUE 1.

Ordnance carried was three SPARROW missiles rather than four because of weight limitations due to carrier operations.

At the time period of this engagement, Navy F-4s generally did not drop their centerline tanks because they were difficult to replace and pilots felt that the empty weight of 250 lb really did not handicap them too much.

In the initial acquisition, BLUE 2 felt that they should have looked beyond the A-4s which were initially identified with radar, and had they done so they probably would have seen the four MIGs trailing the flight of A-4s.

BLUE 2 - Back

He felt that he did not have sufficient practice with "dog fighting" at low altitudes, which makes operation of the weapons system much more difficult, because of the proximity of terrain which greatly increases the amount of radar clutter.

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They had problems with the radar locking on to cloud targets, and it was difficult to distinguish these from aircraft targets inside clouds.

BLUE 3 - Front

It was very difficult to maintain visual contact during the engagement. It was also difficult for the Back to acquire radar lock during the brief engagement and the pilot felt that although he had flown exactly as he had during training (perhaps, not as well due to the combat situation) that extensive and realistic air combat maneuvering training prior to combat, particularly at low altitudes, would have helped their performance.

BLUE 3 - Back

Visual ID requirements made the engagement much more difficult. Would like to be able to fire at once, without visual ID, and probably would have had better results. Because of the ID requirements, the SPARROW is not too useful because generally one must get too close to the target to make the ID.

Having some additional indicators in the back seat would eliminate some of the need for talk between front and back seats. The Back felt that the following would be useful: the 1FF box control -- the pilot is often too busy to set it and at times gets vertigo when he must set it; the g-meter gauge -- this is particularly helpful at night; rate of climb indicator; communication channel indicator; scale indication on the radar scope (either 25- or 50-mi range); left and right RPM gauges; fuel gauges.

BLUE 4 - Front

Probably should have aborted flight when radars were found to be inoperative.

The F-4 is at a distinct advantage when fighting vertically to get separation. F-4s can always separate successfully by climbing in afterburner.

11. DATA SOURCES

Project Interviews: BLUE 1 (Lead) Front, 16 Mar 67; Back, 18 Jan 67
BLUE 2 Front, 18 Jan 67, Back, 18 Jan 67
BLUE 3 Back, 18 Jan 67, Front, 17 Mar 67 (letter)
BLUE 4 Front, 17 Jan 67; Back, 10 Mar 67 (letter)

Messages, Reports:

CTF 77 130309Z Jul 66
CTG 77.8 130454Z Jul 66
CTG 77.8 131002Z Jul 66
7AF DAI 132254Z; DIO 29999 Jul 66
USAF Fighter Weapons Center, Bulletin No. 7
Air Combat Report, 13 July 1967, No. 1 USS CONSTELLATION (CVA-64)

12. NARRATIVE DESCRIPTION

This event consisted of several independent encounters and is described in three separate sections (Parts A, B, and C).

BLUE flight, consisting of four F-4B aircraft was assigned TARCAP in support of an Alpha strike on the Co Trai Bridge. The flight was briefed to overfly the target area after departure of the strike forces to perform preliminary BDA and to watch for possible MIGs.

The flight did not receive any MIG warnings prior to the start of the engagement. After the strike force had departed the target area, BLUE flight made another orbit. Two A-4E IRON HAND aircraft (GREEN 1, 2) were still north of the area. BLUE flight had just decided to depart and were flying in a loose deuce of sections, with the second section (BLUE 3, 4) about 5 mi behind and to the right of BLUE 1(L) and 2.

Part A

T_{0A} The first section (BLUE 1, 2) was proceeding on a heading of about 110° at an altitude of 3500 ft and speed of approximately 450 kt and jinking. BLUE 1 sighted two contacts at his 8 o'clock position at 9000 ft and started to turn back and sent BLUE 2 to make a positive ID. By this time the contacts were close enough
T_{1A} for BLUE 2 to identify them as A-4Es. BLUE 1 returned to his original heading and almost immediately saw two aircraft at about the same position. They were MIG-17s
T_{2A} in a curve of pursuit and starting to fire at BLUE 1. At this point BLUE 1 called a hard left break (at full military power). The two MIGs, (MIG 1, 2) were following BLUE 1, 2 and firing as the range closed. BLUE 1, 2 continued their turn,
T_{3A} went to AB and MIG 1, 2 overshot BLUE 1 firing as he passed. At this point, BLUE
T_{4A} 1 was pointed N, still turning, when another section of two MIGs (MIG 3, 4) started a pass on BLUE 1, also from his 7 o'clock position and high. BLUE 1 (and 2) continued the turn in AB and MIG 3, 4 overshot. By this time MIG 1, 2 returned for a
T_{5A}, second attack. BLUE 1 lowered his nose and relaxed the g's on the aircraft to pick
T_{6A}

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T7A, T8A up speed. BLUE 1 descended to near tree-top level and lost sight of all other aircraft. As BLUE 1 started to pull up, still turning, he sighted two MIGs (probably MIG 3, 4) at a range of 4 mi making a head-on firing run. BLUE 1 was unable to fire as he could not get his pipper lined up. BLUE 1 made a hard left level turn (altitude about 1000 ft) heading approximately east as the MIGs crossed approximately 200 ft above his aircraft. As BLUE 1 went out of AB and climbed slightly he received call to reverse for a single contact at 2 o'clock level. BLUE 1 was below the cloud deck and started a reverse to the right as he saw a bogey approximately 4 to 5 mi away. BLUE 1 put the pipper on the target but did not fire because no ID had been made. As the aircraft closed approximately head-on, BLUE 1 identified the target as a single MIG-17 (probably MIG 6) and fired a SPARROW missile in boresight mode at a range of 4000 to 5000 ft. At the same time the MIG opened fire as evidenced by the muzzle flashes. The SPARROW passed close to MIG 6 but did not detonate. MIG 6 passed BLUE 1 head-on. BLUE 1 started a hard climbing left turn, climbed to 7000 ft and checked his fuel state at 4500 lb. BLUE 2 was still flying wing to BLUE 1. Seeing no further contacts BLUE 1 and 2 proceeded to the coast, jinking. Just off the coast another contact was seen over land. BLUE 1 turned back, however, the contact also turned back and was lost in the clouds (range about 7 mi). BLUE 1 could not pursue the target because of low fuel. BLUE 1 and 2 then proceeded back to the ship.

T9A
T10A
T11A
T12A
T13A, T14A
T15A, T16A
T17A

Part B

T0B, T0C When the second section (BLUE 3, 4) heard the MIG call of BLUE 1 and 2 it headed N toward the other section looking for MIGs. Throughout this encounter the various aircraft of the strike were on the air with MIG calls resulting in a lot of confusion on the communications channel. BLUE 3 sighted two dots in the sky, identified them as MIGs and directed BLUE 4 to go in trail. BLUE 3 acquired the targets on radar at a range of 5 mi, armed the missiles and started an easy right turn. The MIGs were in a hard left turn about 2500 ft behind the two A-4E IRON HAND aircraft (GREEN 1, 2). BLUE 3 locked the radar on the lead MIG and was in range. GREEN 1, 2 were in a hard left turn. Just as BLUE 3 fired a SPARROW, the lead MIG ducked into a cloud and the radar broke lock (range 1-1/2 mi). The second MIG broke off and BLUE 4 followed him. (This part of engagement is covered in Part C). The first MIG (MIG 5) reversed rapidly and came back from 10 o'clock -- 1 to 2 mi away. BLUE 3 went to full AB and climbed to 9000 ft. The MIG turned 90° and crossed approximately 2000 ft ahead of BLUE 3. At the top of the climb BLUE 3 came out of AB and slipped the aircraft through the turn, then went back in AB and headed SSW with a 70° dive angle. MIG 5 was ahead of him in a hard left turn, going East. BLUE 3 leveled off at about 4000 to 5000 ft in a left turn and went into the HEAT mode. The Back picked up a noise target on radar and held lock by override. MIG 5 continued his hard left turn with BLUE 3 2 mi behind and starting to close range pulling more g's than the MIG. With MIG 5 10° left of BLUE 3 and a good SIDEWINDER tone BLUE 3 fired a SIDEWINDER. MIG 5 was below 1000 ft at this time and had started a hard right turn as the missile impacted the tailpipe. MIG 5 then went into a 120° bank and crashed. BLUE 3 followed the MIG around to assess damage and saw an orange fireball. After this BLUE 3 made one more fast orbit, observed no other aircraft and proceeded to the coast at a speed of 450-500 kt, altitude 3000 ft.

T1B, T1C
T2B
T3B
T4B
T5B
T6B
T7B
T8B
T9B
T10B
T11B

Part C

T2C BLUE 3, 4 had sighted two MIGs chasing the A-4Es (GREEN 1 and 2). BLUE 4 had sighted the second MIG (MIG 6) first and crossed over MIG 5 as they turned left. BLUE 4 saw BLUE 3 chase MIG 5 and he went after MIG 6. BLUE 4 pulled up his nose and climbed, turning left. MIG 6 reversed course and BLUE 4 met him head-on. BLUE 4 could have gotten a SPARROW shot had his radars been working. BLUE 4 pulled up to repeat this maneuver, hoping to get sufficient separation for a SIDEWINDER attack. (At this time he heard BLUE 3 call that he had shot down a MIG.) He again made a head-on pass with the MIG and could see the MIG firing his guns. MIG 6 started to turn left and BLUE 4 broke right to turn into the MIG. At this point two other MIGs (probably MIGs 3 and 4) fired rockets at BLUE 4 who rolled to the left and reversed into the attacking MIGs. BLUE 4, sighting a MIG tailing BLUE 1 and 2, headed toward the MIG (probably MIG 6), and tried to get into position to fire a SIDEWINDER. Two MIGs again attacked BLUE 4 with rockets and BLUE 4 broke left and up to separate from the attacking MIGs. BLUE 4 pulled up to make a high reversal and saw the MIGs 2500 ft below him, heading N, while he was heading S. He leveled off at 5000 to 6000 ft and headed for the coast, having approximately 4600 lb of fuel left. BLUE 4 had to use the tanker to get back to the ship.

T3C
T4C
T5C
T6C
T7C, T8C
T9C
T10C, T11C
T12C
T13C
T14C

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EVENT I-37 SUMMARY (PART A)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T ₀	Alt: 3500 ft Heading: 110° Speed: 450 kt	B2 turned left to make ID pass. B1 stayed in 1 to 2 mi trail				B1 (Buck) spotted 2 smoke trails bogeys at 8 o'clock
T _{1A}	Alt: 3500 ft Heading: 045° Speed: 450 kt	Returned to original heading	Two A-4Es (61, 2) heading in southerly direction Alt: 8000-9000 ft	Called "They're friendlies."		Identified bogeys as A-4Es. Fuel approx 8000 lb
T _{2A}	Alt: 3500 ft Heading: 110° Speed: 450 kt Full military power	Hard break to left	B2 stayed with B1 61, 2 out of sight	B1 called "left break"	2 MIGs at 7000 ft 7:30 position 1 mi made gunnery run on B1	
T _{3A}	Alt: 3500 ft Heading: 045° Speed: 400 kt	Continued turn		Called "MIGs"	M1, 2 were firing and closing on B1(L)	
T _{4A}	Alt: 3500 ft Heading: 000° Speed: 350 kt	Continued turn. Went to AB			M1, 2 overshoot on B1 Second section (M3, 4) high, came in from 7 o'clock	
T _{5A}	Alt: 3500 ft Heading: 315° Speed: 350 kt	Continued turn in AB			M3, 4 started to fire in gunnery run	
T _{6A}	Alt: 3500 ft Heading: 270° Speed: 300 kt in AB	Continued turn. Put nose down			M3, 4 continued to fire M3, 4 overshoot M1, 2 returned for second attack	B1(L) lost sight of M3, 4
T _{7A}	Alt: 2000 ft Heading: 135° Speed: 300 kt Kept nose down and g's on aircraft	Relaxed g's to pick up more speed Nose down			MIGs not in range	

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EVENT 1-37 SUMMARY (PART A) (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T 8A	Alt: 100 ft Heading: 110° Speed: 575 kt					B1 completely lost sight of every-body
T 9A	Alt: 1000 ft Heading: 270° Speed: 450 kt				Section of MIGs (probably 3, 4) at range of 4 mi, alt 1000 ft, were heading towards B1, 2. Made head-on firing run	
T 10A	Alt: 1000 ft Heading: 270° Speed: 450 kt	Made hard left turn (level)			MIGs passed B1 head-on, firing. MIGs turned right	B1 could see muzzle flashes
T 11A	Alt: 1000 ft Heading: 090° Speed: 450 kt in AB	Went out of AB			MIGs headed SW. Crossed over top of B1 (200 ft) from 11 o'clock to 5 o'clock	B1 was unable to fire. could not get pipper lined up
T 12A	B1 Alt: 1500 ft Heading: 090° Speed: 450 kt Below cloud deck	Made hard right turn		Back or B2 called to "reverse"; visual contact at 2 o'clock level		
T 13A	Alt: 1500 ft Heading: 180° Speed: 450 kt Slight right turn	Kept pipper on bogey. Did not fire because ID had not been made				Saw a black speck at 2 o'clock, range 4-5 mi, alt approx 2000 ft. Bogey heading: 135° in left turn. No ID made yet

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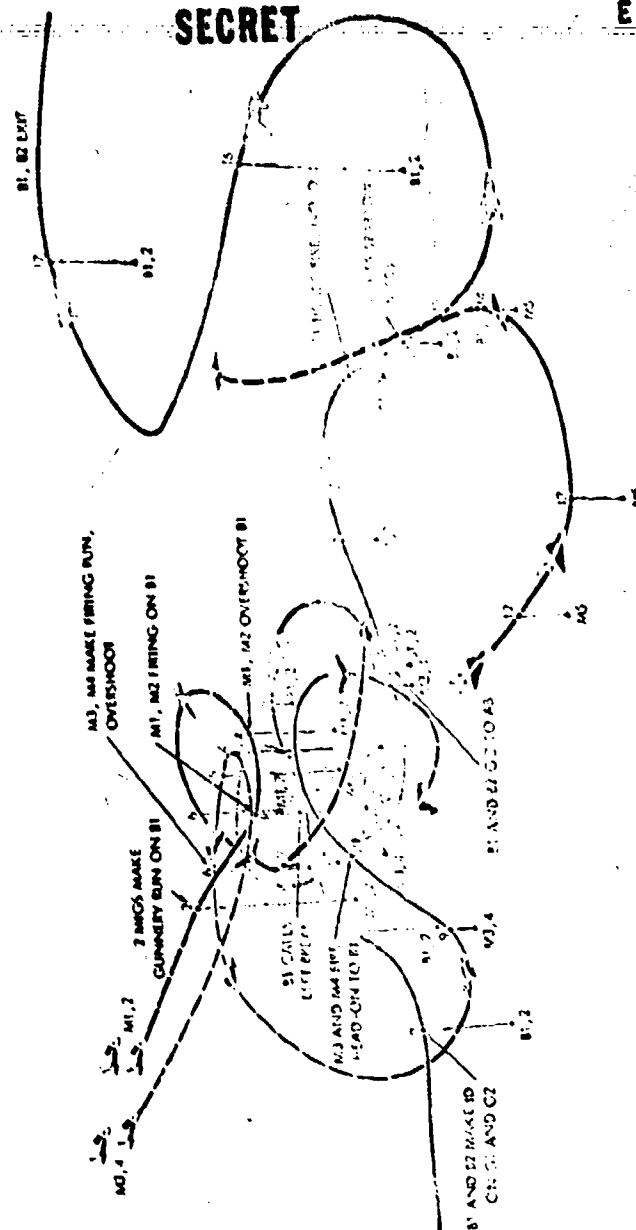
EVENT 1-37 SUMMARY (PART A) (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T14A	Alt: 1500 ft Heading: 180° Speed: 450 kt	Fired SPARROW Range 4000 to 5000 ft in boresight mode			ID showed bogey to be single MIG (probably M6) MIG starts to fire as missile goes by	Missile passed close but did not detonate
T15A	Alt: 1500 ft Heading: 180° Speed: 450 kt	B1 started hard climbing left turn			M6 passed B1 head-on	
T16A	Alt: 7000 ft Heading: 315° Speed: 450 kt	Checked fuel - had about 4500 lb Made gradual right turn to heading of 110 and alt of 4000 ft	B2 still flying wing on B1			B1, 2 at edge of cloud cover No further contacts
T17A	Alt: 4000 ft Heading: 110° Speed: 450 kt	Proceeded to coast, jinking				

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EVENT I-37 SUMMARY (PART B)

Time Mark	Action Aircraft (BLUE 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T 08	Alt: 3000 ft Heading: 100° Speed: 400 kt Jinking	Started to look for MIGs		B1, 2 and G1, 2 reported MIGs in area.		B3, 4 were flying back to coast
T 18	Alt: 3000 ft Heading: 090° Speed: 400 kt Jinking	Started to head N toward B1, 2 (Changed radar scale to see what could be picked up)		B1 identified two contacts as MIGs		All sixteen aircraft were on air with numerous MIG calls resulting in a lot of communication confusion
T 28	Alt: 3000 ft Heading: 070° Speed: 450 kt	Acquired targets on radar at range of 5 mi Locked on lead aircraft Missiles armed Started easy right turn	B3 directed B4 to go in trail Did not see G1, 2 on radar	B1, 2 called two MIGs on tail	MIGs were heading in easterly direction	B3 sighted two dots in sky identified as MIGs
T 38	Alt: 3000 ft Heading: 070° Speed: 450 kt	MIG locked up on radar and in range	G1, 2 in hard left turn	B3 reported two MIGs at 12 o'clock	MIGs were in hard left turn, following G1, 2 at about 2500 ft MIG rolled into 90° left bank, range about 1-1/2 mi	
T 48	B3 was 1-1/2 mi behind MIGs	Fired SPARROW In range light was still on (or ready to go to break x)	G1, 2 still in hard left turn	B3 announced he's firing SPARROW (on ICS)	MIG in hard left turn, ducked into cloud	Radar lost lock (possibly on clouds) just as B3 fired SPARROW Missile went into cloud and missed aircraft
T 58	Alt: 3500 ft Heading: NE Speed: 400 kt	Went to full AB and started climb			MIG returned (1 to 2 mi away) at 10 o'clock position crossing toward 5 o'clock	

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EVENT 1-37 SUMMARY (PART B) (Continued)

Time Mark	Action Aircraft (BLUE 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T'68	In AB Slight climb	Headed straight up to 9000 ft			MIG at 9 o'clock in 90° turn came across about 2000 ft away	
T'78	At top of climb Alt: 9000 ft Heading: -- Speed: 200 kt	Came out of AB, full left stick in corner-half flaps and rudder to slip aircraft around Dove down -- relit AB				Came out of reversal on SSU heading with a 70° dive angle
T'88	As nose swung around, acquired MIG visually Leveled off at 4000-5000 ft in left turn	Went to radar to pick up target. Finally picked up noisy signal and held lock by override		Told Back that MIG is 30° left off nose and low	MIG was in hard left turn going toward the east	
T'98	Alt: 4000 ft Heading: 090° Speed: 450 kt	Continued left turn and closed range			MIG in hard left turn, range about 2 mi	Target was drifting toward nose. B3 pulling more g's than MIG
T'108	Got SIDEWINDER tone Still in left turn Alt: 3000 ft Speed: 400 kt	Fired SIDEWINDER			MIG was still in left turn. Started hard right turn Alt: less than 1000 ft	MIG was 10° left of B3 B3 pilot saw missile leave and make hard left turn (about 20 g's) and head off MIG Range approx 1.5 to 2 mi Fused near tailpipe
T'118	Still in left turn; followed MIG around to assess damage. Got down to 1500 ft alt. Speed: 350 kt Heading: 000°				MIG rolled into 120° bank and crashed	Saw explosion. Orange fireball. MIG pilot did not eject
B3 made one more fast orbit -- observed no other aircraft and proceeded to coast. Speed: 450-500 kt, Alt: 3500 ft.						

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EVENT I-37, SUMMARY (PART C)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T0C	Orbited target area (CCW) Alt: 3500-4000 ft Speed: 400 kt Jinking	Went to AB headed N	B3 went to AB (Seen by B4)	G1, 2 called "MIGs"		B4 lost radars on takeoff -- had no displays, could not use SPARROW
T1C	Alt: 3500-4000 ft Heading: 010° Speed: 475-500 kt		B1(L) and 2 were heading N		MIGs were chasing G1, 2	
T2C	B4 sighted two MIG-17s Alt: 4500-5000 ft Speed: 475-500 kt	Passed directly over first MIG (M5); had sighted M6 first; made clear ID Started to pull up	B3 started pull up* (See Remarks)		M5, 6 were at heading of 160°, separated 1/2 mi, chasing G1 and 2; M5 was at 4500 ft M6 was at 5000 ft	*Note: This is not substantiated by B3's account
T3C	Alt: 4500-5000 ft Speed: 475-500 kt	B4 pulled up no. 90° and climbed turning left	B3 picked up M5 and broke right chasing MIG		M5 was still chasing G1, 2 M6 turned left	B4 lost sight of B3 for remainder of encounter
T4C	Alt: 10,000 ft Speed: 375 kt (On top of pull-up and descending)	Started down and reversed to original MIG heading Met M6 head-on at about 3000 ft			M6 reversed course M5 was still chasing G1, 2	Could have fired SPARROW had radars been working
T5C	Passed M6 head-on Alt: 3000 ft Heading: 135° Speed: 475 kt	Pulled up to repeat maneuver to attempt to get separation for possible SIDEWINDER launch		B3 called that he got a MIG (M5)	MIG reversed to left	
T6C	Out of AB for about 15 sec Alt: 10,000 ft	At top of pull-up maneuver				B4 could see guns firing
T7C	Westerly heading	Made second head-on pass at MIG 6			M6 firing guns at B4	B4 again was in position for SPARROW shot

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EVENT I-37 SUMMARY (PART C) (Continued)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4, 5, 6)	Remarks
	Status	Action				
T _{8C}	Heading: W In AB	Broke right to turn into MIG			MIG started to turn left	
T _{9C}	Alt: 7500-8000 ft Speed: 350 kt In pull up	Rolled to left and reversed into MIGs	B2 also saw MIGs on tail of B4	Back called "two MIGs on tail -- 7 o'clock position"	MIGs (probably 3 and 4) fired air-to-air rockets	Rockets passed behind B4. No evasive maneuver needed.
T _{10C}	Alt: 6500-7000 ft Heading: 180° Speed: 425 kt Came out of AB for turn	Headed toward MIG 6 and B1, 2	B1(L) and B2 in scissors with MIG 6 started to turn NE B1, 2 estimated at about 2500 ft		MIG 6 3000 ft behind B1, 2 Alt: 2000 ft Firing at B1, 2 (probably M6)	Sighted MIG 6 tailing B1, 2
T _{11C}	Alt: 1500 ft Speed: 275 kt and accelerating in AB	Chasing MIG 6--tried to get into position for a SIDEWINDER shot			MIG 6 was hanging on to B1, 2	
T _{12C}	Closed to 2 mi from MIG 6 in front	Broke left and up because of 2 MIGs on tail	B1, 2 continued their maneuvers	Back called "2 MIGs at 7:30 position--firing air-to-air rockets"	Two MIGs had evidently rolled in again and commenced firing rockets	
T _{13C}	Alt: 13,000 ft	Pulled up to make high reversal			MIGs turned left. MIGs were below at about 2500 ft heading W, were in head-on situation	
T _{14C}	Down to Alt 5000-6000 ft, full AB Fuel: approx 4600 lb	Headed for coast				Landed up with low fuel -- had to use tanker

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B4 HEADS TOWARD MIG
AND B1 AND B2

B4 TRIES TO POSITION
FOR SIDEWINDER

M6
FIRES GUNS AT
B4 (MISS)

M3 AND M4 FIRE
ROCKETS AT B4 (MISS)

B4 PASSES OVER M5

B4 BREAKS LEFT AND UP
TO EVADE MISS FILING ON TAIL

B4 LOSING 2500 FT. COULD
NOT U-TURN

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SITUATION DEVELOPMENT (Continued)

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followed by a MIG as BLUE 2 tracked the MIG and fired sporadically. BLUE 1 was in trail position following BLUE 2. The MIG took some hits but was not disabled. A second MIG was on the other side of the circle but not in position to fire on BLUE 1. This continued for several turns as BLUE 2 fired a SIDEWINDER unsuccessfully and when his guns jammed BLUE 1 resumed the lead and went into a high yo-yo to get into position on the MIG. MIG 2 crossed the circle and fired at BLUE 1, scoring hits in the right UHT, wing, and lower fuselage causing a fuel leak. BLUE 1 later ejected over the Gulf of Tonkin as a result of the fuel loss. BLUE 3 continued his turns going down to the deck (50-ft AGL), pulled up, and lost MIG 1 in the clouds. BLUE 2 fired the last SIDEWINDER, but without success.

8. ORDNANCE

	(No. fired/No. hits)			
	SIDEWINDER AIM-9B	SIDEWINDER AIM-9D	20mm Cannon	Remarks
BLUE 1	0/0	0/0	None	
BLUE 2	1/0	1/0	124 rds	SIDEWINDER (AIM-9B) launched at high g's, pitched down and hit ground. SIDEWINDER (AIM-9D) guided but could not follow target. Guns jammed preventing full firing. (See Equipment Problems for details)
BLUE 3	0/0	0/0	None	
MIG 1, 2, 3	Fired unknown amount of 23/37mm cannon			

9. EQUIPMENT PROBLEMS

BLUE 2 - While pulling over four g, the pilot tracked the MIG with the gyro piper and fired the 20mm cannon. The tracers indicated the rounds were passing well behind the target. Apparently the sight was computing insufficient lead over four g. Three of the four 20mm cannon jammed and the rate of fire of the fourth decreased under the g loads.

Right - upper cannon fired 3-4 rounds, lower cannon none.

Left - upper cannon fired 20 rounds, lower cannon almost fired out.

Each cannon was loaded with 100 rounds.

BLUE 3 - Lost radio during first maneuvers when earphone cord became disconnected.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-8 Hours	Combat Missions	Remarks
BLUE 1	3500	1000	210	Much gun and missile firing experience.
BLUE 2	1300	800	8	
BLUE 3	3000	800	125	

NOTE: All BLUE flight had continuous fighter background and were graduates of the F-8 Training Squadron.

Comments on this Encounter and Previous Experience

MIGs were well controlled by GCI and were generally expected to be at 6 o'clock when first sighted. F-8 was able to counter all MIG-17 maneuvers, possibly due to pilot abilities. F-8 had little capability of shooting down the MIG in this encounter, even after maneuvering to the MIG 6 o'clock because: (1) Cannons were completely unreliable, particularly in high-g environment, (2) When successfully engaging the MIG, which of necessity put the F-8 inside the MIG's radius of turn, the F-8 was inside minimum range for the missile.

F-8 gunsight was unreliable due to lead errors generated at high-g. Use of tracers was helpful in determining bullet proximity to the target. A requirement definitely exists for a short-range weapon, for a weapon to assist in the rescue of downed airmen, and for a reliable gun system.

11. DATA SOURCES

Project Interviews: BLUE 1, 17 Dec 66; BLUE 2, 20 Jan 67; BLUE 3 19 Jan 67

SECRET

DATA SOURCES (Continued)

EVENT 1-38

Messages, Reports:

CTG 77.6 OPREP-3 1 160922Z July 66
CTG 77.6 OPREP-3 2 140604Z July 66
CTG 77.6 OPREP-3 3 140850Z July 66
CTG 77.6 OPREP-3 4 140646Z July 66
35 TFW OPREP-3, 35001 FASTEL 569, July 66

12. NARRATIVE DESCRIPTION

After passing the coast-in point, BLUE flight continued inland in a combat formation with BLUE 1 and 2 in section and with BLUE 3 S-turning above to assist in the look-out in the rear hemisphere.

T₀ - Approximately 10 mi before arriving at the diversionary target, BLUE 2 sighted two MIGs in trail passing from right to left, low and to the rear below the clouds. BLUE 2 called, "Wids at 9 o'clock, break left." BLUE 2 took the tactical lead and broke left and down, descending below the clouds in pursuit of the MIGs. BLUE 3 was crossing over the section in a right turn and continued turning as he pulled up into a climbing yo-yo maneuver.

T₁ - As BLUE 3 reached the top of his maneuver, he saw a MIG overshoot to the left as the MIG made a firing pass. BLUE 3 also saw a MIG come up through the clouds on his right. BLUE 3 reversed his turn to the left to counter the first MIG. The MIG saw BLUE 3 reverse, turned left and dove below the clouds, with BLUE 3 following.

T₂ - BLUE 2, with BLUE 1 in trail, leveled out below the clouds at 500 kt, and saw a MIG in an easy, right turn. BLUE 2 reversed his turn to the right (approximately 3 g), and pulled inside the MIG to track for a gun attack.

T₃ - Just as BLUE 2 was ready to shoot, he observed BLUE 3 passing right to left in front of the MIG at a range of approximately 1000 ft. BLUE 2 called BLUE 3 to break left and advised him that he was passing in front of a MIG. BLUE 3 did not hear any radio transmissions because his earphone cord apparently had become disconnected during his first maneuver. The MIG saw BLUE 3 and reversed his turn to the left and commenced tracking BLUE 3 as he closed the range. BLUE 2 also reversed his turn, again pulled to the inside of the turn to track the MIG.

T₄ - BLUE 2 placed the gyro piper on the MIG and fired a burst of 20mm but the tracers passed well behind the MIG.

T₅ - BLUE 2 then used the fixed piper and pulled as much lead as possible with 30° angle off, 500 kt, and 6 g. When he fired again, only the left guns fired, the right guns had jammed. The MIG was hit at least twice, but before significant damage resulted, one of the two guns firing stopped and the other gun fired erratically at a very reduced rate before it finally stopped. BLUE 2 was unable to expend more than about 25 percent of his ammunition.

T₆ - The encounter had developed into a continuously turning, high-g, high-speed engagement, as the altitude ranged from the base of the clouds to the ground (estimated within 50-ft AGL). In trail behind BLUE 3 were the MIG, BLUE 2 and BLUE 1. A second MIG descended through the clouds and was sighted by BLUE 2 as it joined the fight on the opposite side of the circle.

T₇ - Although well outside the missile envelope, BLUE 2 fired a SIDEWINDER-B at the MIG in an attempt to force the MIG away from BLUE 3. The missile came off the launcher and pitched down and behind the MIG into a rice paddy. BLUE 2 then advised BLUE 1 that his guns had stopped firing. The tactical lead was resumed by BLUE 1 who started a high yo-yo to the inside to move into a firing position on the MIG.

T₈ - As BLUE 1 reached the top of his maneuver, the MIG that had just entered the encounter took advantage of BLUE 1's reduced speed and closed the range by cutting across the circle. The MIG fired at BLUE 1 and scored hits in the tail, wing, and lower fuselage. Because of control difficulties, BLUE 1 disengaged by entering the clouds. BLUE 3 observed the hits on BLUE 1 and for the first time saw the MIG on his tail.

T₉ - After slowing to 250 kt, to maintain control of his damaged airplane, BLUE 1 headed for the coast. In an attempt to disengage from the MIG on his tail, BLUE 3 dove for the ground in afterburner to open the range. The MIG did not follow BLUE 3 down to ground level, but remained a little high at 6 o'clock, not in a firing position.

T_{10,11,12} - Unable to lose the MIG by diving, BLUE 3 pulled up hard into the clouds and then executed a 360° right turn just above the clouds followed by a 360° left turn below the clouds and departed the area to the NE. As the MIG detached from BLUE 3, BLUE 2 launched a SIDEWINDER with 60° angle-off, in a 45°-50° climb, at a range of about 1000 ft. The missile appeared to guide initially but passed well behind as the MIG continued to maneuver. BLUE 2 continued to follow both MIGs, which were out in front heading toward Phuc Yen. With no remaining ordnance, BLUE 2 entered the clouds and turned toward the coast after giving BLUE 1 and 3 time to exit the area.

The flight rendezvoused over the water and proceeded toward the carrier at a reduced speed while assessing the damage to BLUE 1. Unable to refuel in flight because of a utility hydraulic failure, the pilot of BLUE 1 ejected when fuel was exhausted (result of fuel leaks from battle damage).

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EVENT I-38 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3)	Remarks
	Status	Action				
T ₀	BLUE flight in tactical formation patrolling for MIGs and acting as strike decoy group.	B2 sights two MIGs passing 3-9 o'clock behind and calls flight to break left. B1&2 turn left and down below undercast and B3 turns right and up due to position on B1&2. B2 takes lead of section.	Altitude 3000 ft Speed 450-kt IAS	B2 calls "MIGs 9 o'clock--break left."	Three MIGs (MIG 1, 2, 3) pass behind BLUE flight and turn to intercept.	
T ₁	B3 at top of yo-yo and in right turn	B3 sees MIG (M2) make firing pass and over-shoot to left--looks down and sees another MIG coming up through clouds. B3 decides must turn left to counter top MIG. B3 reverses left, down to below clouds.			M2 fires on B3 and reverses down to below clouds.	Position of M3 unknown after being seen by B3.
T ₂	B1&2 under clouds looking for MIGs	B2 spots M1 and turns to track him with guns	B1 in trail to B2		M1 in easy right turn	
T ₃	B2 getting ready to fire on M1 at 1000 ft	B2 spots B3 coming from right to left and passing out in front of M1. As M1 reverses on B3, B1&2 also reverse to track M1.		B2 calls "B3 break left, you are passing in front of a MIG."	As B3 passes in front of M1, he reverses and turns to the inside of B3.	B3's radio was out and he did not get B2's message.
T ₄	B2 tracking M1 at 1000 ft. B3 unaware M1 is tracking him	B2 fires on M1 but no hits.			M1 tracking B3 at 500 ft, but not firing for unknown reasons	

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EVENT 1-38 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3)	Remarks
	Status	Action				
T ₅	B2 firing on M1 B3 being tracked by M1	B2 hits M1 at least twice with 20mm. B2 saw holes but it didn't affect M2's performance			M1 still tracking B3	B2's guns not working well, and gradually worsen to where all guns stop B2 was firing approximately 30° angle off, 500-kt IAS, 6 g's
T ₆	B1, 2, 3, M1 all in tight left turn	B2 sees M2 entering circle and directly on opposite side			M2 finds flight below clouds, enters engagement	
T ₇	Same as above	B2 fires SIDEWINDER (AIM 9B) at M1 hoping to scare him off of B3		B2 transmits to B1 that his guns had stopped. B1 states he "will yo-yo high to inside and try to cut across to inside on M1."	Same as above	B2 was aware SIDEWINDER (AIM-9B) had no chance of tracking M1, missile pitched down out of sight B2 did observe what he thought was M1 firing at B3 one time.
T ₈	B2 in trail on M1 with M1 tracking B3. B1 at top of yo-yo getting ready to start down	B1 hit in wing, UHT and fuselage by M2. B1 climbs into clouds to lose M2.	B3 still with no radio, saw M2 fire and hit B1 from across the circle	B1 transmits that he has been hit.	M2 had been gradually gaining on B1 by cutting across the circle and when B1 pitched up, M2 took advantage of B1's reduced speed and was able to maneuver into a firing position.	B1 commenced losing fuel due to hit in fuselage.

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EVENT I-38 SUMMARY (Continued)

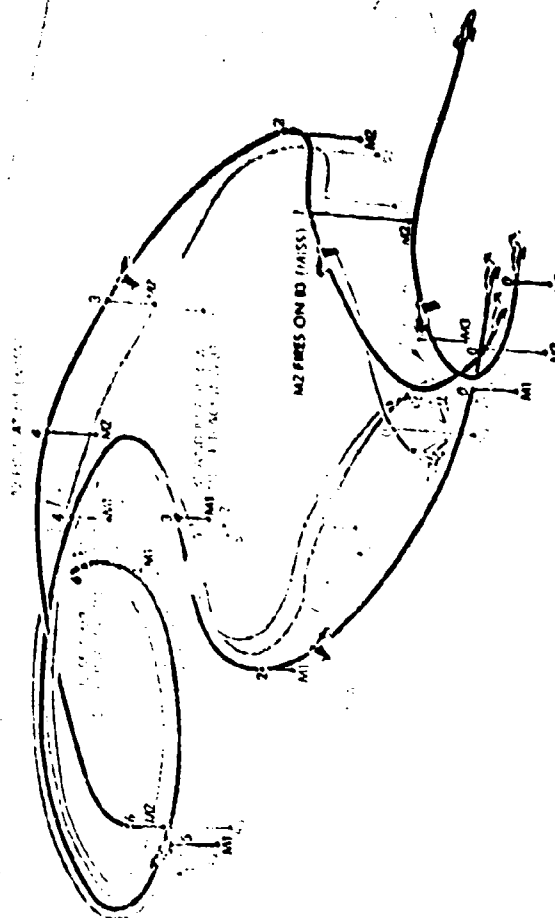
Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3)	Remarks
	Status	Action				
T ₉	B1 in clouds evading M2. B3 still trying to evade M1	B1 slows to maintain control and turns to fly to the Gulf. B3, seeing that M1 is still tracking, dives for the deck in AB to put M1 out of a firing position and to open	B2 still trailing M1		M2 disengages B1 and continues turn toward base. M1 will not follow B3 to ground level, instead stays high at 6 o'clock	B1 subsequently ejects due to fuel exhaustion--cannot refuel due to hydraulic failure.
T ₁₀		B3 pitches up into clouds to evade M1 and does a series of turns above and below clouds to ensure M1 had not followed before heading for the Gulf.	B2 still trailing M1	B1 transmits that he doesn't know whether he will make the Gulf or not.	M1 breaks off from B3 as he enters clouds and continues turn toward base.	
T ₁₁	B2 trailing M2	B2 observes M1 detach from B3, B2 fires SIDEWINDER (AIM-9D) at M1--missile initially guides then passes behind without exploding. B2 also sees M2 ahead and follows both M1B2 in level flight momentarily breaking off with nothing to shoot at them.	B1B3 heading for the Gulf		M1B2 both had broken off attacks and were heading home below clouds.	Although SIDEWINDER (AIM-9D) appeared to guide, B2 now believes he was inside minimum range due to M1's g forces.
T ₁₂		B2 breaks off attack and heads for clouds enroute to the Gulf.			M1B2 in level flight proceeding to base.	

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EVENT I-38

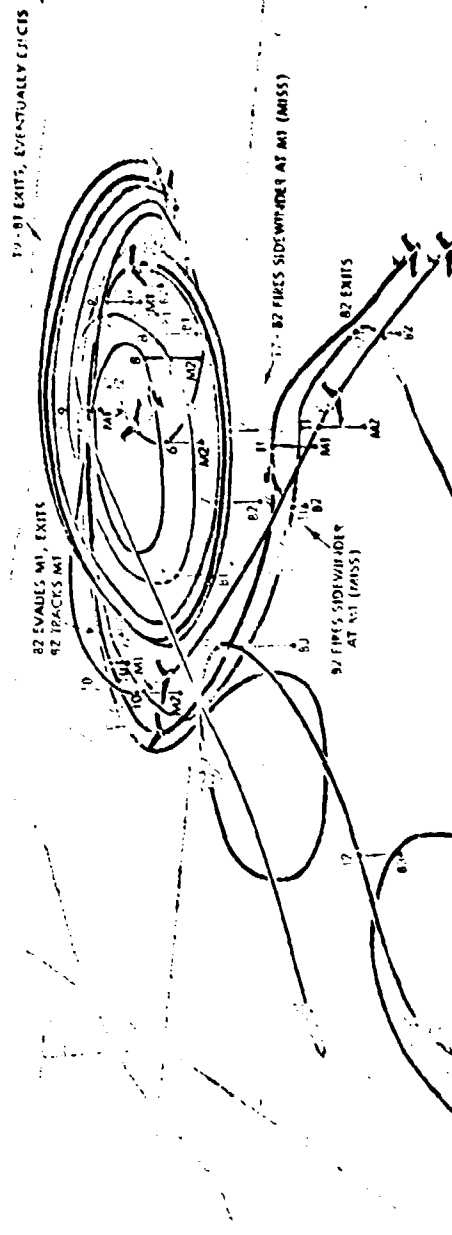
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EVENT 1-38



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EVENT 1-39

Aircraft Involved: One F-105 and four F-4Cs vs two or three MIG-21s

Result: Two MIGs destroyed

Vicinity of Encounter: 21°18'N/105°32'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 14 Jul 1966/about 1200H

Four F-4Cs (BLUE flight) were flying MIG cover for an IRON HAND flight of three F-105s (GREEN flight) which were in turn supporting ROLLING THUNDER strikes in the area north of Hanoi. F-4Cs were to trail and maintain visual contact with IRON HAND flight. Additional support aircraft (MIG EYE, SILVER DAWN, and EB-66s) were airborne at the time of the encounter.

2. MISSION ROUTE

BLUE flight departed Lanang about 1030H and proceeded on approximate course 280° to rendezvous with the tanker in the vicinity of Udorn. After refueling at 26,000 ft, 310 kt, the flight broke off the tanker about 19°N, and proceeded to the rendezvous with GREEN flight with BLUE trailing GREEN 1 to 1-1/2 mi. The flight proceeded in a northeasterly direction, GREEN about 12,000-15,000 ft, BLUE about 3000 ft higher at 550-560-kt TAS. At approximately 21°50'N/104°35'E, GREEN began letting down to 3000-4000 ft, coming to a generally southeasterly heading toward the target area, changing course from time to time and searching for radar (FAN SONG) contacts. GREEN picked up a FAN SONG signal and one SHRIKE was fired. GREEN then reversed course and proceeded northwest picking up another FAN SONG signal. As the flight was too close in for a SHRIKE launch, GREEN lead advised he was making a 560° turn to the right. It was during this turn that enemy aircraft were sighted and subsequently engaged.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

- 4 - SPARKY (AIM-7)
- 4 - SIDEWINDER (AIM-9B)
- 2 - 370-gal wing tanks
- 1 - 600-gal centerline tank
- IPF (BI only) on, TACAN off, camouflage paint

F-105 GREEN 1, 2, 3

Not given. At least two were F-105F WILD WEASEL aircraft and had SHRIKE missiles.

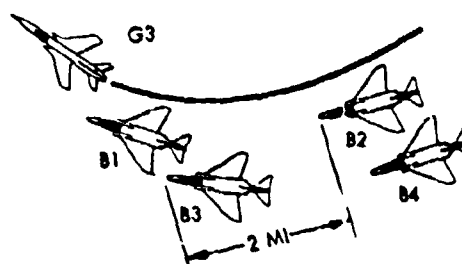
MIG-21 MIG 1, 2

- One AA missile
- Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered to broken cumulus clouds at about 8000-10,000 ft; visibility 10+ with slight haze.

	BLUE				GREEN
	1	2	3	4	3
Altitude:	7500 ft	9000 ft	8000 ft	9000 ft	4500 ft
Heading:	North-northwest (in right turn)				
Speed:	About 500 knots				
Fuel State:	15,000-16,000 lb (full internal plus some external)				
Flight Formation:	Not clearly determined. During the engagement some flight positions became interchanged and it is not clear if this occurred during the maneuver, prior to MIG sighting, or during the initial series of turns after the sighting. Probable relative positions at the time of initial MIG sighting, based on all interviews, is given below.				



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5. INITIAL DETECTION

EVENT 1-59

No MIG warnings received from support aircraft. BLUE flight was in a right (360°) turn, following GREEN when MIG 1 was sighted by BLUE 3 at 7 o'clock.

6. ACTION INITIATED

BLUE 3 called out MIG to flight. BLUE jettisoned tanks. MIG 2 was then almost immediately sighted by BLUE 3 at 4 o'clock passing BLUE 1 and 3 heading toward GREEN 3. BLUE 1 after an initial left turn, reversed to right and sighted the MIG heading toward GREEN 3; he turned to intercept MIG 2 pulling in front of BLUE 3, who had begun to turn toward MIG 2. At this same time BLUE 2 and 4 some 1-1/2 to 2 mi behind became engaged with a MIG. MIG 3 (perhaps this was MIG 1, but not sure) was sighted by BLUE 4 at 4 o'clock. BLUE 4 broke right, jettisoning tanks; BLUE 2 broke right also. BLUE flight was thus involved in two separate, not-related encounters, neither involving the same aircraft. The two encounters will be handled separately.

7. SITUATION DEVELOPMENT

BLUE 1 and 3 were in a chase-type engagement. GREEN 3, continuing with his SHRIKE launch mission (although knowing he was under attack) was pursued by MIG 2 who was in turn pursued by BLUE 1 and 3. As MIG 2 closed in on GREEN 3, BLUE 1 fired a SIDEWINDER which did not hit, but did cause MIG 2 to turn away from GREEN 3. BLUE 1 continued after MIG 2 and downed him with a SIDEWINDER.

BLUE 2 and 4 were in an engagement in which MIG 3 fired a missile at BLUE 4 (missed). BLUE 2 pursued MIG 3 and downed him with a SIDEWINDER.

Neither engagement required extensive maneuvering.

8. ORDNANCE

	(No. fired/No. hits)			
	<u>SPARROW</u> <u>AIM-7</u>	<u>SIDEWINDER</u> <u>AIM-9</u>	<u>Soviet AAM</u>	<u>Remarks</u>
BLUE 1	0/0	3/2		No. 1 passed over MIG. No. 2 guided and detonated behind MIG. No. 3 guided up tailpipe and detonated.
BLUE 2	0/0	2/1		No. 1 guided and detonated near right side of tail. No. 2 not observed.
BLUE 3, 4	none	none		
MIG 1, 2			none	
MIG 3			1/0	Missile corkscrewed low and left rear of BLUE 4.

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	2000	250	~40	TAC fighter background. Had fired SIDEWINDER (4) and SPARROW in training. Only air-to-air engagement.
<u>BLUE 2</u>				
Back	400	100	6	
<u>BLUE 3</u>				
Front	2600	400	~60	TAC fighter background. No missile firings.
<u>BLUE 4</u>				
Back	--Interviewed but this information not recorded--			

Comments on this Encounter

Enemy pilot capability not impressive as indicated by providing good missile target source (afterburner) and failing to take evasive action. (BLUE 1)

F-4C aircraft is an excellent performer. In this case a better deceleration capability would have helped BLUE 1 to back off. (BLUE 1)

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EVENT 1-39

An internal gun might have enabled BLUE 1 to down MIG on first pass. (BLUE 1, BLUE 3)

Radio frequencies are overcrowded and overworked, creating confusion. (BLUE 1)

Comment from Overall Experience

Need more ACT in training (all interviewees).

Need passive SAM detection gear (BLUE 3 Front).

Value of 2-man crew is great, two sets of eyes better than one, especially at night (all interviewees).

11. DATA SOURCES

Project Interviews: BLUE 1-Front (9 Jan 67), BLUE 2-Back (14 Mar 67), BLUE 3-Front (25 Jan 67), BLUE 4-Back (10 Jan 67)

Messages:

7AF OPREP 3, 140722Z; DOCO-O 22886 Jul 66

7AF OPREP 3, 140751Z; DOCO-O 22888 Jul 66

7AF 140755Z; DOCO-O 22887 Jul 66

7AF 140721Z; DOCO-O 22885 Jul 66

7AF OPREP 3, 140825Z; DOCO-O 22892 Jul 66

35 TFW OPREP 3 FASTEL 557 Jul 66

35 TFW OPREP 3 FASTEL 556 Jul 66

Other

Letter, BLUE 1 (Lead)-Back

USAF TFWC CAD Bulletin #7

12. NARRATIVE DESCRIPTION

BLUE flight was in a right-hand turn following GREEN flight (F-105s) who was preparing to launch SHRIKE missiles.

MIG 1 was sighted by BLUE 3 at 7 to 8 o'clock and almost immediately afterwards MIG 2 at 4 o'clock was sighted by BLUE 3.

BLUE lead began a hard left turn and quickly reversed into a hard right turn as MIG 1 passed behind him (estimated 2 mi). In this right turn he sighted MIG 2 coming up behind GREEN 3.

It is not clear how other aircraft in BLUE flight maneuvered relative to BLUE 1, especially in light of the uncertainty regarding the initial formation positions noted previously. It is known that in the initial maneuvers BLUE 3 became wingman for BLUE 1. BLUE 2 and BLUE 4 became separated from the other two and perhaps each other in the initial maneuvers also. During the initial maneuvers all BLUE flight jettisoned their tanks.

After the initial MIG sighting and maneuvering BLUE flight in effect became involved in two separate, nonrelated encounters - neither involving the same aircraft. Accordingly, this section will deal with the encounters separately.

BLUE 1 (Lead) and 3

T₀ - About the time BLUE 1 reversed his turn to the right, GREEN 2 (Lead) called a MIG at 5 o'clock and GREEN 3 confirmed. (Note: It is assumed that GREEN 2 and 3 detected the MIG airborne intercept radar on their special equipment.

T₁ - BLUE 1 spotted the MIG coming up behind GREEN 3 and advised GREEN 3 to break right and that BLUE 1 had the MIG. GREEN 3 declined to break, saying he was preparing to launch a SHRIKE, and continued in a slight right turn - the MIG turning to cut him off about 3 mi behind. BLUE 1 turned and got behind the MIG, overtaking the MIG rapidly.

T₂ - About the time the MIG had closed to approximately 1/2 mi behind GREEN 3 (who by this time has rolled out on an easterly heading) BLUE 1 was 1/2 mi behind the MIG and fired a SIDEWINDER missile which passed without detonating over the canopy of the MIG. The MIG then lit his afterburner and initiated a 30° climb - in a slight right turn.

T₃ - BLUE Lead then fired a second missile which detonated behind the MIG.

T₄ - A third missile then launched by BLUE 1 went up the MIG tailpipe and exploded - the MIG exploded into many pieces.

BLUE 1 and 3 then exited the area, rejoined GREEN flight and all returned to their respective bases.

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EVENT 1-39

BLUE 2 and 4

T₀ - At the time of initial MIG sighting and call by BLUE 3, BLUE 4 was to the rear of BLUE 1 and 3. BLUE 4 spotted a MIG at 4 o'clock and broke right.

T₁ - The MIG turned in behind and fired a missile at BLUE 4; the missile missed low to the left and rear. BLUE 4 continued his right turn and lost sight of the MIG.

T₂ - BLUE 2 meanwhile had broken right and spotting the MIG behind BLUE 4, turned in behind him. The MIG lit afterburner and started climbing. BLUE 4 fired a SIDEWINDER which hit the MIG near the right side of the tail. The MIG pilot ejected and the chute was seen by both BLUE 2 and 4. (BLUE 4 had seen the explosion and flew over to investigate.)

Estimated duration of each engagement, 2-4 min.

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EVENT 1-39 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 3)		Other- Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	<p>B1 7000-8000-ft altitude ~500 kt, 1-2 g's right level turn 15,000-16,000 lb fuel BLUE flight fol- lowing GREEN 1-3 mi</p> <p>B3 8000 ft ~500 kt, 1-2 g's Right level turn 15,000-16,000 lb fuel Sees MIG at 7 o'clock</p>	<p>On hearing MIG call from B3, B1 starts hard turn to the left, goes into AB and Jet-tions centerline tank. As MIG passes behind him about 2 mi, he reverses turn to right and sights MIG to right heading toward G3, turns to engage M2, Jetti-soning wing tanks.</p> <p>B3 calls out MIG to flight. Jet-tions tanks. Breaks into M2 then sees B1 turning in front of him toward MIG. Did not go into AB.</p>	<p>GREEN flight is in a right turn 5000 ft or lower turning toward an easterly heading to launch SHRIKE missile(s) at FAN SONG radar signals. G3 is ~1-2 mi ahead of BLUE flight. G183 pick up MIG AI radar on electronic equip-ment.</p>	<p>B3--MIG at 8 o'clock high G1--MIG at 5 o'clock G3--Confirmed MIG at 5 o'clock</p>	<p>M1 at 9000 ft descending heading from 7 o'clock to 6 o'clock--~2 mi behind BLUE 3. M2 at 6000 ft heading toward G3 in ~45° bank turn.</p>	<p>G183 lose sight of M1 in initial turns as their attention was focused on M2 apparently heading to attack G3. It is possible M1 was subsequently engaged with B284. Looks toward B1 (right side) sees B1's tank(s) go and sees MIG at 4 o'clock passing by B1.</p>

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EVENT I-39 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 1, 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2)	Remarks
	Status	Action				
T ₁	B1 6000 ft ~550 kt in AB 1-2 g's Slight descent B1 rolls in behind MIG about 2 mi	Front tells back to go to 10-mi scope and bore-sight. Back acknowledged and advised front to advise when MIG was in reticle. B1 was accelerating rapidly, up to 550-600 kt. Front advised back MIG in reticle. Back says he is locked on the MIG, in range and also has G3 on the scope. Front started to squeeze the trigger but back advised they were too close. Some-time in here front realized he was overtaking MIG rapidly and came out of AB and extended his speed brakes. Front then switched to HEAT. Back advised they were in range and at less than 2 g's. Flying as wingman for B1.	G3 rolled out of turn on easterly heading.	B1--"G3 break right. B1 has the MIG." G3 --"Negative-- have contact-- getting ready to launch." (SHRIKE)	M2 ~1 mi behind G3 and closing ~1 mi.	
	B3 6000 ft					
T ₂	B1 5000 ft ~500 kt 1-2 g's B3 ~5000 ft	B1 launches SIDEWINDER at MIG. Front saw missile pass over MIG's right wing past canopy. He did not observe it explode but did see smoke trail.			M2 about 1/2 mi behind G3. After missile passed went into AB and started to climb to right.	Front did not recall hearing missile tone, and did not see missile in flight. Did get a break X as missile left. B3 sees B1 launch missile.

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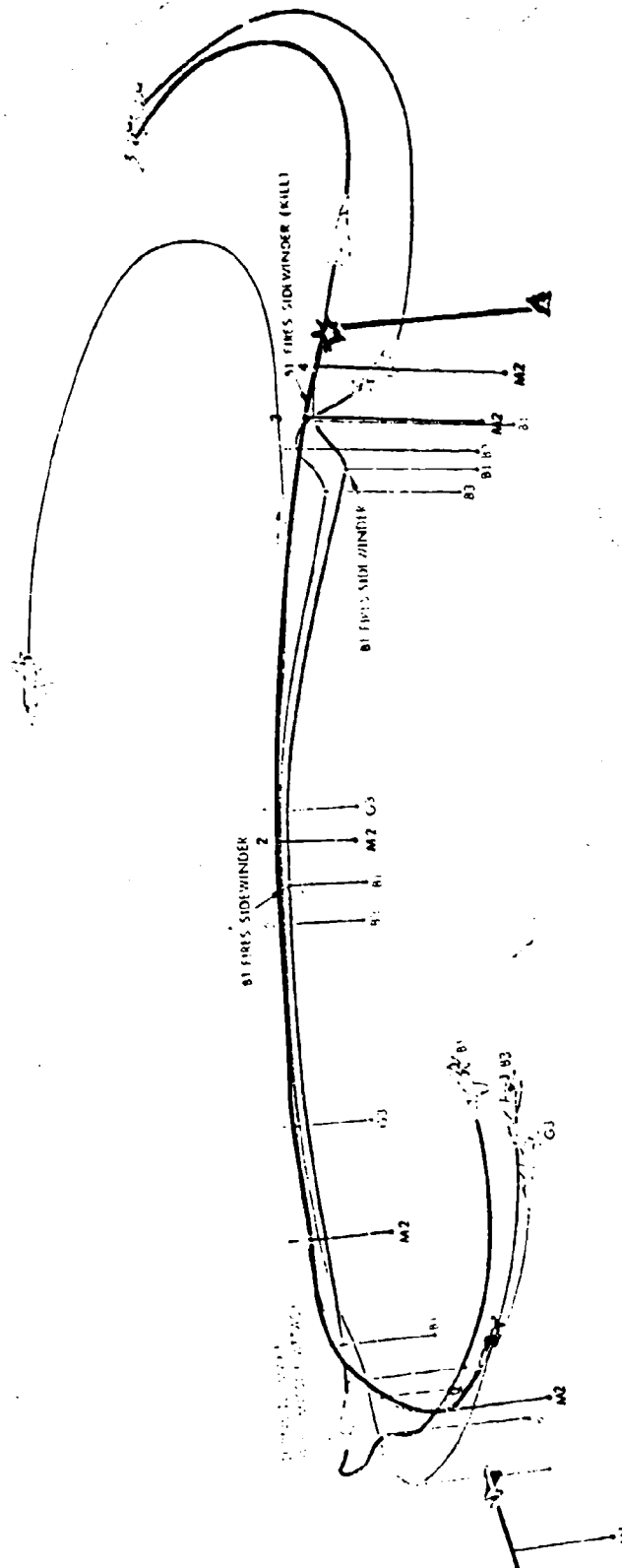
EVENT 1-39 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 1, 3)		Other Friendly	Communications	Enemy Actions (MIG 1, 2)	Remarks
	Status	Action				
T ₃	B1 at 9000 ft ~500 kt, 1 g. B3--no data	B1 back into AB. B1 pursuing MIG. Fires another SIDEWINDER with good tone just as he returns to minimum range (3/4 mi). Missile explodes ~200 ft short. B3 flying wing.	G3 continues on SHRIKE launch.		M2 climbing but not turning. After SIDEWINDER detonation M2 out of AB then back in.	
T ₄	B1 at 10,000-11,000 ft, ~500 kt, 1 g. B3--no data	B1 fires third SIDEWINDER with good tone, very quickly after second firing (T ₃).			Missile goes up tailpipe. M2 exploded into many pieces--some on fire. Pilot ejects (seen by B3 only) before explosion.	B1 sees no ejection. B3 flying wing sees MIG pilot eject. Just before missile hit.
NOTE: After T ₄ B1&3 reestablish communication with GREEN, obtain DF steer and pick them up visually. All exit area and return to bases.						

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EVENT I-39



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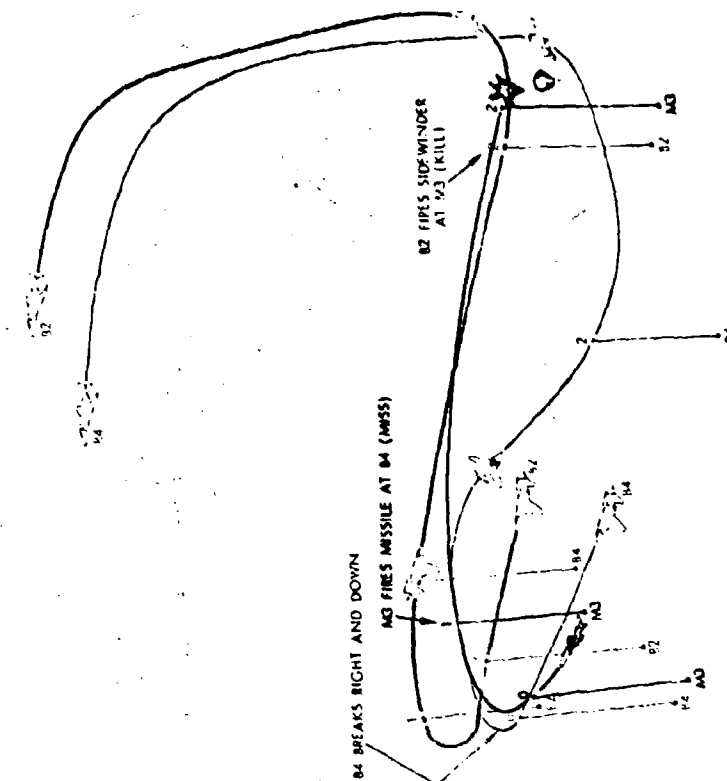
EVENT 1-39 SUMMARY (CONTINUED)

Time Mark	Action Aircraft (BLUE 2, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	B2&4, 9000 ft ~500 kt; in AB (catching up)	B2&4 hear B3 MIG call. B2 sees MIG behind B4. B4 breaks right and down (5 g's). B2 at first eases left then also breaks right. Tanks jettisoned and into AB.	B1&3 ahead-- becoming engaged separately	B2&4 both called MIG behind B4.	M3 close behind B4.	M3 may be M1, the first one sighted by B3.
T ₁	B2: No data B4: 7000 ft ~500 kt, 5 g's	B4 in break. MIG fires missile. B2 is turning to right and begins to pursue MIG.			MIG fires missile at B4. missile misses--low and to rear; MIG then slides behind B4 who did not see him again. B2 sees MIG go into AB and climb.	
T ₂	B2: ~9000 ft, 550 kt, SPARROW mode 10-mi scope and boresight	B2 is behind MIG and closing rapidly. Back advised too close so front put down speed brakes and went out of AB. Front went to HEAT and fired SIDE- WINDER after sliding back into range (good tone). Missile ex- ploded at side of tail- pipe. Pilot ejected. B4 saw explosion off to left. flew over to look and saw chute.			MIG hit, pilot battled out.	

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EVENT I-39



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EVENT I-40

Aircraft Involved: Three F-4Cs vs one MIG

Result: Sighting only

Vicinity of Encounter: 21°40'N/105°50'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 20 Jul 1966/1550H

Three F-4C aircraft (BLUE flight) on a MIGCAP mission near 21°40'N/105°26'E. Flight had launched as a flight of four, but shortly after takeoff from Danang, BLUE 3 had aborted.

11. DATA SOURCES

Messages, Reports:

35TFW, OPREP-3, 20 Jul 66, DCCC-0
7AF, OPREP-3, 201441Z Jul 66, DCCC 023227
CINCPACFLT Staff Study 3-67

12. NARRATIVE DESCRIPTION

BLUE flight departed from Danang at 1505H; configuration unknown, but flight carried no ECM equipment. BLUE 4 sighted a MIG-type aircraft at 1546H. MIG was bright silver in color, 6 to 8 mi in trail with BLUE 4. MIG at 500- to 1000-ft altitude. BLUE flight and MIG heading 150°. BLUE flight turned to make intercept, but lost visual contact with MIG. BLUE 4 observed an SA-2 missile explosion at 1555H, 21°40'N/105°26'E in conjunction with MIG sighting.

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EVENT I-41

Aircraft Involved: One F-104C vs one MIG-21

Result: Sighting only

Vicinity of Encounter: 20°50'N/107°10'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 7 Aug 1966/0910H

One F-104C (BLUE flight) was on an IRON HAND escort mission.

11. DATA SOURCES

Reports: 7AF IBM Print Out, DIO66-2198

12. NARRATIVE DESCRIPTION

BLUE flight observed one MIG-21 at 11,000 ft, heading 360° with a speed of about 550 kt. BLUE flight was at 1500 ft heading 130° and 425 kt. The weather was scattered clouds with 5 mi visibility.

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EVENT 1-42

Aircraft Involved: Three F-4C vs one MIG
Result: Sighting only
Vicinity of Encounter: 22°00'N/104°58'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: Late Aug or early Sep 1966/1430H or 1500H

Three F-4C aircraft (BLUE flight) escorting a flight of F-105 strike aircraft in Route Package VI-A.

11. DATA SOURCES

Project Interview: BLUE 3 (Back) - 16 Mar 1967

12. NARRATIVE DESCRIPTION

BLUE 3 at 10,000 ft, 350-400 kt, on a heading of 080°, saw a possible MIG (silver airplane) passing 5 or 6 mi behind the formation. BLUE 3 turned right to intercept the MIG and lost sight of him. BLUE 3 searched in the direction the possible MIG was heading at 5000-ft altitude, but he was unable to find him.

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EVENT 1-43

Aircraft Involved: Two F-8Es vs two MIG-17s

Result: One F-8E lost, one F-8E damaged.

Vicinity of Encounter: 20°15'N/105°59'E
Route Package IV

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Sep 1966/1645H

Two F-8Es (BLUE 1 and 2), operating in rotation with two other F-8Es, providing TARCAP covering A-4s during attack on a train.

2. MISSION ROUTE

Penetrated NVN coast at 20°07'N/106°20'E on initial heading of 300°, then proceeded north to the scene of action.

3. AIRCRAFT CONFIGURATIONS

F-8E BLUE 1 and 2

2 - SIDEWINDER (AIM-9) load was either 1 AIM-9B and 1 AIM-9D or 2 AIM-9D
400 rounds - 20mm
Radar off
No external stores

MIG-17 MIG 1 and 2

23mm and 37mm cannon

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Broken to overcast, 1500 ft with tops about 2000 ft, occasional buildups to 7000 ft.

BLUE
1-----2
Altitude: --3000-5000 ft--
Heading: South in right-hand turn
Speed: ----400 kt----
Fuel State: ---Near BINGO---

Flight Formation: Loose-deuce, with BLUE 2 in process of crossing under BLUE 1.

5. INITIAL DETECTION

Warnings were not received and MIGs were not sighted before or during engagement. MIG presence was indicated by observation of tracer by BLUE 2 followed by hits on BLUE 2.

6. ACTION INITIATED

When hit, BLUE 2 turned left into a cloud to evade further hostile firing. BLUE 2 observed BLUE 1 turning right into a cloud.

7. SITUATION DEVELOPMENT

BLUE 2 transmitted to BLUE 1 that he had been hit and was heading for the beach. Visual and voice contact with BLUE 1 was lost and never regained. BLUE 1 later reported as missing. Prior to loss of visual contact, BLUE 2 did not observe hits on BLUE 1. BLUE 2 believed that BLUE 1 may have flown into karst after entering cloud cover because terrain elevation was approximately 2300 ft and BLUE 1 was descending through the cloud. At no time did BLUE 2 see enemy aircraft.

8. ORDNANCE

(No. fired/No. hits)

	Soviet AAM	Remarks
BLUE 1, 2	-----None expended-----	
MIG	23mm and 37mm fired	BLUE 2 hit by 23mm and 37mm fire.

9. EQUIPMENT PROBLEMS

The flight was plagued with voice communications problems. BLUE 2 was unable to receive response or acknowledgment from BLUE 1 on several occasions. His last failure may be attributed to the high noise level following destruction of his canopy but prior to that time he had not received responses to his calls or transmissions.

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10. AIRCREW COMMENTS

EVENT 1-43

Experience

	<u>Total Hours</u>	<u>F-8 Hours</u>	<u>Combat Missions</u>
BLUE 2	1800	1200	55-60

Comments on this Encounter

BLUE 2 believed that, due to extensive damage to his aircraft the RIO (or RIOs) considered it unnecessary to follow him further. He stated that he did not receive a RIO warning from any source. Thought there should be aircraft particularly designed for the TARCAP mission, as well as strike. This was due in part to the fact that in multi-mission aircraft the pilot must be proficient in too many areas and is not therefore good enough in any one. It was felt that the communication difficulty was enhanced by the fact that the controllers on the ships did not understand what was going on.

Comments from Overall Experience

BLUE 2 felt that a better gunlight would be desirable on the F-8, and would prefer more ammunition per gun. Would like some indication from the radar when within gun-firing range. In two-place aircraft feels, "RIO as opposed to pilot is better for second crew. Also a RIO is necessary on all-weather aircraft."

11. DATA SOURCES

Project Interviews: BLUE 2, 17 January 1967

Messages, Reports:

CTO 77.6	OPREP-5	051956Z	September 66	
CTO 77.6	OPREP-3	051130Z	September 66	
CTO 77.6	OPREP-3	080722Z	September 66	CH-3
CTO 77.6	OPREP-3	051046Z	September 66	
CTO 77.6	OPREP-3	051708Z	September 66	CH-2

12. NARRATIVE DESCRIPTION

BLUE flight was scheduled as an element for a TARCAP. However, the mission was changed at the last moment because a train had been sighted between Nam Dinh and Phu Ly, about 20°30'N/160°00'E. The A-4 aircraft were dispatched to strike the train with four F-8s flying TARCAP. The first element (pair) of TARCAP was to fly in and orbit over the karst area almost directly south of Phu Ly while the second section was to remain offshore to the south of the mouth of the rivers, E-NE of Thanh Hoa. As the first element neared BINGO fuel, it was to fly outbound and the second element, BLUE 1 and 2, was to relieve the first. The first element reached BINGO fuel after orbiting approximately 20 min, at which time BLUE 1 and 2 flew inbound at about 20°00'N/106°00'E and proceeded along the karst, which runs from SE to NW until the position S of Nho Guan was reached. At this point, BLUE 1 and 2 turned north. The inbound flight was executed between 3000 ft and 5000 ft while jinking. BLUE 1 and 2 held south of Phu Ly and performed right-hand circles with random turns in a loose-deuce tactical formation. There were low clouds in the area with ceilings close to the ridge which at one place reached 4530 ft. Some of the cloud formations had buildups as high as 7000-7500 ft. This cloud cover required BLUE 2 frequently to fly to rear of BLUE 1 to keep him in sight.

After several minutes on station, fuel level was observed approaching BINGO and decision made to depart the area. High-power settings had been maintained to hold about 450 kt in tight turns. At times, BLUE 2 slowed to as low as 350 kt, which though not desirable, became necessary because of the clouds and tight turns involved. BLUE 2 had called BLUE 1 to report that fuel was getting low, but he did not receive an answer from BLUE 1. BLUE 2 assumed that BLUE 1 was monitoring other transmissions; however, later it was believed that BLUE 2's transmitter had failed.

As both aircraft reached a southerly heading at about 4000-4500 ft and turning right, BLUE 2 started to pass behind BLUE 1. At this time, BLUE 2 observed tracers passing to the left of his cockpit. BLUE 2 was then a maximum of 200 ft behind BLUE 1 and possibly 40-50 ft stepped down and at BLUE 1's 5 o'clock position. BLUE 2 called BLUE 1 and said, "We are taking fire from 6 o'clock," at which time a shell struck BLUE 2's canopy. As the shell hit, BLUE 2 observed that BLUE 1 made what appeared to be a negative "g" right turn into a cloud to the right and ahead. BLUE 2 did not observe any hits on BLUE 1 nor any debris. At this time BLUE 2 did not believe that BLUE 1 had been hit.

BLUE 2 observed another cloud buildup to his left and turned hard into it. As he entered the cloud, he turned left to see if there were any aircraft behind but saw nothing. He then turned hard right and at the same time noticed his fuel was down to about 2500 pounds and that his hydraulic warning light was on. BLUE 2 looked to the right again and noticed that a large section of the right wing was gone. A shell had gone through the canopy, and as a result, the noise level was quite high. BLUE 2 had difficulty hearing radio transmissions. BLUE 2 called BLUE 1, reported the hit, was also having hydraulic problems, and now heading "for the beach." At this time, BLUE 2 thought that he heard BLUE 1 make a call of some kind but he could not tell what it was. BLUE 2 was positive that is was

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EVENT 1-43

the voice of BLUE 1 pilot. BLUE 2 considered turning back, but due to the damage to his aircraft decided to continue toward the beach. BLUE 2 does not believe that BLUE 1 had been hit as he entered the clouds, but felt that BLUE 1 flew into the karst. BLUE 2 also believed that the aircraft that were firing on them broke off as soon as he had been hit because his right wing was severely damaged and fuel was streaming out rapidly. BLUE 2 flew out to sea and at this time discovered beyond doubt that his transmitter was not operating. At no time did BLUE 2 receive a MIG warning. It is unknown whether or not his guard receiver was malfunctioning or turned off. BLUE 2 thought he heard a beeper from BLUE 1 at one time. No enemy aircraft were seen by BLUE 2, and he did not observe any ground fire. BLUE 2 had no idea that MIGs had been launched. In view of the angle at which BLUE 2 was hit, it was concluded that it was not ground fire. It is believed that the MIGs were under excellent GCI control. BLUE 2 believed that the MIGs must have been under the clouds and caught BLUE 1 and 2 just as BLUE 2 passed under and behind BLUE 1. BLUE 2 believed that had the action occurred 30 sec earlier or later, BLUE 1 and 2 might have seen the MIGs first. On the way out, BLUE 2 turned on his IFF when he was over the beach.

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EVENT 1-44

Aircraft Involved: Four F-4Cs vs one MIG-21

Result: No damage

Vicinity of Encounter: 21°10'N/106°20'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 14 Sep 1966/1655H

Four F-4Cs on ROLLING THUNDER mission.

2. MISSION ROUTE

Departed Danang direct BROWN ANCHOR, to 21°13'N/107°34'E, Direct 21°18'N/107°00'E, Direct 21°12'N/106°19'E, Direct 21°10'N/106°00'E. Express generally the same route.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

- 4 - SPARROW (AIM-7)
- 4 - SIDEWINDER (AIM-9)
- 4 - Mx-82 (500-lb bombs)

MIG-21 MIG 1

Not given

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Cloud cover not given, reduced visibility in haze.

	<u>BLUE</u>	<u>MIG</u>
	1 2 3 4	1
<u>Altitude:</u>	-----11,000 ft-----	6000 ft
<u>Heading:</u>	-----330°-----	120°
<u>Speed:</u>	-----510 kt-----	Unknown
<u>Fuel State:</u>	-----Unknown-----	Unknown
<u>Flight Formation:</u>	--Normal tactical--	

5. INITIAL DETECTION

Flight was flying 330°, level. BLUE 1 sighted a MIG 4 mi away descending through 6000-ft. No MIG warnings given.

6. ACTION INITIATED

BLUE 1 dropped ordnance (four Mx-82s) and started toward MIG.

7. SITUATION DEVELOPMENT

MIG was lost in haze.

8. ORDNANCE

None fired.

9. EQUIPMENT PROBLEMS

Not available

10. AIRCREW COMMENTS

None interviewed.

11. DATA SOURCES

Project Interviews: None available

Messages, Reports:

35 TFW DCOI PASTEL 522 141455Z Sept 66

35 TFW DCOI PASTEL 518 141442Z Sept 66

12. NARRATIVE DESCRIPTION

BLUE flight was flying toward target Da Cau bypass railroad bridge in Route Package VI A heading 330°, 11,000 ft and 510 kt. At 1655H approximately 21°10'N/106°00'E BLUE 1 sighted MIG-21 4 mi away descending through approximately 6000 ft on a heading of 120°. BLUE 1 jettisoned four Mx-82s and turned toward the MIG, but lost him in the haze at approximately 4000 ft. At no time did the MIG get closer than 4 mi, nor was a hostile intent indicated. Throughout the incident the flight encountered intense 57/85mm AA.

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EVENT 1-45

Aircraft Involved: Three F-4Cs vs four
MIG-17s*

Result: 1 F-4C probably lost;
1 MIG destroyed

Vicinity of Encounter: 21°00'N/106°00'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 16 Sept 1966/1020H

Three F-4C aircraft (BLUE flight 1, 3 and 4) were to strike JCS Target 16 IV, Dap Cau RR and Highway Bridge (21°12'11"N/106°05'44"E), and convert to air superiority mission if MIGs were encountered. F-4 and F-105 strikes in vicinity with 5 min intervals between strikes. BLUE flight was third flight to target with several flights following. See Volume II for MIG encounters of strike flights. EC-121 BIG EYE on station 2000/10700 and SILVER DAWN on station, IRON HAND flight in area.

2. MISSION ROUTE

Departed from Ubon Air Base, Thailand. Refueled at 18,000 ft off east coast of South Vietnam - proceeded up coast at 25,000-ft altitude to in-point (Cam Pha Mines area). Let down to 10,000 ft in delta area, then along ridge line and back out into delta area at 5000 ft.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 3, 4

4 - SIDEWINDER (AIM-9B)
4 - SPARROW (AIM-7)
2 - 370-gal wing tanks
4 - 750-lb bombs on centerline
Camouflage
No ECM equipment

MIG-17 MIG 1, 2, 3, 4

Cannon
Silver color - one with red star, others unmarked.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 13,000-ft scattered clouds, 3- to 5-mi visibility in haze.

	BLUE
Altitude (AOL):	---5000 ft---
Heading:	Approximately due W
Speed:	---500 kt---
Fuel State:	---12,000 lb---
	external wing tanks empty

Flight Formation



5. INITIAL DETECTION

Four MIGs sighted at 2 o'clock at approximately 2 mi by BLUE 1, location 21°10'30"N/106°23'00"E. Received BIG EYE MIG warnings, and MIG calls from retreating F-105 flights. SAM calls from IRON HAND flight.

6. ACTION INITIATED

BLUE flight immediately decided to engage MIGs and entered right hand turn to gain 6 o'clock on MIGs. BLUE flight ordered to drop external tanks, ordnance, centerline MER at approximately 21°03'N/106°23'E. BLUE 4 did not drop ordnance or tanks and could not stay with BLUE 1 during turn.

*While at least four MIGs were initially seen, the numerous attacks by MIGs could have indicated that there were more in the area. BLUE 1 estimated up to eight MIGs.

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7. SITUATION DEVELOPMENT

EVENT I-45

After sighting MIGs, BLUE flight turned right with BLUE 1 climbing and BLUE 3 and BLUE 4 remaining essentially at 5000 ft. After first 360° turn, situation developed into three separate engagements.

BLUE 1 was in climbing and diving right-hand turns, slowing to 300 kt at 10,000-ft altitude and accelerating to 600 kt at 2,000-ft altitude. BLUE 1 observed MIGs firing on BLUE 3 and BLUE 4 and called warnings. BLUE 1 fired three SIDEWINDERS and two SPARROWS unsuccessfully.

BLUE 4, after wide right turn and MIG warning, split-S to ground to escape MIG. BLUE 4 departed and returned to area, passed MIG head on, but without sufficient time to fire a SPARROW. Turned, acquired another MIG, fired two SIDEWINDERS. Did not observe flight of missiles due to attack by another MIG. BLUE 4 then initiated evasive maneuver of split-S to ground, turned and observed debris and parachute in vicinity of previous SIDEWINDER firing.

BLUE 3 was last observed with element of two MIGs in 5 to 6 o'clock position. BLUE 3 did not return from mission.

8. ORDNANCE

		(No. fired/No. hits)	MIG 23mm 37mm Cannon	
	<u>SPARROW</u> <u>AIM-7E</u>	<u>SIDEWINDER</u> <u>AIM-9</u>		<u>Remarks</u>
BLUE 1	2/0	3/0		#1 SIDEWINDER fired and was unsuccessful. #2 SIDEWINDER fired and was unsuccessful. #3 SIDEWINDER fired in radar mode and was unsuccessful. #4 SIDEWINDER did not fire. 2 SPARROWS fired with full system lock-on with radar interlocks in, dot almost centered. First missile did not guide. Second missile guided but MIG turned hard right and missile passed without detonating, 500 to 1000 ft behind MIG.
BLUE 3	Unknown			Lost in engagement.
BLUE 4		2/1		2 SIDEWINDERS fired within 5 sec of each other with good tone about 1 mi range. Both missiles appeared to guide. Did not observe missile flight since it was necessary to evade another MIG.

MIGs 23mm cannon

9. EQUIPMENT PROBLEMS

BLUE 1

One SIDEWINDER did not check out and did not fire. Centerline MER did not jettison, therefore two SPARROWS could not be launched. One SPARROW missile did not appear to guide, despite apparent lock-on.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	3500	800	Unknown	Background all tactical aviation. Began combat tour in September 1966.
<u>BLUE 4</u>				
Front	-----Not reported-----			In F-4s since pilot training. 3 yr in back. 150 hr in front. Had fired three SPARROWS and four SIDEWINDERS before going to theater.

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Comments on this Encounter

EVENT 1-45

BLUE 1 (Front)

Basic tactic of MIG to operate at altitude to maximize turn advantage over F-4.

MIG pilots noted as aggressive.

Visual identification of MIGs was simplified since MIGs were silver and U.S. aircraft camouflaged.

Communication not very active but still at times not intelligible.

Air-to-air weapon with close range required, down to 1500 to 1000 ft. Could have used a gun in several instances.

Requirement to launch SIDEWINDER under a condition of 2 or less is restrictive in visual maneuvering combat.

Aircrew of two valid in GCI environment only. Distracting in visual engagement, because must think about back seat. Coordination difficult if radio garbled.

Procedures for air-to-air weapon launch required head in cockpit for weapon control and head out for visual scan in order to maintain contact with air-to-air situation. Procedure is inefficient and "heads-up" display is mandatory.

Ordnance jettison procedures on F-4 time-consuming and difficult, due to switchology.

F-4s and F-105s were not compatible for intermixed strikes without exact spacing.

F-4s should go to area with full missile and fuel load so they can mix it up with the MIGs and keep them off the strike force.

Missile lock-on should be automated to enable pilot to keep head out of cockpit and attention on situation.

There were so many MIGs, acquired MIGs in most favorable position were the only ones attacked. Many others were seen.

BLUE 4 (Front)

Felt that three-aircraft flight was undesirable because it forced one man to fight singly.

Could have used a gun in several specific places (e.g., T₇). Must have a computing gun-sight with it.

Missile-firing envelope should be expanded in g and range.

Future fighter aircraft should be more maneuverable.

Need improved visibility to rear and down.

Had switchology problem.

Likes pilot in back seat for ACM situations.

11. DATA SOURCES

Project Interviews: BLUE 1 - Front - 9 January 1967
BLUE 4 - Front - 14 March 1967
Letter from BLUE-1 - Back

Messages, Reports:

7AF OPREP-3 162321Z Sept 66 DDOO 25594
7AF MSG 162356Z Sept 66 DIO 30456
7AF OPREP-3 170835Z Sept 66 DDOO EASTEL NR122
7AF OPREP-3 161947Z Sept 66, DDOO 25603
USAF Fighter Weapons School CAD Bulletin No. 7
7AF OPREP-4 161724Z Sept 66 DDOO 25604

12. NARRATIVE DESCRIPTION

On 16 September 1966, BLUE flight of four F-4C aircraft departed from Ubon Air Base in Thailand on a strike mission (with MIGCAP backup mission) against JCS Target 16 IV, Dap Cau Railroad and Highway Bridge. Refueling took place off the east coast of South Vietnam at 18,000 ft and was uneventful except that BLUE 2 external tanks were not feeding after refueling operation. BLUE 2 returned to base. Flight of three F-4s continued to target in V formation with BLUE 4 flying left wing on BLUE 1 and BLUE 3 an element of a single aircraft. BLUE flight was the third strike group with several strike of F-4s and F-105s following at 5-min intervals.

BLUE flight entered North Vietnam at the Cat Spa Mines area at 25,000-ft altitude. Let down to 10,000-ft altitude as delta area was approached, then along the ridge line, departed the ridge line into delta target area at 5,000-ft altitude. On the way in, several SAM warnings were given, and with each one, the flight broke down to ground level.

BLUE flight was alerted to MIG threat in area, and had experienced MIG sightings on previous two days.

As BLUE flight proceeded at 5,000-ft altitude, in a westerly heading, approximately 10 to 15 mi from the target, a MIG warning was received from an F-105 strike leaving the

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12. NARRATIVE DESCRIPTION (Continued)

EVENT 1-45

target. BLUE 1 detected a flight of two elements of two MIG-17s, at 2 o'clock position at a range of 2 mi. BLUE 1 called MIG warning to flight and ordered "Drop ordnance."

BLUE 1 ignited afterburner, called "afterburner" and entered a climbing hard right turn. MIGs also entered right-hand turn. While in turn BLUE 1 observed a MIG firing and called "Break" to BLUE 4, who broke and left area.

After BLUE flight entered hard right turn the event developed into three separate engagements. The details of BLUE 1's encounter will be described followed by BLUE 4's encounter.

BLUE 3 is assumed to have been lost in the engagement. BLUE 3 was last observed by BLUE 4 with an element of MIGs approaching 6 o'clock position and firing.

BLUE 1 continued to operate in right turns climbing to 10,000-ft altitude and slowing to 300 kt, followed by a dive to 2000 ft and accelerating to 600 kt. MIGs also continued right-hand turns, but level at 5000-ft altitude. While in turn BLUE 1 observed MIG firing and called "Break" to BLUE 3, who did not acknowledge. Radio reception was garbled at that time.

During initial three turns BLUE 1 fired three SIDEWINDER missiles. MIGs generally presented a plan view and missile "tone" was not optimum. The fourth SIDEWINDER did not launch. BLUE 1 felt that firing should be attempted even if the situation is non-optimum since the engagement time is limited because of fuel.

After completion of another right turn BLUE 1 acquired a MIG and fired two SPARROW missiles without success. In both cases acquisition was complete with full system lock-on and interlocks in. At firing BLUE 1's altitude was 10,000 ft, and the MIG was at 7000 ft, going away and in a slight turn. The first SPARROW that was launched did not appear to guide. The second SPARROW appeared to guide toward the MIG; however, the MIG broke as the missile was half-way to the target and it passed the MIG's 6 o'clock position at 500 to 1000 ft. No detonation was observed.

BLUE 1 observed another MIG and attempted to fire last two SPARROWS. The missiles did not launch since the MER was still on.

BLUE 1 gained 6 o'clock position at 600 ft from MIG and again attempted to launch remaining SPARROW and SIDEWINDER missiles without success.

After the initial MIG warning from BLUE 1, BLUE 4 entered a right-hand turn, generally level, and attempted to jettison ordnance and tanks, but missed the switch. Due to heavier load, BLUE 4 could not hold turn with leader. BLUE 4 received a warning from BLUE 1 that a MIG was closing at 6 o'clock and firing. BLUE 4 responded with a hard break to the left away from the turn and a split-S to within 50 feet of the ground. Afterburner was ignited at this time. BLUE 4 proceeded in a northeasterly direction toward ridge line and made additional hard-breaking maneuvers. At this time the ordnance and tanks were jettisoned. BLUE 4 entered the ridges and maneuvered in the ridge line. After evading the MIG, BLUE 4 returned to the engagement (out of afterburner). While at 4000 to 5000 ft, BLUE 4 acquired a MIG dead ahead and approaching 3-to 4-mi range, but was unable to acquire with radar for a SPARROW launch. Bore-sight firing attempted but SPARROW not launched. BLUE 4 passed MIG with approximately 500-ft separation. At this time BLUE 4 ignited afterburner, made a hard turn, in attempt to catch MIG. BLUE 4 observed another MIG at 12 o'clock - going away, at 2-mi range. In afterburner, BLUE 4 closed on MIG and prepared to launch SIDEWINDER. With strong SIDEWINDER tone, BLUE 4 launched two missiles and both appeared to guide to MIG.

At this time a MIG was observed rolling on over the top in BLUE 4's 6 o'clock position. BLUE 4 made a hard left and then a hard right turn. As BLUE 4 came back to location of SIDEWINDER firings, he observed debris and a parachute. The attacking MIG was still following and BLUE 4 rolled into a split-S to the ground and proceeded to ridge line, making hard maneuvers. Fuel was low and BLUE 4 exited the area.

On exiting, BLUE 4 closed to within 2 or 3 mi of a flight of four F-105s, when he observed a single aircraft on the south side of the ridge line closing on the F-105s. Since identification could not be made, BLUE 4 turned to engage. BLUE 4 was on SPARROW position on the missile panel and the back s-water locked on. On closing the aircraft turned out to be BLUE 1.

BLUE 4 then joined on BLUE 1, with about 5 min of fuel remaining, so BLUE 1 and BLUE 4 exited south of Cam Pha Mines and started to climb, to cruise altitude, receiving pretty heavy and accurate 85mm fire. BLUE flight (two aircraft) maneuvered through this and BLUE 4 started emergency squawk on IFF and SIF. BLUE flight then rendezvoused with the BROWN ANCHOR tanker through ADF and, after refueling, proceeded to Udorn.

BLUE 4 commented that the BLUE 3 aircraft seemed to be a little underpowered since during climb and SAM evasion on way to the target BLUE 3 had trouble staying with the other flight members. BLUE 3 also was flying at a single-plane element in this flight.

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EVENT I-45 SUMMARY

Time Mark	Action Aircraft (BLUE 1)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T0A	Fuel 12,000 lb; 500 kt, 5000-ft altitude. 2 wing tanks 4 750 GP bombs 4 SPARROWS 4 SIDEWINDERS	B1 initially sights four MIGs 2 o'clock, 2 mi. Calls MIG sighting.	V formation in trail to target. B1 in lead, 5000-ft altitude, 500-kt speed, heading W to target. Status same as B1. B4 wing for B1. B3 single aircraft element.	B1 calls MIG warning--"MIG-17s at 2 o'clock." F-105 (IRON HAND) flight coming off target also calls "MIGs."	Flight of two elements of two MIG-17s each, heading SE. 4500-ft altitude. Elements are F-105s and F-4s with 1500 to 2000 ft in trail. (Possibly three elements of two MIGs each.)	B2 previously aborted at refueling. BLUE flight part of strike forces composed of F-105s and F-4s with five minutes TOT separation. BLUE flight third flight in strike force with several flights behind.
T1A		Jettisoned ordnance, tanks dropped; center MER did not eject; AB ignited. Began hard right-hand climbing turn to 10,000 ft and came back down.		B1 calls "Ordnance off"--afterburner.	MIGs at approx 5000 ft stayed level in hard right turns.	Immediate decision to engage MIGs. Procedures for jet-tisoning complex.
T4A	Altitude 6000 ft, speed 500 kt.	Sees MIGs' cannon puff, loses visual contact with B3 & 4, continues three hard right 360° turns in vertical plane, climbing to 10,000 ft and 300 kt and diving to 2000 ft and 600 kt. In and out of afterburner in turns; used burner to close on target. In the turns attempted to fire SIDEWINDERS--three fired, but no hits; one SIDEWINDER lunged. At one time a MIG approached from 4 o'clock and an overshoot was forced by a high-speed yo-yo. After this, the third SIDEWINDER was fired.	For B3 & 4 activities, see B4 event summary.	B1 called break to B4.	Firing on BLUE flight. MIGs making level turns.	After the call of break, the flight became completely separated, operating as three separate aircraft.
					A lot of MIGs in a turn, but seen singly, in plain view.	Used burner to close on target. B1 tried to pick up MIGs within missile parameters. The tone briefing was marginal. During the turns, MIGs are never a threat to B1--never sees detonation of any missile. One SIDEWINDER was fired at a MIG who was close behind an

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EVENT 1-45 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T _{4A}						F-105. MIGs acquired at about a mile, and by the time an attack was established & set up, the range was about 2500 ft. By time position reached where he was tracking and had 9 profile regulated so g could be relaxed and still keep MIG in reticle & SIDE-WINDER 9 envelope. Range was about 2000 to 1500 ft.
After T ₄ the time/event marks are no longer synchronized between 81 and 84.						
T _{5A}	Altitude 10000 ft; speed 600 kt.	Sees MIG at 5 o'clock.. Sees MIG ahead.	F-105s coming out from target also engage MIGs. See Volume II.	Called break for B3, but not sure MIG firing at B3. No acknowledgement.	MIG at 5 o'clock firing cannon. MIG at 7000 ft altitude going away in a slight right turn.	
T _{6A}	10,000 ft lookdown aspect on MIG-- almost straight and level.	Locks on and fires, full system two SPARROWS-- interlocks in. Does not see detonation of second missile.	No contact. See B4 Time/Event Chart.		MIG heading NW 7000 ft. MIG broke right when missile SPARROW did not halfway there and second SPARROW passed 6 o'clock position 500 to 1000 ft from MIG.	MIG initially in parameters. First SPARROW did not guide. Firings with full system lockon-interlocks in.
T _{7A}	8000 ft.	B1 up to 10,000 ft and left. Lost sight and concern for MIG.				

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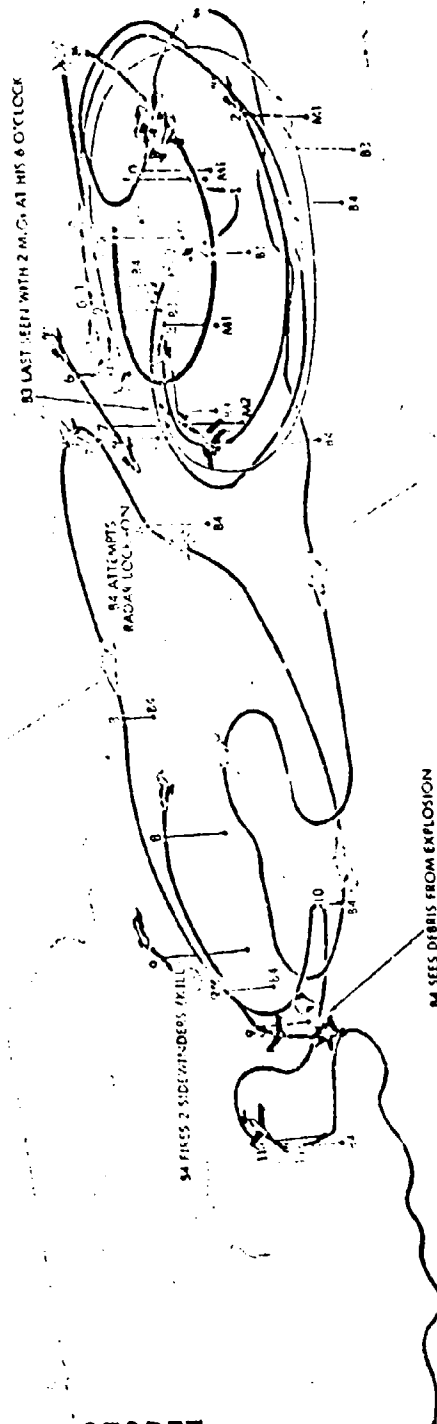
EVENT 1-45 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T 8A	10,000 ft.	Picked another MIG. Attempts to fire last two SPARROWS in bore-sight. No lockons -- no fire.			MIG 11 o'clock heading SE.	
T 9A	10,000 ft.	Gained 6 o'clock at 600 ft from MIG -- able to track left turn 1/2 to 1 min -- broke off as energy dissipated. Tries SPARROW & SIDE-WINDER. No firing.			Initial slight left turn, then rolled out MIG at 12 o'clock.	No tone on SIDE-WINDER firing attempt.
T 10A	6000 lb fuel. 15,000 ft.	Picked up B4 and headed E. Refueled on way out.		B1 gives "BINGO" call. Calls B4-- join up.		

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EVENT I-45



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EVENT I-45 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T00	Fuel 12,000 lb; 500 kt; 4500 ft altitude; MRT. 2 Wing Tanks, 457 lb 4 750 GP bombs 4 SPARROWS 4 SIDEWINDERS	B4 sees three 2-aircraft elements.	See B1.	See B1.	See B1.	See B1.
T18	4500 ft altitude; 500 kt TAS.	Turned right to attack MIGs. Lost sight of last two elements of MIGs. Passed attack against lead elements.		B1 message "Jettison ordnance and tanks."	MIGs approx 5000 ft stayed level in hard right turns.	B4 not able to jettison tanks and ordnance--missed the switches.
T28	4500 ft MRT.	Turning to attack had element of MIGs in 16- unit turn.	See B1 Time/Event Sheet. B3 one- half mile out and one-half mile back in trail.	B1 called "Break"-- MIG closing in rear.	Lead element of MIGs outturn B4 and gained position at 4 to 5 o'clock.	Due to ordnance load could not maintain turn.
T36	4000 ft MRT.	Turning right 3g.	B1 leading attack. B3 observed with element of MIGs approaching from rear.	B4 called B3 warn- ing of MIGs.	Follows B4.	B4 lost sight of second MIG of lead element which is following him.
T40	2000 to 3000 ft altitude; 500 kt.	B4 broke hard left in AB with split-S to 50 ft off the ground. MIG observed to begin to follow. Reversed to right; disengaged from MIG with hard maneu- vering turns and jinking, staying close to ground.	B3 observed out wide in right turn with two MIGs at 4 to 5 o'clock firing.	B1 called "Break hard."	MIG at 4 o'clock level firing at B4. Two MIGs at 6 o'clock on B4, firing.	B4 realized that he had not jettisoned ordnances and tanks.
	Time/Event marks are not synchronized between B1 and B4 from T4 on.					

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EVENT J-45 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T5B	50 ft & 500 ft AGL; 550 to 600 kt TAS; in AB.	Jettisoned wing tanks, bombs and MER. Makes hard turns to check 6 o'clock. Does not see MIG. Turns to return to engagement area, out of AB and climbs to 1000 to 5000 ft.	Lost contact with B1 and B3.	Much chatter on radio. Not intelligible.	Disengaged.	Runs to ridge line area; makes maneuvers close to ridge line despite speed. All stores jettisoned cleanly.
T6B	4500 ft; 500-600 kt TAS; MRT.	Sights MIG at 12 o'clock head-on, 3 to 4 mi away. Attempts radar lock-on without success. Attempts bore-sight firing without success.			MIG 4500 ft level.	Cannot get radar lock due to clutter and confusion.
T7B	4500 ft; 550 kt; MTR.	Passes MIG head-on, 500 ft separation. Commences left turn and engages AB. Turn is 16-17 units.			MIG 4500 ft level.	
T8B	2500 ft altitude; 550 kt TAS. 16-17 units of angle of attack. In AB.	Hard left turn completed. At finish of turn, sights MIG ahead in light maneuvering. Changed from SPARROW to SIDEWINDER.			MIG altitude 4500 ft.	
T9B	4000 ft altitude; 550-600 kt in AB slight left bank.	Closes to within 1 mi with MIG at 6 o'clock. Fires two SIDEWINDERS. MIG sighted rolling in on B4. Hard left break down to 2000 ft altitude. Turn is 20 units.			Light maneuvering; shallow turns; no evasive maneuver. MIG in slight left bank. MIG attacks B4 rolling in from barrel-roll. MIG at about 6500 ft. Inverted.	Fires two SIDEWINDERS within 5 sec. Both missiles appear to guide. Back sights MIG rolling as from above to attack B4. Could not follow SIDEWINDER due to evasive maneuvering.

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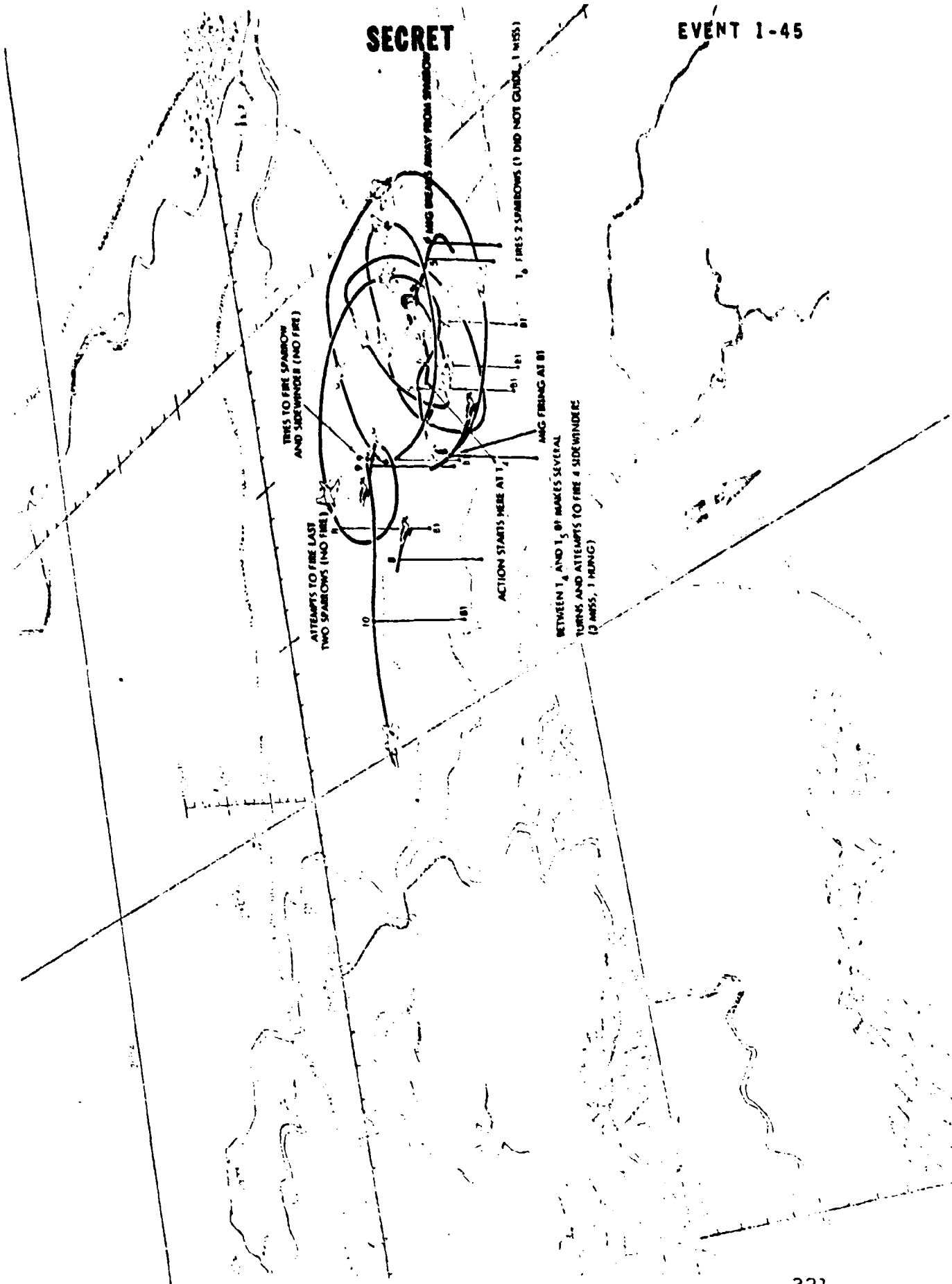
EVENT I-45 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T108	2000 ft altitude; 500-600 kt in AB.	Reversed turn to hard right. Sights debris and parachute where MIG had been. Turns are 20 units. Comes back over the top.				
T118	7000 ft altitude to 25 ft in AB; 550-650 kt; fuel state 2000 lb.	Back still sees MIG following. Rolls around into a sort of split-S to 25 ft off the deck; made some hard jinks, heads out. Runs down B1 on radar intercept. Thinking B1 is hostile. Refueled on way out.			MIG above at 7 o'clock.	

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EVENT 1-45



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EVENT 1-46

Aircraft Involved: Three F-4Cs vs two MIG-17s

Result: One F-4C lost

Vicinity of Encounter: 21°13'N/106°28'E
Route Package VIA

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Sep 1966/0920H

Strike on JCS-16 primary mission, back-up mission, MIOCAP. Flight of three F-4Cs proceeding to Route Package VI A (fourth returned to base due to refueling difficulty). Two minutes out from target area the F-105s over target reported MIG attack. F-4s jettisoned ordnance and proceeded at high speed into the delta just east of the target.

2. MISSION ROUTE

Proceeded west from Gulf of Tonkin, north of the ridge line, north of Haiphong; during engagement turned toward Haiphong and egressed generally over inbound route.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3

- 4 - CBU-24 (B1)
- 4 - 750-lb bombs on centerline (B2 & B3)
- 2 - 370-gal tanks
- 4 - SIDEWINDER (AIM-9) on inboard station
- 4 - SPARROW (AIM-7)

Radar, TACAN, IFF operating

MIG-17 MIG 1, 2

Guns
Camouflage

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear, 5 mi in haze.

	BLUE
	1 2 3
<u>Altitude:</u>	-----4500 ft-----
<u>Speed:</u>	-----450 knots-----
<u>Fuel State:</u>	Full internal (some still in wing tanks) 11,500-12,000 lb

Flight Formation:

Relative to BLUE 1: BLUE 2 - 30° cone behind BLUE 1 and 1500 ft out to right
BLUE 3 - 20°-30° back and flying high and 4000 ft to left

5. INITIAL DETECTION

Flight was inbound to target when MIG alert was called by RB-66 aircraft. At the same time warning was given when F-105s were engaged by MIGs. MIGs were initially acquired visually. They were seen climbing up "out of the terrain" at 6 o'clock position. Flight leader (BLUE 1) reported seeing three MIGs; BLUE 2 noted two MIGs. Range at contact approximately 1500 ft.

6. ACTION INITIATED

BLUE 2 and 3 jettisoned the 4 750-lb bombs carried on centerline station at MIG alarm. BLUE 3 jettisoned fuel tanks; BLUE 2 did not. MIG 1 fired cannon at BLUE 2 "intermittently." MIGs at BLUE 2's 3, 9, and 7 o'clock positions. BLUE 3 maneuvered into position to attack MIG 2.

7. SITUATION DEVELOPMENT

After MIG 1 made cannon attack on BLUE 2, BLUE 2 was instructed to break hard left and egress the area. Although there was no immediate indication that BLUE 2 had been hit by gunfire, he had received four or five probable aircraft cannon hits. BLUE 2's left engine exploded en route to the Gulf of Tonkin. Later the right engine flamed-out from fuel starvation and BLUE 2 ejected. BLUE 3 sighted second MIG at 9 o'clock and positioned to fire SIDEWINDERS at MIG 2. BLUE 1 maneuvered into MIG 2's 6 o'clock position and fired both SIDEWINDERS and SPARROWS at MIG 2.

MIG 2 did not turn back to fight, but maneuvered violently to avoid the missiles fired at him while following a general heading toward Haiphong. On anticipated low-altitude engagements, BLUE flight had prepared to use SIDEWINDERS.

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8. ORDNANCE

EVENT 1-46

	SPARROW AIM-7	(No. fired/No. hits) SIDEWINDER AIM-9	Cannon	Remarks
BLUE 1		3/0		Good tone before firing; firing against blue sky background. Later opinion range was below minimum; missiles did not guide. One missile known to be inoperative and was not fired; launch of the second missile judged to be within range and g-force limits. Tracked enemy in AB; missile detonated behind violently maneuvering aircraft. First 2 fired in boresight mode at 500- to 1000-ft altitude. 5-6000-ft range. Detonation not observed. Of second 2, one missile hung up on launcher; one tracked and detonated in vicinity of aircraft. No remarks.
BLUE 2	0/0	0/0		
BLUE 3		3/0		Fired singly. Opinion that missile launch was inside minimum range. No tone. Missiles did not guide.
MIG 1			1/0	Sporadic firing of guns observed.

9. EQUIPMENT PROBLEMS

BLUE 1 - One SIDEWINDER inoperative before take off, one SPARROW malfunction during encounter.
 BLUE 2 - (Back) radio and intercom out when stores jettisoned. Survival raft inflated with difficulty. BLUE 2 pilot's raft did not inflate.
 BLUE 3 - 1 SIDEWINDER inoperative. Maintenance personnel reported no previous history of problems with missiles fired, but BLUE 1 APA-157 launch computer failed postflight check.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
BLUE 1 (Front)	2450	800	75	5-1/2 years F-100, 3-1/2 years F-4C - instructor, test work; extensive gun/missile experience, AF Fighter Weapons School, Nellis Air Force Base.
BLUE 2 (Front)	430	200	62	No gunnery or missile firing experience.
BLUE 3 (Back)	3100	350	20-30	Had fired SIDEWINDERS and cannon from F-100. Fired 1 SPARROW from F-4 prior to event.

Comments on this Encounter

BLUE 1 (Front) - Believed MIGs have developed tactics to defeat missiles. Would like to have gun -- feels would have more control. Need range information or device to indicate "in range," and in firing envelope. On each firing, observed MIG to fly a continuing hard "S-ing" maneuver and toward lower altitudes.
 BLUE 2 (Front) - MIGs broke off because BLUE 2 outran them, reaching Mach 1.2-1.3. There is about a 40° cone in the F-4 where you cannot see a thing and the back must pull himself around to see behind. MIG seemed radar vectored.
 BLUE 3 (Back) - Guns would have killed MIG. Struggled to open range for missile envelope. Aircraft performance adequate for engagement.

Comments from Overall Experience

BLUE 1 - Firm believer in two-man crew. Prefers second man be a pilot.
 BLUE 2 - Advantage of back seater on night missions -- simply keep pilot informed of altitude when pulling up from run under flares helps to keep from running out of airspeed.
 BLUE 3 - Suggests varying frequency tone to give indication of all parameters satisfied. This would permit watching MIG and not taking eyes off target "to look at piper." Prefers navigator -- radar specialist, not pilot, but should have instrument training for night bombing. Weaponwise -- pilot required to throw too many switches.

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11. DATA SOURCES

EVENT I-46

Project Interviews:

BLUE 1(Front)- 8 Jan 1967
BLUE 2(Front)- 9 Feb 1967
BLUE 3(Back)- 8 Mar 1967

Messages, Reports:

7AF MSG/211124Z Sept 1966 DOCO 25829
7AF OPREP-3/221544Z Sept 1966 DOCO 25906
35TFW MSG FASTEL 795 Sept 1966 210940Z Sept 1966
35TFW MSG FASTEL 804 Sept 1966 211415Z Sept 1966
35TFW MSG FASTEL 780 Sept 1966 210615Z Sept 1966
35TFW MSG FASTEL 778 Sept 1966 210442Z Sept 1966
7AF MSG 212252Z Sept 1966 DIO 30492

12. NARRATIVE DESCRIPTION

A flight of three F-4Cs was flying west at 4500-ft altitude to provide MIOCAP for F-105s reported under attack in the target area. The F-4s jettisoned ordnance and proceeded to the target area at high speed, BLUE 2 was about 1500 ft out and 30° behind BLUE 1. BLUE 3 was 20°-30° back and high behind BLUE 1. BLUE 2 was right wing, BLUE 3 was left wing. The flight was engaged by two or three MIG-17s (BLUE 1 called three; BLUE 3 reported two MIGs) who climbed up from below and to the rear of the formation; apparently under OGI. BLUE 3 sighted the attacking MIGs approaching from the 4, 5, and 6 o'clock positions. BLUE 1 and 3 broke right, into the MIGs. MIG 1 maneuvered into firing position on BLUE 2. When BLUE 2 turned left MIG 1 followed a pursuit course firing on BLUE 2, intermittently. While BLUE 2 was turning left he was hit by "four or five" aircraft cannon rounds (reported "thumps"). BLUE 2 continued a hard diving left turn, completing two 360° turns. MIG 1 broke away to the right and was not seen again. BLUE 2 egressed the area at low level and at a high rate of speed and subsequently ejected over the Gulf of Tonkin after the left engine exploded as a result of the hits sustained from MIG 1 and the right engine flamed-out from fuel starvation.

BLUE 3 observed one MIG (MIG 2) in the 9 o'clock position. BLUE 3 maneuvered in behind MIG 2 and was followed by BLUE 1. BLUE 3 could not obtain a "tone" but decided to fire SIDEWINDERS "visually". The first two missiles were fired inside minimum range and did not guide. The MIG either outmaneuvered the third missile or the missile did not guide.

BLUE 1 then took the lead and released three SIDEWINDER and three SPARROW missiles. The first two launches were probably inside minimum range. The third SIDEWINDER was within the envelope with good tone and the MIG was in afterburner, but the MIG appeared to outmaneuver the missile. BLUE 1 went boresight, put the MIG under the pipper and fired the first two SPARROWS with inter-locks-in. When the SPARROWS were released, the MIG dove for the ground. Two more SPARROWS were fired, one hung up and the other detonated close to the MIG. The SPARROWS appeared to guide but the MIG was able to see them coming and outmaneuvered them. BLUE Flight was near BINGO fuel and the engagement was moving close to Haiphong so they broke off to the left and the MIG continued on toward Haiphong.

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EVENT I-46 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	Bombs jettisoned in preparation for MIG engagement. B1 retained tanks. B2&3 jettisoned tanks	Inbound to the target (JCS-16)	Heading west altitude 4500-6000 ft. tactical formation - B2 right wing 1500 ft out; B3 left wing 4000 ft out and high	F-105s called MIGs attacking in the target area. B3 sights and calls "MIGs 3, 9 & 7 o'clock low"	MIGs coming in and up from 6 o'clock to 3 o'clock position	
T ₁		B1 broke down and into MIGs. reversed to the left. B2 unable to stay in turn, breaks off to left. B3 continues hard right diving turn 270° - 360°.	BLUE flight is split up. B1&3 400 ft reversing left in climbing turn. B2 turning left. B3 continues right turn to about 270°.	B2 rear seat sights MIGs during turn. calls them out, but intercom is not transmitting.	M1 drops in behind B2. M2 probably followed M1 in the left turn going high.	3 MIGs sighted. 2 MIGs engaged.
T ₂	Same	B1 after completing reverse sees MIG shooting at B2. B3 sees 2 MIGs. 1 shooting at B2 and the second at 9 or 10 o'clock. B2 starts a diving left turn	M1 at B2's 6 o'clock. B1 is 1000-2000 ft behind M1 and B3 is 2500 ft behind B1.	B1 called B2 to break left. B3 called "MIG 9 o'clock"	M1 shooting at B2. M2 is at 9 o'clock to B2.	
T ₃	B1 same B3 idle and speed brakes	B3 turns into M2 and B1 follows B3 around the turn. B2 is turning left at high speed and very low level completes two 360° turns and departs the area for the poststrike tanker	B3 in a left turn very close to M2. B1 behind them		M1 broke off B2 in the turn and left the area. M2 is turning left with B3 very close behind him	B3 too close to MIG and attempts to back-off to shoot SIDEWINDER.

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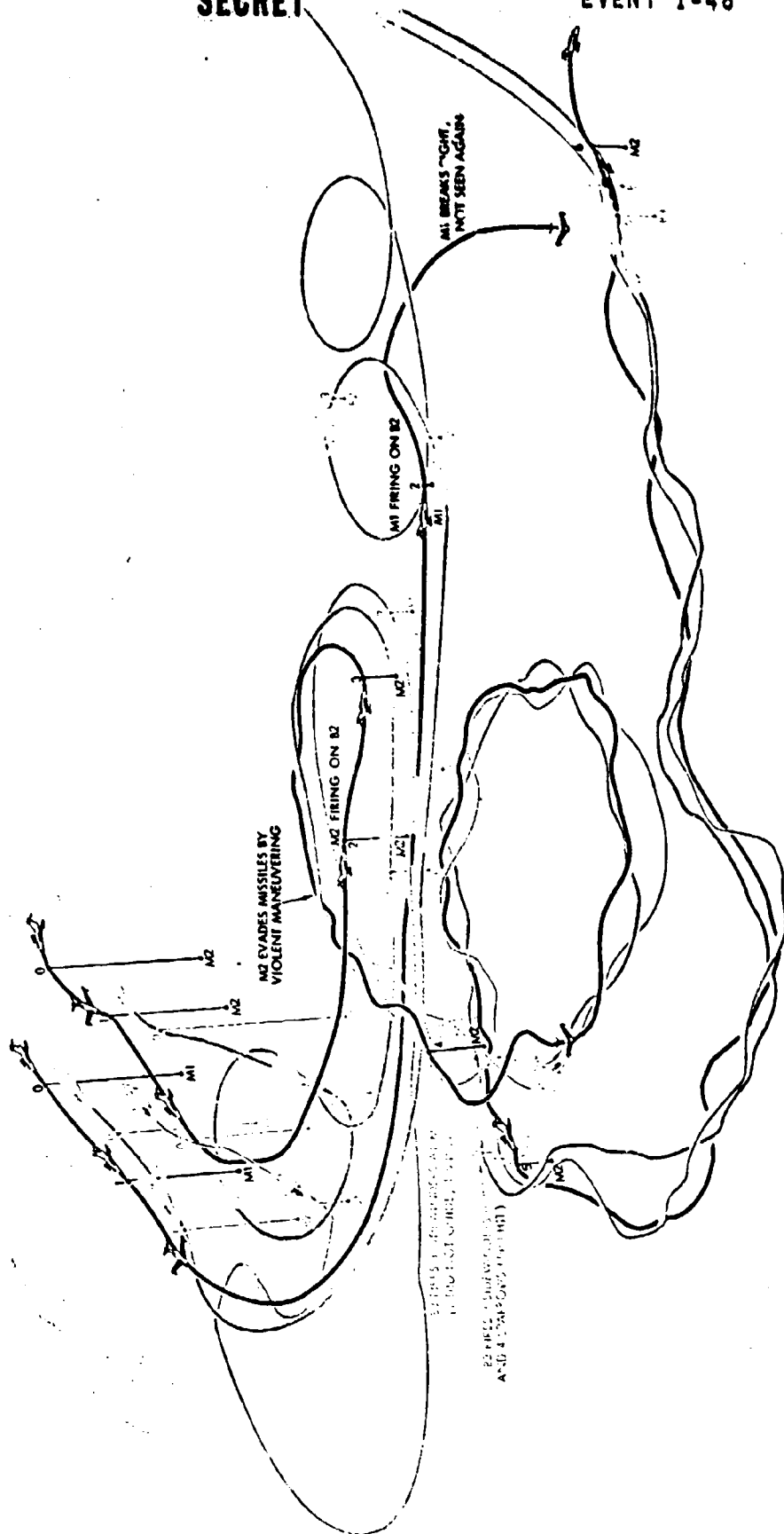
EVENT I-46 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T 4		B3 behind M2 trying to back off to get within the SIDEWINDER firing envelope. B1 pulled into B3 6 o'clock and thence around to his 9 o'clock. BLUE 3 fires three SIDEWINDERS at M2	B2 on his way out of the area. B3&1 behind M2		M1 has departed area. M2 is in a series of diving, climbing turns avoiding SIDEWINDERS	B3 fired 2 SIDEWINDERS inside the minimum range. They did not appear to guide. The third SIDEWINDER seemed to guide but the MIG saw it and out-turned the missile causing it to miss.
T 5		B1 took over lead and fired 4 SPARROWS and 3 SIDEWINDERS. B3 flew fighting wing on B1.	BLUE flight now in normal fighting formation with B1 in the lead		M2 employing dives and zoom and hard turns in an effort to evade the missiles. M2 in afterburner most of the time.	B1 fired 3 SIDEWINDERS (1 missile defective and not fired.) Also fired 4 SPARROWS, but one hung up on the rail. B1 believed to be within the minimum launch range with 2 SIDEWINDERS but did not guide. Other SIDEWINDER seemed to guide well. The MIG was able to outmaneuver missiles by taking extreme evasive action when missiles were launched.
T 6	B1 ordnance expended. B3 has 4 SPARROWS, BINGO fuel.	Engagement ended at this time. BLUE flight was BINGO fuel. B3 still had 4 SPARROWS, but had lost MIG in the haze and unable to regain contact.	B1&3 broke off to return to base.	B1 asked B3 to fire any ordnance but B3 was BINGO fuel and had lost visual contact with the target.	M2 successfully evaded all the missiles and was flying toward Haiphong at low level.	

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EVENT I-46



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EVENT 1-47

Aircraft Involved: Two F-4Cs vs two MIG-21Cs

Result: No damage

Vicinity of Encounter: 21°20'N/106°47'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Sept 1966/1121H

Strike against JCS target 16.00 (Dap Cau Hwy/RR Bridge). After strike to remain in area as MIGCAP until fuel BINGO reached. F-105s striking the same target. BLUE flight was scheduled to be the third or fourth flight on the target that day. MIGs were engaging F-105s.

2. MISSION ROUTE

From Danang over water to 21°11'N/107°30'E, then west to 21°36'N/106°09'E and return by the same route. Refueled en route on BROWN TRACK, at 22,000 ft.

3. AIRCRAFT CONFIGURATION

F-4C BLUE 1 and 2

4 - SPARROW (AIM-7)
4 - SIDEWINDER (AIM-9)
6 - Mk 82 (250-lb bombs)
2 - 370-gal external fuel tanks
1 - 600-gal external fuel tank
Camouflage colors.

MIG-21 MIG 1, 2

Atoll missiles
Cannon
Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Light haze (not considered a factor by BLUE 1)
Altitude: 17,000-ft MSL
Heading: 260°
Speed: 450-kt TAS
Fuel State: Not indicated
Flight Formation: Loose deuce

5. INITIAL DETECTION

While recovering from a SAM break at 5000-ft MSL, BLUE 2 observed MIG-21 at 6 o'clock on BLUE 1(L).

6. ACTION INITIATED

BLUE 2 called MIGs at 6 o'clock several times, jettisoned ordnance and external fuel tanks.

7. SITUATION DEVELOPMENT

MIG 1 fired one Atoll missile and apparently fired out his cannon on BLUE 1 as latter climbed back to 15,000 ft. BLUE 1 did not hear BLUE 2's MIG calls until he reached 15,000 ft, at which time BLUE 1 jettisoned ordnance and external fuel tanks, broke right and descended to the deck to evade MIG 1. (MIG 1 apparently did not attempt to follow.) During climb back to 15,000 ft, MIG 2 was on BLUE 2's tail. MIG 2 fired one Atoll missile and cannon, but broke off the attack before reaching 15,000 ft. BLUE 1 and 2 attempted to re-engage MIGs after their separation maneuver, but were unable to locate the MIGs. No damage to any of aircraft involved.

8. ORDNANCE

	(No. fired/No. hits)		
	<u>Atoll</u>	<u>Cannon</u>	<u>Remarks</u>
BLUE 1 - No missiles fired			
BLUE 2 - No missiles fired			
MIG 1	1/0	?/0	Passed high and to right of BLUE 1 (unknown miss distance)
MIG 2	1/0	?/0	Passed high and to the right of BLUE 2 approximately 100 ft

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EVENT 1-47

9. EQUIPMENT PROBLEMS

None

10. AIRCREW COMMENTS¹

Comments on this Encounter

BLUE 1(L), Front

"Due to excessive amount of radio chatter, did not hear BLUE 2's numerous calls warning that MIG 1 was at my 6 o'clock." This allowed MIG 1 to fire out before BLUE 1 knew he was in danger. BLUE 1 (Back) had not seen MIG 1. Communication situation also hampered front- to rear-seat communications.

BLUE 1 (Front) felt that his flight has been subjected to a coordinated MIG/SAM attack. He felt that the two unidentified aircraft that he saw on reciprocal heading before the SAMs were fired were the MIGs that later jumped him. In essence, the enemy plan of attack appeared to have been the following: The SAMs were fired knowing that if the F-4s saw them, they would break down. This would put the F-4s co-altitude with the MIGs. It would require accurate timing. However, the MIGs in conjunction with the SAM firing could have made a 180° turn and arrived in position of the F-4s as they bottomed out of the SAM break.

BLUE 2, Front

Due to all flights operating on the same frequency, radio communication was almost impossible. This lack of radio communications made any coordinated defensive or offensive action impossible.

The lack of an internal gun and lead computing sight denied the flight the short-range, accurate weapon that was needed to turn a near defeat into victory.

Comments from Overall Experience

BLUE 1, Front

MIGs have a great respect for the F-4.

MIG-21 has a real problem in disengaging from the F-4. The only chance MIG-21 has is to get down to the treetops where it is difficult to acquire him either in a SIDEWINDER or SPARROW shot.

The F-4 has no problem turning with the MIG-21 below 15,000 ft at about Mach 0.9.

The F-4 should have a gun but not at the expense of the existing missile capability, i.e., a gun in addition to the missiles to give it a close-in capability.

As to the utilization of the back seater during an engagement, he wants the back seater to lock his eyes on an identified MIG. He does not want him to look away until relieved by the front seater.

The F-4 should get every MIG that gets on his tail.

11. DATA SOURCES

Project Interview: BLUE 1 -(Front) 28 Jan 67.
Messages, Reports: Letter - BLUE 2 (Front), (undated, approx 15 Feb 67)
35th TFW, OPREP-3, 210440Z Sept 66 FASTER 777
35th TFW, OPREP-3, 210745Z Sept 66 FASTER 787
7th AF, OPREP-3 211433Z Sept 66 DCC 25843

12. NARRATIVE DESCRIPTION

On 21 September 1966 BLUE flight of four F-4Cs was scheduled for a strike mission against JCS Target 16.00 (Dap Cau Hwy/RR Bridge) and to function as MIGCAP after the strike mission. Two of the F-4Cs aborted and the other two, BLUE 1 and 2, proceeded on the mission as planned. Each F-4C carried six Mk 82 (250-lb general-purpose bombs), four SIDEWINDER missiles and four SPARROW missiles in addition to two 370-gal fuel tanks.

T0 At about 1120 (local time) while at 17,000 ft on heading 260°, BLUE 1(L) observed two unidentified aircraft pass under the flight on a reciprocal heading. He assumed them to be F-105s departing the area. BLUE flight was scheduled as the third or fourth flight to hit the target that day.

T1 At 1121 (local) BLUE 2 called SAMs at 12 o'clock. BLUE 1 also observed the SAMs, waited for the proper time, and called the SAM break. The two SAMs, when picked up, were at 8000 ft on a heading of 90° with a 20° climb angle heading directly toward BLUE flight. SAMs were about 1000 ft apart in trail. BLUE flight was in a loose-deuce formation with BLUE 2 on the left.

At "SAM break" BLUE 1 and 2 rolled almost inverted (i.e., about 45° from the inverted position) and headed down, keeping the SAMs in sight with the idea of making a 4g pull-up as the SAMs started to maneuver downward. The SAMs continued on the original path with no attempt to track.

¹ Aircrew experience data not obtained.

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EVENT 1-47

T₂ As BLUE 1(L), while on heading about 170° and at 5000 ft, started pull up to the right to return to original altitude and heading, BLUE 2 on heading 180° observed a MIG-21 at BLUE 1's 6 o'clock and firing at BLUE 1. MIG was at BLUE 2's 4 o'clock position about 800 ft away. BLUE 2 called MIGs at 6 o'clock and jettisoned bombs and external fuel tanks. However, due to the saturation of radio communications on the assigned frequency, BLUE 1 did not hear this call and continued his climb to 15,000 ft.

T₃ MIG 1 fired one Atoll missile from about 500-ft range which missed BLUE 1(L) high and to the right. MIG 1 continued to fire cannon, apparently firing out during the period. BLUE 1 did not realize he had a MIG at his 6 o'clock. Neither Front nor Back BLUE 1 observed the MIG.

T₄ About the time he jettisoned his ordnance, BLUE 2 observed a second MIG (MIG 2) at his 6 o'clock. MIG 2 fired one Atoll missile, which passed 100 ft and to the right of BLUE 2. MIG 2 then fired cannon, after which he broke off the engagement.

After several attempts to alert BLUE 1 of his situation, BLUE 2 was finally able to get through the communication clutter as BLUE 1 reached 15,000 ft. BLUE 2 advised BLUE 1 to jettison his ordnance, which he did, and then BLUE 1 heard BLUE 2 calling "You have a MIG on your tail, take it down."

T₄ At this time BLUE 1 broke right and down, unloaded the aircraft, and accelerated past Mach 1. BLUE 2 followed.

T₅ After about 45 sec in afterburner at low altitude BLUE flight reversed course to reengage, but was unable to regain visual or radar contact. MIG 1 apparently disengaged about the time BLUE 1 broke.

BLUE flight remained on MIGCAP until BINGO fuel was reached and then returned to Danang.

BLUE flight had not fired any missiles and received no damage from the MIG-21C attack.

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EVENT 1-47 SUMMARY

Time Mark	Action Aircraft (BLUE 1 and 2)		Other Friendlies	Communications	Enemy Actions (MIG 1 and 2)	Remarks
	Status	Action				
T ₀	17,000-ft MSL 450-500-k: TAS Hdg 260°	B1(L) observes two unidentified aircraft pass beneath him on opposite heading. B2 on left of B1 flying loose-deuce formation.				B1 assumes the aircraft are F-105s departing the target area.
T ₁	SAMS at 12 o'clock 80° Hdg 20° climb angle	B1 observes SAMS and waits for proper time to break. B1&2 roll almost inverted (to within 45° of inverted) and head down watching the SAMS to see if they follow.		B2 calls "SAMS at 12 o'clock." B1 calls SAM break.	SAMS do not follow - continue on same flight path.	
T ₂	5000-ft MSL 4g B1(L) Hdg 170° B2 Hdg 180°	B1 bottoms out of SAM break and starts right climbing turn to original altitude and heading. B2 observes MIG-21 (X1) at B1's 6 o'clock and firing. M1 is 4 o'clock, 800 ft from B2. B2 jettisons ordnance and fuel tanks and attempts to position on M1.		B2 calls several times telling B1 he has a MiG on his tail.	At about 500-ft range M1 fired Atoll missile at B1. Missile passed high and right, unknown distance. M1 then fired caution at B1.	B1 does not hear B2's MIG warning because of extreme saturation of the communications. All flights are on the same HF channel.

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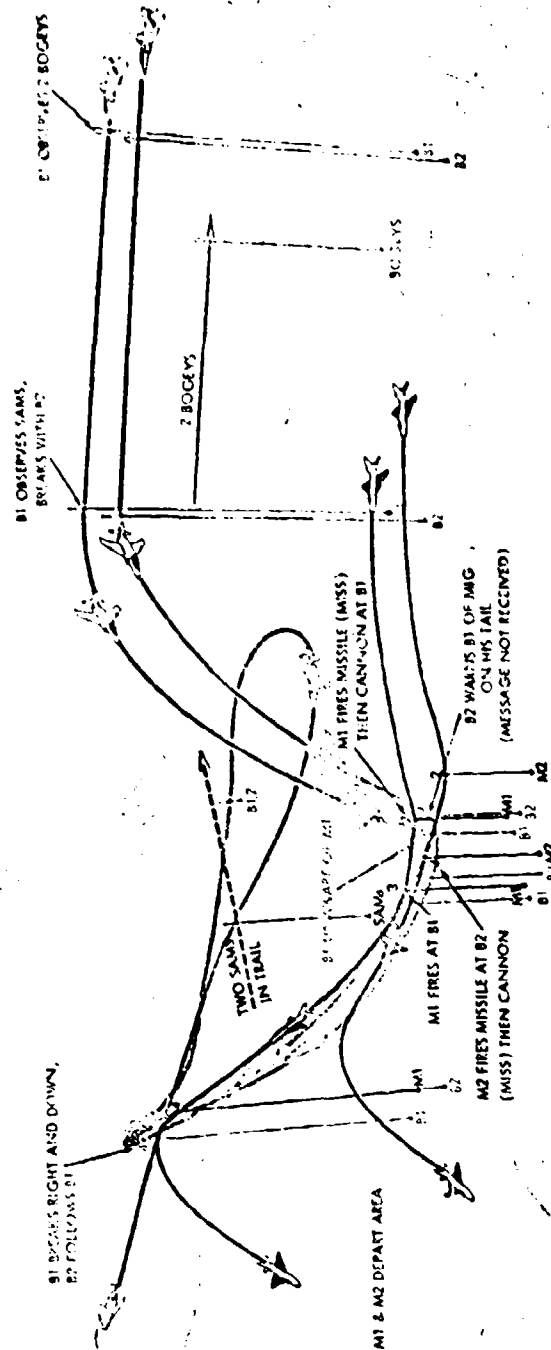
EVENT I-47 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1 and 2)		Other Friendlies	Communications	Enemy Actions (MIG 1 and 2)	Remarks
	Status	Action				
T ₃	Climbing to 15,000 ft 450-500-kt TAS	B1 continues climb unaware of MIG firing at him (right turn). B2 observes a MIG (M2) at his 6 o'clock firing.		B2 continues to transmit warnings to B1.	M1 still firing at B1. M2 fires Atoll at B2 which passes high and right about 100 ft. M2 then fires cannon at B2 and disengages.	
T ₄	15,000-ft AB Mach 1.1+ 500 ft	B1(L) hears B2 jet-tison call and jet-tisons bombs and external fuel tanks. B1 breaks right and down to the deck in AB. B2 follows B1.		B2 tells B1 to jettison ordnance. B2 tells B1 that he has a MIG on his tail and to take it down. B1 hears.	M1 probably dis-engages as B1 breaks.	
T ₅	500 ft AB Mach 1.2	After about 45 sec in AB BLUE flight reverses course to the right in an attempt to re-engage but cannot sight the MIGs. B1 and B2 take up MIGCAP station until reaching BINGO fuel and then return to Danang without further incident.			M1 and M2 have apparently departed the area.	

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EVENT 1-47



SECRET

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EVENT 1-48

Aircraft Involved: Two F-4Cs, one EB-66 vs
four MIG-17s

Result: Sighting only

Vicinity of Encounter: 21°42'N/104°50'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 23 Sep 1966/0800H

Two F-4C airplanes (BLUE flight) escorting an EB-66 (GREEN flight). Two BLUE aircraft were ground aborts, a third was an airborne abort. Orbit point for GREEN flight was approximately 21°30'N/104°50'E. Numerous F-105 flights were conducting strikes in the same area.

2. MISSION ROUTE

BLUE flight departed Danang. The route of flight to the orbit point is unknown.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

4 - SPARROW (AIM-7E)

4 - SIDEWINDER (AIM-9B)

2 - 370-gal wing tanks

1 - 600-gal centerline tank

IFF and TACAN operable but off, camouflage paint

EB-66 GREEN 1

Not given

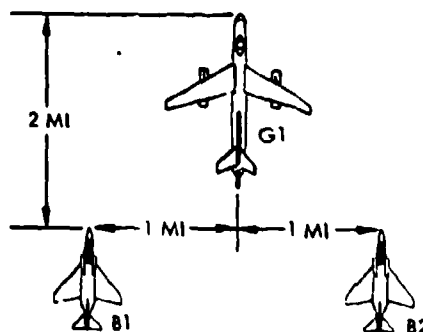
MIG 17 MIG 1, 2, 3, 4

Unknown

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: A very thin, low, scattered layer; clear, visibility unlimited elsewhere.

	BLUE	GREEN
	1 2	1
<u>Altitude:</u>	----- 30,000 ft -----	31,000 ft
<u>Heading:</u>	----- 360° -----	360°
<u>Speed:</u>	----- 0.8 Mach -----	0.8 Mach
<u>Fuel State:</u>	----- 9000 lb -----	Unknown
<u>Flight Formation:</u>		



5. INITIAL DETECTION

BLUE 2 Front and Back simultaneously sighted a flight of four MIG-17 airplanes at 3 o'clock, 5000 ft, heading 250°, in direction of F-105 flights, about 2 mi E of Yen Bay. BLUE flight was passing over Yen Bay at this time and was observing F-105 flights making strikes directly below them.

6. ACTION INITIATED

None. BLUE 2 was unable to communicate to BLUE 1 due to excessive radio chatter by the F-105 flights. BLUE 1 never sighted MIGs.

7. SITUATION DEVELOPMENT

BLUE flight maintained its escort position in orbit until scheduled return time.

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EVENT 1-48

8. ORDNANCE

None expended

9. EQUIPMENT PROBLEMS

BLUE 1 - None
BLUE 2 - None

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>
BLUE 1 - Front	-----	Unknown	-----
BLUE 2 - Back	800	500	100

Comments on this encounter

BLUE 1 - Front

Excessive radio chatter by F-105 flights.

BLUE 2 - Back

Pilot thought it would have been very simple to dive down on the MIG flight and shoot down at least one before the MIGs knew he was there. He said he would have closed to 1 to 2-1/2 mi. and then started firing SIDEWINDERS.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front), 29 Jan 67
BLUE 2 (Back), 17 Mar 67
Messages, Reports: 35TFW 220305Z Sep 66

12. NARRATIVE DESCRIPTION

BLUE flight launched from Danang as a scheduled four-plane escort of an EB-66; however, only two F-4C aircraft actually made the flight. BLUE 1 and 2 proceeded to the tanker, then north to Yen Bay to the prescribed orbit point. Where GREEN 1 joined the flight is unknown. GREEN 1 established a left orbit oriented N-S, escorted by BLUE 1 and 2.

After approximately one orbit, heading 360°, BLUE 2 Front and Back simultaneously sighted a flight of four MIG-17 aircraft at 3 o'clock, very low (approximately 5000 ft) heading 250°. Because of excessive radio chatter BLUE 2 was unable to inform BLUE 1 of the MIGs or to warn several flights of F-105s directly below BLUE flight making strikes. The MIGs continued 250° on an intercept course for the F-105s, who very shortly called out that they were being attacked by MIGs. BLUE 2 finally contacted BLUE 1 but BLUE 1 decided to maintain position on the EB-66. GREEN 1 continued in his orbit approximately 20 min and then egressed with BLUE flight.

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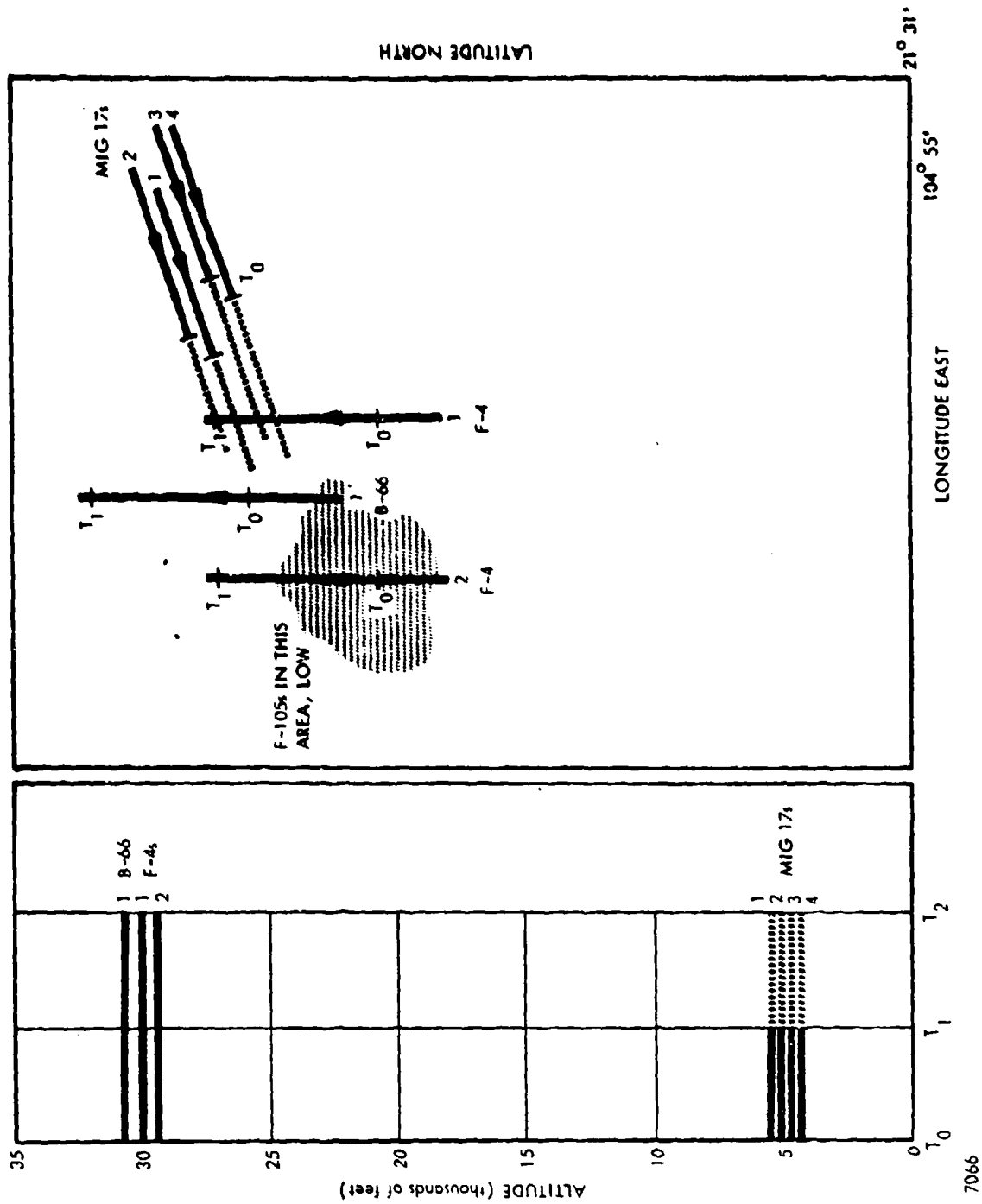
EVENT I-48 SUMMARY

Time Mark	Action Aircraft (BLUE 1,2)		Friendly Aircraft (GREEN 1)	Communications	Enemy Actions (MIG 1, 2, 3, 4)	Remarks
	Status	Action				
T ₀	B and 2 at 30,000 ft. Mach 0.8. Heading 360°. 9000 lb of fuel. 2 mi in trail of G1	B2 sights a flight of 4 MIG-17s	G1 at 31,000 ft. Mach 0.8. Heading 360°. Several flights of F-105s directly below BLUE flight making attacks	B2 attempts to call B1, but radio is completely saturated by F-105s	Four MIG-17s at approximately 5000 ft. Heading 250° in direction of F105 flights	
T ₁	Unchanged	BLUE flight continues on escort mission		B2 finally informs B1 of MIGs		MIGs seen only by C2

SECRET

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EVENT I-48



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EVENT 1-49

Aircraft Involved: Four F-4Cs vs two MIG-17s

Result: Sighting only

Vicinity of Encounter: 21°17'N/107°00'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 27 Sep 1966/1600H

Four F-4Cs on MIGCAP mission from 1505H to 1630H with orbit area in vicinity 21°34'N/106°47'E.

11. DATA SOURCES

Messages, Reports:

7AF 272224Z Sep 67 DIO 30540.

CINCPACFLT Staff Study, 3-67.

12. NARRATIVE DESCRIPTION

BLUE flight of four F-4Cs on MIGCAP mission sighted two MIG-17s. No engagement occurred. F-4C flight was headed 300° at 6000 to 8000 ft altitude. When BLUE 3 saw MIGs near 21°17'N/107°00'E heading 225°. MIGs made no attempt to engage. BLUE 3 lost the MIGs in a right turn and was unable to make further contact due to cloud cover.

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EVENT I-60

Aircraft Involved: Two F-4Cs vs three MIGs

Result: Sighting only

Vicinity of Encounter: 21°30'N/105°30'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: September 1966/

Two F-4Cs (BLUE flight) escorting an EB-66 acting as ECM support for an F-105 strike. Aircraft were in an east-west orbit across the Red River valley north of Hanoi.

11. DATA SOURCES

Project Interviews: BLUE 1 (Back) 10 March 1967

Messages, Reports: None

12. NARRATIVE DESCRIPTION

BLUE flight was on heading of about 040° at an altitude of 30,000 ft with BLUE 1 to the right and BLUE 5 to the left of the EB-66. BLUE 1 (back) sighted two MIGs at his 7 o'clock low heading about 220°. BLUE 2 confirmed the sighting and indicated there were three MIGs in the formation. BLUE flight observed the MIGs until they departed the area, but did not attempt to engage because of the flight's primary responsibility to escort the EB-66. Shortly after this sighting, BLUE flight heard an F-105 flight call out that they had been jumped by MIGs. BLUE flight crews felt that this attack may have been by the MIGs sighted earlier.

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EVENT 1-51

Aircraft Involved: One F-4B vs one MIO

Result: No damage.

Vicinity of Encounter: 20°44'N/105°35'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 1 Oct 1966/0814H

Four F-4B aircraft (BLUE flight) were flying routine TARCAP mission for a strike at Phu Ly. After the strike, BLUE flight departed the target area SW to meet TARCAP relief. Approx 15 mi of target area the flight swung north to the vicinity west of the target. BLUE 1 made radar contact with a single bogey heading south, 030° relative, at 15 mi.

2. MISSION ROUTE

Departed the carrier westward to landfall south of the target, proceeded inland, then turned north to Phu Ly. Exited the target area by the reverse route.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1

- 4 - SPARROW (AIM-7E)
- 2 - SIDEWINDER (AIM-9B/Mk-15 fuze)
- 1 - 500-gal centerline tank

Bogey aircraft type unidentifiable due to weather. Configuration unknown.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Target area weather 4500-ft ceiling; broken/overcast in haze. Visibility 5 mi.

BLUE

1

Altitude: 4000 ft
Heading: 360°
Speed: 450 kt
Fuel State: Unknown
Flight Formation: Unknown

5. INITIAL DETECTION

No MIO warning was received. BLUE 1 had completed a right turn to a northerly heading west of the target area when radar contact was made with a single aircraft at 15 mi. The bogey was heading 180° between 4500 and 5000 ft with an overtake of 750 kt at BLUE 1's 1 o'clock position.

6. ACTION INITIATED

BLUE 1 accelerated from 450 kt to 550 kt and started right turn.

7. SITUATION DEVELOPMENT

As the bogey descended from 4500 ft to just above mountain tops BLUE 1 continued descending right and launched a single SPARROW missile at 4-1/2 mi with an aspect heading to bogey of 090°. BLUE 1 and bogey altitude at launch was 2000 ft. BLUE 1 Mach was 0.95 at launch and bogey Mach was estimated at 0.80. Weather at launch position was overcast to 3000 ft with 2-mi visibility in haze. The bogey was in a descending turn at missile firing and appeared to take evasive action by the descending turn into a mountain valley. BLUE 1 visually assessed the missile guiding well and detonating at approximately 200-ft AGL. No wreckage was spotted in area. Both crew members confirmed bogey as being airborne. Miss distance was unknown because of weather/visibility.

8. ORDNANCE

	(No. fired/No. hits)		
	SPARROW AIM-7E	SIDEWINDER AIM-9B	Remarks
BLUE 1	1/0	0/0	Guided well, detonated 200-ft AGL. Miss distance unknown due to weather.

9. EQUIPMENT PROBLEMS

The bogey was possibly able to evade SPARROW BY a descending turn from 2000 ft into mountain valley.

10. AIRCREW COMMENTS

Aircrews were not interviewed.

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EVENT 1-81

11. DATA SOURCES

Messages, Reports:

CTG 77.8 OPREP-4 010312Z Oct 66

Air-to-Air Missile Weapon System Flight Report (NAVWEPS Form 8811/4(12-64) completed by BLUE 1.

12. NARRATIVE DESCRIPTION

Four F-4B aircraft (BLUE Flight) were on a routine target CAP mission for a strike at Phu Ly. After the strike, BLUE Flight retired from the target area and headed south to meet the TARCAP relief. Approximately 15 mi SW of the target area BLUE Flight swung north again to the vicinity west of the target. BLUE 1 made radar contact with one aircraft, 030° at 15 mi. The bogey was heading 180° between 4500 and 5000 ft with an overtake of 750 kt. TAS of BLUE 1 was 450 kt. BLUE 1 accelerated to 550-kt TAS while the bogey descended to just above the mountain tops. BLUE 1 fired one SPARROW missile at 090° aspect angle. The bogey was in a descending turn at missile firing. Range at firing was 4.5 mi. The missile guided well and detonated at approximately 200-ft AGL. No wreckage was spotted in the area. Both BLUE 1 crew members confirmed the target as being airborne. It appeared that the target took evasive action by a descending turn into the mountain valley.

BLUE 1 never made visual contact with the bogey to obtain positive ID.

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EVENT I-52

Aircraft Involved: Two F-4Cs and two EB-66s
vs possible MIGs

Result: 1 F-4C probably lost

Vicinity of Encounter: 21°29'N/104°23'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Oct 1966/0748H

Upon completion of road interdiction mission at 19°14'N/104°15'E at 0740H, BLUE flight of two F-4Cs was diverted to escort mission for two EB-66 airplanes (GREEN flight). EB-66 orbit was oriented north-south at approximately 21°32'N/104°08'E.

2. MISSION ROUTE

BLUE flight launched from Ubon, Thailand, proceeded to their refueling track, direct to the target, direct to the EB-66 rendezvous point, thence direct to the orbit point.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
6 - Mk-82 (500-lb bombs)
Unknown fuel tanks

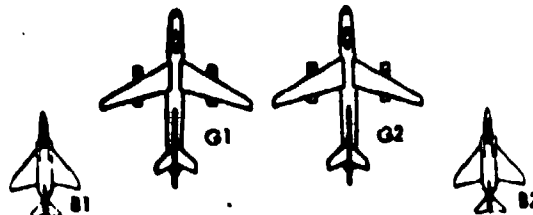
Probable MIGs

Probable AAM

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 7000-8000 ft broken to overcast

	BLUE		GREEN	
	1	2	1	2
<u>Altitude:</u>	About 30,000 ft	30,000 ft	About 30,000 ft	30,000 ft
<u>Heading:</u>	360°	360°	360°	360°
<u>Speed:</u>	-----Approximately 0.8 Mach-----			
<u>Fuel State:</u>	-----Unknown-----			
<u>Flight Formation:</u>				



5. INITIAL DETECTION

Numerous MIG warnings received prior to F-4 being hit. No MIGs ever sighted.

6. ACTION INITIATED

None. First indication of enemy action was by GREEN 2 who observed an airplane going down in flames at the 9 o'clock position.

7. SITUATION DEVELOPMENT

Shortly after the airplane was seen by GREEN 2 going down in flames, the crew members of BLUE 1 were heard on Guard Channel from the ground. The SAR effort initiated successfully recovered only the back seat pilot.

8. ORDNANCE

Suspect BLUE 1 hit by AAM from unobserved MIG.

10. AIRCREW COMMENTS

Comments on this Encounter:

BLUE 1 (Back) thought his airplane was hit by SIDEWINDER-type missile. He heard explosion, and then felt the hit.

11. DATA SOURCES

Project Interviews: None.

Messages, Reports:

7AF MSG 051534Z Oct 66 (S)
7AF MSG 052244Z Oct 66 (S)
CINCPACFLT Staff Study 3-67

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12. NARRATIVE DESCRIPTION

EVENT I-62

BLUE flight launched as a scheduled road interdiction mission from Ubon, Thailand. The flight refueled on time and then proceeded to 19°14'N/104°15'E where each aircraft dropped six Mk-82 bombs with no antiaircraft fire observed at any time. Upon completion of the air-to-ground delivery, BLUE flight was diverted to escort two EB-66 airplanes. BLUE flight rendezvoused with GREEN flight at 18°50'N/104°30'E and established a north-south orbit at approximately 21°32'N/104°08'E.

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EVENT 1-83

Aircraft Involved: Two F-4Bs vs two MIGs

Result: One F-4B lost

**Vicinity of Encounter: Approximately 50
mi south of Hanoi**

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 9 Oct 1966/0830H

BLUE flight of two F-4Bs from an aircraft carrier on RESCAP mission. Target area 50 n mi south of Hanoi. Aerial engagement between F-4s and MIGs.

11. DATA SOURCES

Radio Broadcast - Hanoi VNA International Service in English, 1708Z, 19 Oct 66.

Hanoi Radio, broadcast of BLUE 1 (Back) statement, 12 Oct 66.

12. NARRATIVE DESCRIPTION

USN F-4B #VF-154 was lost on 9 Oct 66. The only supporting statements as to the cause are two Radio Hanoi broadcasts; one a statement from BLUE 1 (Back), who is believed a captive in NVN; and the other a description of air battle by NVN pilot who claims to have made the kill. Following is BLUE 1 (Back) statement as reported by Hanoi radio on 12 Oct 66: "On 9 Oct 66 at 0830H, BLUE 1 (Front) and myself departed from the ship for a target about 50 n mi south of Hanoi. We were #1 in a flight of two F-4Bs. About 10 mi before we got to the target I saw two MIGs in my mirror swooping down upon us. One of the MIGs had already launched a missile. It hit #2. He went down. I called to the pilot, 'MIGs, break.' I was afraid and full of anxiety. The MIGs had the upper hand. As we broke away it was of no use. The second MIG had launched a missile and it hit us in the tail section. We lost control and ejected." Only one F-4B was lost on this engagement. Message traffic (OPREP-3, PINNACLE 004chg 3, Z091018 Oct 66 from CTG 77.3) indicates that the loss was from 57mm AAA, and therefore this event not considered to be a MIG encounter. It is included only for the purposes of completeness. The MIG encounter of the SAR forces is reported in Vol. II.

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EVENT 1-54

Aircraft Involved: Four F-8Es vs two MIG-21s

Result: One MIG destroyed

Vicinity of Encounter: Phu Ly
20°32'N/105°48'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 9 Oct 1966/0845H

Twenty-four A-4s making a strike on Phu Ly. A-4s escorted and capped by four F-8Es flying between 2000 and 5000 ft. Four IRON HAND A-4s at 10,000 ft.

2. MISSION ROUTE

Rendezvoused with A-4s from aircraft carrier, proceeded to vicinity of Ban Wi and took circuitous route to Phu Ly transshipment area.

3. AIRCRAFT CONFIGURATIONS

F-8E BLUE 1, 2, 3, 4

1 - SIDEWINDER (AIM-9B)

1 - SIDEWINDER (AIM-9D)

400 rds - 20mm ammo

Grey-white color, no external stores.

TACAN, IFF, radar operational but radar not in use (See pilot comments)

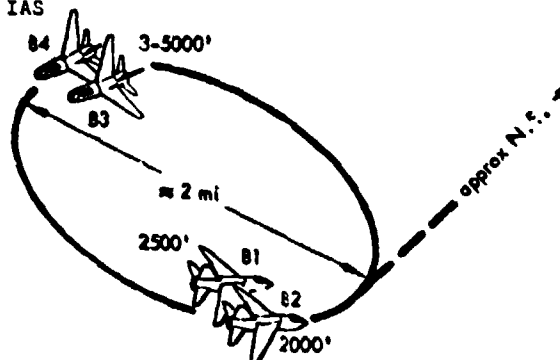
MIG-21 MIG 1, 2

Two or three. Silver color. F-8s reported two MIGs. E-2A detected third MIG returning north.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Heavy haze 5000 to 10,000 ft, visibility 3 to 5 mi in haze. No cloud cover.

	BLUE			MIG
	1	2	3	4
<u>Altitude:</u>	2500 ft	2000 ft	3000-5000 ft	
	BLUE 2 - position 1000 ft behind BLUE 1 and 500-600 ft right of BLUE 1			
	BLUE 3 and 4 - opposite side of TARCAP orbit from BLUE 1 and 2			
<u>Heading:</u>	In counterclockwise orbit; BLUE 1 and 2 approximate northeast heading at detection.			
<u>Speed:</u>	400 to 450-kt IAS			
<u>Fuel State:</u>				
<u>Flight Formation:</u>				



5. INITIAL DETECTION

Visual detection of one MIG-21 at 2 o'clock high -- approximately 9000-ft altitude. BLUE flight in CAP orbit, BLUE 1 and 2 on approximate NE heading. BLUE 1 made first detection. Detection made shortly after returning to orbit from unsuccessful attempt to intercept MIGs reported by both PIRAZ ship and E-2A AEW aircraft. Approximately 0845H.

6. ACTION INITIATED

BLUE 1 and 2 lit afterburners, turned to right and climbed toward MIG.

7. SITUATION DEVELOPMENT

BLUE 1 and 2 positioned to close and climbed at 100 kt to about 1 to 1-1/2 mi from MIG when MIG detected the attack. MIG rolled inverted in crude split-S maneuver, continuing to left and downward slowly. BLUE 1 rolled inverted (matched wings) followed

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EVENT 1-54

and fired SIDEWINDER B, followed shortly after with SIDEWINDER D. He fired in a 20°-30° nose-down, inverted position at a range of 1 to 1-1/2 mi from MIG. BLUE 1 followed leader protecting rear hemisphere and prepared to fire if BLUE 1 attack was unsuccessful. BLUE 3 and 4, upon hearing BLUE 2 call MIG, cut across CAP orbit and climbed high (7000-8000 ft) to protect BLUE 1 and 2. MIG wing blown off by one missile. First missile reported to go "up tailpipe." Parachute sighted. MIG crashed on karst.

8. ORDNANCE

	(No. fired/No. hits)		Remarks
	SIDEWINDER AIM-9B	SIDEWINDER AIM-9D	
BLUE 1(L)	1/1	1/1	BRAVO missiles in first firing position. Insufficient DELTAs available to carry two each.
BLUE 2, 3, 4	0/0	0/0	
MIG 1	Did not fire		

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-8 Hours	Combat Missions	Remarks
BLUE 1	3500+	1000	210	
BLUE 2	1800	1000		
BLUE 3	-----Not interviewed-----			
BLUE 4	650	300	60-65	

Comments on this Encounter

BLUE 2-BLUE 4

Nothing but praise for E-2A AEW aircraft giving MIG alerts and relative positions with strike group. A-4s and A-8s all knew which direction to look.

While the F-8 radars were operable that day, they were not in use since pilots agree that it is necessary to keep head out of cockpit to avoid running into flak trouble.

F-8 pilots believe F-4 with guns and higher g-loading would make outstanding vehicle.

When first over target and setting up the TARCAP orbit the F-8s saw "2 or 3" silver-colored tethered (wire or rope) balloons at about 1500-ft altitude. Investigated, but did not go after them.

Comments from Overall Experience

BLUE 2-BLUE 4

Most engagements degenerated into very low-altitude old-fashioned-type hassle or dogfight. (50-ft to 2000-ft alt). High speeds with afterburners lit -- 550 kt, slowing to 475 kt in turns of up to 7-1/2 g. Accelerometers often pegged at 8-1/2 g.

F-8 guns were general problem. In conditions of 4-1/2 g or greater, guns are not reliable. Also guns stop due to loss of air. Fix has been to put extra "T"-seals in lines so that loss of air on one gun does not affect other three guns.

With high-g loading launches, SIDEWINDERS turn into relative wind, exceed max look-angle and go ballistic.

Pilot needs indication of minimum range for SIDEWINDER. Possibly graduated tone for different ranges so that pilot need not look in cockpit to read ranges off radar to ps.

Most squadron encounters with MIGs found MIG in 6 o'clock position and first detected in mirror. MIGs were usually at lower altitudes and close in.

BLUE 1

This squadron prefers a relatively tight-in wingman position (killer position) to loose-deuce formation.

Would like better radar. MIG in this event was higher than expected (above the F-8s).

Suggest training for fighters include practice for low-altitude hassles.

There is a definite need for a short-range missile (i.e., when turning with MIGs too close-in to use SIDEWINDERS). When guns jam, try to run MIGs out of fuel, then use SIDEWINDER when they head for home.

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11. DATA SOURCES

Project Interviews: BLUE 1 (Lead) - 12 Dec 66
BLUE 2 - 20 Jan 67
BLUE 4 - 20 Jan 67

Message Reports:

OPREP-3 090424Z Oct 66
OPREP-3 090116Z Oct 66
USS ORISKANY Msg 101442Z Oct 66

12. NARRATIVE DESCRIPTION

This engagement resulted in a MIG-21 kill by an F-8E, one of four carrier-based F-8Es on TAPCAP NW of the target. The target under attack by 24 A-4s was Phu Ly (21°32'N/105°48'E). The four F-8Es in two 2-plane elements were flying at altitudes between 2000 ft and 5000 ft in a counterclockwise race-track pattern NW of the target, a position between the MIG threat and the attacking A-4s. Silver tethered balloons were sighted at 1500 ft prior to setting up TAPCAP (see pilots' comments). The briefed procedure was for the two elements to maintain positions on opposite sides of the CAP circle constantly changing altitude, pulling up to 3 g in turns as they jinked around the pattern. There was also an attempt to randomize the CAP pattern.

There was a heavy haze layer from 5000-10,000 ft, visibility of 3-5 mi in the haze and no cloud cover. The low-altitude CAP was chosen to detect low-flying enemy aircraft, since this was considered the primary attack threat.

Four A-4 IRON HAND aircraft were also in the area flying at about 10,000 ft watching for enemy attempts to launch missiles from the complex in the vicinity of the target.

At 0842H a MIG contact was reported by PIRAZ ship (USS KING) giving relative bearing and distances from the striking A-4 aircraft. MIG flight direction 354° and distance (44 n mi) were relayed four times; "44, 37, 22" and "plot merged." Warnings were also received from an E-2A AEW aircraft in the area. BLUE flight reported some confusion due to repeats of contacts from both ship and aircraft. Transmissions from the AEW aircraft were "clearer" because the TAPCAP was at low altitude.

On receipt of contact from the PIRAZ ship, lead F-8 (BLUE 1), and BLUE 2 turned on a 340° heading to intercept the MIGs and continued on that heading until informed by PIRAZ (or E-2A) that the MIGs had passed through and merged plot with the strike group.

During the strike an A-4 called that a delta-winged aircraft had gone through the flight of A-4s. The A-4s broke hard and lost the delta-winged aircraft, which was presumed to be a MIG. Since the plane was not identified and locations of the MIG and A-4s were not identified, the (TAPCAP) orbit was not changed.

T0 BLUE 1 and BLUE 2 returned to the target area and made "a couple" of 360° turns at about 2000-ft altitude. In a NE heading, BLUE 1 locked up and saw a MIG-21 at 2 o'clock on a parallel course at about 9000 ft. The MIG was preparing to make an attack on the IRON HAND aircraft flying at about 10,000 ft. BLUE 2 called "MIG at 2 o'clock." BLUE 1 called for a turn to position on MIGs, lit afterburner and began climbing at 400 kt toward the MIG, closing to approximately 1 to 1-1/2 mi behind him. At this time the MIG pilot gave his first indication that he was aware of the F-8s approach.

T1 BLUE 4 heard BLUE 2 call MIG. Although BLUE 4 saw no MIG, in accordance with the briefed plan, BLUE 3 and BLUE 4 cut across the CAP circle to join up with the lead element and maintain a position to protect the lead's 6 o'clock position, as well as be prepared to attack if the lead expended all ammunition.

T2 As BLUE 1, followed by BLUE 2, closed on the MIG-21, the latter rolled to the inverted position and began a maneuver which looked "something like a split-S." BLUE 1 "matched wings," rolled inverted and as the nose passed through the horizon, the MIG rolled under BLUE 1's gunsight. Upon hearing a SIDEWINDER tone, BLUE 1 fired a SIDEWINDER B followed by a D. (Sufficient Ds were unavailable to the squadron, and hence the procedure was to carry Bs in position to fire first and a D for second shot.) The range was estimated at 1 to 1-1/2 mi.

When BLUE 4 first saw the MIG it was inverted and descending in a slight left-hand turn approximately 1-1/2 to 2 mi away. BLUE 3 and 4 were still climbing "over the top" and were higher than BLUE 1 and 2. BLUE 1 was approximately 1 to 1-1/2 mi behind the MIG at 20°-30°, nose down.

BLUE 1 continued increasing g in the event he had to complete the split-S and possibly close to gun range. As parts of the MIG were observed flying by, BLUE 1 rolled out at about a 60° dive and cleared the area.

BLUE 4 was aware of the missile exploding and then aware of the missile track by the smoke which lead back from the target to BLUE 1. BLUE 4 was of the opinion that he saw the missile "go up the MIG tailpipe." BLUE 4 positively observed a very bright, large explosion surrounded by pieces. The only piece of structure identifiable was

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EVENT 1-54

a delta-shaped wing which tumbled "falling-leaf fashion" to the ground.

At the time of the missile impact and explosion, BLUE 3 and BLUE 4 were at 7000 to 8000 ft and were in a turn about 2000 to 3000 ft above the M10 when it exploded. A parachute was sighted and the remains of the M10 crashed on a forest.

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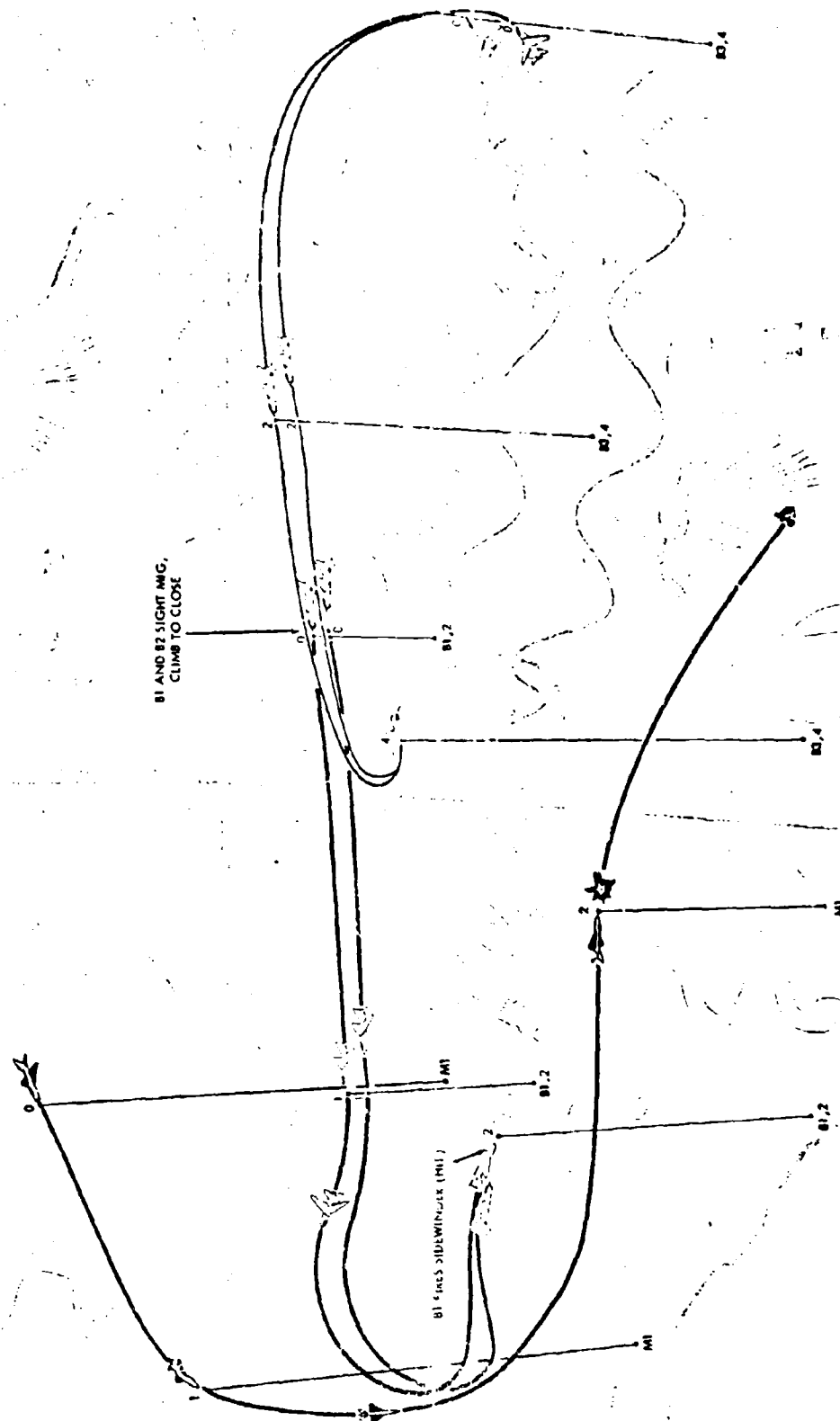
EVENT 1-54 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	B1 2500 ft; 400-450 kts. B2 2000 ft; 1000 ft behind on starboard side. B3B4 approximately 2 mi across CAP orbit. All with 1-98 & 1-9D + 400 rds 20mm.	Flying TARCAP. 15 mi NW of Phu Ly. All aircraft jinking. Pulling 3g turns and randomizing CAP orbit.	B1 sights MIG at 2 o'clock high about 2 mi distance. Goes into AB. B3B4 cannot see MIG but begin cutting across orbit and going high.	B1 calls right turn and climb. B2 calls MIG to B3 and B4.	MIG-21, 9000 ft heading preparing to attack IRON MAN A-4 at 10,000 ft. (External stores: look like drop tanks.)	B1 and B2 had returned from intercept attempt at 3 MIGs after being informed by E-2A that MIGs had flown through and merged with A-4s. At 10 B1 & B2 had completed several 360° orbits after returning.
T ₁	B1B2 climb; 400 kts. 4500 lb fuel. B3B4 cutting across circle and climbing.	B1B2 close on MIG to 1 to 1-1/2 mi where MIG is first aware of F-8s.	B1 rolls inverted to "match wings" with MIG. First indication by MIG that he is under attack is "some sort of split-S" maneuver.		MIG aware of F-8 at 8 o'clock 1.5 mi. MIG rolls inverted and descends in "slight" left-hand turn (crude split-S)	
T ₂	B1 inverted and nose down 20°-30°. B2 protecting B1 rear hemisphere. B3B4 climbing high	B1 has SIDEWINDER cone as nose passes through horizon MIG passes through sight. Releases AIM-9B followed shortly by AIM-9D.	Fired missiles at approximately 6000 ft inverted 20°-30° dive angle - 475 kts. pulling 29s.		MIG hit at approximately 5000 ft alt. One missile blows off wing. One missile appears to go up tail pipe.	

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EVENT I-54



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EVENT 1-55

Aircraft Involved: Three F-4Cs vs various bogeys

Result: Sighting only

Vicinity of Encounter: NW of Yen Bai

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: October 1966

Three F-4Cs (BLUE flight) were escorting one EB-66 (GREEN 1) which was providing ECM support for strikes over North Vietnam. Orbit area was E-W from points north of Thai Ngyen and Yen Bai and NE-SW between the point north of Yen Bai and a point some 40 to 50 mi west of Phu Tho. BLUE flight was instructed to stay with the EB-66 at all times, leaving him only to engage aircraft which were committing a hostile act toward the EB-66 or escorts.

2. MISSION ROUTE

From Danang to the operating area, presumably refueling en route.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3

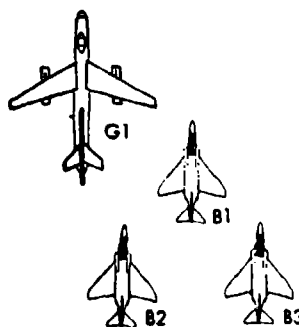
- 4 - SPARROW (AIM-7) fuselage
- 4 - SIDEWINDER (AIM-9) inboard wing stations
- 2 - 370-gal wing tanks, outboard
- 1 - 600-gal centerline tank
- Radar operating

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER¹

Weather: Clear, good visibility

	BLUE			GREEN
	1	2	3	1
Altitude:	---- 28,000-29,000 ft ----			28,000-29,000 ft
Heading:	----- 040° -----			----- 040° -----
Speed:	----- 0.8 Mach -----			--- Unknown ---
Fuel State:	Enough for about 20 min more on station			--- Unknown ---

Flight Formation:



5. INITIAL DETECTION

The EB-66 had been calling out MIGs to the south, east, and SE for about 10 min (contacts from on-board electronic warning equipment) while the flight was on its SW leg. Also, during this time BLUE had bogeys on radar to the south at about 20 mi, on slightly converging courses, losing them as BLUE and GREEN reversed heading to the NE. While on the NE leg BLUE 1 (Back) and another Back in the flight observed two aircraft at about 7000 or 8000 ft below, coming from right to left (on a northerly heading) passing under BLUE flight at a slightly higher speed. The bogeys were only spots in the sky -- markings, color of the aircraft, or outlines could not be distinguished. Normal radar search by BLUE 1 while on this mission was a one bar scan on 25-mi scale.

6. ACTION INITIATED

None

¹Encounter here refers to the visual detection. Conditions listed would be same for the radar detection noted except heading was about 210°.

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EVENT 1-55

7. SITUATION DEVELOPMENT

The flight continued on to normal completion of its mission with no action in response to visual and radar detection of unidentified aircraft. The EB-66 made no further MIG calls after the sighting described above.

8. ORDNANCE

None

9. EQUIPMENT PROBLEMS

None

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1 - Back	420	220	50	

Comments on this Encounter

The bogeys sighted might have been F-105s.

BLUE flight had adequate fuel to engage the aircraft sighted, had they been enemy.

11. DATA SOURCES

Project Interview: BLUE 1 (Back), March 1967

12. NARRATIVE DESCRIPTION

The flight continued on to normal completion of its mission with no action in response to visual and radar detection of unidentified aircraft. The EB-66 made no further MIG calls after the sighting described above.

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EVENT 1-56

Aircraft Involved: Two EB-66s, three F-4Cs vs
one MIG-21

Result: Sighting only

Vicinity of Encounter: 21°50'N/104°55'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 2 Nov 66/1700H

Three F-4Cs (BLUE flight) escorting two EB-66s (GREEN flight). BLUE leader had air-aborted at the tanker.

2. MISSION ROUTE

BLUE flight departed Danang direct to refueling at GREEN ANCHOR then to the IP at 22°05'N/105°07'E, establishing a right-hand-race-track pattern oriented 040°-220° with 50 to 75 mi legs.

3. AIRCRAFT CONFIGURATION

F-4C BLUE 1, 2, 3

- 4 - SPARROW (AIM-7)
- 4 - SIDEWINDER (AIM-9)
- 2 - 370-gal wing tanks
- 1 - 600-gal centerline tank

EB-66 GREEN 1,2

Not reported

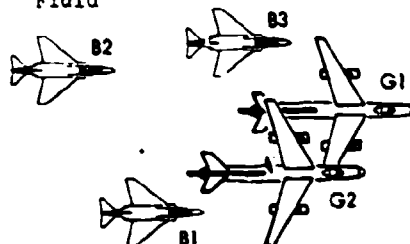
MIG-21 MIG 1

Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear and 10 mi visibility

	BLUE			GREEN	
	1	2	3	1	2
Altitude:	32,000ft	29,000 ft	28,000 ft	28,000 ft	29,000 ft
Speed:	-----	480-kt TAS	-----	-----	Mach 0.8
Fuel State:	-----	8500 lb	-----	-----	Unknown
Flight Formation:	-----	Fluid	-----	-----	-----



5. INITIAL DETECTION

No MIG warnings were broadcast. BLUE 1 saw an aircraft at his 5:30 position at 1-1/2 mi range slightly low and thought this to be BLUE 2. The aircraft (later proved to be a MIG) continued closing on the formation, crossing low and slightly behind BLUE 1 and into BLUE 2's 3 o'clock, slightly low, position. BLUE 3 also spotted the still unidentified MIG at his 5:30 to 6 o'clock position and estimated the range at 3 mi. The bogey was identified as a MIG-21 as it rolled left to enter a split-S.

6. ACTION INITIATED

BLUE 3 broadcast the presence of an aircraft to BLUE flight and received acknowledgment from BLUE 2 only. BLUE flight continued to watch the aircraft until out of sight as it maintained escort of GREEN flight in orbit.

7. SITUATION DEVELOPMENT

BLUE 1 thought the incoming MIG was BLUE 2 maneuvering in the escort formation and did not confirm the MIG until it turned away and BLUE 3 had transmitted "We just had a MIG in formation."

BLUE 2 saw the MIG passing at 3 o'clock low and thought it was BLUE 1. The MIG continued in BLUE 2's 1 o'clock position before turning left.

BLUE 3 observed the MIG for approximately 30 seconds as it moved toward the 6 o'clock slightly low position on GREEN 2.

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EVENT 1-56

8. ORDNANCE

None expended and none observed.

9. EQUIPMENT PROBLEMS

None reported

10. AIRCREW COMMENTS

Comments from Overall Experience

BLUE 1 has vast experience in TAC fighters. He prefers to be high (2000-3000 ft) on a perch behind the B-66 with a 30° to 45° angle off.

11. DATA SOURCES

Project Interviews: BLUE 1 (front) 28 Jan 67/BLUE 2 (back) 29 Jan 67

Messages, Reports:

366TFW OPREP-3 DCOI FASTEL 45 Nov 66 Ser #0011
366TFW OPREP-3 DCOI FASTEL 50 Nov 66 Ser #0011, Change 1
7AF OPREP-3 Z021702Z Nov 66, DOCC 28037 66

12. NARRATIVE DESCRIPTION

This ECM escort mission had been planned with two EB-66s and four F-4Cs to operate in a right-hand race-track pattern, 0.8 Mach (480-kt TAS), base altitude of 28,000 ft. The original BLUE leader air-aborted and BLUE 3 assumed command and became BLUE 1. GREEN 1 led the pattern and GREEN 2 was 2 mi in trail stacked 1000 ft high at 29,000 ft. BLUE 3 was on the left wing and level with GREEN 1. BLUE 2 was flying 1/4 mi out and 1/2 mi behind the left wing of GREEN 2. BLUE 1 was 2000-3000 ft high on GREEN 2 and behind on the right side about 2 miles at a 60° angle

GREEN and BLUE flights were strung out in routine patrol/escort-type formation and had just completed an abrupt 180° right turn. No MIG warnings had been broadcast and BLUE flight was preoccupied with maneuvering to keep GREEN flight in sight and be in optimum position as escort. During this turn each member of BLUE flight lost track of other BLUE flight aircraft.

The MIG appeared to be under GCI and was apparently being vectored in a quartering stern attack in a shallow descent and good overtake Mach (estimated 1.2) from GREEN flight's 5 o'clock position. The MIG entered the formation as BLUE 1 was trailing GREEN 2 in the turn rollout. BLUE 1 was crossing to the right side as he spotted an aircraft at his 5 o'clock position level, 1-1/2 mi and assumed it to be BLUE 2.

BLUE 2 next spotted the MIG when it was 3 o'clock slightly low and an estimated 1/2 mi out. BLUE 1 observed the MIG at the same time in his 10 o'clock position. Both BLUE 1 and 2 thought it was a BLUE flight member. BLUE 3 observed the MIG for opportunity 30 seconds as it continued on to BLUE 2's 1 o'clock position and to BLUE 1's 11 o'clock position past GREEN 2. BLUE 3 made identification and started dropping back to engage as the MIG started a left turn and then split-S to low altitude heading east toward Hanoi. All three BLUE flight members observed the MIG departure but only BLUE 3 called it out. BLUE 3 made a radio check after the MIG left then stated a MIG had been in "our formation." Neither BLUE 1 nor BLUE 2 ever called the "bogey" and both thought it was a BLUE flight member until BLUE 3's positive statement over the radio.

Note: It was brought out in the interview that the MIG seemed to be vectored out of the formation when he entered the F-4s missile-firing envelope.

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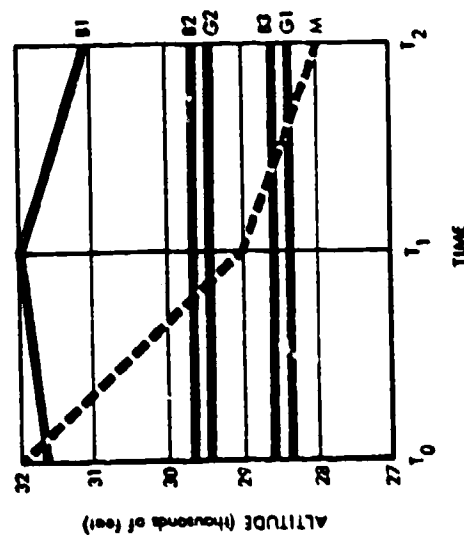
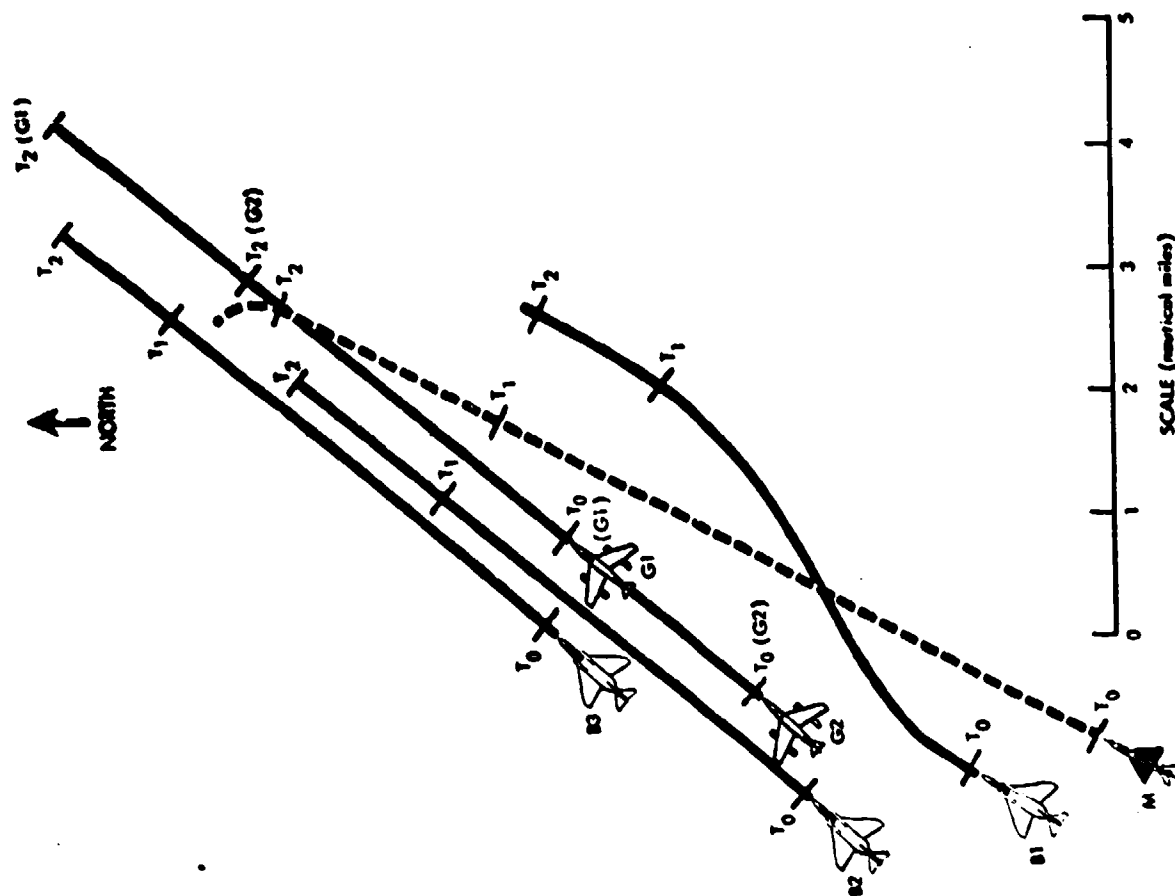
EVENT I-56 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly (GREEN 1, 2)	Communications	Enemy Actions (MIG 1)	Remarks
	Status	Action				
T ₀	B1 at 31-32,000 ft B2 at 29,000 ft B3 at 28,000 ft Fuel 8500 lb	B1 spots bogey at 5:30 o'clock level, 1-1/2 n mi B3 sees aircraft at 5:30 o'clock, 4 mi	B1 at 28,000 ft B2 2 n mi in trail at 29,000 ft, heading 040°, 0.8 Mach	None	Bogey appeared to be under GCI descending in a 270° off stern attack on G2	B1 assumes bogey is B2 B3 unable to identify
T ₁		B1 sights bogey at 10 o'clock, 1-1/2 mi. B2 sees bogey at 3 o'clock 1 mi. B3 still has bogey in same o'clock position		None	Bogey has passed between B1 and B2, slightly low and 5 o'clock 1 mi on G2	Bogey still assumed to be B1 or B2
T ₂		B1 observes bogey in left descending turn. B2 watches bogey roll left and split-S to the east. B3 slowing to get back and identify the MIG as it breaks left and down		B3 gets radio check from B2. B3 calls MIG in formation. B2 says it was B1	Started left turn then split-S out of the area	Bogey was assumed to be friendly until split-S.

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EVENT 1-56



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EVENT 1-87

Aircraft Involved: Three F-4Cs vs two MIG-21Ds

Result: No damage.

Vicinity of Encounter: 22°00'N/104°20'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 3 Nov 1966/1540H

Three F-4Cs (BLUE flight) escorting an EB-66 (GREEN flight). BLUE 2 had a ground abort and one EB-66 had also aborted. Original orbit was changed to a north-south racetrack orbit centered at approximately 21°31'N/104°40'E (counterclockwise).

2. MISSION ROUTE

Departed Danang on approximate heading of 290°, altitude 27,000 ft, Mach 0.82 to rendezvous with tankers in area of Udorn. Then proceeded in a northeasterly direction to rendezvous with EB-66 in vicinity of 103°30'E/19°30'N.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 3, 4

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
2 - 370-gal wing tanks (outboard)
1 - 600-gal centerline tank
IFF and TACAN always on
Camouflage paint

EB-66 GREEN 1

Not given

MIG-21D MIG 1, 2

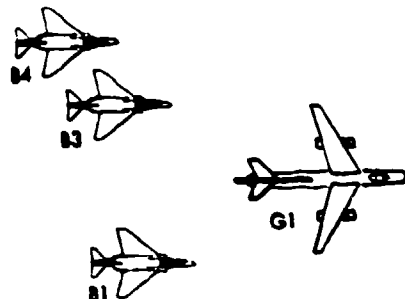
2 - AA missiles
Drop tanks
Apparently did not have cannon
Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Low-level clouds over mountains SW of Red River. Fairly thick haze at lower altitudes (below 7000 ft)

	BLUE			GREEN
	1	3	4	1
Altitude:	30,000 ft	28,000 ft	28,000 ft	28,000 ft
Heading:	northerly heading			Unknown
Speed:				
Fuel State:	Full internal plus some in wing tanks			

Flight Formation:



5. INITIAL DETECTION

Received MIG warnings from PANAMA and DEEP SEA. BLUE flight was in left 180° turn when MIGs were sighted by BLUE 3 at 8 o'clock behind flight entering the turn. BLUE 1 (L) was crossing over BLUE 3 as the EB-66 rolled out of its turn.

6. ACTION INITIATED

BLUE flight dropped external tanks, went to AB and started left descending turn. The EB-66 was told to drop to low altitude and depart the area.

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7. SITUATION DEVELOPMENT

EVENT 1-57

BLUE flight was in essentially a diving-turning engagement. Lead aircraft fired six missiles at MIG-21; no hits were scored (see section below). BLUE 4 was not aware that a MIG was at 6 o'clock until warned by BLUE 1(L) and 3. MIGs apparently did not have guns. MIG 1 fired AA missile at BLUE 1 and missed. The engagement lasted approximately 6 min.

8. ORDNANCE

	(No. fired/No. hits)			Remarks
	SPARROW AIM-7E 270	SIDEWINDER AIM-9B	Soviet AAM	
BLUE 1		4/0		Both appeared to guide well, one did not detonate. One did not guide, other three guided "lazy" and one did not detonate.
BLUE 3, 4	0/0	0/0		
MIG 2			1/0	Went behind BLUE 1.

9. EQUIPMENT PROBLEMS

BLUE 1(L). SIDEWINDER tone was poor when system was checked during rendezvous with tanker. Heads of SIDEWINDERS were pitted from rain which may have accounted for this difficulty. One SPARROW would not tune. Radar had a minor discrepancy before engagement which would not affect firing, condition had not changed in postengagement check. Post-flight groundcheck reported radar as being okay.

BLUE 3 (Front). He encountered difficulty in moving his head and shoulders in the cockpit. He almost tore the automatically restrained shoulder harness out during the encounter, resulting in badly bruised and sore shoulders. As a result he blocked the manual unlocks on future flights over NVN to override the automatic restraining feature and to be sure of his shoulder movement.

BLUE 4. Sticky heading indicator on the way out.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
BLUE 1				
Front	3500	800	over 80	All TAC fighter background. Had fired one SIDEWINDER and one SPARROW in training, plus several SIDEWINDERS from F-100s. First air-air engagement.
Back	580	200	over 80	25 escort missions with EB-66.
BLUE 3				
Front	4400	480	over 80	Mostly tactical fighter background. Has fired 30-40 SIDEWINDERS and 1 SPARROW in various programs. First air-air engagement.
Back	550	350	85	First air-air engagement.
BLUE 4				
Front				Not interviewed.
Back				Not interviewed.

Comments on this Encounter

MIG-21s apparently had no guns or they could have caused BLUE 4 a great deal of difficulty. MIGs were silver, F-4Cs camouflaged, silhouette looked very similar in air -- if marked alike, it would be difficult to identify MIG-21s.

Gun would have been helpful in this engagement for BLUE 1 at T₉ to T₁₁.

Rearward visibility was poor.

Martin Baker seat harnesses cause trouble by locking up in maneuvering and restraining pilot motion. This also impedes movement needed for visual scanning.

F-4C can pull away from MIG-21 anywhere below 15,000 ft and disengage at will.

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MIG pilots were aggressive and showed no inclination to disengage.

EVENT 1-87

Interviewees felt that the MIGs were under OCI control and were vectored to their 6 o'clock position because of the series of MIG warnings they had received.

Always flew with missiles selected. Usually flew with HEAT selected (SIDEWINDERS) since they were considered best unless weather indicated that SPARROWS should be the prime weapon. SPARROWS were tuned coming off tanker. The arm-safe switch was set to ARM when passing NVN border.

The backseater can see things the frontseater cannot see and was helpful.

During the attack when the aim dot was just outside of the ASE circle, BLUE 1 (Back) was unable to communicate this fact to BLUE 1 (Front), and they both felt that the back might have helped the attack by using the stick to position the dot since the front was tracking the target visually and did not use the scope display.

11. DATA SOURCES

Project Interviews:

BLUE 1 (Lead) - Front - Jan 24, 1967
 Back - Mar 14, 1967
BLUE 3 - Front - Jan 26, 1967
 Back - Jan 19, 1967

Messages, Reports:

7AF OPREP-3, 031728Z, DOGO 28085, Nov 1966
7AF DAI Message U-032324Z, DIO 0761, Nov 1966
USAF Tactical Fighter Weapons School Combat Analysis Division (CAD) Bulletin #9, 14 Dec 1966.

12. NARRATIVE DESCRIPTION

BLUE flight was flying escort for an EB-66 (GREEN 1) in a north-south orbit centered at 21°30'N/104°40'E. This flight was launched at Danang across to Thailand and refueled in the Udorn area. There were only three aircraft in the flight. BLUE 2 aborted on the ground. BLUE flight rendezvoused with the EB-66 over Laos. Two EB-66s were scheduled, but one had aborted, and therefore the assigned orbit area was changed to the one described above.

During the first orbit MIG warnings were received from DEEP SEA and PANAMA and the flight was alert and looking for MIGs. BLUE flight was starting the second orbit flying at 28,000 to 30,000 ft at approximately Mach 0.8 when BLUE 3 sighted the MIGs at 8 o'clock. At the time BLUE flight was three-quarters of the way through a left 180° turn. Thus, the MIGs were behind them, just starting the turn.

The flight jettisoned tanks and the second element (BLUE 3, 4) broke left into the MIGs. At the same time the EB-66 was directed to head for the deck and depart the area. MIG 2 launched a missile at BLUE 1 and missed. MIG 2 overshot BLUE 1 after firing the missile.

BLUE 1 executed a high-g roll to the inverted position and looked for the MIG. Another MIG, below BLUE 1 was attempting an attack on BLUE 3 from a 90° angle-off position. BLUE 4 was at a 90° angle-off on the same MIG. BLUE 1 was directly behind the MIG (zero angle-off) and slid straight down, past the nose of BLUE 4 and started to attack the MIG. All aircraft at this time were in a descending Lufberry maneuver, lined up as follows: BLUE 3, MIG 1, and BLUE 1. Both BLUE 1 and 3 had lost sight of BLUE 4 and MIG 2 at this point.

BLUE 1 launched two SIDEWINDER missiles and the first one broke hard right on launch and did not guide. The second missile passed the MIG and did not detonate. BLUE 1 was pulling less than 2 g at this time. BLUE 1 then switched to SPARROWS and launched two missiles with interlocks in. The first one tracked and appeared to guide well and detonated near the MIG. The second one also guided well, passed in front of the MIG and did not detonate. BLUE 1 then selected HEAT again and fired two more SIDEWINDERS. Both SIDEWINDERS guided but in a lazy manner and both detonated; however, they apparently did not hit the MIG.

During this time MIG 2 was getting into an attack position on BLUE 4. BLUE 3 attempted twice to reach attack position on MIG 2 by doing a high side yo-yo. However, each time he pulled his nose up above the horizon, MIG 1 would start closing in to a more advantageous position, whereupon BLUE 3 had to break off the attack in order to maintain separation from MIG 1. BLUE 3 descended to the deck in afterburner and ducked into the haze along the Red River bed, hoping to separate from MIG 1 and to get into an attack position. He was down about 500 ft above ground level and kept up a heading generally down the Red River Valley. When BLUE 3 thought he had lost MIG 1, he started a pull-up in a hard left climbing turn and at about 7000 to 8000 ft (having turned about 60°) he picked up a MIG coming in at 8 o'clock. BLUE 3 then made two tight 360° turns trying to get into a firing position on the MIG and starting to close slightly with each turn. However, at the end of the second 360° turn BLUE 3 hit BINGO fuel and was forced to break off the engagement. BLUE 1 and 3 passed

¹It is not known if this was a verbal problem or due to a crowded communication channel.

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EVENT 1-57

C BLUE 4 twice while they were in the descending turns, each time noting that a MIG was on BLUE 4's tail and warning him accordingly. BLUE 4 disengaged and headed out of the area. After BLUE 1 fired his last SIDEWINDER he switched back to the radar mode and started to attack MIG 1 again. In the meantime, MIG 2 had broken off the engagement and was re-joining MIG 1. He crossed in front of BLUE 1 and went high and wide sandwiching BLUE 1 between MIG 1 and 2. BLUE 1 then turned hard into MIG 2 and then exited the area.

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EVENT 1-57 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	B1 - 30,000 ft B3B4 - 28,000 ft Mach 0.8 Fuel: B1 - 12,500 lb B3 - 12,600 lb B4 - no data	B3 sighted MIGs coming in BLUE flight dropped tanks, went to AB	G1 in lead; B1(L) high (about 2000 ft) on right, B3,4 on left slightly lower. Trailing G1 by 1-3 mi	There had been numerous MIG warnings from support forces (PARAMA and DEEP SEA). B3, 4 called MIGs at 8 o'clock. G1 told to depart area and head for deck. B3 called for left break	MIG-21s coming in, in hard left turn-- probably just supersonic	Flight in left 180° turn (about 3/4 through turn). elements crossing over in turn
T ₁	Full internal fuel still in 3g turn. B1 in descending left break. In AB. Mach 1.2. Heading SE toward Yen Bay	B3,4 broke sharp left and down. B1 turned into missile	G1 headed for deck, departed area	B1 backseater calls MIG firing from 6 o'clock	M2 fired missile at B1	Missile left a distinctive white trail -- it curved just outside of B1(L)'s turn
T ₂	B1 sees missile go by and M2 over-shooting	B1 reversed to inverted high-g right barrel roll but could not see M2. B1 spotted M1 directly below with 90° angle off on B3; also saw B4 outside of B3's turn, behind M1			M2 overshoot and passed outside of B1's turn. M1 behind B3 at about 90° angle-off	
		When B3 broke left, he outturned B4 who slid to outside and lost ground. The MIG turned inside of B3's break, ended up and maintained 90° angle-off as B3 started descending maximum-g left Lufberry.				
T ₃	B1 joined Lufberry for two turns (supersonic), was at less than 2g	B1 slid behind MIG 1. B1 fired one SIDEWINDER at about 1 mi. Immediately followed by another one	B1 observed B4 passing with M2 on his tail	B1 called B4 to warn him of MIG	M2 on tail of B4	SIDEWINDER broke hard right -- did not guide. Second missile appeared to track, but in "lazy manner"--did not detonate

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EVENT 1-57 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T 4	B3 also saw B4 with MIG on his tail at 10 o'clock high	B3 attempted high side yo-yo to get position on M2. B3 gave up attempt because M1 was closing on him			M1 closed on B3 as soon as he pulled up nose (plus losing air speed)	
T 5		B3 rolled over and down to gain airspeed and g's made another 360° (Lufberry)			M1 could not close to firing position	
T 6	B3 again saw B4 with M2 still on his tail. At top of yo-yo alt 15,000 ft Mach 1.2	B3 tried another high side yo-yo to get on M2 but broke it off because of M1 closing in. B4 disengaged and departed the area		B3 advised B4 of MIG on his tail	M1 again tried to get into position on B3	
T 7	B1 ended up behind M1 and B3, falling back rapidly. B3 continued to maintain high angle-off on MIG	B1 went to SPARROW, went to max power (re-lit AB) and started to close up. Had full system interlocks in		At 2-1/2 m mi. B1 rear seater asked to push power up as separating too fast		
T 8	B1 fired 2 SPARROWS B3 continued down and gained separation. Alt ~10-15,000 ft	At 3 mi B1 fired SPARROW. At 2 to 2-1/2 mi fired second SPARROW. Overtake velocity estimated at 150 kt +50 kt				Both missiles were fired with interlocks in. Both appeared to guide well. One missile exploded near M16 (probably behind him). the other went past and did not detonate. Last time that B1 saw B3.

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EVENT 1-57 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₉	B1 closed in on M1. Alt 10,000 ft. Out of AB. about Mach 0.9	B1 fired two SIDEWINDERS			M1 in lazy left turn, apparently unaware of position of B1	One SIDEWINDER went ballistic. One SIDEWINDER tracked "lazy" and detonated to rear of MIG
T ₁₀	B1 ended up about 500 ft behind M1	Tried to back off in shallow left turn				
T ₁₁	B1 approaching min SPARROW firing range. Went into AB. Alt 7000 to 8000 ft. Mach 1.2	Broke hard right into M2. Disengaged on heading of 230°. Low level 'til out of area. disengaged AB. cruised out at optimum altitude.			M2 passed in front of B1 and made hard left turn (high at 1:30) (between B1 and M1) M1 broke right, sandwiching B1 between M1 and M2	At this point B1 departed area, and proceeded to Udorn for refueling. Had 2 SPARROWS left (one would not tune)
	In the meantime, B3 makes two more "ou" descending max-g turns. B3 did not see either B1 or B4 again during this engagement. B3 was gaining on M1 but not sufficiently to reach firing position. B3 could have broken off at this time, but "wanted to try to get a MIG"					
T ₁₂	Descended down to 500 ft AGL	Tried to lose MIG in haze layer - flying down Red River valley			MIG fell back (perhaps 3 to 3-1/2 mi)	
T ₁₃	Alt 500 ft, 700 kt	B3 pulled up in hard left turn to 7000 ft			MIG 2000 ft below and 8000 to 9000 ft out at 8 o'clock position of B3	B3 thought there was sufficient separation
T ₁₄	After 60° of turn (7000 ft) MIG closed to 6000 ft behind B3	B3 started high-g turns			MIG closed on B3	
T ₁₅	B3 made two hard (max g) 360° turns	Gradually gained ground on MIG				B3 pulled about 7+ g's

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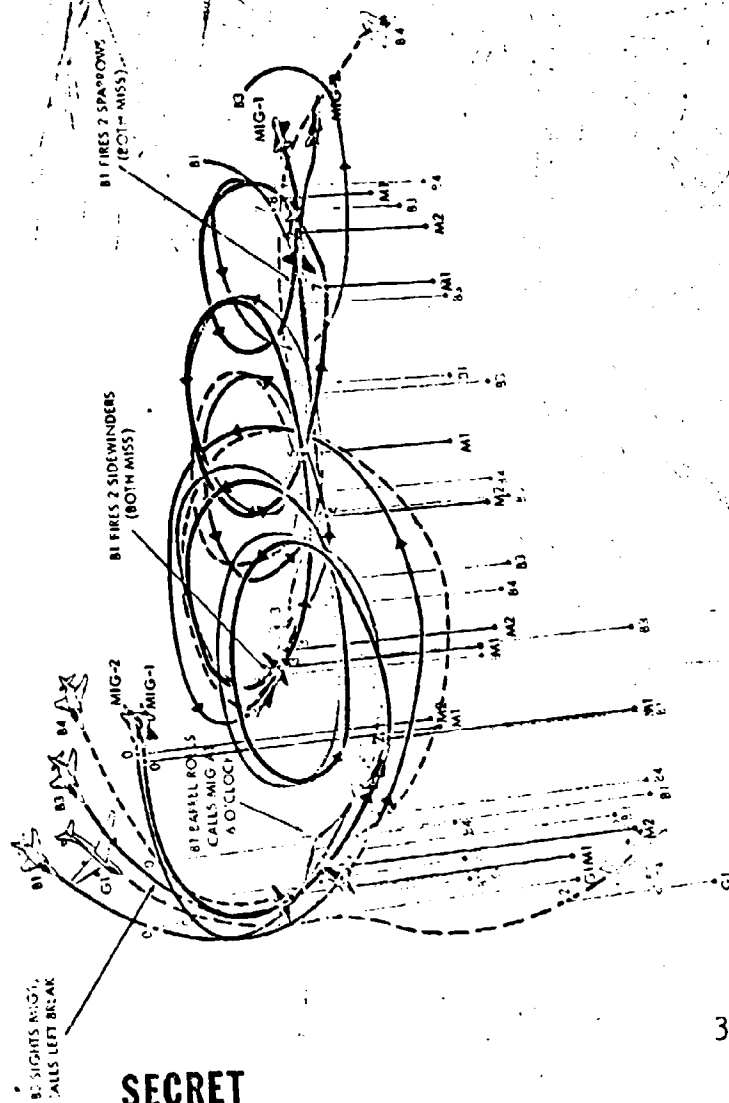
EVENT 1-57 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T16	B3 reached BINGO fuel (4300 lb) B3 landed Udorn with 800 lb fuel	Disengaged to SW-- "ducked into cloud"-- stayed in AB long enough to get positive (>1 mi) separation. Then climbed to 42,000 ft in high Mach climb and returned to Udorn	.		Did not see whi-h direction MIG de-parts	B3 disengaged before he reached firing position on MIG

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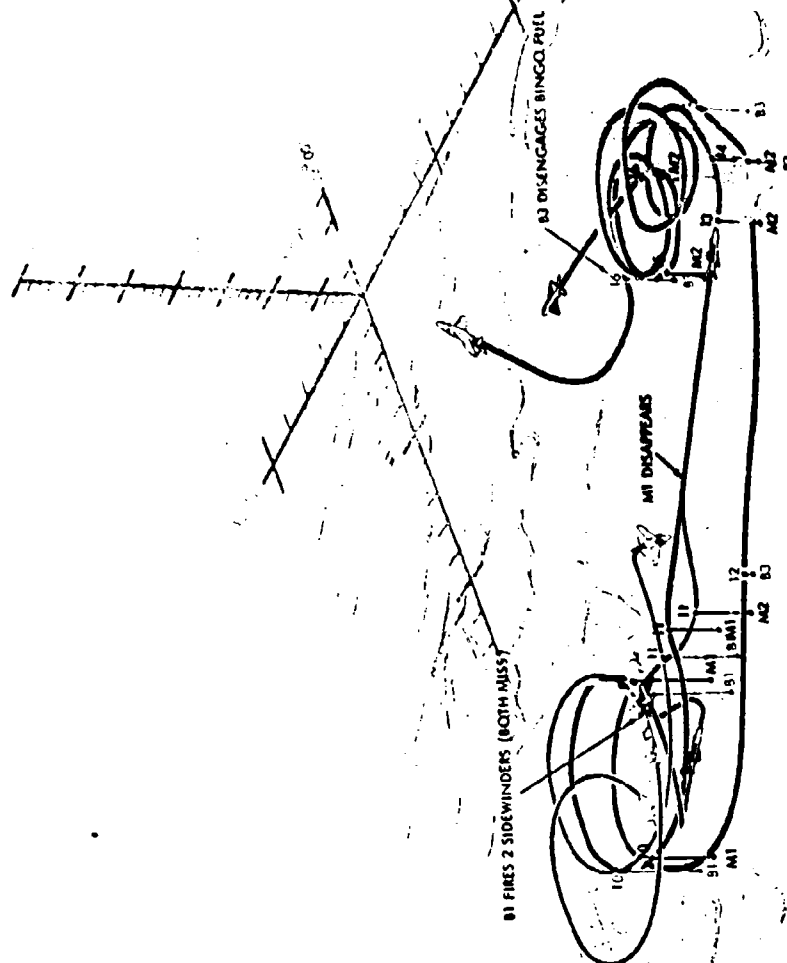
EVENT 1-57



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EVENT I-57



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EVENT 1-68

Aircraft Involved: Four F-4Cs vs one MIG-17

Result: Sighting only

Vicinity of Encounter: 21°22'N/107°00'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 4 Nov 1966/between 1535-1548H

Four F-4Cs (BLUE flight) on a MIOCAP mission covering F-105 strikes in vicinity 21°00'N/106°00'E. Time over target was 1535 to 1600 (local).

11. DATA SOURCES

Messages, Reports

7AF OPREP-4 041715Z Nov 66.

7AF Message 042330Z Nov 66.

12. NARRATIVE DESCRIPTION

BLUE 2 at 3500 ft sighted one silver colored MIG-17 at 21°22'N/107°00'E, altitude 3000 ft, in a left turn. No markings were visible on the MIG. BLUE 2, who was in a turn when he sighted the single MIG, attempted to turn into the MIG but lost it in the haze.

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EVENT 1-59

Aircraft Involved: Three F-4Cs vs one MIG

Result: Sighting only.

Vicinity of Encounter: 21°00'N/107°50'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 4 Nov 1966/1556H

Three F-4Cs on ECM escort at 30,000 ft over Gulf of Tonkin 21°00'N/107°50'E.

11. DATA SOURCES

Messages, Reports:

7AP DIA 042330Z Nov 66 DIO 30770

12. NARRATIVE DESCRIPTION

Three F-4Cs were at 30,000 ft on an escort mission in the vicinity of 21°00'N/107°50'E when they saw a silver airplane heading 120° pulling a contrail. The bogey was at flight's 10 o'clock. When 20 mi from BLUE flight position the bogey made a descending right turn to about 40,000 ft, heading 190°-200°. The airplane passed the flight at 9 o'clock within 6 mi. BLUE 3 obtained a radar contact at about 15 mi which indicated aircraft was flying at 800 kt. No action was taken to intercept the possible MIG.

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EVENT 1-60

Aircraft Involved: Four F-4Cs vs two or more
MIG-21Ds

Result: Two MIGs destroyed

Vicinity of Encounter: 22°23'N/105°17'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Nov 1966/1630H

Four F-4C airplanes (BLUE flight) escorting one EB-66 (GREEN flight). The EB-66 was providing support for strike airplanes and the F-4Cs were to protect the EB-66. All fighters were at or near BINGO fuel. The EB-66 was making a final orbit at approximately 22°05'N/105°10'E. MIG warnings had been received prior to the actual sighting.

2. MISSION ROUTE

BLUE flight departed Danang, proceeded direct to BLUE ANCHOR-75 refueling area. Rendezvous with GREEN flight was at 19°30'N/103°30'E. Then proceeded direct to the orbit IP at 22°10'N/105°40'E.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
2 - 370-gal external wing tanks
1 - 600-gal external centerline tank
Avionics standard and operating. IFF in STBY except BLUE 1 was in NORMAL.
Camouflage paint

EB-66 GREEN 1

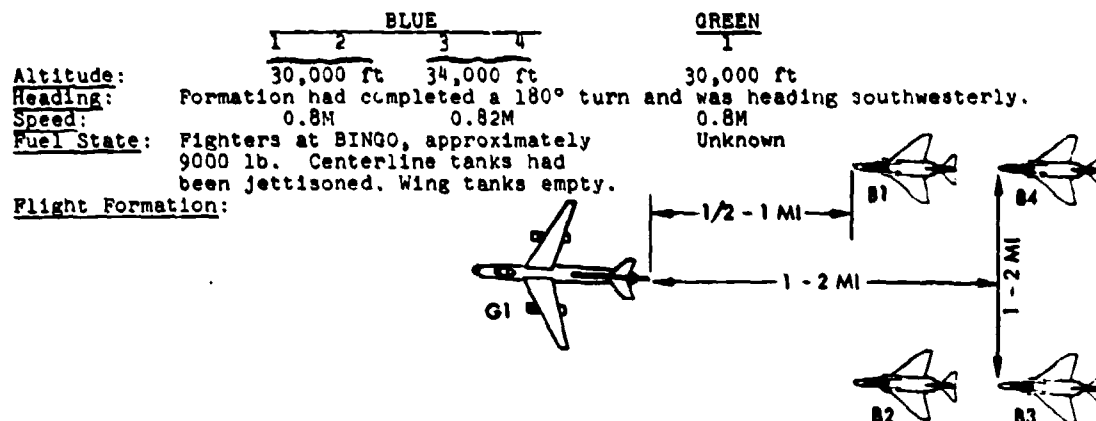
Not given

MIG-21D MIG 1, 2

2 - ALKALI (AA-1) on wing pylons
Silver in color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Above 10,000 ft clear, visibility 15 mi or more. Haze below 10,000 ft restricted
visibility to approximately 2 mi. Thin cloud layer at 9000 ft.



GREEN 1 was the formation lead. BLUE 1 and 2 were on each wing of GREEN 1, 1/2 to 1 mi out and 1/2 to 1 mi behind GREEN 1. BLUE 3 and 4 were 4000-5000 ft above GREEN 1 and 1 to 2 mi behind.

5. INITIAL DETECTION

Two radar targets were detected by the fighters, 30° left, 18 mi. BIG EYE also broadcast a MIG warning. GREEN 1 commenced a left turn when radar targets were at about 10 mi range. Targets disappeared from the radar scope, 60° right, 4 mi. GREEN 1 rolled out of turn heading approximately 240°. Shortly thereafter BLUE 1 called MIG at 3 o'clock to BLUE 2. Local time about 1630H.

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6. ACTION INITIATED

BLUE 1 called GREEN 1 to break right and told BLUE 2 to get the MIG. All airplanes, GREEN 1, BLUE 1 and 2, and two MIGs started a right turn, diving spiral.

7. SITUATION DEVELOPMENT

The MIG launched a missile at GREEN 1 just as he broke into a diving spiral. The missile missed. As the airplanes spiraled down, BLUE 1 launched three SPARROW missiles. The last missile caused the MIG engine to flame out. The pilot ejected. BLUE 2 observed a MIG pull up in front of him. He followed and launched a SIDEWINDER. The missile exploded at the tail pipe. The MIG pilot ejected.

8. ORDNANCE

(No. fired/No. hits)

	<u>SPARROW</u> <u>AIM-7E</u>	<u>SIDEWINDER</u> <u>AIM-9B</u>	<u>SOVIET</u> <u>AA-1</u>	<u>Remarks</u>
BLUE 1	3/0			MIG kill from a near miss. MIG engine flamed out. Pilot ejected.
BLUE 2		1/1		MIG kill. Pilot ejected.
MIG 1			1/0	GREEN 1 turned as MIG launched missile. The missile missed, did not detonate.

9. EQUIPMENT PROBLEMS

Both BLUE 1 and 2 unintentionally safetied the missile system when intending to switch from RADAR to HEAT mode. BLUE 1 had one SPARROW which failed to launch.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	3100	350	78	Had participated in a SPARROW test program. Had fired seven missiles. Had fired several SIDEWINDER missiles, mostly from F-100.
Back	350	<90	34	Was rear seat pilot on training flight during launch of one SIDEWINDER and one SPARROW at a towed target.
<u>BLUE 2</u>				
Front	----- Not Interviewed -----			
Back	360	80	4	Had previously fired one SPARROW and one SIDEWINDER.

Comments on this Encounter

BLUE 1 - Front

Warning from GREEN of presence of MIGs at 6 o'clock would have been helpful. A gun would have been useful. Need a missile that can be used in close while in high-g maneuver. MIG pilot was determined in his pursuit of GREEN 1. Stated he had plenty of power to maintain an in-trail position and had to reduce throttle to idle several times to prevent overshooting the MIG.

BLUE 1 - Back

Would have liked to have done something before the MIG gained a 6 o'clock position. Need a tail warning.

BLUE 2 - Back

Desired better visibility to the rear. Back seat crewman should be radar intercept officer, not a pilot.

Comments from Overall Experience

BLUE 1 - Back

Back seat crewman is valuable as another pair of eyes and to operate the radar. The front seat pilot cannot take his eyes off the target airplane during combat maneuvering because of possibility of losing sight of the enemy.

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11. DATA SOURCES

Project Interviews: BLUE 1 - Front, 9 March 1967, BLUE 1 - Back, 30 January 1967;
BLUE 2 - Front, not interviewed, BLUE 2 - Back, 27 January 1967.
GREEN 1 - Aircrew not interviewed.

Message Reports:

7AF 051714Z Nov 1966, DOCO 28197
7AF 061112Z Nov, 1966, DOCO 28238
Intell Mag. 7AF 110742Z Nov 1966, DIO 30812

12. NARRATIVE DESCRIPTION

GREEN 1 was the formation leader with BLUE 1 and 2 flying close fighter cover and with BLUE 3 and 4 providing high cover.

T0 During the last orbit in the target area BLUE flight acquired radar targets 30° left at a range of approximately 22 mi. Interpretation of the radar scope indicated the targets were in an orbit.

T1 GREEN 1 started a left turn. The radar targets were now at 18 mi and closing. BIO EYE broadcast a MIG warning.

T2 & T3 GREEN 1, with BLUE flight, continued in a left turn and rolled out heading about 240°. The boxey closed very rapidly on GREEN 1 and was identified as a MIG by BLUE 1. BLUE 2 jettisoned his external fuel tanks. From a position about 3/4 mi behind GREEN 1, MIG 1 launched an ALKALI missile. BLUE 1 called GREEN 1 to break right. GREEN 1 broke hard right into a diving turn. The formation was at 30,000 ft, 0.82M. The ALKALI missile missed GREEN 1.

T4 BLUE 1 acquired a radar lock-on and attempted to fire a SPARROW at MIG 1. The missile failed to launch. MIG 1 continued to pursue GREEN 1 in the diving spiral. BLUE 1 was in trail behind MIG 1. A second MIG dropped in behind BLUE 1 and BLUE 2 maneuvered in behind MIG 2.

T5 The airplanes continued down in a tight spiral. BLUE 1 and 2 used afterburner to maneuver and to maintain position. Both attempted to change from RADAR mode to HEAT mode but unintentionally safetied the missile system instead.

T6 BLUE 1 switched back to the RADAR mode and launched a SPARROW at close range. The missile passed over MIG 1 but did not detonate. BLUE 1 attempted to force MIG 1 off GREEN 1 by flying up alongside and overlapping wings. The MIG moved out but immediately returned to the same position.

T7 BLUE 1 launched a SPARROW in full system. The missile passed close behind MIG 1 but did not detonate. GREEN 1 entered a thin cloud layer at about 10,000 ft. BLUE 1 called GREEN 1 to reverse his turn. GREEN 1 reversed and commenced a climb. MIG 1 continued down in the spiral.

T8 BLUE 1 acquired MIG 1 in boresight, locked-on interlocks out, pulled lead and launched a SPARROW. Just the day before, the pilot had read a Navy report on the technique of launching a SPARROW against a maneuvering target. The missile detonated in front of the MIG. No debris from the MIG was seen; however, the MIG decelerated very rapidly, and as BLUE 1 passed the MIG, the pilot ejected. BLUE 1 then turned hard right, saw the MIG pilot limp in his parachute, but he did not see MIG 2; therefore, he departed the area.

T9 At the time GREEN 1 entered the clouds, BLUE 2, who was maneuvering for a firing position on MIG 2, saw a MIG pull up in front of him. BLUE 2 maneuvered into a trail position and launched a SIDEWINDER. The missile detonated near the tailpipe of the MIG. BLUE 2 had reduced his throttles to idle to prevent overrunning the MIG. As a result, he found himself in a steep climb, decelerating rapidly. As the pilot maneuvered to regain airspeed, BLUE 2 saw a MIG with an empty cockpit and a MIG pilot in a parachute.

T7a BLUE 2 engaged afterburner and departed the area at high speed, diving from 20,000 ft on a westerly heading.

NOTE: BLUE 3 and 4 actions were not reported, and they did not engage MIGs in this event.

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EVENT I-60 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	BLUE flight: 4 SPARROWS (AIM 7E) 4 SIDEWINDERS (AIM 9B) 2 external wing fuel tanks B182 30,000 ft B384 33,000- 35,000 ft A11 0.8-0.85 IMN BLUE flight at BINGO fuel 9000 lb	B2 reported a radar contact 30° left, 22 mi B1 on right wing of G1, B2 on left wing, 1 mi out and 1 mi back.	EB-66 (G1) leading on easterly heading. B384 above and behind.	B2 reported radar contact.	MIGs appeared in trail formation evaluated in turn due low V. 400-500-kt. Altitude below BLUE flight	BLUE flight escorting G1. Commencing last orbit prior to departing the area. B182 close element B384 high cover element
T ₁			G1 started left turn	Bogeys reported at 18 mi. V increasing. C 800-kt MIG warning from BIG EYE	MIGs closing formation	
T ₂		G1 and BLUE flight in left turn to westerly heading			MIGs closing rapidly	Radar targets off scope 60° right at 4 mi
T ₃	B2 jettisoned external tanks	Out of turn heading 250°	G1 into right diving break turn	B1 reported MIG at 3 o'clock to B2. Told B2 to "Go get him." B1 called G1 to break right	M1 closing very rapidly on G1. Estimate 1.2-1.5 Mach M1 fired missile at G1, estimate range 3/4 mi	M1 appeared intent on attack against G1. Ignored F-4s. M1 fired ALKAL1.
T ₄	G1 26,000 ft	B1 had full system radar lock-on M1. Attempted to launch SPARROW, no motor fire.	G1 in a tight, right, diving spiral	Radio rather cluttered. B1 calling G1 to break right plus a lot of talk between cockpits	M1 slowed down rapidly and was following G1.	

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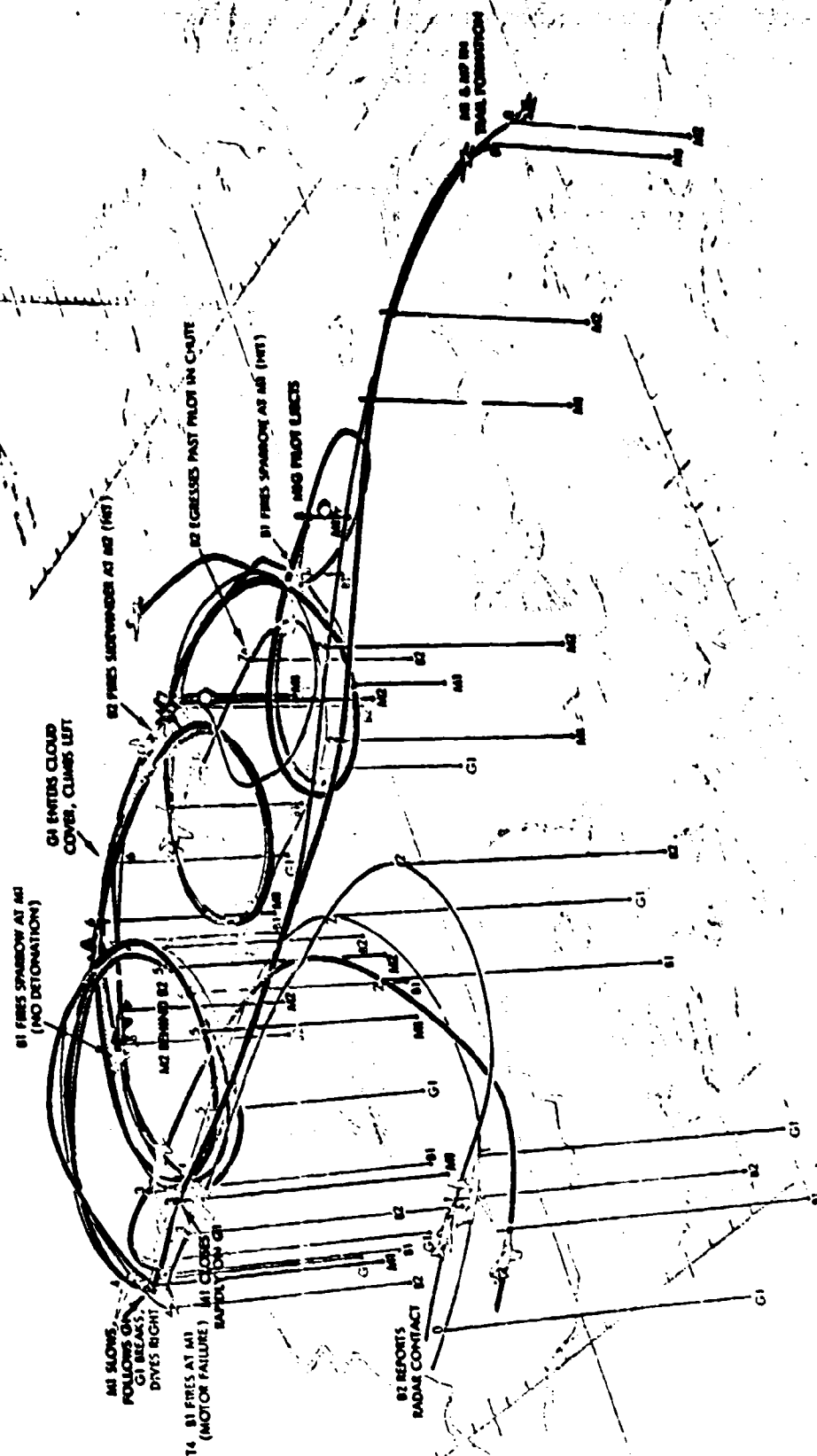
EVENT I-60 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly (GREEN 1)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₅	B1 and B2 in AB B1 misfire SPARROW B2 has jettisoned external tanks. B1B2 0.9-1.2 IMN G1 0.98 IMN	B1B2 in diving spiral behind G1 attempting to gain missile firing positions on M1B2. B1B2 both attempted to switch from RADAR mode to HEAT but put system on SAFE.	G1 in tight spiral		M1 behind G1 M2 behind B1	B2 sight a MIG as it passed at high speed indicating the possibility of more MIGs in the area. B1B2 use AB as necessary to maneuver
T ₆	B1 20,000 ft	B1 switched back to RADAR and fired SPARROW at close range. Missile passed over M1, did not detonate.			M1 maneuvering to stay behind G1	B1 after firing missile closed on M1. Maneuvered to force M1 off G1 and to gain range to fire another SPARROW.
T _{6a}	B2 18,000 ft	B2 saw MIG in climb and maneuvered into SIDEWINDER firing position. B2 fired SIDEWINDER.			M2 (or M3) pulled up in front of B2.	SIDEWINDER detonated near the tail of the MIG.
T ₇	B1 15,000 ft	B1 fired SPARROW full system. Missile passed close behind M1, did not detonate.	After entering cloud layer G1 reversed to climbing left turn.		M1 pursuing G1 M2 after B1	G1 entered broken layer of clouds at about 10,000 ft. B1 told G1 to break left.
T _{7a}		B2 departed area to west, 1.2 IMN diving from 20,000 ft				B2 observed MIG pilot in chute and saw airplane with empty cockpit.
T ₈	B1 4000 ft	B1 acquired target in boresight, switched to full system and fired SPARROW. Missile exploded in front of M1.			M1 appeared to flame out. Pilot ejected.	B1 made tight circle around pilot in chute while checking for M2 at 6 o'clock. B1 departed area heading westerly.

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EVENT I-61

Aircraft Involved: One F-4B, radar contact
Result: Two radar contacts only
Vicinity of Encounter: Unknown

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Nov 1966/----

Airborne radar control aircraft vectored two separate F-4Bs (BLUE 1 and BLUE 2) on unidentified aircraft in target area.

11. DATA SOURCES

Messages, Reports

CTO 88.8 OPREP-4 051842Z Nov 66 040 ROLLING THUNDER.

12. NARRATIVE DESCRIPTION

BLUE 1 acquired radar contact on bogey heading 020°, speed 340, and altitude 6000 ft. Tracked bogey, but failed to make a visual identification. BLUE 1 could not reacquire contact when second intercept was attempted. BLUE 2, with BLUE 1 in trail, tracked a second bogey heading 010°, speed 550, altitude 3500 ft. Contact was lost in ground clutter as bogey proceeded north.

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EVENT 1-62

Aircraft Involved: Navy BARCAP vs MiGs

Result: No damage

Vicinity of Encounter: 20°30'N/106°30'E

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Nov 1966/late morning

Navy aircraft on BARCAP mission were vectored by RED CROWN to intercept confirmed MiGs in vicinity of 20°30'N/106°30'E headed SE.

11. DATA SOURCES

CTG 77.3 OPREP 4 210621Z Nov 66.

12. NARRATIVE DESCRIPTION

Contact was never effected. MiGs closed to within 30 mi of BARCAP and then withdrew. BLUE broke off pursuit 5 mi prior to reaching the coast.

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EVENT 1-63

Aircraft Involved: Four F-4Cs vs two unidentified aircraft

Results: Sighting only

Vicinity of Encounter: 21°50'N/104°36'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 4 Dec 1966/1665H

Four F-4Cs (BLUE flight) on ECM escort.

11. DATA SOURCES

Message: 7AF MSG 042250Z Dec 66 DIO 30926

12. NARRATIVE DESCRIPTION

At 1665H BLUE flight visually sighted two unidentified silver aircraft which were at 21°50'N/104°36'E heading 350° and at an altitude of 28,000 ft. BLUE flight was heading 200° and was at 30,000 ft. The BLUE flight turned into the unidentified aircraft which were attempting to maneuver to the 6 o'clock position over BLUE flight. The unidentified aircraft broke, turned and disappeared into the clouds. BLUE flight was never closer than 4 to 5 mi to the unidentified aircraft. BLUE flight had no QRC-160 pods.

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EVENT 1-64

Aircraft Involved: Four F-4C and one MIG

Results: Sighting Only

Vicinity of Encounter: 21°55'N/105°44'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Dec 1966/1105H

Four F-4Cs (BLUE flight) on ECM escort

11. DATA SOURCES

CINCPACFLT Staff Study 3-67

CINCPACFLT IBM Listing

12. NARRATIVE DESCRIPTION

BLUE flight was on ECM escort at 30,000 ft. BLUE 3 saw a possible MIG come out of sun and pass under BLUE 3. The flight did not know if they had been fired upon.

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EVENT 1-65

Aircraft Involved: Two F-4Cs vs three MIG-17s

Result: No damage

Vicinity of Encounter: 20°40'N/104°40'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 30 Dec 1966/1520H

Two F-4Cs (BLUE flight) were escorting two EB-66s (GREEN flight).

2. MISSION ROUTE

Departed Ubon and refueled, prestrike, on WHITE ANCHOR 62, then went to a 20 mi northwest-southeast orbit around an IP 20°40'N/104°40'E. Poststrike refueling was on WHITE ANCHOR 45 and 46.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

- 4 - SPARROW (AIM-7)
- 4 - SIDEWINDER (AIM-9B)
- 2 - 370-gal external wingtanks
- 1 - 600-gal centerline tank
- Camouflage paint

EB-66 GREEN 1, 2

None given

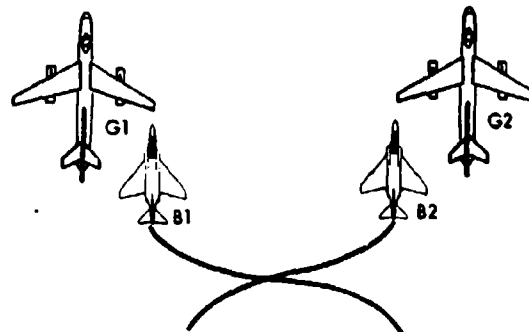
MIG-17 MIG 1, 2, 3

Either camouflaged or dark coloring.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear, 15-mi visibility at flight altitude, broken cloud deck at 10,000 ft.

	BLUE	GREEN
Altitude:	-30,000 ft--	31,000 ft 33,000 ft
Heading:	---330°---	
Speed:	--0.8 Mach--	
Fuel State:	--Unknown---	
<u>Flight Formation:</u>		



5. INITIAL DETECTION

BLUE 2 (Front) sighted two (possibly three) bogeys at 3 o'clock at distance of 7-8 mi. No MIG warning heard by BLUE 2. BLUE 1 heard a MIG warning 10 min before the encounter. BLUE 2 did not hear warning.

6. ACTION INITIATED

BLUE flight continued to weave behind EB-66s as MIGs followed with the closest bogey at a range of 3-4 mi. After continuing for 20 mi, the lead bogey closed to 3 to 3-1/2 mi and BLUE 2 directed the EB-66s to break left. Bogeys were then observed to arrive at BLUE 1's 7 o'clock position.

7. SITUATION DEVELOPMENT

BLUE 2 also broke left and in turning identified the first two hostile aircraft as MIG-17s. BLUE 2 remained with the EB-66s, while BLUE 1 turned into the MIGs. BLUE 1 jettisoned all tanks and BLUE 2 jettisoned the centerline tank. As BLUE 1 turned into the MIGs, BLUE 2 observed the MIGs breaking off to the right and disengaging. BLUE 1 did not see MIGs after his break. BLUE 1 and 2 resumed escort role, and no further sightings were made. All maneuvering took place at approximately 30,000 ft.

8. ORDNANCE

None expended by BLUE or MIGs.

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9. EQUIPMENT PROBLEMS

EVENT 1-65

BLUE 1 centerline tank did not drop until switches were reset.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 2	3800	150		Three years experience in EB-66.

Comments on this Encounter

BLUE 2 felt that in order to perform the ID, they had to get in too close, putting them outside missile parameters, so would like to have a gun. MIG executed an attack for which BLUE flight had been briefed to expect. BLUE 2 felt that the MIGs were just testing them. In the turn after the EB-66, BLUE 2 was very vulnerable to an IR missile.

11. DATA SOURCES

Project Interviews: BLUE 2 (Front)

Messages, Reports:

8TFW OPREP-3 301230Z Dec 66 DOI 12776
010412Z Jan 67 DIAAP 26260
7AF 302224Z Dec 66 Msg

12. NARRATIVE DESCRIPTION

BLUE flight was to cover GREEN 1 and 2, but due to maintenance had only two F-4s to cover the two EB-66s. After reaching the orbit point and completing two orbits, two, and possibly three MIGs were sighted by BLUE 2 at 3 o'clock at 7-8 mi (the flight was heading North). The MIGs made a 90° beam approach, converted and ended up in BLUE 1's 7 o'clock position with the closest bogey at 3-4 mi.

At this time BLUE 1 observed the MIGs, while BLUE flight maintained a weave behind GREEN 1 and 2. The first MIG was 4 mi in trail and 1000 ft below BLUE flight. MIG 2 was 5-6 mi in trail and 5000 ft above BLUE flight. A third aircraft was 7-8 mi in trail, but could not be identified. At this time BLUE 2 (Front) could not see MIG 3 but his BLUE 3 back could.

After about 20 mi in this position, to about 21°20'N/104°40'E, the MIGs began closing to within 3 to 3-1/2 mi. At this time BLUE 2 called a left break for the EB-66s, which broke left to about 150° and down. In this turn BLUE 2 definitely identified the first two aircraft as MIG-17s. BLUE 1 yo-yoed to a high position, and BLUE 2 went high outside and started to swing back to the inside to cover the EB-66. BLUE 1 decided to jettison his centerline tank and initiate a turn into the MIGs. The centerline tank would not jettison at first and when BLUE 1 averted his attention to the switches, the last sight of the lead MIG. The tank did not come off until later and BLUE 1 never saw the MIGs again. The lead MIG came in 7 o'clock low to BLUE 2, and lined up with BLUE 2, not the EB-66. The lead MIG got to within 2 mi of BLUE 2 simultaneously with the time that BLUE 1 got to the high position. At this point the lead MIG broke hard to the right, underneath and behind BLUE 2. At this time they were positively identified as MIG-17s and were observed to be dark in color.

BLUE 1 did not observe the MIGs after his tanks came off, nor were there any sightings for the remainder of the flight. The encounter occurred between 1620H and 1635H.

The MIG-17s were either camouflaged or of a dark color. The identification was based on the high tail and swept wing of the MIG. No markings or armament were observed.

NOTE: Due to the simplicity of this event, no drawing was required.

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EVENT I-66

Aircraft Involved: Two F-4Bs vs two unidentified hostile aircraft (believed to be Colt type)

Result: One confirmed kill

Vicinity of Encounter: 19°27'N/105°58'E
Route Package IV

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 20 Dec 1966/0207H

Two F-4B aircraft (BLUE flight) from a carrier at Yankee Station launched from Condition I CAP to intercept two unidentified aircraft designated as hostile.

2. MISSION ROUTE

From carrier position at 18°48'-30'N/107°38'-35'E the flight intercepted the target at 19°27'N/105°58'E. Returned to carrier.

3. AIRCRAFT CONFIGURATIONS

F-4B BLUE 1, 2

2 - SPARROW (AIM-7E)
1 - 600-gal centerline tank
2 - wing pylons
2 - LAU-17 adapters
APR-27, IFF on, TACAN, radar altimeter
(The unit policy was to load only two missiles on night alert aircraft to allow more fuel on board at recovery weight.)

Unidentified Hostiles RED 1, 2

Enemy aircraft configuration unknown, believed to be Colt.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Overcast 1000 ft, tops 2000 -- clear above tops.

	BLUE	
	1	2
<u>Altitude:</u>	-----3000 ft-----	
<u>Heading:</u>	-----310°-----	
<u>Speed:</u>	-----500-kt TAS-----	
<u>Fuel State:</u>	11,000 lb (at encounter)	9000 lb (at encounter)

Flight Formation:

BLUE 1 and 2 operated as individual aircraft.

5. INITIAL DETECTION

PIRAZ ship detected unknown aircraft at 20°52'N/106°09'E, heading south. BLUE 1 AI radar detection at 28 mi, BLUE 2 AI radar detection at 6 mi.

BLUE 1 and 2 never visually sighted the aircraft. BLUE 1 and 2 were cleared to fire without a visual identification.

6. ACTION INITIATED

BLUE 1 turned to collision course upon AI radar acquisition, maintaining 2500-3000 ft, 500-kt TAS. BLUE 2 followed GCI information, maintaining 2500-3000 ft, 500-kt TAS during intercept.

7. SITUATION DEVELOPMENT

BLUE 1 (Back) locked on at 12 mi and fired one SPARROW missile at 3 mi, and attempted to fire his other missile which would not fire. BLUE 1 observed the missile impact and a ball of fire. BLUE 1 turned back out to sea, headed approximately 090°.

BLUE 2 had very poor AI radar detection and followed GCI information, closing on BLUE 1. BLUE 2 saw BLUE 1 fire and observed the fireball of the first enemy aircraft. BLUE 2 made a 360° orbit to give BLUE 1 time to evacuate the area. BLUE 2 was vectored in on the second enemy aircraft, detected him at 6 mi, locked up at 5 mi, and fired a SPARROW missile at 4 mi. BLUE 2 and BLUE 1 observed the missile to impact followed by a big fireball.

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8. ORDNANCE

EVENT 1-66

(No. fired/No. hits)

	<u>SPARROW AIM-7E</u>	<u>Remarks</u>
BLUE 1	1/1	Attempted to ripple fire other SPARROW, but it would not fire. Cannon plug was not connected at launcher and was discovered on postflight.
BLUE 2	1/1	BLUE 2 had one SPARROW on board that detuned due to bent receiver on missile.

9. EQUIPMENT PROBLEMS

Only 50% of ordnance operation on each aircraft.

BLUE 1 - One missile launched in ripple fire, the other remained aboard. Loose cannon plug. Had airborne interrogator but did not work due to radar problems.

BLUE 2 - Had a very weak AI radar (7-8 mi) detection, and one SPARROW missile that tuned for 3 min after takeoff, then went out and stayed out for remainder of flight. The other missile did not tune until just prior to intercept. This aircraft was airborne 15-25 min with no indication of a ready weapon. Postflight check disclosed missile had bent receiver head and radar had bad servo motor.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u>				
Front	1925	700	145	Both previously fired a SPARROW and SIDEWINDER.
Back	750	750	150	Naval Flight Officer.
<u>BLUE 2</u>				
Front	1300	1000	150	Had fired 8 SPARROWS and 4 SIDEWINDERS.
Back	200	200	15	Naval Flight Officer. Had fired 3 SPARROWS and 1 SIDEWINDER.

Comments on this Encounter

BLUE 1 (Front) - Two missiles were carried on night missions so that more fuel was available for landing operations. The download from four to two missiles gave 900 more pounds of fuel that could be carried when coming aboard. This would permit one more pass, that is three, compared to two if four missiles were carried.

The tank jettisoning would have been a problem in a hassle because to jettison it, the aircraft speed would have to be reduced. The problem then would be to select the proper tactic to achieve the correct jettisoning conditions. Jettisoning the centerline tank is necessary in order to be able to fire the two forward SPARROWS.

Switchology is a problem if tanks or stores are on the aircraft at the start of an engagement. The bomb panel must be set up properly in order to get rid of the centerline tank without jettisoning missiles also.

The missiles were never carried in the armed position because once the missile is tuned and armed with the select light on, there is no indication of missile subsequent detuning.

Would like a gun in a future fighter. Wants missile minimum range decreased. Back should have full capability to set up manually when automatic system fails or is degraded. BARCAP aircraft were not carrying SIDEWINDER because of weight problem. His training was adequate. Computer does not deliver accurate firing parameters, hence interlocks out.

BLUE 2 (Front) - Would like to see missile with higher g capability. F-4 is too complex. Roll rate is all right but would like more endurance.

BLUE 2 (Back) - Liked SPARROW weapons system.

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11. DATA SOURCES

EVENT 1-66

Project Interviews:

BLUE 1 Front 9 Mar 67
BLUE 1 Back 9 Mar 67
BLUE 2 Front 10 Mar 67
BLUE 2 Back 10 Mar 67

Messages, Reports:

CTO 77.5 OPREP-3 200835Z Dec 66 CH-2
USS KITTY HAWK MSG 200755Z Dec 66
CTE 70.2.1.1 MSG 221910Z Dec 66
7AF MSG 202240Z Dec 66 DIO 31049
COMSEVENTHFLT MSG 220456Z Dec 66
CTU 77.0.2 OPREP-3 191926Z Dec 66
CTO 77.5 OPREP-3 192015Z Dec 66
CTO 77.5 OPREP-3 200430Z Dec 66 CH-1
Air-to-Air Missile Weapons System Flight Report BUWEP3 8810 for BLUE 1

12. NARRATIVE DESCRIPTION

BLUE 1 and 2 were on Condition I CAP aboard USS KITTY HAWK. At approximately 0200H both aircraft were launched to intercept an unidentified bogey declared hostile. BLUE 1 was given a vector 310°, 82 mi, by RED CROWN (USS LONG BEACH) immediately after the catapult. BLUE 1 climbed through an overcast and leveled off on top at about 3000 ft and maintained 500-kt TAS. The hostile aircraft were detected on BLUE 1's AI radar at 28 mi. BLUE 1 continued the intercept as the bogeys turned toward land (a westerly heading), giving BLUE 1 a closing velocity of approximately 300 kt (stern aspect) on a slow target. BLUE 1 back obtained a radar lock-up at 12 mi and passed the steering dot to the pilot. BLUE 1 fired a SPARROW missile at 3 mi and observed the missile until impact and a large fireball. BLUE 1 had attempted to fire two SPARROW missiles, however, one missile failed to fire. After firing BLUE 1 headed 090° out to sea to clear the area.

BLUE 2 had launched approximately one minute after BLUE 1, climbed through a cloud layer, and leveled off on top at 3000 ft. BLUE 2 tried 50- and 25-mi scale but neither worked so kept set on 10 mi. BLUE 2's radar had a maximum detection capability of only 7-8 mi, so he utilized OCI information to maneuver toward the unidentified aircraft. BLUE 2 closed range on BLUE 1 and saw BLUE 1 fire the SPARROW and the fireball of the hostile aircraft on impact of the missile.

BLUE 1 egressed the area to the east, and BLUE 2 detected him on AI radar. BLUE 2 executed a 360° turn and allowed BLUE 1 to evacuate the area. BLUE 2 was then vectored after a second hostile aircraft, detected the target on AI radar at 6 mi, locked up, and fired a SPARROW missile at 4-mi range. BLUE 1 and 2 observed the missile to explode and a glow on the water. BLUE 1 and 2 returned to the carrier for a normal recovery.

Both targets disappeared from all the radar after missile detonations. Due to conflicting radar track information concerning the number of bogies both before and after the encounter, the encounter was initially listed as resulting in two aircraft "damaged and possibly destroyed." This was later changed to one confirmed kill.

BLUE 1 and 2 operated interlocks out for the entire mission; however, at firing all parameters of the 157 computer were met.

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EVENT I-66 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
T ₀ 0139H	B1B2 on Condition 1 CAP	PIRAZ control at 19°37'N/106°47'E detected unknown aircraft contact at 20°52'N/106°09'E heading south.		0207H KITTY HAWK directed to launch Condition 1 CAP.	Bogey track at 100 kt, alt 5000 ft Heading now 210° maintaining 3-5-mi separation still at 5000 ft	PIRAZ control at 0159H declared hostile aircraft. 0209H correlation completed as to hostile from two different sources. 0206H request birds free from AWC. 0209H raid split into two parallel units
T ₁ 0215H		B1 launched with vector 310/82 mi to bogey position 19°50'N/106°09'E B2 launched at 0218H vector 310/72 mi follows B1 initially at 25 mi but gaining slightly				B1 tossed missiles when altitude is reached. Armed when 70-80 mi from intercept. Started in 100-mi scale. At 55 mi to go went to 50-mi scale 0220H aircraft under control
T ₂ 0227H	B1 speed 500-kt TAS, alt 3500 ft. 50-mi scale on radar	B1 detected one contact on radar, range 28 mi. 50 to left, started intercept course to contact at range of 21 mi, contact split into two targets.		Continual vectoring by PIRAZ At 18-mi range PIRAZ confirmed that bogeys were a section	Hostile aircraft 8 mi from coast	B1B2 under RED CROM control 0228H-B1 no visual ID required, confirmed with Panama. At range of 21 mi shift to 25-mi scale. Radar in MAP mode. wide sweep display. auto/manual tracking, normal clutter, linear polarization.

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EVENT 1-66 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
	BLUE 2 00 ft. Mach 1.0.	B2 had radar problems and could not acquire targets on the 100-, 50- or 25-mi scale setting.			As B1 closed on contact, backseat noted bogeys turned toward land and descended.	B1 emptied fuel in centerline tank but could not jettison due to speed. However, he felt jettisoning the tank was unnecessary.
T3	BLUE 1 3500 ft. Mach .9.	B1 got radar lock-on at 10 mi and B1 back passes dot to B1 front. Closing velocity 350 kt at 20° aspect to bogey heading (tail on 150°)		At 6-mi range B1 was given clear to fire by PIRAZ control.	Bogey at 4000-5000 ft in right turn	
T4 0232H	Speed 500-kt TAS Altitude 3500 ft in normal turn vicinity of 19°27'N/105°58'E B2 speed Mach 1, altitude 5000 ft. 3-4 mi in trail of B1, following B1	B1 ripple fired at 3-mi range. Interlocks out. Aspect to bogey heading 20°. Saw missile impact and exploded after firing, B1 broke right to heading of 090° B2 observed B1 firing, saw missile impact and explode and 20-30 seconds later an explosion on the ground. B2 also broke with B1 since B2 had no radar contact			Bogey above B1 at 4000 ft After firing hostile disappears from PIRAZ scope	Ripple fire of 2 SPARROWS was attempted but due to malfunction, only one left the aircraft. Select and ready light went out when trigger was pulled but missile did not fire. B2 had armed 20 mi from the bogey. B2 radar detection range 7-8 mi.

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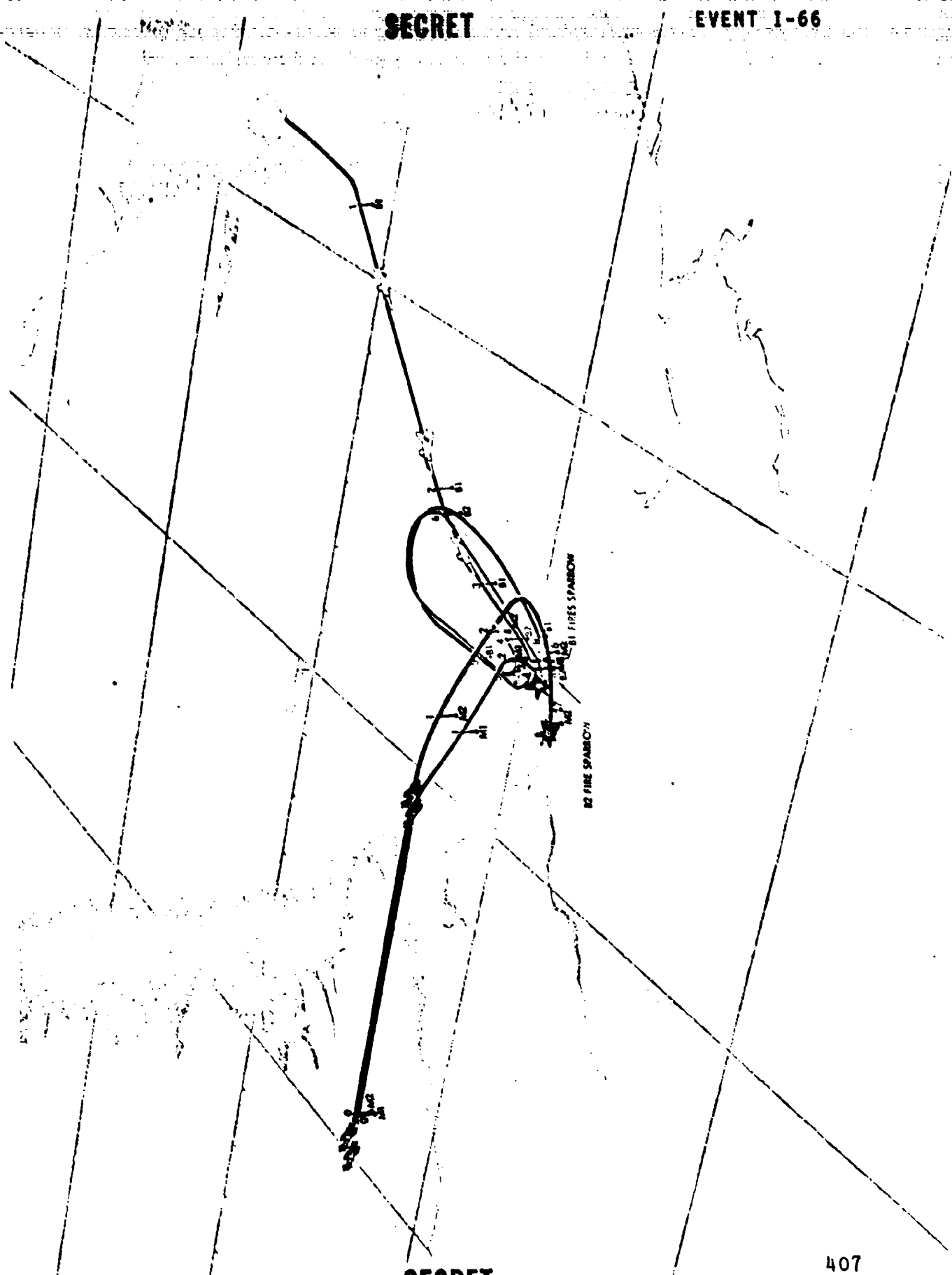
EVENT I-66 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Other Friendly	Communications	Enemy Actions	Remarks
	Status	Action				
T5	B2 coming out of break	B2 got large radar contact on approximately same heading of 090° and with same speed. B1&2 both headed out to sea about 20 mi while B2 made one orbit.		B2 communicated with B1 and established B1 as the radar contact.		
T6	B2 5000 ft	B2 got a vector of 290/30 mi from RED CROWN toward another bogey. B1 orbited staying out over the sea.				
T7	B2 Mach .9 descending from 5000 ft	B2 detected bogey at 6 mi, 15° right, locked on right way. Made 15° correction.				Radar on 10-mi scale, missile-free environment
T8 0241H	B2 Mach .9 (525 KIAS), altitude 3000 ft nose down 1 g slight right turn	B2 fired one S7ARROW range 3.5-4 mi, closing velocity 350 kt, interlocks out. Saw missile explode, shortly thereafter a faint glow was seen on the water. B2 4-5 mi south also saw explosion. B1&2 recovered to carrier since missiles expended.			After firing hostile disappears from PIRAZ scope.	Missile guides down 500-1000 ft.

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EVENT 1-66



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EVENT 1-67

Aircraft Involved: Four F-4Cs, two EB-66s
vs one MIG

Result: No damage

Vicinity of Encounter: 20°50'N/105°00'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 30 Dec 1966/1610H

Four F-4Cs (BLUE flight) escorting two EB-66s (GREEN flight).

2. MISSION ROUTE

Departed Ubon and proceeded to the WHITE ANCHOR track for refueling. After refueling the F-4 flight joined the EB-66s and proceeded to the area in which the incident occurred.

3. AIRCRAFT CONFIGURATION

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7E)

4 - SIDEWINDER (AIM-9B)

Camouflage paint

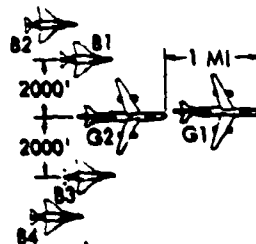
MIG 1

2 - AAM

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 7000 ft broken layer - all higher levels clear and 15 mi visibility

	BLUE				GREEN	
	1	2	3	4	1	2
<u>Altitude:</u>		29,500		27,500	29,000	27,000
<u>Speed:</u>		Mach 0.80		Mach 0.8		
<u>Fuel State:</u>			Unknown			
<u>Flight Formation:</u>						



5. INITIAL DETECTION

Flight was in a right turn (heading 080°-090°) when BLUE 4 (Back) saw two missiles spiraling up about 1/2 to 1 mi behind the flight. About 30 sec later BLUE 4 (Back) saw a delta wing aircraft at about 40°-60° angle-off launch two missiles toward them from 2 mi in trail.

6. ACTION INITIATED

About 10 seconds after the missiles were launched BLUE 4 (Back) lost sight of the missiles, called a break, took control and initiated level break into the missiles and the launching aircraft. At this time BLUE 4 (Front) again took control of the aircraft and made a max power descending break. BLUE 1, 2, 3 followed BLUE 4 for about 150° then reversed left and continued south with GREEN 1 and 2.

7. SITUATION DEVELOPMENT

BLUE 4 (Front) at no time saw the MIG and had executed his break maneuver to evade the missiles. Somewhere through the break BLUE 4 (Back) informed the aircraft commander of the MIG. BLUE 4 at this time spotted four bogies heading northeast and pulled in on them for an ID pass. He soon learned that he had joined on an F-105 flight. Unable to re-establish contact with the MIG, BLUE 4 rejoined BLUE flight and continued with the EB-66 escort.

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EVENT 1-67

8. ORDNANCE

(No. fired/No. hits)

Soviet AAM

Remarks

BLUE flight
MIG 1

none

2 Possibly 4/0

All missiles fired passed behind BLUE flight. Although four missiles were seen in flight only two were seen leaving the MIG.

9. EQUIPMENT PROBLEMS

None reported.

10. AIRCREW COMMENTS

The only aircrew comment on this event was that the EB-66 and the escort aircraft should be on the same frequency. BLUE 4 (Front) made this comment because he felt that the escort aircraft could assist the EB-66 by warning them of an imminent MIG attack.

There is no experience information available.

11. DATA SOURCES

Project Interviews: BLUE-4 (Back), 8 Feb 67; BLUE-3 (Front), 9 Feb 67; BLUE-2 (Front), 8 Feb 67.

Messages and Reports: 7th AF Msg 302224Z Dec 66 DIO 31112
8TFW OPREP-3 DOI 12773 301230Z Dec 66
010412Z Jan 67 DIAAP-22626

12. NARRATIVE DESCRIPTION

On the afternoon of 30 December 1966 BLUE flight was escorting an EB-66 over North Vietnam. While the flight was in an easy right turn, BLUE 4 (Back) observed two missiles -- similar to the SIDEWINDER -- climbing vertically to pass behind them. About 30 sec later this same BLUE 4 (Back) saw an unidentified delta wing aircraft, coming toward them from the 5 o'clock position and, from a high angle-off, the aircraft launched two missiles. As the missiles closed, BLUE 4 (Back) became concerned, took control of the aircraft and started a level break. BLUE 4 (Front) saw only the missiles and not the MIG, took control from the BLUE 4 (Back) and pulled into max power right descending break. During the break BLUE 1, 2, and 3 broke only about 150° of turn then reversed and resumed the EB-66 escort. While in the break the BLUE 4 (Back) told BLUE 4 commander that there was a bogey attacking. At this time BLUE 4 commander spotted a four-aircraft flight and pulled over to them for an ID pass. As he closed on the flight he identified it as an F-105 flight of four. BLUE 4 then rejoined BLUE 1, 2, and 3 without further MIG activity.

At no time did BLUE 4 (Back) actually observe the missiles in detail. Only the smoke trails which emitted from them were actually seen.

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EVENT 1-67 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	BLUE flight at 29M escorting GREEN 1 and 2. Both flights in a right turn 8-flight in 30° bank	B4 back sees 2 SIDE-SPINDLER-like smoke trails spiraling vertically upward behind the flight, low and to the right. Turn continued by GREEN and BLUE flights.	GREEN 1 - an E8-66 in lead does not have radio contact with BLUE flight (different frequency)	Intercept only on B4	Unknown	As these missiles posed no threat BLUE 4 did not call them out or take evasive action
T ₁	Same as T ₀	B4 back observes a delta wing aircraft fire two missiles toward flight. No evasive action. Range at least 2 miles in trail. Aircraft at 5 o'clock. Only dark outline is observed as backseat must look toward sun.	Not aware of action, continues right	B4 backseat tells frontseat that two missile trails are SE	Unknown type delta wing acft fires two missiles toward BLUE flight. Angle off between 40-50°. Lead aircraft in about 30° bank slight descent	B4 initially was not concerned with missiles so no action or calls were made. Missile trails descend but do not correct for BLUE flight. Burn time is long, about 10 sec.
T ₂	BLUE flight in right level break full aft power	B4 back sees missiles disappear to his 6 o'clock. MIG following at about 1 mi in trail and on inside of BLUE flights turn, starts level break. B1, 2, and 3 break with B4. B4 front takes control after about 30°	Open flight, not aware of action - continues right turn to SE	B4 back called the flight into a break. As certain break was for missiles	Apparently disengaged since he isn't seen again	B4 front seat is not aware of the enemy aircraft. B4 backseat thought frontseat had MIG therefore went into cockpit and 1 mi scope, ready to go bore sight
T ₃	B4 in maximum power right descending break	B4 commander takes the aircraft, lights AB, and pulls into rt descending break. BLUE 1, 2, 3 discontinue break and retain GREEN flight. B4 backseat sees MIG at 3 o'clock high passing behind	Continues on course	B4 back suspects that front is unaware that a MIG was in trail. Tells front seat about the aircraft	Passes behind F-4s hdg 090 or 120	B4 back suspects that B4 commander has not seen the aircraft that launched the missiles

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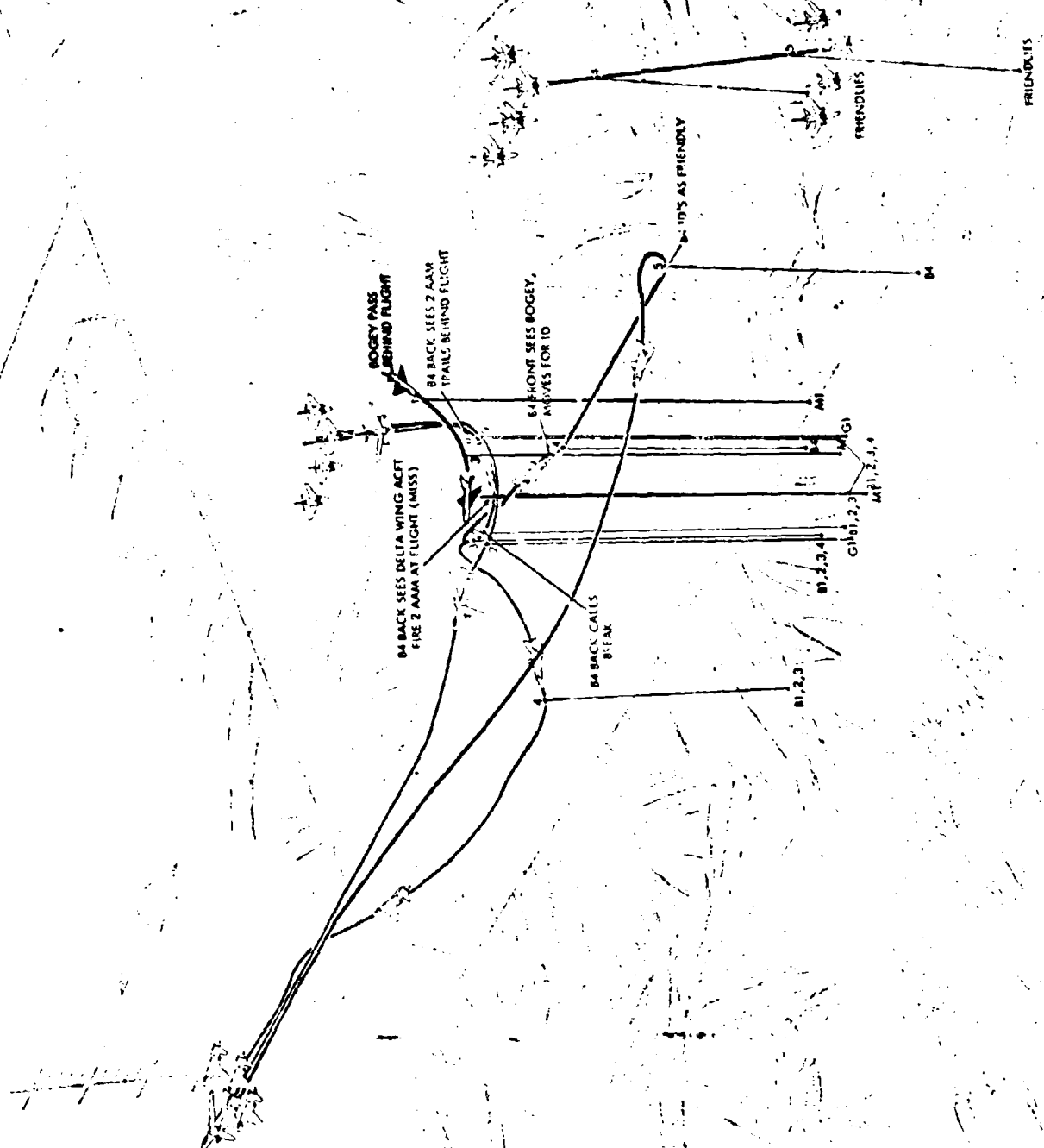
EVENT 1-67 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 3, 4)		Other Friendly	Communications	Enemy Actions (MIG 1.2)	Remarks
	Status	Action				
74	B4 in rt break blue 1, 2, 3 on escort with GREEN 495 bndts	B4 front spots a flight of 3 strangers and moves in on them for identification. Hdg about 330° range about 7 mi	GREEN 1 continued in course	Frontseat call: bogeys	None	
75	B4	B4 after identifying the strangers as 4 friendly F-105s, range 5 miles. Make right turn back to South - ask for ADF - pick up B66 on radar (by seeing the chaff) - however it turned out to be the relief B66 aircraft. Kept going and eventually joined up.	No action		None	B4 complained that E1 was on a VHF frequency different from BLUE frequency and consequently could not be warned of eminent MIG threat

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EVENT 1-67



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EVENT I-68

Aircraft Involved: Twelve F-4Cs vs fourteen to twenty MIG-21s

- (a) Four F-4Cs vs five to seven MIG-21s
- (b) Four F-4Cs vs five MIG-21s
- (c) Four F-4Cs vs unknown number of MIG-21s

Results: Seven MIG-21s destroyed plus two probables

- (a) Three MIGs destroyed
- (b) One MIG destroyed
- (c) Three MIGs destroyed

Vicinity of Encounter: 21°15'N/105°40'N
Route Package VI

1. Event I-68 covers the USAF "Operation BOLO" of 2 January 1967. Operation BOLO was a planned fighter sweep of North Vietnam airfields involving large numbers of fighter and support airplanes. (Airfields were not authorized targets at this time.) The actual MIG encounters by three flights of F-4C airplanes will be covered in detail in Events I-68(a), (b) and (c). Event I-68 is a brief summary of the planning and background effort that ultimately resulted in the destruction of seven MIG-21 airplanes.

2. On 22 December 1966 the Eighth Tactical Fighter Wing at Ubon, Thailand, was tasked by the Seventh Air Force to devise a plan to reduce or nullify the North Vietnamese air threat. On 28 December 1966 the proposed plan was approved.

3. The plan called for F-4C airplanes to simulate a large strike force of F-105 airplanes. The simulation was accomplished by the F-4Cs flying the F-105 strike group profile of an F-105 strike group, and carrying QRC-160 noise-jamming pods for the first time. A total of 56 F-4Cs, 8 F-104s, and 28 F-105 airplanes (plus other support airplanes) were scheduled to participate. The F-105s were assigned the IRON HAND mission. Of these, only 32 F-4Cs, 4 F-104s and 20 F-105s completed the mission; the aborts were due to weather, fuel transfer, ECM and flight control problems. Of this force 6 flights (24 aircraft) of F-4 proceeded via Laos to the sweep area and of these, 3 flights saw at least a total of 11 MIGs. Their encounters are described in Event 68a, b, and c. A flight of 4 F-104s also entered through Laos and orbited northwest of Hanoi but saw no MIGs. Four flights of F-105s (16 aircraft) also followed the same route and one flight saw MIGs but no engagement ensued. The force that was planned to enter via Route Package VIB was depleted by weather and only 3 flights of F-4Cs and 1 flight of F-105s took part. None of these aircraft observed MIGs.

4. Two waves of fighters were planned, in addition to normal CAP. The first wave consisted of three flights of four F-4C airplanes launched at 5-min intervals. The 5-min interval was equivalent to the estimated combat fuel available. Four flights of four F-5Cs were planned for the second wave, but one flight aborted.

5. Prior intelligence revealed that the MIGs normally orbited in two areas near Thud Ridge north of Phuc Yen awaiting inbound flights of F-105s on strike missions. The first wave of fighters were authorized a "missile-free" environment along Thud Ridge. The first flight (BLUE flight) would proceed north to the Red River, and then to the northern edge of Thud Ridge, thence south along the SW side of the ridge to Phuc Yen. "Missiles-free" was authorized until the first flight returned north to the ridge from Phuc Yen. The second flight (PURPLE flight) followed BLUE flight's track except it proceeded down the Red River, "missiles-free." The third flight (GREEN flight) followed BLUE flight's track except it proceeded down the NE side of the ridge, "missiles-free."

6. It was anticipated that the first wave of fighters would engage the MIGs and the second wave would prevent the MIGs from recovering at their home bases, thus forcing them to engage or run out of fuel. F-4Cs from Danang were to block alternate recovery fields. If the MIGs were deceived they would be encountering heavily armed F-4Cs instead of the expected heavily loaded F-105s, thus enabling the F-4Cs to take advantage of the situation and exact a high toll of enemy aircraft.

7. Operation BOLO was flown as planned on 2 January 1967 and, as anticipated, was met with heavy MIG 21 opposition. Weather and coordination problems degraded the effort to block MIG egress and recovery. However, the mission was highly successful, resulting in seven MIG-21 airplanes confirmed kills and two MIG-21 airplanes listed as probables. There was no damage to USAF airplanes from MIG armament. Extensive mission planning, training and aircrew briefings contributed to the success of the mission.

8. Prior to executing Operation BOLO some of the aircrews and most of the airplanes participated in a training/reliability program designed CHARGING SPARROW. The purpose of the program was to give aircrews an opportunity to launch a SPARROW missile at a drone target and to check out the airplane weapon system.

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EVENT I-68

9. Summary of Pilot Comments

a. Improved missile capabilities desired:

- (1) "Snapshot"
- (2) Short range (earlier arming)
- (3) Higher g (translates to better pursuit capability against a target turning with high g).
- (4) Increased gimbal limits in guidance loop.

b. Improved aircraft characteristics desired:

- (1) More endurance
- (2) Better turn radius and higher rate of roll
- (3) Improved rearward and downward visibility
- (4) Better trim system
- (5) More power in military
- (6) Eliminate fuel smoke
- (7) Better jettison arrangements so external stores can be dropped under all conditions
- (8) Simpler tank configuration for "quick-change" capability

c. Additional systems desired:

- (1) Gun
- (2) Air-to-air IPF
- (3) Ability to jam GCI
- (4) Recorder for easy recall of firing parameters to assist in analysis
- (5) Communications hardware to accommodate exchange of inter- and intraengagement information without overcrowding circuits.
- (6) Auto lock-on capability from boresight mode
- (7) A "heads-up" display showing range, g, in or out of missile envelope
- (8) Compatible ECM and RHAW equipment

d. Back seat need not be filled by a pilot but he should be familiar with all aircraft systems.

10. The following are related events:

- a. Event I-77 (23 January 67) was planned similar to Event I-68 and was called BOLO II, but the absence of airborne MIGs and SAM intensity influenced flights to turn back.
- b. Event I-71 (6 January 67) was a deception flight with F-4Cs simulating RF-4Cs in flight profile.

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EVENT I-68(a)

Aircraft Involved: Four F-4Cs vs five to seven
MIG-21s

Result: Three MIGs destroyed

Vicinity of Encounter: 21°18'N/105°45'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 2 Jan 1967/about 1500H

(See Event I-68)

2. MISSION ROUTE

BLUE flight launched from Ubon, Thailand, at 1325H, followed at 5-min intervals by PURPLE and then GREEN flights. The flight refueled on schedule and proceeded north to the NW of Thud Ridge (21°40'N/105°28'W) and then SE along the ridge to the end, and then turned south to Phuc Yen airfield.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
1 - 600-gal centerline tank
1 - 370-gal wing tank
1 - QRC-160 pod
IPF and TACAN operating, camouflage paint

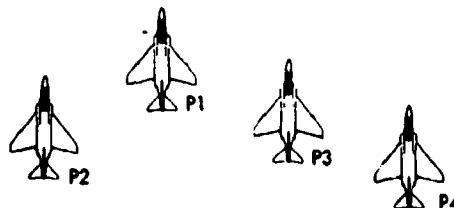
MIG-21

Silver color
Cannon
No tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Complete overcast at 7000 to 8000 ft; clear, visibility unlimited above the overcast deck.

	1	2	3	4
<u>Altitude</u> :	12,000 ft	14,000 ft	16,000 ft	18,000 ft
<u>Heading</u> :	---- Southerly, then right turn to NW ----			
<u>Speed</u> :	----- 0.9 Mach -----			
<u>Fuel State</u> :	Full internal (external tanks jettisoned just prior to encounter)			
<u>Flight Formation</u> :				



5. INITIAL DETECTION

Heading NW past Phuc Yen, BLUE 3 acquired a low, very fast radar contact at 12 o'clock, 17 mi. The lead was passed to BLUE 3. The radar contact was pursued in a diving intercept to the top of the cloud layer where the radar broke lock as the target passed under the flight. BLUE 1 resumed the lead and climbed back to 12,000 ft heading toward Thud Ridge. PURPLE flight had just entered the area and reported a MIG at 6 o'clock to BLUE flight and closing.

6. ACTION INITIATED

BLUE 1 commenced a hard, left turn into the MIG and sighted the bogey at 7 o'clock, about 2 mi. BLUE 1 then saw two MIG-21s (actually there were three in trail) at 10 o'clock, slightly low, in an easy left turn, at a subsonic speed.

7. SITUATION DEVELOPMENT

BLUE 1 maneuvered in behind the MIGs at 10 o'clock, used boresight, acquired lock-on, and launched two SPARROW missiles, interlocks in. The radar broke lock at computer minimum range and the missiles did not guide. BLUE 1 then launched a SIDEWINDER without a good tone. The missile failed to guide as the MIG dived into the cloud layer. BLUE 2,

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EVENT I-68(a)

while still in wing formation, obtained a radar lock-on and launched two SPARROW missiles at a second MIG. The second missile destroyed the MIG. BLUE 4 had turned right to sight MIGs at 5 o'clock, which the Back seat pilot had reported. BLUE 4 reversed to the left to rejoin the flight. A MIG was sighted firing at BLUE 3. BLUE 4 rolled in behind the MIG, launched one SIDEWINDER, and destroyed the MIG. Still in a left turn, BLUE 1 saw a MIG at 10 o'clock, level, in a gentle left turn at 1 mi. BLUE 1 executed a barrel roll to the outside of the turn and launched two SIDEWINDER missiles. The first missile destroyed the MIG. BLUE 4 called BINGO and the flight exited the area to the SW at high speed, in loose formation, jinking.

8. ORDNANCE

	(No. fired/No. hits)			
	SPARROW AIM-7E	SIDEWINDER AIM-9B	Soviet Cannon	<u>Remarks</u>
BLUE 1	2/0	3/1		Radar broke lock on SPARROW firings. Second SIDEWINDER knocked off part of wing.
BLUE 2	2/1			First, no guide; second, impacted ahead of tail.
BLUE 3				No attempt to fire.
BLUE 4		1/1		Impacted in tail.
MIG			Burst/0	Fired at BLUE 3, no damage, not enough lead.

9. EQUIPMENT PROBLEMS

- BLUE 1 - None
- BLUE 2 - QRC-160 intermittent in target area
- BLUE 3 - None
- BLUE 4 - Centerline tank did not transfer.

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1 - Front	4900	100	WWII	Much WWII experience in fighters, fired one missile (SPARROW) prior.
Back	500	300	92	Fired two SPARROWS in training.
BLUE 2 - Front	900	550	50	Fired one SIDEWINDER, two SPARROWS in training.
Back	500	200	Unknown	Fired one SIDEWINDER, two SPARROWS in training.
BLUE 3 - Front	---	Not interviewed	---	
Back	450	250	71	Fired one SIDEWINDER, one SPARROW in training.
BLUE 4 - Front	1800	370	Unknown	Fired one SIDEWINDER, three SPARROWS in training.
Back	525	370	Unknown	Fired three SIDEWINDERS.

Comments on this Encounter

BLUE 1 - Front

Would like to have had a gun in the airplane. Did not believe MIGs he attacked realized his presence. Radio communication frequencies crowded.

BLUE 1 - Back

Would like better lock-on capability in ACM environment.

BLUE 2 - Front

Would like auto-lock in boresight mode of radar. Need close-in weapon.

BLUE 2 - Back

None

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EVENT 1-68(a)

BLUE 3 - Front

Not interviewed.

BLUE 3 - Back

Would like better turn radius. Did not think MIG pilots were very skillful, lacked coordination.

BLUE 4 - Front

None

BLUE 4 - Back

Did not think MIG downed ever saw them. Thought tactics of fighting low and fast great; worked as planned.

Comments from Overall Experience

Generally, pilots wanted a close-in, high-g weapon and a more maneuverable airplane (turn radius, roll rate). Most of the pilots indicated lack of faith in SPARROW weapon system. Air-to-air IFF would have helped. A "heads-up" range, g and envelope presentation for the aircraft commander is desirable.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front) - 8 Feb 67; BLUE 1 (Back) - 10 Mar 67
BLUE 2 (Front and Back) - 7 Feb 67
BLUE 3 (Back) - 10 Feb 67
BLUE 4 (Front and Back) - 19 Jan 67

Messages, Reports:

Mission BOLO - 2 January 1967, Working Paper, Directorate, Tactical Air Analysis Ctr, DCS/Operations, Headquarters, 7AF.

CINCPACAF Msg 182255Z Jan 67, SECRET.

BTFW UBON Msg 021230Z Jan 67.

12. NARRATIVE DESCRIPTION

BLUE flight launched as the lead flight on a planned fighter sweep of North Vietnam air bases. The flight entered the area at the northern end of Thud Ridge and flew SE along the southwestern side of the ridge. At the southern end of the ridge the flight turned south toward Phuc Yen and Hanoi. No contact was made so the flight reversed course and headed north. BLUE 3 acquired a radar contact at 12 o'clock, low, at a range of 17 mi. The target was closing at very high speed indicating a head-on situation. The lead was passed to BLUE 3 and the solution to the intercept resulted in BLUE flight entering a shallow dive. At the top of the cloud layer the radar broke lock as the target passed under BLUE flight. BLUE 1 resumed the lead of the flight and returned to 12,000 ft while heading toward Thud Ridge.

T0 BLUE 1 sighted MIGs popping up through the cloud layer and initiated a hard, left turn to gain a firing position. PURPLE flight passed overhead on an easterly heading and called MIGs at 6 o'clock to BLUE flight. As BLUE 1, 2, and 3 turned left, BLUE 4 turned hard right to watch bogeys sighted at 5 o'clock.

T1 BLUE 1, with 2 and 3, continued to press the attack. The MIGs continued in a climbing left turn with BLUE flight maneuvering to gain firing position. BLUE 1 obtained a radar lock on the lead MIG. BLUE 4 lost sight of the MIGs at 5 o'clock, reversed the turn to the left to rejoin BLUE flight, which was 7000 to 8000 ft away, low.

T2 BLUE 1 launched two SPARROW missiles in full system, interlocks in. Shortly after launch BLUE 1 reached computed minimum range, the radar broke lock, and the missiles failed to guide. BLUE 4, from a position high at 7 o'clock, saw a MIG closing on BLUE flight. The MIG closed on BLUE 3 and commenced firing cannon. The MIGs under attack by BLUE flight continued in left turn of about 3 to 4 g without further evasive maneuvers.

T3 BLUE 1 launched one SIDEWINDER without a distinct tone. The missile appeared to guide on the clouds, as the MIG escaped by diving into the clouds. BLUE 2 obtained radar lock on second MIG as BLUE 4 closed rapidly from the rear.

T4 BLUE 2 launched two SPARROW missiles at the MIG. The first missile failed to guide but the second missile destroyed the enemy. BLUE 3 was still being fired on by a MIG. There was some uncertainty whether there were one or two MIGs behind BLUE 3. BLUE 4 closed on the MIG which was firing at BLUE 3, as BLUE 1 sighted a MIG at 10 o'clock.

T5 BLUE 4 maneuvered into a firing position behind the MIG that was shooting at BLUE 3, and launched a SIDEWINDER. The missile scored a hit; the MIG exploded and pitched down violently. BLUE 1 was in an unfavorable position behind the MIG which was at 10 o'clock. To improve the position, BLUE 1 rolled to the right to inverted flight. The roll was continued with BLUE 1 ending up on the outside of the turn, in position to launch a SIDEWINDER, as the MIG obliged by relaxing g and starting an easy climb.

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EVENT 1-60(a)

T6 BLUE 1 launched two SIDEWINDER missiles at the MIG, which was slightly above and nearly at 12 o'clock. The first missile guided toward the target and scored a direct hit in the area of the wing root. One wing was blown off the MIG and the airplane entered uncontrolled, tumbling flight toward the cloud layer. The pilot was not observed to eject.

T7 BLUE 4 called BINGO fuel and BLUE flight exited the area in a jinking, loose formation. Unguided SAMs sighted during egress.

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EVENT 1-68(a) SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (PURPLE 1, 2, 3)	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₀	Heading NW 12,000 ft, 0.9 M, full internal pod formation. Four SPARROWS, four SPARROWS, one QRC-160 pod, full internal fuel (except B4)	B1 starts hard left turn to pick up M4. B4 back pilot sees two MIGs at 5 o'clock. B4 turns hard right to try to get visual	PURPLE flight approaches from above 9 o'clock, 90° crossing angle	B3 calls BLUE flight. MIG at 6 o'clock	One MIG-21 (M1) closing BLUE flight from 6-7 o'clock level, two more (M2, 3) closing from 5 o'clock about 5 mi	All fuel tanks already jettisoned
T ₁	B1, 2, 3 in hard left turn (3 g) descending B4 reverses his turn to left	B1 and 2 see two more MIGs at 9 and 12 o'clock. B1 locked on first MIG in column that he sees (using bore-sight). B4 tries to join flight now 7000-8000 ft away and low	No longer involved	B3 calls "Bogey" at 9 o'clock	MIGs at 9 and 12 o'clock all in climbing left turn about 90° off B1's heading. They do not evade.	B4 loses sight of two MIGs at his 5 o'clock, rolls back to left. There are actually three MIGs at B1's 9-12 o'clock; however, he sees only two, locks up on second one which he believes is Lead.
T ₂	B1, 2, 3 still in hard left turn as a flight. B4 Back high, at 7 o'clock	B1 fires two SPARROWS at M4 but radar breaks lock after launch. B4 is closing flight, sees one MIG closing rapidly at 7 o'clock to B3		B4 calls "MIG at 6 o'clock" to BLUE flight	MIGs fired on by B1 do not evade. appear to be unaware of B1. M6 closing on B3 commences firing with cannon	It is unknown whether MIG closing on B3 is one of the original two MIGs that were seen at 6 o'clock to BLUE flight
T ₃	B1, 2, 3 still in hard left turn as a flight. B4 closing rapidly at 6 o'clock	B1 fires one SIDEWINDER at M3, 15° nose down, 1.5-2.0 g, indistinct growl, missile guides toward clouds. B2 locks-on to M5 behind MIG B1 is firing on.			MIG fired on by B1 dives into clouds, escapes	B2 has a lock-on but is waiting for B1 to finish firing

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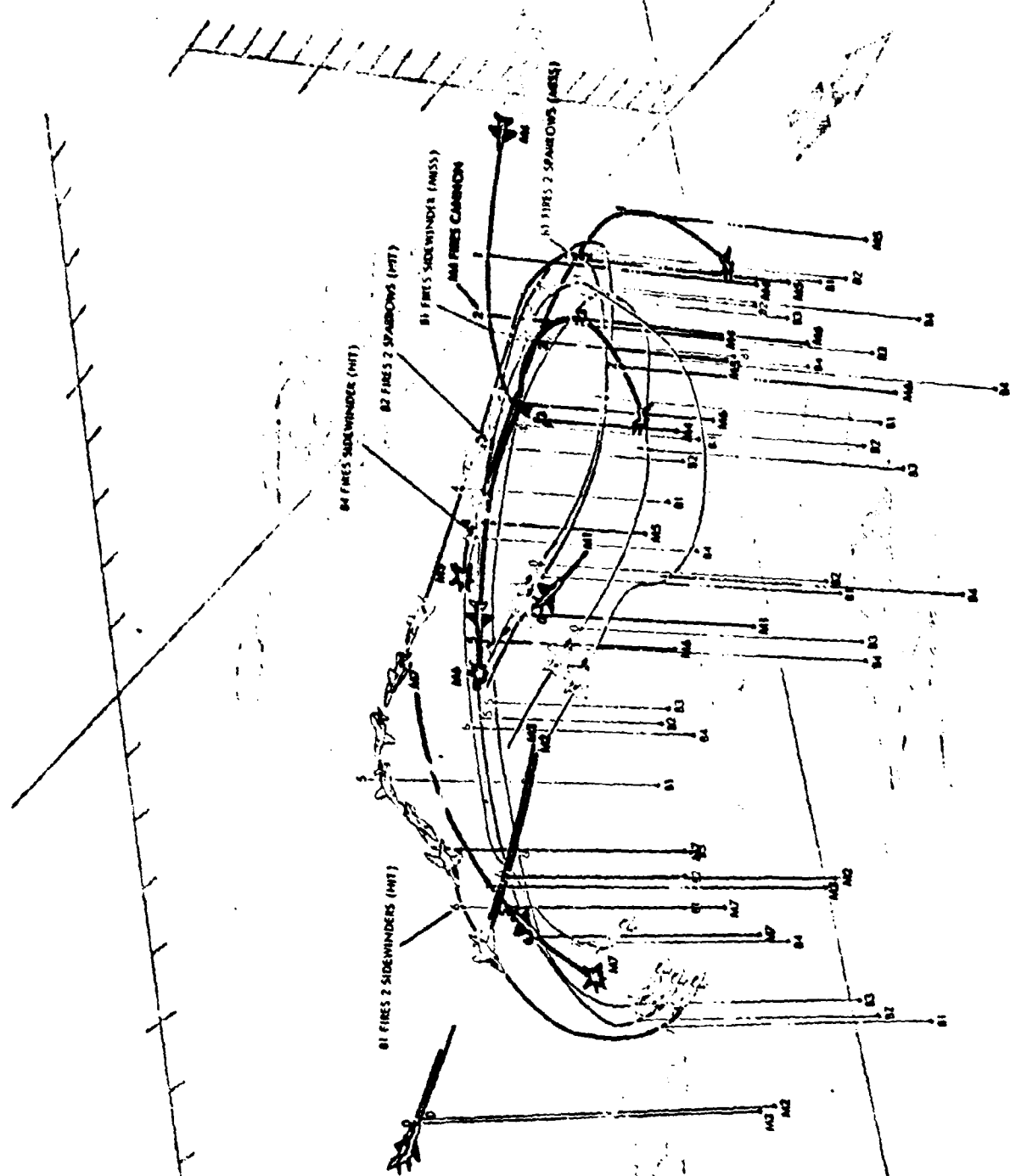
EVENT I-68(a) SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (PURPLE 1, 2, 3)	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₄	B1, 2, 3 still in left turn, loose. B4 closing on MIG at 6 o'clock to B3	B2 fires two SPARROWS at M5 full system at 14,000 ft. 560-kt TAS, 1.5 g, 6000-7000-ft range, slight overtake. First missile does not guide, second impacts in tail section. B1 sights another MIG (M7) at 10 o'clock level. B4 sights M6 behind B3 firing			M5 explodes, goes into flat spin. MIG behind B3 continues fire	There is some uncertainty as to whether there are two MIGs behind B3 or only one
T ₅		B4 slides in behind M6 which was firing at B3. fires one SIDEWINDER at 4500-ft range, 10° angle off, 9000-ft altitude, 1.5 g, 525-kt TAS, which impacts in tail section. B1 barrel rolls to outside around M7 at his 10 o'clock.		B4 yells "I got one. I got one. I got one."	M6 explodes, pitches down violently. No ejection observed.	
T ₆	B1 turning hard left followed by B2, 3, 4	B1 fires two SIDEWINDERS at M7, at 14,000-ft range, 15° angle off, 14,000-ft altitude, 1 g, 550-kt TAS. First missile impacts at left wing root. Second missile appears to guide			Left wing of M7 torn off as MIG falls into clouds. No ejection observed	M7 made an easy chandelle allowing B1 to relax g. get good growl against blue sky
T ₇	BLUE flight in visual contact. B4 6900-lb fuel	B1 heads out followed by B2, 3, 4 in AB, jinking				B4 at this time called BINGO fuel (his centerline tank had not transferred). Several SAMs were seen by BLUE flight during egress: none were guided toward flight

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EVENT I-68a



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EVENT I-68(b)

Aircraft Involved: Four F-4Cs vs five MIG-21s

Result: One MIG-21 destroyed

Vicinity of Encounter: 21°13'N/105°43'W
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 2 Jan 1967/1510H

(See Event I-68)

2. MISSION ROUTE

PURPLE flight departed Ubon, Thailand, at 1230 local and proceeded to the refueling track on schedule. The flight then proceeded north to approximately 21°30'N/105°10'W, then along the southern edge of the Red River, crossed the Black River and turned east at the reservoir heading directly toward Phuc Yen Airfield. All navigation was accomplished by use of inertial navigation instruments and dead reckoning due to the 7000- to 8000-ft overcast layer.

3. AIRCRAFT CONFIGURATIONS

F-4C PURPLE 1, 2, 3, 4

- 4 - SPARROW (AIM-7E) (PURPLE 3 had only three)
- 4 - SIDEWINDER (AIM-9B)
- 1 - 600-gal centerline tank
- 1 - 370-gal wing tank
- 1 - QRC-160 pod
- IPP and TACAN operating, camouflage paint.

MIG-21

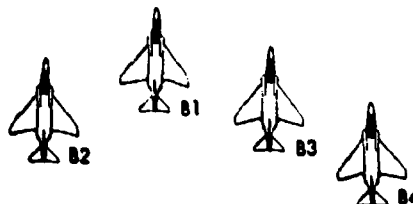
Silver color
No tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Complete overcast at 7000 to 8000 ft; clear, visibility unlimited above the overcast deck.

	PURPLE			
	1	2	3	4
<u>Altitude:</u>	15,000 ft	16,000 ft	14,000 ft	15,000 ft
<u>Heading:</u>	----- 080° -----			
<u>Speed:</u>	----- 0.9 Mach -----			
<u>Fuel State:</u>	Full internal (tanks jettisoned at start of encounter)			

Flight Formation:



5. INITIAL DETECTION

PURPLE flight was just approaching their planned TOT, west of Phuc Yen, heading east in a pod formation, approximately 15,000 ft. Back seat pilot in PURPLE 3 made radar contact at greater than 10 n mi at 12 o'clock, slightly high, closing.

6. ACTION INITIATED

PURPLE 3 obtained full system lock-on, interlocks in; the aircraft commander squeezed the trigger out of range; missile did not launch. Pilot went to interlocks out, fired again at 7 mi and then again at 3-1/2 mi with dot centered.

7. SITUATION DEVELOPMENT

Missiles fired by PURPLE 3 ineffective. MIGs (identified as two MIG-21s) continued to close and rolled out behind BLUE flight which was crossing to the north directly under PURPLE flight. PURPLE flight warned BLUE flight of MIGs and BLUE flight evaded.

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EVENT 1-68(b)

Another MIG at this time was tracking PURPLE 4 at 600 ft, 5 o'clock. PURPLE 3 and 4 broke right, lost visual contact with each other and egressed the area at high speed (Mach 1.3). MIG tracking PURPLE 3 and 4 switched to PURPLE 1 and 2 when PURPLE 3 and 4 broke right. MIG overshoot PURPLE 2. PURPLE 2 rolled in behind MIG and fired one SIDEWINDER which destroyed him. As PURPLE 2 broke after the MIG, PURPLE 1 fired three SIDEWINDER missiles at two MIG-21 aircraft closing from high, dead ahead in an attempt to disrupt their attack. PURPLE 1 and 2 egressed the area at high speed.

8. ORDNANCE

	(No. fired/No. hits)			
	SPARROW AIM-7E	SIDEWINDER AIM-9B	Soviet	Remarks
PURPLE 1	0/0	3/0		SIDEWINDERS fired head on as a "scare tactic"
PURPLE 2	0/0	1/1		Direct hit, exhaust area
PURPLE 3	2/0	0/0		First SPARROW no motor fire, second pitched straight up after launch.
PURPLE 4	0/0	0/0		
MIG 1, 2, 3, 4			Unknown	

9. EQUIPMENT PROBLEMS

PURPLE 1 - None
PURPLE 2 - None
PURPLE 3 - None
PURPLE 4 - None

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
PURPLE 1 - Front	----	Not interviewed	----	
Back	---	unknown	60	
PURPLE 2 - Front	3100	Unknown	30	Fired many SIDEWINDERS, one SPARROW in training
Back	----	Not interviewed	----	
PURPLE 3 - Front	4050	800	88	Fired two SPARROWS in training
Back	----	Not interviewed	----	
PURPLE 4 - Front	----	Not interviewed	----	
Back	----	Not interviewed	----	

Comments from This Encounter

PURPLE 2 - Front

Would like a close-in weapon, more confidence in SPARROW system. Thought MIG pilot was very poor in maneuvering, he could have escaped easily if he had not reversed his turn.

PURPLE 3 - Front

Would like to have had a close-in weapon.

11. DATA SOURCES

Project Interviews: PURPLE 1 Back, PURPLE 2 Front, PURPLE 3 Front, all 10 Feb 67.

Messages, Reports:

Mission BOLO - 2 January 1967, Working Paper, Directorate, Tactical Air Analysis Ctr, DCS/Operations, Headquarters, 7 AF

CINCPACAF MSG 182255Z Jan 67 SECRET

12. NARRATIVE DESCRIPTION

PURPLE flight launched as the second of three flights in the first of two waves of fighters on a planned fighter sweep of North Vietnam airfields, particularly Phuoc Yen. The flight proceeded uneventfully to the north and then to the Black River and reservoir where it turned 080° toward Phuoc Yen. First radar contact was made by the pilot in PURPLE 3. (T₀) Contact was at 11 o'clock, high, closing rapidly, at greater than 10 mi. With full system lock-on, interlocks in, PURPLE 3 attempted to fire one SPARROW but was

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EVENT 1-68(b)

still out of range. The pilot switched to interlocks out, fired again at 7 mi and again at 3-1/2 mi. (T₁) The first missile ejected from aircraft, emitted two puffs of smoke, and fell to the ground. The second missile launched ahead 1500 ft and then pitched straight up. No other member of flight held his radar contact. The contact (then identified as two MIG-21s) closed, passed directly under PURPLE flight in a right, descending turn, and rolled out behind BLUE flight which was just crossing below PURPLE flight and heading north. PURPLE 3 Front at this time picked up the MIGs (M_{1,2}) and called out to BLUE flight "MIGs at 6 o'clock." (T₂) The pilot then looked to his right, saw another MIG (M₃) at 5 o'clock position, 600 to 700 ft from PURPLE 4 and called "PURPLE 4 break right." PURPLE 3 and 4 broke hard right and down (4 entered a cloud layer), lost visual contact with each other, and immediately egressed at high speed. As PURPLE 3 and 4 broke, MIG 3 switched to PURPLE 1 and 2, closing rapidly. (T₃) PURPLE 2, after several attempts, succeeded in informing PURPLE 1 of the situation. PURPLE 1 then broke right and reversed left as MIG 3 overshoot. (T₄) As PURPLE 1 pulled hard left (3.5 g) two MIGs (M_{4,5}) were sighted at 12 o'clock, descending, head on. PURPLE 1 told PURPLE 2 to get MIG 3, then pulled up and fired three SIDEWINDERS head-on at MIGs 4 and 5 in an attempt to scare them off. (T₅) MIGs 4 and 5 broke hard down, headed south and egressed. PURPLE 1 then continued in a left turn, followed PURPLE 2 and egressed at high speed after MIG 3 was destroyed.

(T₆) MIG 3, after overshooting, reversed hard left and descended passing directly under PURPLE 2. (T₇) PURPLE 2 reversed left, reduced power, and rolled easily to MIG 3's 6 o'clock. PURPLE 2 then went into AB and maintained 2000-ft separation on MIG 3 now pulling 4-5 g (no radar lock-on). PURPLE 2 followed MIG 3 through a continuous hard left turn until the MIG relaxed g, and reversed to the right. PURPLE 2 then fired one SIDEWINDER at 1 g, 500-kt TAS, 10,000 ft, 15° nose down, loud tone, which impacted in the AB section of the MIG. (T₈) MIG 3 pitched up, then nosed over and fell uncontrolled through the cloud layer. PURPLE 2 then went full AB and egressed, followed by PURPLE 1.

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EVENT I-60(b) SUMMARY

Time Mark	Action Aircraft (PURPLE 1, 2, 3, 4)		Other Friendly (BLUE 1, 2, 3, 4)	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₀	PURPLE flight level 10,000 ft. 0.9M heading 080° full internal fuel	P3 picks up contact 11 o'clock high >10 n mi high closure	BLUE flight of four F-4Cs passing below flight to left		Two MIG-21 continue to close at supersonic speed (estimated) head-on (M1, 2)	No other member of PURPLE flight has radar contact
T ₁	PURPLE flight status unchanged	P3 fires two SPARROWS at 7 n mi and 3-1/2 n mi. interlocks out, full system. One has no motor fire, the other pitches straight up in front of P3	BLUE flight continues north		MIGs continue to close. start right turn	P3 attempted to fire. interlocks in, while out of range. then switched to interlocks out and fired
T ₂		P2 sees MIGs at BLUE flight's 6 o'clock. Also sees one MIG-21 at 6 o'clock to P4. P3 and 4 break right and down	BLUE flight continues north, commences left turn when bogeys called at 5 o'clock	P2 calls "MIGs at 6 o'clock" to BLUE flight and "break right" to P4	Head on MIGs turn right in descending turn to roll over at BLUE flight's 6 o'clock	Single MIG is 600 to 700 ft behind P4, rd firing
T ₃	P1 and 2 in gentle right turn, P3 and 4 in diving right turn	P2 stays on wing of P1. both turn into single M3	BLUE flight engages separately down three MIG-21 aircraft	P2 calls out MIG at 5 o'clock to P1 and 2	Single MIG shifts his attack to P1 and 2, closes solidly	P2 had much difficulty in informing P1 of closing MIG
T ₄		P3 and 4 egress at rapid speed, P4 in cloud layer. P1 and 2 reverse turn into MIG who over-shot badly			MIG overshoots, reverses his turn to left and passes directly underneath P2	
T ₅	P1 and 2 in hard left turn (3.5 g)	P1 sees two more MIGs at 12 o'clock high, closing, fires three SLOEMINNERS head on. P2 rolls out easily behind MIG		P1 calls two MIGs at 12 o'clock. tells P2 to take single MIG	Two MIGs close head on. Single MIG stays in hard left turn (4-5 g)	P1 fired SLOEMINNERS to scare MIG out of attack.

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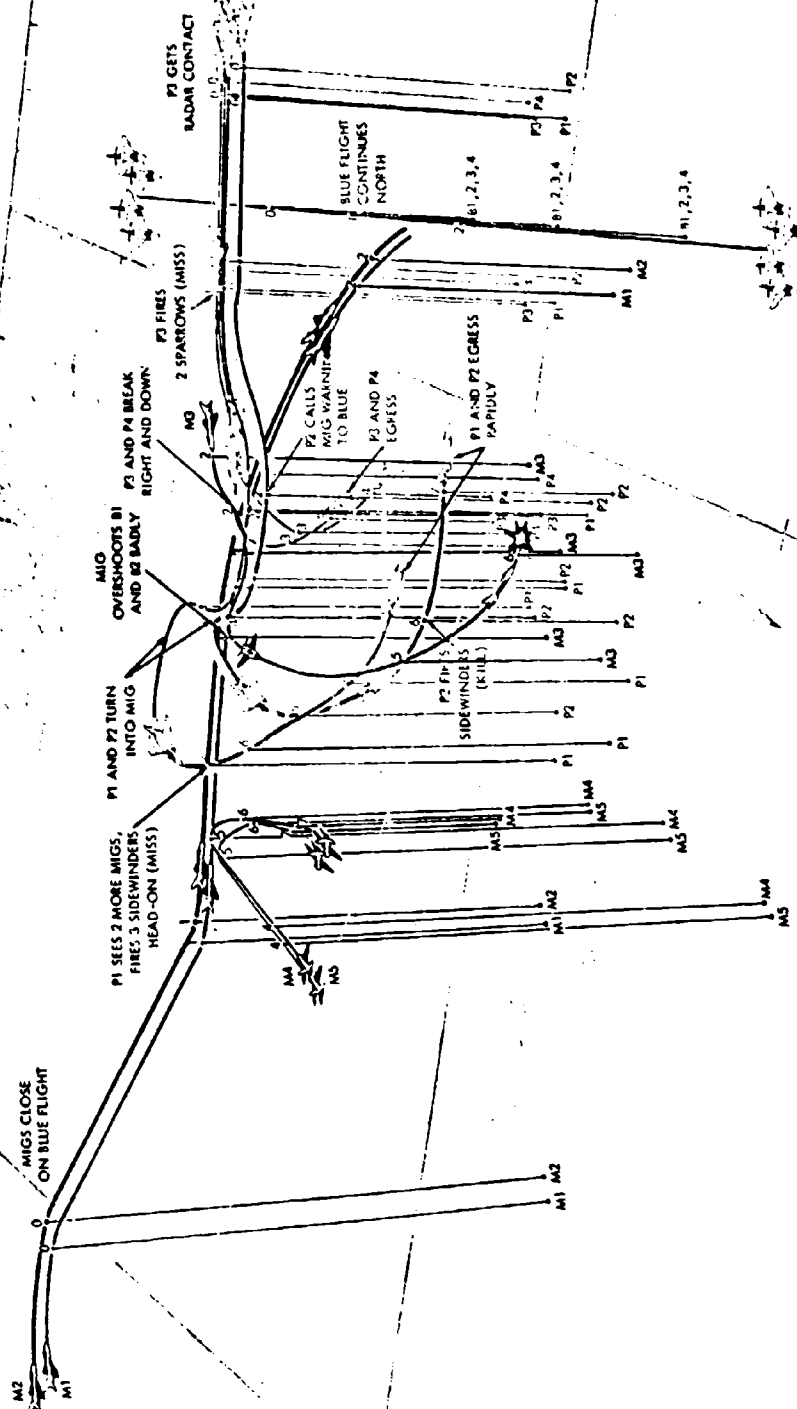
EVENT I-6B(b) SUMMARY (Continued)

Time Mark	Action Aircraft (PURPLE 1, 2, 3, 4)		Other Friendly (BLUE 1, 2, 3, 4)	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T 6		P2 fires one SIDEWINDER at 1 g, 500-kt TAS, 15° nose down, 3500-ft separation		Two MIGs break down and egress south. Single MIG starts to reverse, is hit in tail section, falls from sky		Single MIG made mistake of reversing, allowing P2 to unload g and fire easy SIDEWINDER shot. P2 says MIG-21 would have escaped if he had continued hard left turn
T 7		P1 and 2 depart the area rapidly with P2 in the lead				

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EVENT 1-68(c)

Aircraft Involved: Four F-4Cs vs unknown number of MIG-21s

Results: Three MIG-21s destroyed,

Vicinity of Encounter: 21°20'N/105°40'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION -

Date/Time: 2 Jan 1967/1515H

Third flight in first wave of fighter sweep in vicinity of Phuc Yen airfield.
(See Event I-68 for detailed plan.)

2. MISSION ROUTE

Four F-4Cs (GREEN 1, 2, 3, 4) launched from Ubon, Thailand, refueled en route, proceeded to northern end of Thud Ridge (21°45'N/105°30'E), then turned SE to proceed along the northeastern side of Thud Ridge, then made right turn over Phuc Yen airfield.

3. AIRCRAFT CONFIGURATIONS

F-4C GREEN 1, 2, 3, 4

4 - SPARRON (AIM-7E) except G3 with three AIM-7E
4 - SIDEWINDER (AIM-9B)
1 - 600-gal centerline tank
1 - 370-gal wing tank
1 - QRC-160 pod
Radar, IFF and TACAN operating
Camouflage color

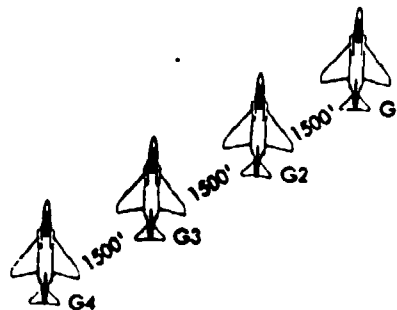
MIG-21

Silver color
No external tanks
Cannon, rockets, possibly AIMS but none were observed to be fired.

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Solid undercast with tops 7000 to 8000 ft, clear with unlimited visibility above the undercast.

	1	2	3	4
Altitude:	16,000 ft	17,000 ft	19,000 ft	20,000 ft
Heading:	----- ~ 330° -----			
Speed:	----- 550- to 580-kt TAS -----			
Fuel State:	----- Full internal -----			
Flight Formation:				



5. INITIAL DETECTION

On heading approximately 330° GREEN 2 Back observed MIGs at 3 o'clock low, climbing up out of clouds on heading about 020° in easy left turn. Later observations by the members of flight indicated there were probably six MIG-21s in the flight. (A flight of four followed by two more in a 2-m trail.)

6. ACTION INITIATED

GREEN 2 had radio failure and could not take lead on initial sighting as prebriefed. GREEN 1 eventually picked up the MIGs, tightened his right turn, and reversed to the left to get in a firing position.

7. SITUATION DEVELOPMENT

MIG leader on observing GREEN flight closing to firing position made hard left turn which resulted in MIGs and F-4Cs all over the sky vertically in a generally hard left turning engagement.

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EVENT I-68(c)

8. ORDNANCE

	(No. fired/No. hits)		
	<u>SPARROW</u> <u>AIM-7E</u>	<u>SIDEWINDER</u> <u>AIM-9B</u>	<u>Remarks</u>
GREEN 1	3/1	0/0	No. 1 no motor ignition; No. 2 exploded in MIG tail section resulting in kill; No. 3 appeared to guide satisfactorily
GREEN 2	3/1	0/0	No. 1 no motor ignition; No. 2 exploded on MIG wing root resulting in kill; No. 3 passed about 2000 ft long; No. 4 SPARROW was damaged when GREEN 2 flew through MIG debris; it would not release.
GREEN 3	3/?	0/0	No. 1 pitched hard right after release; No. 2 followed MIG into cloud, probable kill; No. 3 no motor ignition.
GREEN 4	3/1	4/?	SPARROW No. 1 no motor ignition; No. 2 exploded on MIG resulting in kill; No. 3 no motor ignition; No. 4 would not release due to rack malfunction. SIDEWINDER No. 1 and 2 exploded in vicinity of MIG; No. 3 and 4 not observed because GREEN 4 had to break right immediately after firing. Credited with probable.
MIGs			Two bursts of cannon, one set of rockets. No hits.

9. EQUIPMENT PROBLEMS

GREEN 1

None

GREEN 2

Intermittent radio and ICS failure. QRC-160 stopped operating in encounter after pulling g's. Later investigation revealed circuit breaker inside the set had popped.

GREEN 3

None

GREEN 4

Lost left generator on take-off, continued flight with one generator. QRC-160 stopped operating during egress.

10. AIRCREW COMMENTS

Experience

	<u>Total</u> <u>Hours</u>	<u>F-4</u> <u>Hours</u>	<u>Combat</u> <u>Missions</u>	<u>Remarks</u>
<u>GREEN 1</u>				
Front	--- Unknown ---		125	Fired one SPARROW, two SIDEWINDERS in training; planned much of mission
Back	----- Not Interviewed -----			
<u>GREEN 2</u>				
Front	1000	700	125	Fired thirteen SPARROWS, two SIDEWINDERS in training
Back	Unknown	250	85	Fired one SPARROW, one SIDEWINDER in training
<u>GREEN 3</u>				
Front	4000	~ 230	60	Fired ~80 missiles of various kinds during career, all fighter experience
Back	400	150	Unknown	Fired one SPARROW, one SIDEWINDER in training
<u>GREEN 4</u>				
Front	2800	150	~15	Fired numerous missiles during career
Back	350	100	<10	Fresh out of training command

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EVENT 1-68(c)

Comments on This Encounter

GREEN 1 - Front

Would like to have had a short-range, high-g missile.

GREEN 2 - Front

Would like to have had a short-range, high-g missile, more rearward visibility, more endurance.

GREEN 3 - Front

Would like to have had a short-range, high-g missile, also guns, better roll rate, better rearward visibility. Thought MIGs were mainly defensive, one was not familiar with his missile system.

GREEN 4 - Front

Would like to have had more missiles.

11. DATA SOURCES

Project Interviews:

	GREEN			
	1	2	3	4
Front	19 Jan 67	19 Jan 67	7 Feb 67	7 Feb 67
Back	--	2 Feb 67	7 Feb 67	7 Feb 67

Messages, Reports:

7AF message to CINCPACAF DOA 19004, 11 Jan 67; Detailed report of BOLO

"Mission BOLO - 2 January 1967," Analysis prepared by Col. Wood and Major Ow of the Directorate, Tactical Air Analysis Center, Headquarters, 7AF

12. NARRATIVE DESCRIPTION

GREEN flight proceeded uneventfully along their prescribed route utilizing time distance and inertial navigation references due to complete undercast obscuring the ground. The flight turned right on the northern tip of Thud Ridge and proceeded southeasterly in a right echelon with the lead at 15,000 ft to 16,000 ft and GREEN 4 at 20,000 to 21,000 ft. The purpose of this formation was to provide better SAM lookout in the direction of the high SAM threat in the vicinity of Thai Nguyen. QRC-160 pods had been turned on over the Black River and centerline tanks jettisoned over the Red River.

While on the southeasterly heading along the northern edge of Thud Ridge GREEN flight were authorized "missiles-free" area in the sector between 045° and 135°. GREEN 3 made a radar contact 025° right at 35 mi. GREEN 1 agreed with GREEN 3 that this was outside the missiles-free area and elected to continue as planned rather than go through the normal ID procedure.

At this time radio chatter indicated that BLUE and PURPLE flights (Events 1-68(a) and (b)) were engaged with MIG-21s. GREEN 1 asked BLUE 1 for his location and if GREEN flight could be of assistance, but did not get a readable answer.

T₀ GREEN flight continued SE and turned toward the north over Phuc Yen airfield. In the process of the turn the echelon shifted from the right to the left. Still in the turn, on heading about 330°, GREEN 2 observed MIG-21s at 3 o'clock, 6 n mi coming up out of the overcast on heading about 020° in easy left turn. GREEN 2 had radio failure and could not alert the flight and take the lead which was the prebriefed procedure for the flight member making contact which was not seen by the flight leader. GREEN 4 also observed the MIG flight which contained four MIG-21s with two more in a 2- to 3-mi trail. GREEN flight continued right turn to NE heading on an appropriate intercept path. GREEN 1 now sighted the MIGs.

T₁, T₂ Upon observing GREEN flight closing, the MIG leader broke left and GREEN 1 steepened his turn to follow. This placed GREEN 4 on the outside of the echelon, in a position where he had to go high to clear the other members of GREEN flight turning into him. As GREEN 4 went high in left rolling maneuver he observed a MIG and locked-on; he went to AB, and following the MIG, accelerated in front of GREEN 1 and 2. As GREEN 4 passed GREEN 1 and 2, GREEN 2 had a good SIDEWINDER tone on MIG 3, which GREEN 4 was chasing, but GREEN 2 did not fire because he saw GREEN 4 closing to firing position.

T₅ GREEN 4 closed on MIG 3, yo-yoed to avoid overshoot, tracked MIG 3 visually through the windscreen (recalling recommendations of Navy high-g SPARROW firing tests) and fired two SPARROW missiles in full system, interlocks out. First missile was not observed (probably no motor ignition). The second SPARROW impacted with a large explosion in the

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EVENT 1-68(c)

tail section. GREEN 4 observed the pilot with parachute already open almost simultaneously with the explosion.

T₂ At T₁ (during the initial left break) two of the MIG-21s, possibly MIG 5 and 6, who were 2 mi behind the lead flight of four MIG-21s, maneuvered to obtain an advantageous position on GREEN 1 and 2, who were attacking what was probably MIG 1 and 2. MIG 5 passed low between GREEN 1 and 2 and MIG 6 fired cannon at high angle off with no effect. GREEN 1 broke right and reversed back to the left to continue his attacks on MIG 1 and 2. At this (or possibly some later time) GREEN 2 lost GREEN 1, ended up in a left barrel roll high and rejoined on GREEN 4, which he thought was GREEN 1. MIG 5 and 6 maneuvers after T₃ not observed.

T₆ After his evasive maneuver GREEN 1 again closed behind MIG 1 and 2 and fired three SPARROW missiles. The second SPARROW exploded at the wing root of MIG 2 destroying the MIG-21.

T₄ Upon break at T₁, GREEN 3 saw a MIG, (which for purposes of this writeup is called MIG 4) pass under his nose 2000-3000 ft low with about 090° angle off. GREEN 3 chandelled up to inverted, made a hard descending turn toward MIG 4, jettisoned his wing tanks and went to AB. MIG 4 made a diving high-g left spiral toward the clouds upon seeing GREEN 3. GREEN 3 fired two SPARROW missiles. The first missile did not guide and the second followed MIG 4 into the clouds. The SPARROW may have hit MIG 4 in the clouds. GREEN 3 pulled up into a right chandelle, turned about 180° and reversed to the left at about 14,000-ft altitude.

T₇ T₈ GREEN 1 on a heading of about 020° picked up three radar contacts 030° right at 12 mi. He turned right to ID these contacts but then visually acquired two MIGs at 10-11 o'clock, 3 mi in a left turn passing a NW heading. GREEN 1 turned left to position on these MIGs intending a SIDEWINDER launch.

GREEN 2 and GREEN 4 now flying as an element tailed in behind additional MIGs. The MIG flight split in two with MIG 7* and possibly one other MIG going left and down and MIG 8 going to the right and up. GREEN 2 followed MIG 7 and GREEN 4 followed MIG 8.

T₉ GREEN 2 fired two SPARROW missiles at MIG 7. The second SPARROW exploded on MIG 7. GREEN 2 flew through the debris causing some damage to his aircraft. The MIG pilot was observed to be making a parachute descent.

T₁₀ GREEN 2 fired SPARROW at another MIG. The SPARROW passed 2000 ft in front of the MIG.

T₁₁ GREEN 4 fired two SPARROW missiles at MIG 8 who was in a high-g right turn. Neither SPARROW was observed. The motor on one probably did not ignite and the other did not release due to a rack malfunction. At this point MIG 8 pulled up and GREEN 4 switched to HEAT.

T₁₂ GREEN 4 fired four SIDEWINDERS at MIG 8. Two were observed to detonate near MIG 8. As he was firing the last two SIDEWINDERS, GREEN 4 heard GREEN 3's call "F-4C I don't know your call sign, but there's a MIG on your tail, break hard right!" and GREEN 4 broke hard right. This prevented observation of the last two missile impacts. GREEN 3 had seen a MIG closing on GREEN 1 when he made his call. GREEN 1, 2 and 4 all broke right on GREEN 3's call and departed the area. GREEN 2 observed two more MIGs which he wanted to attack but did not because of his radio problem and desire to maintain element integrity with GREEN 4.

GREEN 3 performed left chandelle to inverted to attack MIG 9 who had made the run on GREEN 1. (GREEN 1 thought that this aircraft might have been one of the three radar targets he had picked up at T₇.) MIG 9 entered a diving left spiral.

T₁₃ GREEN 3 fired a SPARROW at MIG 9 which apparently had no motor ignition since it was never observed. GREEN 3 continued to turn with MIG 9 at 4 to 5 g when he decided that he should break off as had been briefed rather than hassle. About that time GREEN 3 Back advised there was another MIG (MIG 10) at 7 o'clock 2 to 3 mi closing. GREEN 2 unloaded to 2 to 2-1/2 g and accelerated.

T₁₄ About that time GREEN 3 observed MIG 10 firing cannon and 8-10 rockets. GREEN 2 pulled hard left 5 to 5-1/2 g and none of the rockets passed near GREEN 2. MIG 10 disengaged right to the south. GREEN 3 made one more pass up Thud Ridge and egressed the area jinking at Mach 1.1.

GREEN flight joined up at the refueling point, refueled and returned as a four-plane flight.

It was impossible to reconstruct the flight paths of all the MIGs in this encounter. Whether there were only a total of the six MIGs originally sighted or more MIGs which joined the engagement was not clear. Numbers after MIG 6 are used for ease of portrayal and may actually be some of the original six MIG-21s.

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Three MIG-21s were confirmed kills. The only damage to GREEN flight was to GREEN 2 when he flew through the MIG debris at T₉.

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EVENT I-68(C) SUMMARY

Time Mark	Action Aircraft (GREEN 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₀	500-kt TAS G1 15,000 ft G2 16,000 ft G3 19,000 ft G4 20,000 ft Right turn	GREEN flight continued right turn. Had shifted from right to left echelon in the turn			Flight of six MIG-21s climbing out of overcast in easy left turn	G2 had radio failure and was unable to assume lead as prebriefed upon being first to sight MIGs
T ₁		G1 made hard left turn			MIG flight observed GREEN flight closing, broke left into GREEN flight	
T ₂	G4 in AB	G4 slid to outside and climbed in AB when G1 turned left. G4 spotted MIG, passed G1 and 2 while pursuing			MIG flight separated into different elements for which exact flight paths cannot be reconstructed	
T ₃		G1 and 2 still following the lead MIG element, observe a MIG making firing pass on him, made hard left then hard right, continued to follow M1 and 2	G2 lost G1 at this point. After rolling out of left barrel roll G2 later joined with G4 whom he mistook for G1		M5 and 6 element made pass on B1 and 2. One MIG passed between B1 and B2 low. Other fired short burst not hitting	
T ₄	G3 20,000 ft	Upon contact with the MIG flight at T ₁ G3 saw MIG pass under his nose 2000-3000 ft low with about 90° angle off G3 chandelled up, went to boresight, made hard turn toward MIG, jettisoned the one wing tank and went to AB. Made left rolling maneuver to get behind M4. G3 got full system lock-on at T ₄ , fired two SPARROW missiles as M4			M4 in descending left spiral pulling g's went into clouds at about 8000 ft	G3 fired two SPARROWS at 020° dive angle. 1-1/2 mi range. First missile did not guide. Second missile followed M4 into the cloud deck. G3 front and back felt radar

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EVENT I-68(c) SUMMARY (Continued)

Time Mark	Action Aircraft (GREEN 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₄ cont'd	G3 11,000 ft G3 14,000 ft	entered cloud deck in tight left turn. G3 pulled up did not follow M4 into clouds. G3 came out of AB climbing in right chandelle				illuminator had been maintained long enough for the SPARROW to have hit M4.
T ₅	G4 640 kt 12,000 ft	G4 fired two SPARROW missiles at M3. Full system, interlocks out. 2- to 3-mi range			MIG 3 in left turn	Apparently no motor ignition on first SPARROW. Second SPARROW hit M3 resulting in kill. M3 pilot ejected.
T ₆	G1 580 kt 15,000 ft 10° nose down	G1 fired three SPARROW missiles at M2. Interlocks out. Range about 1-1/2 mi			M2 in hard left turn	First SPARROW apparently no motor ignition, second missile impacted just to rear of wing root on M2. Third appeared to guide. Credited with kill M2. M2 pilot ejected.
T ₇	580 to 590 kt	G1 got radar contact three bogeys, 030° right; turned right to make ID				
T ₈		G1 observed two MIGs at 10 to 11 o'clock about 3 mi, reversed turn to left to attack.				
T ₉	G2 500-kt TAS 14,000-15,000 ft 030° left bank 3-4 g	G2 who had been flying with G4 (thinking G4 was G1) fired two SPARROW missiles at M7. Full system interlocks out.				First SPARROW no motor ignition. Second SPARROW hit MIG-21. MIG pilot ejected. G2 flew through the debris causing following damage to his

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EVENT I-68(c) SUMMARY (Continued)

Time Mark	Action Aircraft (GREEN 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIGS)	Remarks
	Status	Action				
T ₉ contd						aircraft: 1. Intake lips 2. Right inboard leading edge flap. 3. Underside of right wing cut. 4. Underside of fuselage damaged. 5. Left engine AB section damaged. 6. Chipped nose cone on right aft SPARROW.
T ₁₀	G2	G2 fired one SPARROW at another MIG-21. Immediately after passing through debris of one MIG 7				SPARROW passed 2000 ft in front of MIG
T ₁₁	G4 690-kt TAS 12,000 ft high-g turn	G4 fired two SPARROWS at M8 in high-g right turn. 2- to 3-mi range			M8 in high g right turn	Neither SPARROW was observed
T ₁₂	G4 550 to 600-kt TAS 15,000 ft G3 3-1/2 g 20,000 ft	G4 switched to HEAT followed M8 as he started to climb unloaded g's and fired four SIDEWINDERS at 9000-ft range. Then broke right after G3 warning call. Break prevented observations of last two SIDEWINDERS G1 and G2 also broke right after G3's all-inclusive call. G3 moved into position behind M9 with left chandelle to inverted, pulled through to position on M9.		G3 observed a MIG-21 closing on an F-4C and called "F-4C I don't know your call sign, but there's a MIG-21 on your tail. Break hard right."	M8 pulled up in climb M9 closing on BLUE 1 M9 entered, diving left spiral	SIDEWINDER No. 1 detonated to right high of M8 tail pipe. SIDEWINDER No. 2 low right of tail. Mes. 3 and 4 not observed due to G4's sudden right break on G3's warning call.

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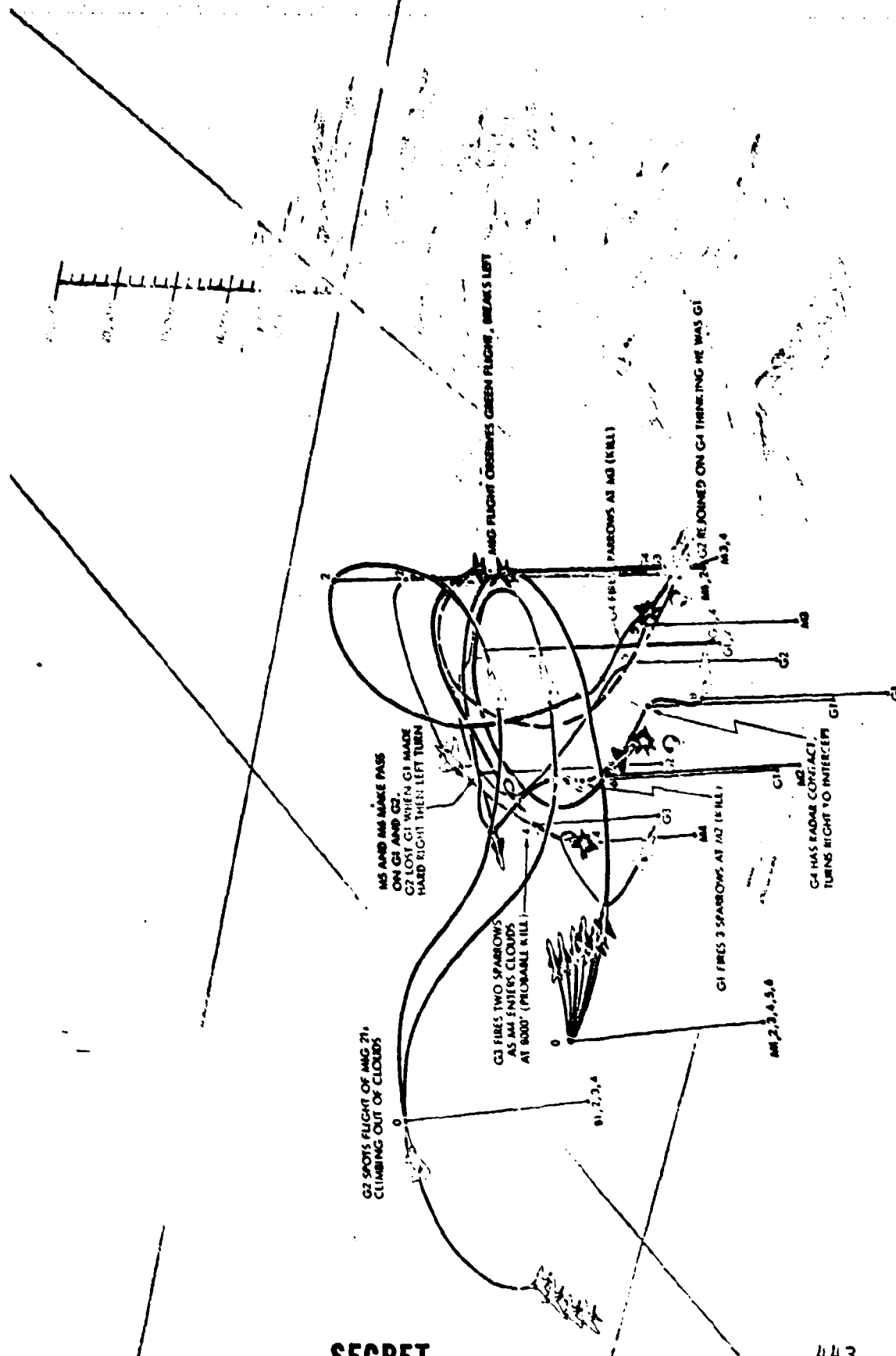
EVENT I-68(C) SUMMARY (Continued)

Time Mark	Action Aircraft (GREEN 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (MIGs)	Remarks
	Status	Action				
T ₁₃	600 kt. In 020°-030° descent, 3-1/2 g 14,000 ft	G3 fired SPARROW 6000-ft range G3 pulled 465 "g's" to stay with M9 for short time then decided to break off as prebriefed rather than try close-in hassle G3 unloaded g's to about 2-1/2 to accelerate		At time G3 decided to break off G3 Back advised there was a MIG at 7 o'clock	M10 closing at about 2-mi range fired short burst of cannon. No effect.	Did not see SPARROW, apparently no motor ignition
T ₁₄	15,000 ft	G3 observed rocket firing, pulled about 5.5 g tightening his turn and climbed slightly. Rockets were not observed after initial firing. (Did not come close.) G3 flew up Thud Ridge and departed the area jinking at Mach 1.1. G1, 2 and 4 had already departed. G2 in company with G4 spotted two more MIG-21s at 10 o'clock during egress from the area. Wanted to attack but did not since G4 was departing the area and G2 was not too sure of his radio.			M10 fired 8-10 rockets M10 broke off to the right after the rocket firing	

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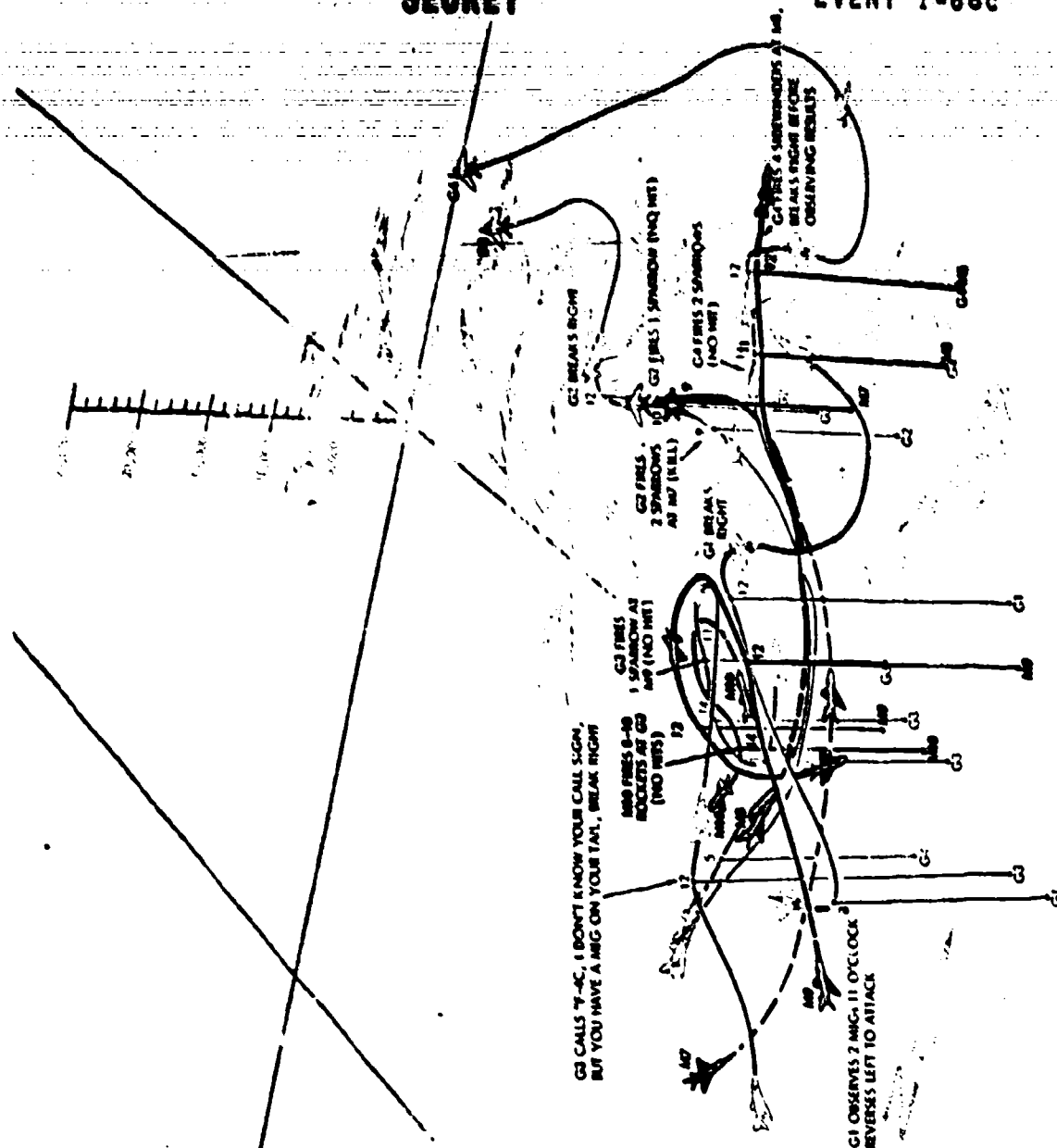
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EVENT I-68c



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EVENT 1-69

Aircraft Involved: Four F-4Cs vs MIOs

Result: Sighting only

Vicinity of Encounter: Unknown

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 3 Jan 1967/1550H

Four F-4Cs (BLUE flight) flying cover for two B-66s on strike mission.

11. DATA SOURCES

Messages, Reports

7AP, OPREP-3, 031737Z Jan 67, DOCO 12016

12. NARRATIVE DESCRIPTION

Eleven MIO calls were issued to BLUE flight indicating MIOs were flying parallel to their track. The MIOs eventually turned into the flight and the B-66s were then turned away from the possible attack. When MIOs were finally sighted visually, they broke off and did not engage BLUE flight.

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EVENT I-70

Aircraft Involved: Four F-4Cs vs two MIG-21s

Result: No damage

Vicinity of Encounter: 21°40'N/105°20'E
Route Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Jan 1967/1201H

Four F-4C aircraft (BLUE flight) escorting two B-66 aircraft (GREEN flight) on ECM mission north of Hanoi in vicinity of 21°30'N/105°00'E.

2. MISSION ROUTE

Aircraft departed Ubon to 20°00'N/104°00'E to 22°10'N/105°30'E to 21°30'N/104°30'E to 18°00'N/104°55'E.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

4 - SPARROW (AIM-7)

4 - SIDEWINDER (AIM-9B)

External tanks - at least one centerline

B-66 GREEN 1, 2

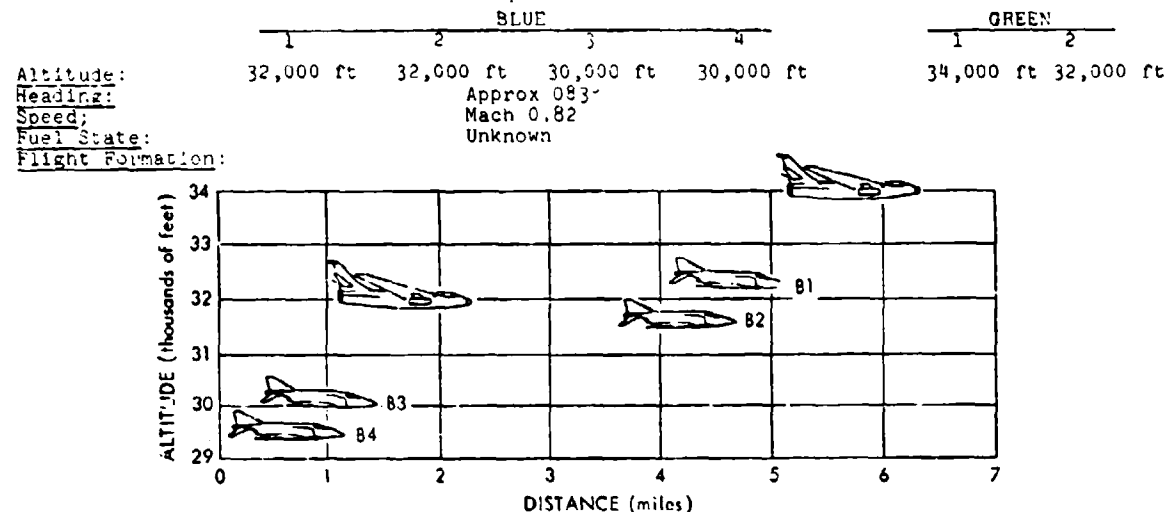
Not given

MIG-21 MIG 1, 2

Unknown

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Total undercast with tops at 7000 to 10,000 ft. Clear and unlimited visibility above undercast.



5. INITIAL DETECTION

Just after crossing Red River, BLUE 1 had radar contact at 35 mi range, 30° right, and low (approx 15,000 ft). Contact was confirmed by GREEN flight radar. Bogeys appeared to be climbing in direction of BLUE flight (heading approx 290°).

6. ACTION INITIATED

BLUE 1 advised GREEN flight and BLUE 2 to make 180° turn and egress the area. BLUE 1 and 2 jettisoned tanks. BLUE 1 initiated a descent towards bogeys and increased speed to Mach 0.95. BLUE 3 and 4 initially started chase after jettisoning tanks but resumed escort when MIGs not visually acquired and GREEN departing area.

7. SITUATION DEVELOPMENT

BLUE 1 continued intercept as bogeys continued their climb directly toward GREEN flight. BLUE 1 had a visual at 17 mi and attained lock-on at 15 mi with bogeys 20,000 ft. An in-range light was obtained at about 6 mi but visual identification had not been made. Both flights continued head-on to each other until a break 4 mi when bogeys broke up and right then back down and headed in the direction of Thuc Yen. During break the bogeys

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were identified as MIG-21 aircraft. BLUE 1 restrained from firing because he was concerned that bogeys could have been friendly. BLUE 1 did not pursue, but made hard left turn to rejoin and continue escort of GREEN flight.

8. ORDNANCE

None expended

9. EQUIPMENT PROBLEMS

None reported

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1 - Front	3450	220	43	1 SPARROW firing

Comments from Overall Experience

Indicated need for better airborne identification system.

Indicated need for guns on F-4C because of their flexibility (can "scare off" as well as kill) and lack of limitations, such as g forces and in minimum ranges "inherent in missiles."

Feels that it is essential to have another pilot in back seat of F-4 due to variability of missions assigned and to provide a career progression to the front seat.

11. DATA SOURCES

Project Interview: BLUE 1 (Lead-Front) 9 Feb 67
BLUE 3 (Front) 10 Feb 67

Messages:

8 TFW, OPREP-3, 050415Z Jan 67, DCI 01097
432 TRW, OPREP-3, 050605Z Jan 67

12. NARRATIVE DESCRIPTION

Same as Item #7

SECRET

EVENT 1-71

Aircraft Involved: Two F-4Cs vs Four MIG 21Cs

Result: Two MIGs destroyed

Vicinity of Encounter: Approximately 30 mi NW of Hanoi. Route Package VI-A.

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 6 Jan 1967/1030H

Two F-4Cs (BLUE flight) flying as decoys, simulating an RF-4C weather reconnaissance mission in an attempt to lure MIGs into an attack.

2. MISSION ROUTE

BLUE flight departed Ubon, refueled on WHITE ANCHOR track, proceeded to TACAN Channel 97, then headed for 21°52'N/104°20'E, turned NE to 22°08'N/104°56'E, turned SE to 21°55'N/105°51'E, and turned South to 21°35'N/106°00'E, all at an altitude of 9000 ft. At this point the flight made a left turn to heading of 297° for approximately 30 mi, made a left turn to heading of 160° and started to descend to 3500 ft. Due to intense AAA ground fire the flight climbed to higher altitude. MIG engagement occurred in the vicinity of Phuc Yen. After the engagement the flight returned to Ubon without refueling.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
1 - 370-gal wing tank (left side)
1 - 600-gal centerline tank
1 - QRC-160 ECM pod
RHAU equipment (APR-25)
IPP, TACAN
Camouflage

MIG-21C MIG 1, 2, 3, 4

No external stores observed
Not camouflaged (silver with red star)

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: 4500-ft overcast, tops 7500 ft, visibility unlimited on top, 6-mi smoke and haze below overcast.

	BLUE	2
<u>Altitude:</u>	-14,000 ft--	
<u>Heading:</u>	----140°----	
<u>Speed:</u>	500-550-kt TAS	
<u>Fuel State:</u>	10,500 lb	9000 lb

Flight Formation: BLUE 1 and 2 were in a close "parade formation" to appear on radar as a single RF-4C, with BLUE 2 on left side of Lead until radar contact was made with the MIGs. BLUE 2 then crossed over to the right of BLUE 1 (Lead) and flew loose combat wing.

MIG Formation: Four aircraft extended in a loose trail over a 3-mi length with the trail elements stepped up.

5. INITIAL DETECTION

BLUE flight received a MIG warning from BIG EYE that MIGs were in Route Package VI-A and made a left turn to heading 140°. BLUE 1 made radar contact at 22 mi, 5°-15° right. Visually sighted at 8 mi. Visually identified as MIG-21s at 5 mi.

6. ACTION INITIATED

BLUE flight turned right to nearest collision course (160°) and jettisoned external fuel tanks.

7. SITUATION DEVELOPMENT

BLUE flight ran a head-on intercept (180° track crossing angle (TCA)) on four targets until the targets reached 12 mi at which time the targets turned away. BLUE flight continued to close from the rear aspect until the range decreased to 5 mi. At 5 mi BLUE 1 identified the aircraft as MIG-21s and the MIGs turned right. BLUE 1 and 2 continued a radar intercept aided by visual contact. Both members of BLUE flight fired a SPARROW missile, interlocks in, 30° TCA. Neither was able to observe missiles. BLUE 1 then went interlocks out, pulled his aircraft up and generated lead on the MIG until the MIG was visually displaced just above the radome and fired another SPARROW. BLUE 1's second SPARROW detonated near the midsection of the MIG, resulting in a kill.

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SITUATION DEVELOPMENT (Continued)

EVENT 1-71

BLUE 2 observed the burning MIG and then lost contact with the engagement. BLUE 1 continued the attack on MIG 2 which dove into the clouds. BLUE 1 observed MIGs 3 and 4 at BLUE 2's 6 o'clock and barrel rolled into MIG 3 and 4's 6 o'clock. MIG 3 and 4 went into the clouds. MIG 3 and 4 came out of the clouds and BLUE 1 executed a rear quarter attack which degenerated to a slow-speed scissors. BLUE 1 fired three SIDEWINDERS, none of which achieved a kill. Leader of the MIG element rolled on his back, put his nose down and egressed. BLUE 2 sighted the engagement, acquired a boresight radar lock-on and informed BLUE 1. BLUE 1 disengaged allowing BLUE 2 to fire a SPARROW, interlocks in, but no detonation was observed. BLUE 2 continued the attack on MIG 4 which lost control or flamed out due to extreme nose-high attitude. MIG 4's pilot ejected just prior to the aircraft entering the clouds. BLUE 1 and 2 reached BINGO fuel and egressed the area.

Engagement lasted approximately 4 min (verified by rescue aircraft in area).

8. ORDNANCE

	(No. fired/No. hits)		
	SPARROW AIM-7E	SIDEWINDER AIM-9B	Remarks
BLUE 1	2/1	3/0	First SPARROW fired interlocks in, missile flight path could not be observed--missed. (Pilot reported he had erratic steering dot.) Second SPARROW fired interlocks out, successful kill. SIDEWINDERS all fired outside of missile parameters (angle-off too great).
BLUE 2	2/0	0/0	SPARROWS fired interlocks in, missile flight paths could not be observed. MIG subsequently lost control or flamed out and pilot ejected.
MIG 1,2,3,4	-----None-----		

9. EQUIPMENT PROBLEMS

Both BLUE 1 and 2 had difficulty with the SPARROW system. A total of three missiles were fired with interlocks in but no kill was achieved. However, no data are available indicating that this was due to equipment malfunction. BLUE 1 reported a very erratic steering dot. After the mission it was discovered that apparently both BLUE 1 and 2 may have been locked on the same target perhaps causing some mutual interference. When BLUE 1 fired a missile with interlocks out, he did achieve a successful kill.

10. AIRCREW COMMENTS

Experience

	Total Hours	F-4 Hours	Combat Missions	Remarks
BLUE 1 Front	2500	300	16	Both members had fired one SPARROW. All pilots had predominantly fighter backgrounds.
Back	600	300	14	
BLUE 2 Front	3400	250	41	Had fired one SPARROW; five SIDEWINDERS.
Back	-----Not interviewed-----			

Comments on this Encounter

BLUE 1 (Front) - F-4 never lacked in turning or climbing capability. Each time BLUE 1 would light AB because he thought he started to lose position on the MIGs, he found that it was a mistake and would have to come out of AB and throttle back almost to idle in order to maintain position.

MIGs never lit their AB during engagement.

BLUE 1 was in an ideal gun position on MIGs 3 and 4 for at least 2 to 2-1/2 min and could have chosen either one of them for a successful attack because he had adequate maneuverability and speed reserve available. He felt that the MIGs were aware of the situation, because each time that BLUE 1 maneuvered to increase the range, they reversed into him, using very little power and without going to AB.

BLUE 2 - BLUE 2 was very disappointed in the performance of his missiles and indicated that in the next engagement he would fire multiple missiles with interlock out and felt that he probably would get better results. He felt that MIG's efforts were half-hearted, probably inexperienced pilots.

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Comments from Overall Experience

EVENT 1-71

BLUE 1 - Training did not include sufficient air combat tactics. Would want better short-range weapon (either missile or gun). Aircraft does not need additional acceleration, turn rate, climb rate. Would want more endurance under battle conditions, and better rear visibility. Second crew member is necessary but need not be a pilot.

11. DATA SOURCES

Project Interviews: BLUE 1 (Front and Back), 19 January 1967; BLUE 2 (Front), 7 February 1967

Messages, Reports:

8TFW 060815Z Jan 67, DOI 01126
7AF 060518Z Jan 67, DOCO 12033
8TFW 060840Z Jan 67, DO 01127

12. NARRATIVE DESCRIPTION

On 3 and 4 January a single RF-4C weather reconnaissance aircraft had been forced to abort its planned weather reconnaissance route in North Vietnam because of MIG aircraft attacks. On 5 January a flight of two F-4C aircraft was assigned to fly a route similar to that of the weather reconnaissance aircraft, in a close formation so as to present a radar signature as nearly similar to a single aircraft as possible in order to deceive the enemy radar operators into thinking it was a reconnaissance flight. This entire mission route was flown above the cloud formations which were topping about 7000-7500 ft. No radar contacts or visual sightings of enemy aircraft were obtained. The mission was to operate in a "missile-free" environment making visual ID unnecessary. On 6 January, BLUE flight was to lead a MIGCAP for an F-105 strike flight. However, the strike was canceled due to weather and BLUE flight was reassigned the previous day's mission. A "missile-free" air environment was again established so that any sighting or radar contact could be assumed to be an enemy. BLUE flight flew a route simulating a single RF weather reconnaissance flight in an attempt to decoy the MIGs. When radar-controlled AAA was encountered near Phuc Yen, BLUE 1 turned on the QRC-160 pod. The flak became inaccurate, falling either well short or wide of the flight. BLUE 2, in the stress of the engagement, neglected to turn on his pod, an oversight which was not discovered until the end of the mission. Preplanned tactics were to attempt to establish a radar contact, maneuver the flight to satisfy the requirements of the fire control system and fire a SPARROW. BLUE flight received MIG warning calls and turned left to a heading of 140°. Both aircraft immediately acquired four radar contacts. The trail contact was at a higher altitude than the lead targets.

T₀ The contacts ranged from 22-25 mi, 5°-30° right. BLUE 1 locked on the nearest target, instructing BLUE 2 to lock on and intercept the target farthest right as had been preplanned to eliminate confusion. A head-on type intercept (heading 160°) was established with V_C of approximately 900 kt. BLUE 1 and 2 were indicating 550-kt TAS at approximately 14,000 ft.

T₁ The head-on intercept continued until the targets were about 12 mi away, at which time the bogeys reversed course and V_C dropped off to about 100-200 kt. (The turn away may have resulted from a GCI warning, or the MIGs may have visually sighted the F-4Cs.)

T₂ BLUE 1 and 2 went to afterburner and closed from the rear aspect to within approximately 5 mi of the target. The enemy aircraft were visually sighted at 8 mi but could not be positively identified as MIG-21s until at 5 mi range.

T₃ At 5 mi the MIGs turned right with BLUE 1 and 2 continuing to fly a collision course as dictated by the steering dot. BLUE 1's steering dot was erratic but both aircraft fired a SPARROW with interlocks in at approximately 4 mi, 30° angle-off. Neither SPARROW could be observed, and a kill was not achieved.

T₄ BLUE 1 then went interlocks out, generated lead visually by maneuvering to put the MIG on a line tangent to the radome and fired a second SPARROW at 3 mi which he observed guide and detonate about MIG 1's mid-fuselage.

T₅ The MIG burst into a ball of flame; the tail section either completely came off or was engulfed in flames, pieces were "coming off the aircraft and it was falling uncontrolled almost like a leaf, bobbing around and a slight spiral effect." BLUE 1 continued the attack, pursuing the downed MIG's wingman (MIG 2) who dove for the clouds.

T₆ BLUE 2 observed MIG 1 burning (hit by BLUE 1's SPARROW), watched it for approximately 12 sec, and lost sight of the fight while continuing on a westerly heading.

T₇ While attacking MIG 2, BLUE 1 sighted MIGs 3 and 4 approaching BLUE 2's 6 o'clock as BLUE 2 proceeded on a westerly course. BLUE 1 warned BLUE 2 twice of the MIGs at his 6 o'clock, but BLUE 2 did not appear to hear the transmission. BLUE 1 barrel-rolled to a 6 o'clock position on MIGs 3 and 4 which were behind BLUE 2 as MIG 2 disappeared in the clouds. MIGs 3 and 4 also dove into the clouds.

T₈ BLUE 1 continued turning hard right assuming the MIGs would continue their turns in the clouds. MIGs 3 and 4 came out of the clouds in wing formation, wings level.

T₉ BLUE 1 barrel-rolled left to decrease lateral separation and to drop into the MIGs' rear aspect. The MIGs spotted BLUE 1 while he was barrel-rolling and turned into him.

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NARRATIVE DESCRIPTION (Continued)

EVENT 1-71

T₁₀ As BLUE 1 completed the roll, he put the gunsight pipper on MIG 4's tailpipe, switched to HEAT, heard a SIDEWINDER tone, realized he was in range but too high angle-off, but fired a SIDEWINDER to "keep their attention." The SIDEWINDER went about 300-400 ft behind MIG 4. BLUE 1 visually generated as much lead as possible, and still hearing a SIDEWINDER tone, fired a second SIDEWINDER. The MIG was at the base of the sight reticle.

T₁₁ The SIDEWINDER appeared to guide very close to MIG 4's tail (30-40 ft) but did not achieve a kill. MIGs 3 and 4 reversed, increased the nose attitude and the fight degenerated to a slow-speed scissors with the nose attitude of the MIGs and BLUE 1 increasing to almost the vertical position. MIG 3 apparently realized that he was getting into a disadvantageous position, rolled his aircraft to the inverted position, pulled his nose below the horizon, and egressed. During the scissors maneuver, BLUE 1 fired a third SIDEWINDER which did not achieve a kill. The range may have been outside the missile envelope.

T₁₂ BLUE 1 had no difficulty staying with the MIG in the slow-speed scissors and could have used a gun as he was inside minimum range for both SIDEWINDER and SPARROW. MIG 4 continued the scissors maneuvers.

T₁₃ BLUE 2 regained sight of the fight and locked on MIG 4, informing BLUE 1 that he had locked on. BLUE 1 rolled his aircraft right, pulled the nose below the horizon, and separated from the MIG to allow BLUE 2 to shoot a SPARROW. BLUE 2 observed the MIG to be in an almost vertical position, fired a SPARROW interlocks in, but observed that the SPARROW failed to detonate.

T₁₄ BLUE 2 pulled up high in a slight overshoot, passing very close to the MIG which was at about an 80° nose-high attitude.

T₁₅ The MIG flipped on its back, spiraling approximately 1-1/2 turns; the nose suddenly dropped extremely low and the pilot ejected as the aircraft entered the clouds. BLUE flight returned to home base separately and did not try to rejoin because of low fuel state. BLUE 2 did not refuel and landed with 1300 lb.

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EVENT 1-71 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2)		Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action			
T ₀	<p>8182 Altitude: 14,000 ft Heading: 140° Speed: 480-500-kt TAS true Fuel: 81 approx- mately 10,500 lb. 82 approximately 9000 lb</p>	<p>82 behind 81, crossed over from left to right--acquired radar contact at 22 mi, 30° right, V_C = 800-1000 kt 82 followed steering dot (in system program for collision course). 8182 changed heading to head-on course.</p>	<p>Received MIG warnings from BIG EYE. 81 advised 82 to take target farthest on right.</p>	<p>Four MIGs (second element behind and above first element) proceeding in NW direction. (Total spread of formation about 3 mi)</p>	<p>Radar contact (81) of four MIGs at 22 mi. 8182 slightly lower (13,000 ft) and 8244 above (15,000 ft)</p>
T ₁	<p>8182 Altitude: 14,000 ft Heading: 160° Speed: 500 kt</p>	Continuing intercept.		<p>At range of 12 mi MIGs started left turn.</p>	<p>82 never discriminated two MIGs. Was locked-on and did not want to break, since radar performance was "barely adequate."</p>
T ₂	<p>8182 Altitude: 14,000 ft Heading: 160° Speed: 500 kt</p>	<p>V_C changed to 100 kt. 8182 1ft AB to pursue MIGs. V_C increased to 200 kt.</p>		<p>MIGs in left turn reversing course</p>	<p>8182 chased MIGs for about a minute, made visual contact at 8 mi. 81 saw four MIGs, 82 saw only two MIGs.</p>
T ₃	<p>8182 Altitude: 14,000 ft Heading: 160° Speed: 600 kt</p>	<p>8182 came out of AB. 8182 started right turn.</p>		<p>MIGs reversed course to right at range of 5 mi</p>	<p>8182 identified bogeys as MIG-21C aircraft at range of 5 mi V_C increased to about 500 kt</p>
T ₄	<p>Altitude: 14,000 ft Heading: 200° 82 about 1500 ft off 81 at 4 o'clock</p>	<p>8182 both fired SR-AROW at MIGs (later determined to be same aircraft) 81 30° angle-off, 4-mi range 82 30° angle-off, 6-mi range Both fired with interlocks in nearly simultaneously. Exact time relationship unknown.</p>		<p>MIGs still turning heading about 220° level flight at 12,000-13,000 ft</p>	<p>Neither 81 nor 82 saw missile flight path, both missiles missed MIGs. 81 had erratic steering dot. 82 had normal dot. Both were apparently locked-on same target (not known at time).</p>

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EVENT 1-71 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Communications	Enemy Actions (M16 1,2,3,4)	Remarks
	Status	Action			
T5	B1 Altitude: 12,000 ft Heading: 240°	B1 fires second SPARROW at M1 with interlocks out. Dot was in ASE circle.	B1 called missile launch.	M162 about 270° heading, still in right turn. M384 were behind B1.	Missile fired at range of 3 mi. 3 g on aircraft. Interlocks out. B1 observed missile flight and hit on M1. M384 did not pose threat to B1. B1 broke lock on M1 after hit and M2 went off scope to the left and under, at high velocity.
T6	B2 Altitude: 12,000 ft	B2 observed burning M16, chandelied up and to the right, to 15,000 ft	B2 reported M16 kill	M2 pulled hard right and down, toward Thud Ridge	B2 observed burning M16 for about 10-15 sec and lost sight of B1 and other M16s.
T7	B1 Altitude: 9000 ft Heading: 045°	B1 continued around. Turned hard right in descending turn and tried to follow M2. Lost M2 in clouds at range of 7 mi. B1 broke off pursuit because of M384 and barrel-rolled to the left. B2 outside of turn and high.	B1 warned B2 of M384 on his tail. B2 did not reply and B1 repeated warning.	M2 entered clouds about 7 mi from B1. M384 were coming up in B1's 5 o'clock position but posed no threat to B1. Getting into firing position on B2's 6 o'clock	B1 barrel-rolls to sandwich M384 between himself and B2. Apparently B2 never heard B1's warning.
T8	B1 was behind and above M384 B2 Heading: 090°	At end of barrel-roll B1 turned right and climbed. B2 made several S-turns, searching area above clouds		M384 still behind B2 entered clouds in 030° dive angle.	
T9	B1 Altitude: 12,000 ft Heading: 180° B2 Altitude: 12,000 ft observed bogeys at 7 mi	B1 barrel-rolled to left (over the top) and pulled close to M384. B2 determined that one bogey was an F-4 (determined by plan view).		M384 headed 140° as they came out of clouds (010° climb angle). M384 turned into B1.	

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EVENT 1-71 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2)		Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action			
T ₁₀	B1 completes barrel-roll	Pulls behind M384 with high angle off, but wanted to keep M384's attention and fired a SIDEWINDER	B2 called B1 and reported that B1 was in sight.	M384 reverse to left.	Had good tone, pipper on M4. SIDEWINDER went behind M4's tail by 300-400 ft.
T ₁₁	B1 still behind M384	B1 pulled additional lead and fired another SIDEWINDER. B2 had M4 on scope most of the time, but had lost sight of B1.		M384 reverse to right. M3 up and M4 down.	Still had tone. Target was at base of sight reticle. SIDEWINDER went 30-40 ft from M4's tail.
T ₁₂	B1 still behind M384	B1 in slow-speed scissors maneuver with M384 continually decreasing airspeed with increasing pitch angles. Fired another SIDEWINDER.		M3 stopped his reversals, rolled aircraft and broke left and down and departed area. M4 kept climbing. Right bank 045°-050°, speed under 300-kts CAS.	MIGs never lit AB. SIDEWINDER went wide of target. (Apparently fired well outside missile parameters.) B1 thought there was an outside chance of a successful kill.
T ₁₃	B1 behind M4	B1 rolled off to the side and departed area. B2 had M4 at his 12 o'clock position.	B2 called B1 that he was entering fight and that he was locked on M4. B1 advised he was breaking off.	M4 continued steep, slow climb.	
T ₁₄	B2 in right climbing turn trying to get behind M4	B2 fired SPARROW, 045° right, 020°-030° bank angle. Interlocks in. Missile fired 2 sec later, at which time the angle off had changed to 060°.			B2 estimated 3 g on airplane at missile launch.

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EVENT I-71

EVENT I-71 SUMMARY (Continued)

458

Time Mark	Action Aircraft (BLUE 1, 2)		Communications	Enemy Actions (MIG 1,2,3,4)	Remarks
	Status	Action			
T15	B2 continued turn	B2 overshoot on turn, passed very close to M4 (who was standing almost on his tail) then lost sight of him.	.	M4 on seeing missile attack, pulled into steeper climb (pitch angle to 080°).	B2 passed M4 within 100-150 ft.

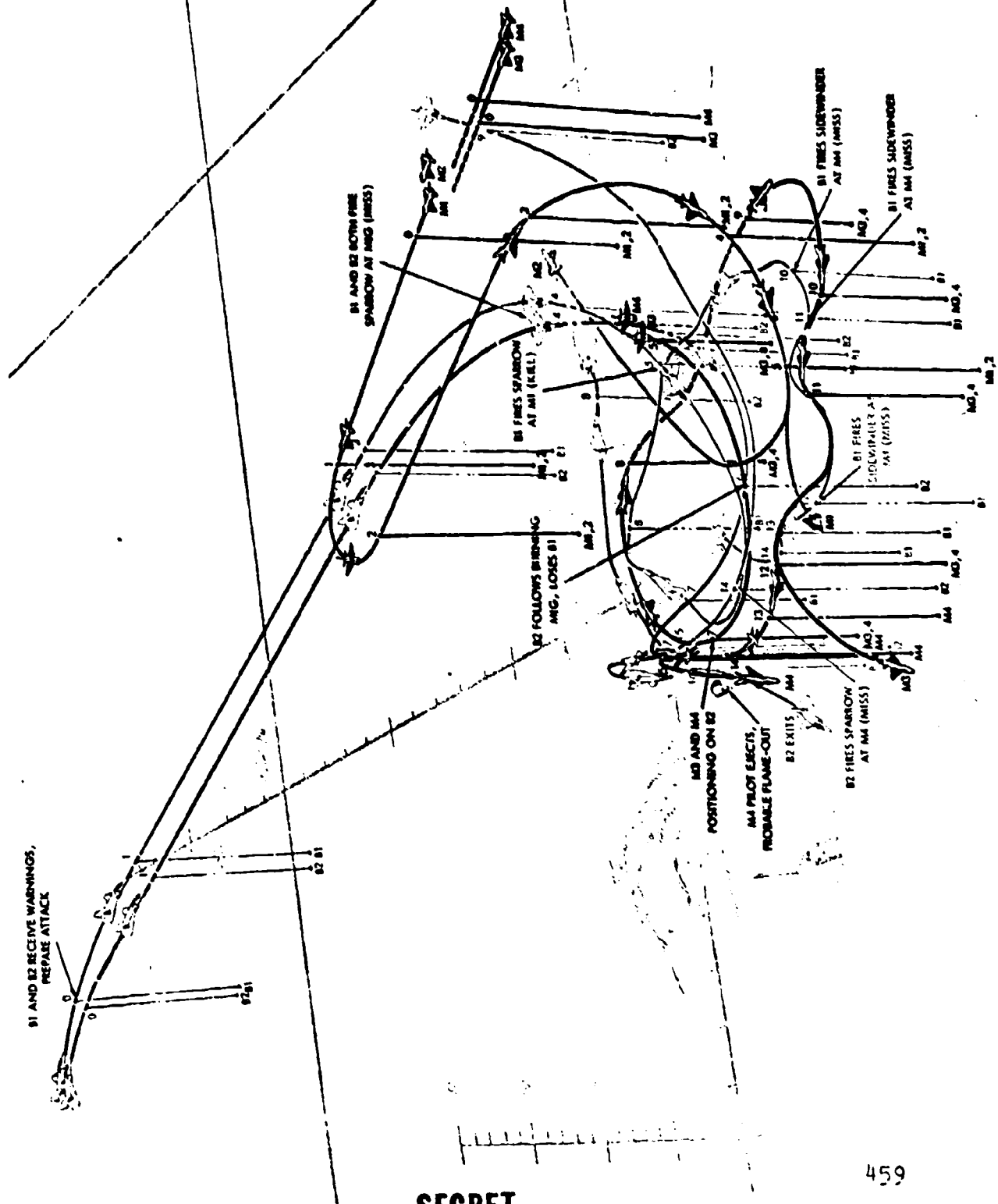
B2, having pulled to an altitude of perhaps 35,000 ft, next saw M4 in an almost vertical, but slow, dive. M4 was about 080° nose down and was approaching the cloud layer when the pilot ejected; B2 was following him down. B2 was close to BINGO fuel and departed area. B1 and B2 departed separately (at optimum altitude of 39,000-40,000 ft) and did not attempt to rejoin because of fuel. They had about 7000 lb of fuel each. B2 did not refuel and landed with 1300 lb.

It was theorized by BLUE flight members that M4 may have flamed out in the maneuver, because any aircraft with a full power dive would have been near maximum airspeed, and M4 was definitely much slower.

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EVENT I-71



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Maxwell/Beatty

EVENT 1-72

Aircraft Involved: Three P-4Cs vs two MIGs

Result: No damage

Vicinity of Encounter 21°25'N/104°30'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 6 Jan 1967/0920H

Three P-4Cs (BLUE flight) escorting two EB-66s (GREEN flights) in vicinity of 20°00'N/103°33'E.

2. MISSION ROUTE

Departed Cam Ranh Bay to rendezvous with GREEN flight orbiting at 17°50'N/104°00'E to 20°00'N/104°00'E to 21°40'N/104°15'E to 21°30'N/103°30'E to 17°00'N/105°00'E. Flight recovered at Ubon because there was no tanker available.

3. AIRCRAFT CONFIGURATIONS

P-4C BLUE 1, 2, 3

4 - SPARROW (AIM-7)

4 - SIDEWINDER (AIM-9)

EB-66 GREEN 1, 2

RR-44 and RR-59 chaff

MIG MIG 1, 2

Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Low overcast, tops 7000 to 8000 ft.

	BLUE		
	1	2	3
Altitude:	31,000 ft	31,000 ft	31,000 ft
Heading:	-----	150-160°	-----
Speed:	-----	510-KT TAS	-----
Fuel State:	-----	Unknown	-----
Flight Formation:	-----	Fluid	-----

	GREEN	
	1	2
Altitude:	32,000 ft	29,000 ft
Heading:	160°	157°
Speed:	-----	Unknown
Fuel State:	-----	Unknown
Flight Formation:	-----	GREEN 2 - 3000 to 4000 ft in trail and 3000 ft below GREEN 1

5. INITIAL DETECTION

GREEN 1 called MIGs in BLUE flight's 8 o'clock position. BLUE 2 sighted two silver aircraft (unidentified) at 7 o'clock high -- moving low to the 6 o'clock position.

6. ACTION INITIATED

BLUE 2 called for Lead to break and both BLUE 1 and 2 broke right and down. BLUE 3 broke down and left.

7. SITUATION DEVELOPMENT

BLUE 1 and 2 rolled out, jettisoned external tanks and reversed left; MIG 1 rolled out in BLUE 1's 6 o'clock position one mi in trail. BLUE 1 lit AB in hard climbing turn to the left and lost the MIG. BLUE 3 lit AB and rejoined flight in tactical formation.

8. ORDNANCE

No ordnance expended

9. EQUIPMENT PROBLEMS

None reported

10. AIRCREW COMMENTS

None

11. DATA SOURCES

Messagcs:

8 TFW OPREP-3 060640Z Jan 67 DOI 01124

432 TRW OPREP-3 060650Z Jan 67 FASTEL 53430

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EVENT 1-72

12. NARRATIVE DESCRIPTION

GREEN 1 made the first visual sighting of two MIGs in close formation at his 8 o'clock position, heading 270°. He was also receiving IFF signals from the MIGs. The MIGs made a left turn into GREEN and BLUE flights. GREEN 1 stated they were silver in color; however, he did not notice external ordnance or fuel tanks. GREEN 1 advised BLUE flight of the sighting and BLUE 2 picked up a bogey at his 7 o'clock high position moving to 6 o'clock low. BLUE 2 called BLUE 1 for a break and BLUE 1 and 2 broke hard right and down. BLUE 3 made his break down and to the left. BLUE 1 observed a MIG execute an aileron roll as it appeared to be tracking BLUE 2. BLUE 1 called "jettison tanks," and then reversed to the left. BLUE 1 turned approximately 100° rolled out, and jettisoned the remaining fuel tank. At this time the bogey rolled into BLUE 1's 6 o'clock position approximately one mi in trail. BLUE 1 lit AB and executed a hard left climbing turn. BLUE flight lost the MIGs somewhere in this turn. After his break, BLUE 3 jettisoned tanks, lit AB, and went back to the right to rejoin the flight in tactical formation. BLUE flight resumed a cover position on GREEN flight and proceeded to the post-strike refueling area. No tanker was available forcing BLUE flight to recover at Ubon.

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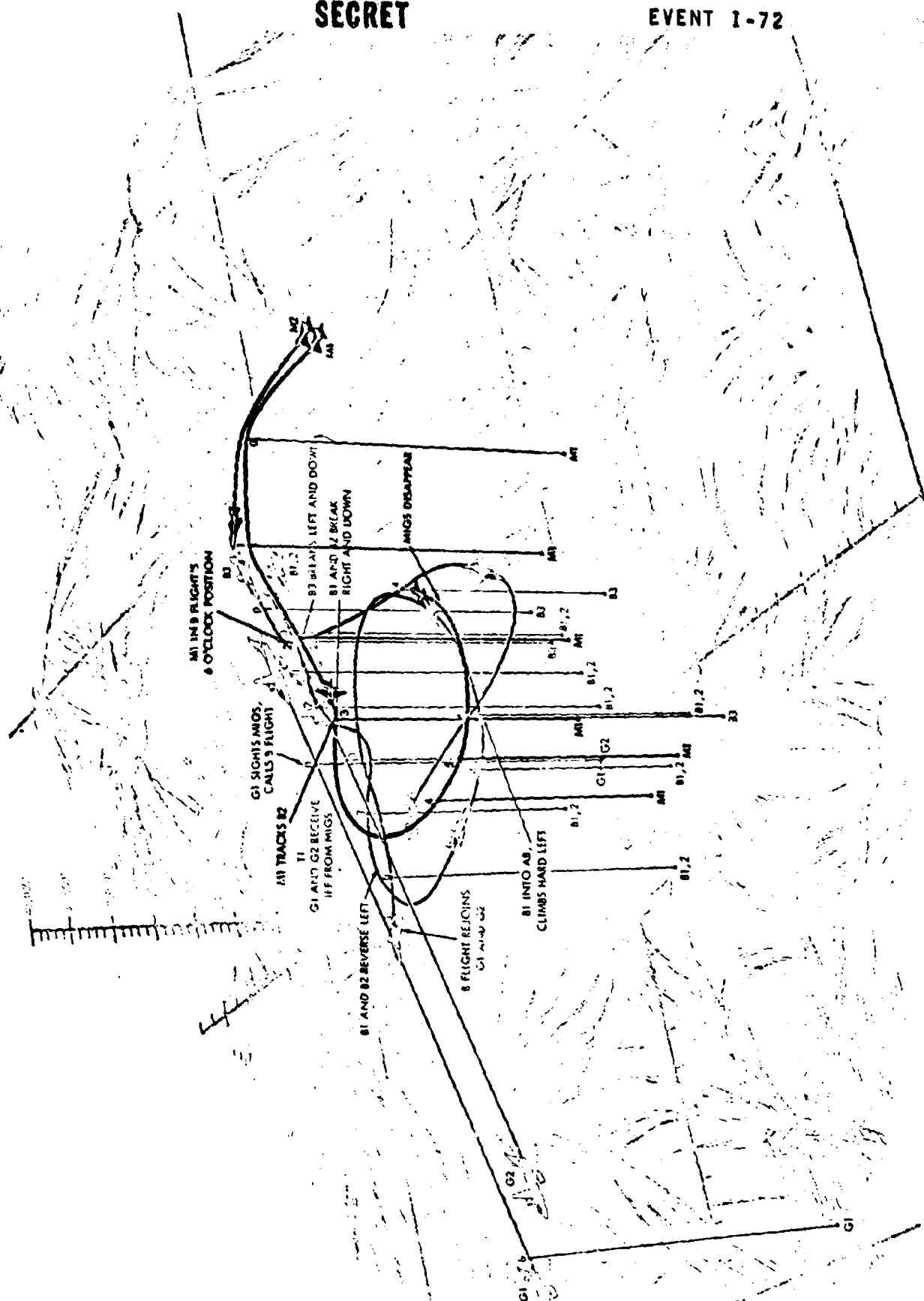
EVENT 1-72 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly (GREEN 1, 2)	Communications	Enemy Actions (MIG 1, 2)	Remarks
	Status	Action				
T ₀	Alt 31,000 ft Heading 160° 510-kt TAS	G1 sights MIGs at 8 o'clock	GREEN flight is two B8-66 aircraft on ECM mission being escorted by BLUE flight	G1 calls out MIGs to BLUE flight	MIGs make left turn into GREEN and BLUE flights.	MIGs silver color no observed external ordnance or tanks
T ₁	Alt 31,000 ft Heading 160° 510-kt TAS	Maintaining track	Maintain formation	B2 calls bogey to lead and requests break	MIGs approach from 7 o'clock high moving into 6 o'clock low on B1 and 2	G1 and 2 are receiving IFF signals from MIGs. B2 sees only one bogey
T ₂		B1 and 2 break right and down	B3 breaks left and down. G1 and 2 maintain course.	None	M1 rolls into BLUE flight's 6 o'clock position	
T ₃		B1 and 2 reverse to the left	B3 continues left break and rolls out E. G1 and 2 maintain course	B1 calls "jettison tanks"	MIG executes aileron roll and begins tracking B2	BLUE Lead observes MIG do an aileron roll and begin tracking B2. He then elects to reverse left.
T ₄		B1 and 2 turn to heading 060° and jettison remaining fuel tanks	Same as T ₃		M1 rolls out in BLUE Lead's 6 o'clock position at 1-mi range	
T ₅		B1 lights AB and executes hard left climbing turn	B2 on wing. B3 and GREEN flight same as T ₃		Position 6 o'clock 1 mi on B1. Unknown action after BLUE flight initiates turn.	MIGs disappear somewhere during BLUE flight's climbing turn.
T ₆	B3, speed Mach 1.2 in AB	B1 and 2 continue turn and rejoin GREEN flight	B3 goes AB and turns back right to join B1 and 2. GREEN flight maintains course		MIG track unknown	MIG contact lost. M2 was not seen by B1 and 2 during actual encounter

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EVENT 1-72



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EVENT 1-73

Aircraft Involved: Four P-4Cs vs three MIO-21s

Result: Sighting Only

Vicinity of Encounter: 21°30'N/104°55'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 16 Jan 1967/1545H

11. DATA SOURCES

PACAF Command Post No. 27 listed on Project MIO Incident Summary

12. NARRATIVE DESCRIPTION

None

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EVENT 1-74

Aircraft Involved: Four F-4Cs and four F-105s
vs two MIG-17s

Result: No damage

Vicinity of Encounter: 22°N/104°E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 17 Jan 1967/0807H

Four F-4C aircraft (BLUE flight) inbound to target area to provide escort (MIGCAP) for four F-105 IRON HAND (GREEN flight) and twelve F-105 strike aircraft.

2. MISSION ROUTE

Departed Danang for WHITE ANCHOR (Laotian refueling route) to target area and recovered Danang via WHITE ANCHOR (poststrike refueling).

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

- 4 - SPARROW (AIM-7)
- 4 - SIDEWINDER (AIM-9)
- 2 - 370-gal tanks
- 1 - 600-gal tank

F-105 GREEN 1, 2, 3, 4

- 2 - 450-gal tanks
 - 1 - QRC-160 pod
- Ordnance had been expended at time of encounter.

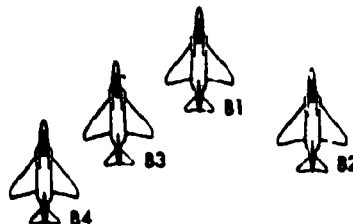
MIG-17 MIG 1, 2

- Drop tanks
- Silver color

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Clear, visibility in haze 2-3 mi into sun; 3-5 mi away from sun.

	BLUE	GREEN
Altitude:	12,000 ft	5000 (estimated)
Heading:	130° True	310° True
Speed:	450-kt IAS	As fast as possible
Fuel State:	13,000 lb	Unknown
Flight Formation:		



5. INITIAL DETECTION

B-1 (back) called MIGs to BLUE Lead on interphone and BLUE 3 called "Strangers 6 o'clock" to F-105s. Two MIGs were 3 o'clock low at 1-3 mi heading in opposite direction to BLUE flight and 1 mi in trail with a flight of four F-105s (GREEN flight). MIGs were picked up visually. No prior warning was received.

6. ACTION INITIATED

BLUE Lead called "break right" and BLUE flight initiated a descending right break into the MIG-17s.

7. SITUATION DEVELOPMENT

The MIGs were not able to maintain relative position or overtake GREEN flight. MIGs apparently had BLUE flight in sight because as BLUE flight broke towards them, the MIGs jettisoned tanks and initiated a right climbing turn into BLUE flight. Approximately 20° into turn, BLUE flight jettisoned tanks. The MIGs then reversed their turn back left and disappeared into heavy haze. BLUE flight was unable to reestablish contact so continued with fraggged mission. BLUE flight's radar was on 50-mi scan.

No information on the number of g's used or turn radius of MIGs or BLUE flight. Also no indication as to who was in the most advantageous position or gaining advantage and no information on relative positions when contact was lost. Interviewed BLUE Lead only.

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EVENT I-74

8. ORDNANCE

No ordnance expended by friendlies or enemy.

9. EQUIPMENT PROBLEMS

None

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
<u>BLUE 1</u> Front	-----	Unknown	-----	All tactical fighter background.

Comments on this Encounter

BLUE 1 - Look-down capability of radar is bad. Described MIGs as light in color with swept wings and round wing tips.

11. DATA SOURCES

Project Interviews: BLUE 1 (Lead) - Front

Messages, Reports:

366 TPW OPREP-3 170500Z Jan 67 No. 003

12. NARRATIVE DESCRIPTION

BLUE flight (four F-4s) on escort/MIOCAP mission, was inbound to target area heading 130° at 12,000 ft, 450-kt IAS, in spread formation when they sighted GREEN flight (four F-105s) below them at 3 o'clock, 5000 ft in QRC formation exiting target area heading in opposite direction with two stragglers 1 mi in trail and falling behind. BLUE flight broke right and down towards the now identified MIG-17s and jettisoned fuel tanks. At the same time, the MIGs jettisoned tanks and started a right climbing turn into BLUE flight. The MIGs then reversed their turn and disappeared into heavy haze. BLUE flight was unable to reestablish contact so continued with their fraged mission.

Six of the eight personnel involved observed the enemy aircraft. BLUE flight had all ordnance systems armed and working. GREEN had QRC-160 in operation.

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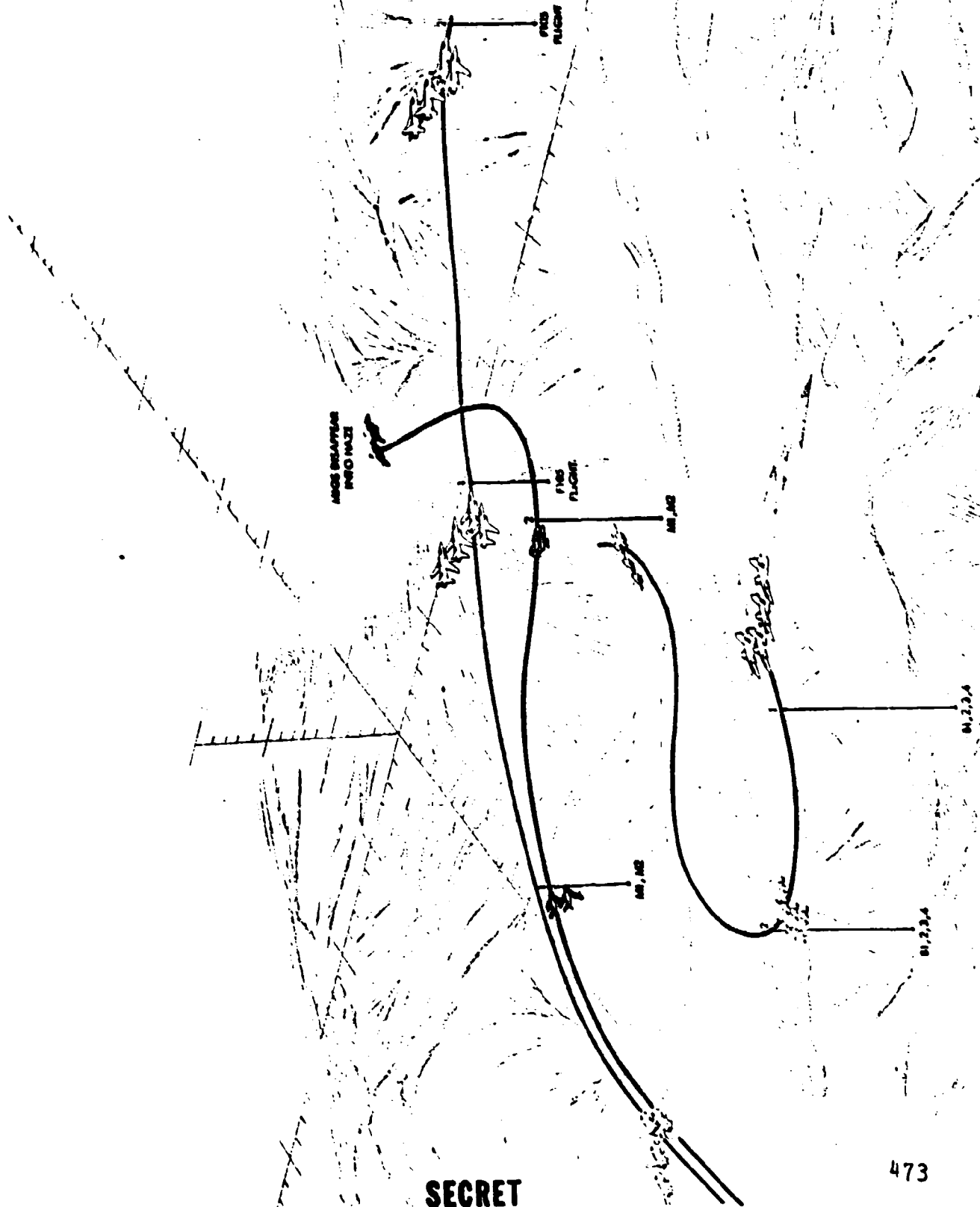
EVENT 1-74 SUMMARY

Time Mark	Action Aircraft (BLUE 1.2.3.4)		Other Friendly	Communications	Enemy Actions (MIG 1.2)	Remarks
	Status	Action				
T ₀	12,000 ft 450-kt IAS 13,000 lb 4 SPARROWS 4 SIDEWINDERS 1 QRC-160	Some F-105s were exiting Flight of F-4s were exiting to the SW then turned NW F-105s in QRC formation All systems armed and operating All working	Escorting F-105s Four F-105s IRON HAND Twelve F-105s strike aircraft	01 Back called MIGs to lead over interphone 03 called "Strangers 6 o'clock" to F-105s	Two MIG-17s were in trail about 1 mi behind F-105s at about 5000 ft MIGs were not able to keep up with F-105s--were losing out	Weather clear, but hazy. Visibility into sun 2-3 mi; away from sun 3-5 mi Picked up MIGs visually at about 1 to 1-1/2 mi No MIG warnings
T ₁			BLUE flight jettisoned tanks	Lead called break right	Migs started turn up toward BLUE flight--got about 20° into turn--at this time F-4s jettisoned tanks	Radar on 50-mi scale
T ₂			BLUE flight lost sight of MIGs		MIGs reversed and headed into haze MIGs were swept wing, silver color	Look-down capability on radar is poor

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EVENT 1-74



SECRET

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EVENT 1-75

Aircraft Involved: Three F-4Cs vs one MIG-17D

Result: No damage

Vicinity of Encounter: 21°10'N/104°50'E
Route Package V

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 21 Jan 1967/0855H

Three F-4C aircraft following an F-105 IRON HAND flight.

2. MISSION ROUTE

Departed Danang and flew directly to the ORANGE ANCHOR refueling orbit. After refueling, the flight proceeded to the area of the encounter.

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3

4 - SPARROW (AIM-7E)

4 - SIDEWINDER (AIM-9B)

QRC-160 pod

Avionics, tank configuration, camouflage, etc., unknown

MIG-17D

Guns only

Silver in color

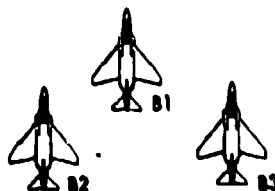
Scan-ODD radar

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered clouds at 2000 ft. Visibility into the sun was 3 mi and in other quadrants was 10 mi.

	BLUE	MIG
Altitude:	-----16,000-----	30,000
Heading:	-----050°-----	180°
Speed:	-----480-kt CAS-----	Unknown
Fuel State:	---Pull internal plus some--- fuel in the external tanks	Unknown

Flight Formation:



5. INITIAL DETECTION

Flight was in formation shown above when BLUE 3 sighted a stranger at 10 o'clock high. Shortly thereafter he called "MIG 12 o'clock high."

6. ACTION INITIATED

BLUE flight continued straight ahead until the MIG was in the 6 o'clock position--co-altitude and about 4000 ft back. BLUE 3 called a MIG break, and the flight executed a hard right descending turn as BLUE 3 jettisoned his tanks.

7. SITUATION DEVELOPMENT

After BLUE flight broke down and right, the MIG disengaged and departed the area. BLUE flight did not sight the MIG again.

8. ORDNANCE

No ordnance was expended by any of the airplanes involved.

9. EQUIPMENT PROBLEMS

BLUE 1 - No problems

BLUE 2 - No problems

BLUE 3 - Had indications (both a red and a green light) that his QRC pod was only partially effective.

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EVENT 1-75

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>	<u>Remarks</u>
BLUE 1 Front	-----	Not Obtained	-----	Not interviewed.
Back	↓	↓	↓	
BLUE 2 Front				
Back				
BLUE 3 Front	↓	↓	↓	First mission in N. Vietnam.
Back				Not interviewed.

Comments on this Encounter

BLUE 3 front felt that he was not properly trained or mentally prepared for this encounter, particularly since it occurred in an area where MIG attacks were not expected. Also, it was his first mission and he was quite surprised to encounter a MIG. BLUE 3 later believed that in the same situation he could have reached a firing position on the MIG and would not have called a break-away which resulted in losing sight of the MIG.

11. DATA SOURCES

Project Interviews: BLUE 3 (Front), 28 Jan 1967

Message Reports:

366TFW 210608Z Jan 67

12. NARRATIVE DESCRIPTION

BLUE flight was in a loose finger tip formation at 16,000 ft indicating 480-kt CAS and heading 050° when BLUE 3 sighted a stranger at 10 o'clock high heading 180°. As the bogey came overhead, it maneuvered down and into trail with BLUE flight. BLUE 3 identified the bogey as a MIG-17D. When the MIG had maneuvered to 4000 ft at 6 o'clock, BLUE 3 called a break. The flight broke down and right as BLUE 3 jettisoned his tanks. At this time the MIG disengaged and was not seen again.

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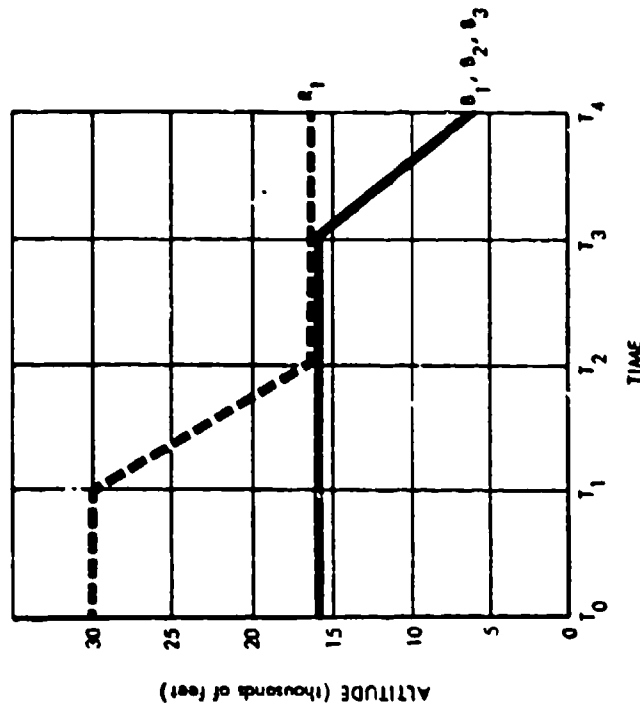
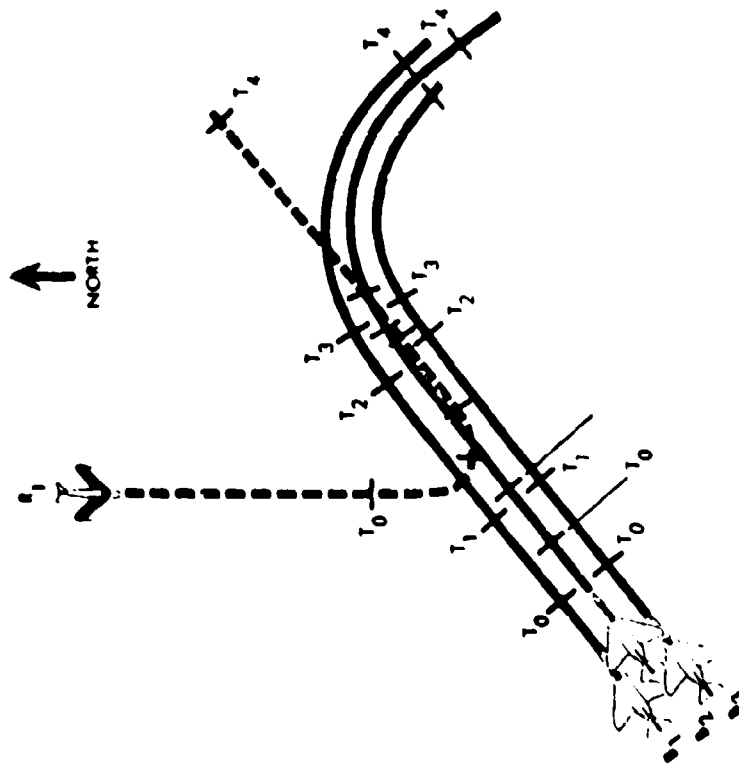
EVENT 1-75 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3)		Other Friendly	Communications	Enemy Actions (MIG 1)	Remarks
	Status	Action				
T ₀	Loose finger tip formation at 16,000 ft, 480-kt CAS, heading 050°	B3 sights a bogey at 10 o'clock high	3 F-4Cs following an F-105 IRON HAND flight	B3 sights bogey and calls it out. B1 replied "No Joy."	Bogey continued toward BLUE flight	
T ₁	Same	B3 identifies bogey, now at 12 o'clock high, rolling in, as a MIG		B3 calls MIG rolling in	M1 came overhead and maneuvered down and in trail with BLUE flight	B3 identified bogey as probably a MIG-17D
T ₂	Same	B3 observes M1 at 6 o'clock to the flight		B3 calls "He's at 6 o'clock."	M1 now closing in the 6 o'clock position	
T ₃	Same	B3 observes M1 4000 ft at 6 o'clock to the flight		B3 calls MIG break	M1 closed to 4000 ft at 6 o'clock	
T ₄	Same	BLUE flight breaks right and down to 6000 ft. B3 jettisons tanks. B1 and B2 retained tanks.			M1 disengages	BLUE flight after recovering from the break, does not sight the MIG again. B3 feels that he muffed the event and that given the same chance again he would have been able to handle the engagement better.

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EVENT I-75



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EVENT 1-76

Aircraft Involved

and four F-105s

Result: No data

Vicinity of Eng

105°43'E

Package VI

MISSION AND TIME

Time: 22 Jan 76

F-4Cs (BLUE flight)

END flight (WHITE)

ON

ensive support on

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Target 18.33.

ne time.

ROUTE

ated Danang dis

ver JCS 18.33.

poststrike route

FOR refueling and

on of mission 33.

al recovery at Dan

anned route to orbit

eeded to WHITE

AFT CONFIGURATION

1, 2, 3, 4

PARROW (AIM-7)

DEWINDER (AIM-7)

70-gal wing tank

70-gal center tank

and TACAN working

EN 1, 2, 3, 4

operational

iven

1, 2

color

CONDITIONS PRI

Clear, visibility

BLUE

1, 2, 3, 4

11,000

130°

500-mt

Full fuel

some in

nal tanks

GREEN

1, 2, 3, 4

not reported

190°

not reported

not reported

QRC-160

not reported

iven

DETECTION

Flight received

105°10'E (33)

at approx 6 mi.

ght). BLUE flight

and the MIGs.

out MIGs in the

. Two MIG aircraft

above and close to

all external fuel

while proceeding

ed at 11 o'clock

flight of F-105s

sterburners and

INITIATED

Flight began to

ing of 210° and

ack the MIGs became

lowest possible

Flight and turned

escape.

ION DEVELOPMENT

Flight pursued

in in the vicinity

BLUE flight broke

but lost sight of

105°41'E. BLUE flight

ement and climbed

they ducked around

have an opportunity

ensive orbit.

ACE

(1)

(bits)

SP-1

AIM-7

Set AAM

arks

3, 4

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EVENT 1-76 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly (GREEN 1, 2, 3, 4)	Communications	Enemy Actions (MIG 1,2)	Remarks
	Status	Action				
T ₀	Heading 135° 11,000 ft 500-kt CAS Flight all had fuel tanks.	Saw F-105s and MIGs at about 6-mi range. Jettisoned all external fuel tanks.	Flight of F-105s (IRON HAND) heading 190°	B4 called MIGs (claimed he saw plain view of 21)	Saw two MIGs at about 1000 ft. Appeared to be heading flight of MIGs.	Weather clear with 10-mi visibility. Observed flight of MIGs.
T ₁		F-4s pressed in to about 2 mi			ing right turn around hill	lost sight of MIGs
T ₂		Went into SAM break to left		B2 Back called "BLUE flight, SAM 9 o'clock."	B2 Back saw SAM fired from 9 o'clock	Lead did not see SAM. Total time 3 min or less.

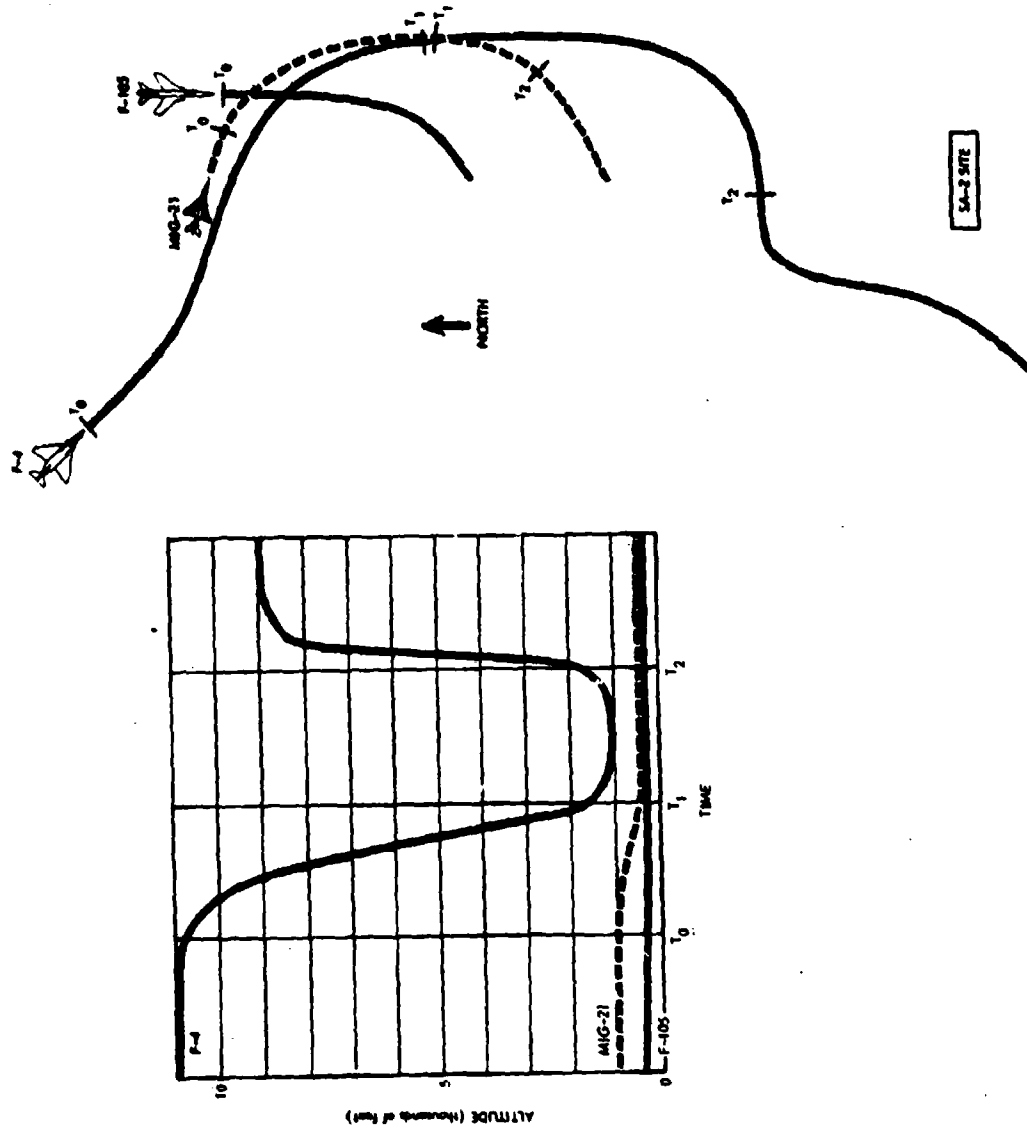
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EVENT I-76



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EVENT 1-77

Aircraft Involved: Twelve F-4Cs

Result: One F-4C lost and one damaged by SAMs

Vicinity of Encounter: Northern end of Thud Ridge and Yen Bai

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 23 Jan 1967/ _ _ _ _

The mission was a planned fighter sweep consisting of three flights of F-4Cs (BLUE, GREEN, BROWN). The mission, called BOLO II, was initiated because of the success of an earlier fighter sweep called BOLO I (EVENT 1-68). In addition to the F-4 flights at least four F-105 IRON HAND flights in the area, two of which preceded the F-4s. To assist in the planned deception, the first two F-4 flights were to simulate the F-105's flight profile.

2. MISSION ROUTE

BLUE flight was the lead flight, and after take-off from Ubon proceeded to RED ANCHOR for air-to-air refueling, then to 20°33'N/105°10'E, then to 20°50'N/105°20'E.

GREEN flight was spaced 3 min behind BLUE. They were to parallel the Red River until the second turning point and then make a 090° track to Phuc Yen. After take-off from Ubon, and refuel at ORANGE ANCHOR, GREEN flight proceeded to 20°56'N/104°07'E direct to 21°31'N/105°00'E direct to 21°12'N/105°20'E direct to 21°10'N/105°37'E at which point GREEN flight broke off and egressed the area.

BROWN flight originated at the same base and followed the preceding flights to the vicinity of Yen Bai.

3. AIRCRAFT CONFIGURATIONS

F-4C

BLUE

4 - SPARROW (AIM-7E)
4 - SIDEWINDER (AIM-9B)
1 - QRC-160 pod
1 - 370-gal wing tank
1 600-gal centerline tank
Exact type of RHAW gear
unknown
Camouflage paint
Radar on
Status of TACAN, IFF
unknown

GREEN

Same as BLUE
except that one
aircraft had an
ALQ-71 pod instead
of the QRC-160 pod.
APR-25

BROWN

Probably same
as BLUE.
1 - QRC-160 pod
No RHAW gear

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Overcast at 18,000 ft, solid layer at about 7000 ft, visibility unlimited.

	BLUE	GREEN				BROWN
		1	2	3	4	1,2,3,4
Altitude:	Unknown	14,000 ft	14,000 ft	15,000 ft	16,000 ft	16,000 ft
Heading:	Unknown	090°				Unknown
Speed:	Unknown	525-kt TAS				Unknown
Fuel State:	Unknown	Not Reported				Unknown
Flight Formation:						

QRC-160 pod formation. GREEN 4 had inoperative QRC-160 pod and was close to GREEN 3.

5. INITIAL DETECTION

BLUE flight observed one SAM coming up in a 45° to 60° (trajectory elevation) climb with sustainer burning. Three more SAMs followed the first one.

GREEN flight saw a group of four missiles, GREEN 2 called the missiles first, at 9 o'clock, 2-1/2 mi.

BROWN saw four SAMs come out of the overcast with sustainer burning at 2:30 o'clock position, range 8 mi.

6. ACTION INITIATED

BLUE flight watched the initial SAM explode and then maneuvered to evade the remaining three. No warnings were given to BLUE flight. BLUE 1 and 2 had indications from activity lights but no PRF warning.

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EVENT I-77

GREEN flight watched the SAMs to determine if they were tracking. GREEN flight heard BLUE flight's SAM call, and APR-25 was active. GREEN 3 had first launch light.

BROWN flight turned into the SAMs and watched them. They had heard the SAM call from GREEN flight as well as the IRON HAND launch indications. BROWN flight had no APR-25.

7. SITUATION DEVELOPMENT

During the maneuver to evade the SAMs, the number 2 SAM exploded near BLUE 2 damaging the number 5 fuel cell and the afterburner section. The time elapse from sighting of first SAM to final observation of the fourth SAM was 5-6 sec. The flight egressed after BLUE 2 sustained the battle damage.

GREEN 1 and 2 broke left and down while GREEN 3 and 4 broke left and up. GREEN 4 was close to GREEN 3 since GREEN 4's ECM pod was inoperative. However, GREEN 4 took a direct hit and the aircraft exploded in a large fireball. As the flight rolled to 300° heading at about 11,000 to 14,000 ft, three more SAMs were seen at 3 o'clock. The flight broke down and right as the missiles passed above and detonated harmlessly. The flight immediately left the area.

BROWN flight saw the first SAM detonate immediately after they leveled off. Shortly after, a second SAM also detonated still far away from the flight. As the remaining two closed within 4 mi, BROWN flight started to descend; at this time the third SAM detonated. The fourth SAM still appeared to be guiding on the flight so BROWN flight broke right; as they rolled out of this break, the final SAM exploded at about 3000 to 5000-ft range. The flight then egressed.

8. ORDNANCE

None

9. EQUIPMENT PROBLEMS

BLUE - None reported

GREEN 4 - QRC-160 pod inoperative

BROWN 4 - QRC-160 pod ceased operating during a break

10. AIRCREW COMMENTS

Experience

	<u>Total Hours</u>	<u>F-4 Hours</u>	<u>Combat Missions</u>
GREEN 1 - Front	4400	150	-
BROWN 1 - Front	3450	220	43

Comments on this Encounter

GREEN 1

"Vector box" (APR-25) is useful only for X-band radar when QRC-160 is operating. The QRC-160 blanks out S-band reaction.

Since weather was not good enough to bomb, the deception was not authentic.

BROWN 1

Felt SAM batteries had altitude but not range on them due to SAM trajectories. SAM batteries appeared to be using command detonation.

SAM misses were closer than previous F-105 experience had indicated. He felt that the operators were adjusting to the ECM interference.

11. DATA SOURCES

Project Interviews: GREEN 1-Front; BROWN 1-Front (exact date unknown, in Jan-Feb of 1967).

Messages:

8TFW 230515Z Jan 67 DOI 01536

8TFW 23----Z Jan 67 DOI 01537

12. NARRATIVE DESCRIPTION

See Item #7.

GREEN flight received MIG warning 10 min after missile blast. BIG EYE reported MIGs did not take off early that day.

SECRET

EVENT 1-78

Aircraft Involved:

Result:

Vicinity of:

F-4Cs vs eight MIG-17s

022

07°N/105°22'E

Area Package VI

1. PRIMARY MISSION AND TACTICAL SITUATION

Date/Time: 5 Feb 1967/1530H

A flight of four F-4Cs (BLUE flight) while orbiting encountered a total of eight MIG-17s in a brief span of twenty F-105s were striking a target about 7 mi in a period some friendly aircraft were airborne in the area.

an F-105 strike
this period some
e. During this

2. MISSION ROUTE

Danang to refueling on WHITE track to TACAN channel orbit area.

07°N/105°22'E, then to

3. AIRCRAFT CONFIGURATIONS

F-4C BLUE 1, 2, 3, 4

- 4 - SPARROW (AIM-7E) (Note: One F-4C, specific and AIM-7Es)
- 4 - SIDEWINDER (AIM-9B)
- 1 - QRC-160 pod on right outboard pylon
- 1 - 370-gal tank on left outboard pylon
- 1 - 600-gal centerline tank
- Radar on, IFF and TACAN not radiating
- Camouflaged

ed; had only three

MIG-17s MIG 1, 2, 3, 4, 5, 6, 7, 8

ATOLL missiles

Cannon

Silver color with solid red star on wings and fuselage stabilizer.

ange bar on vertical

External fuel tanks

4. FLIGHT CONDITIONS PRIOR TO ENCOUNTER

Weather: Scattered clouds at 1000 to 3000 ft; 3 to 5-mi Broken cloud layer at 20,000 ft.

a moderate haze.

Flight Conditions: 3000-ft altitude, 450-kt TAS, SE

Fuel: 13,000 lb fuel (Note: B3 & 4 were unable to centerline tanks--approximately 4000 lb of fuel.)

fuel from their

Flight Formation: Close-in fluid four--about one-half

ing.

5. INITIAL DETECTION

The flight was heading 148° when BLUE 1 (Front) identified as a MIG-17) at 10 o'clock, about 1 mi distance, 300-350 kt, heading about 285°. As BLUE flight made a turn observed in company with the first. While in the turn at 6 o'clock (to the southeast), less than 1 mi distance, the same time a flight of four more MIGs was observed. It had been heard en route to the orbit area, but there was no encounter.

MIG (readily identified wings level, airspeed, a second MIG was sighted two MIGs at closing. At about east. MIG warnings of this specific

6. ACTION INITIATED

Lead called out the initial MIG and told the flight about a 4-g turn, going to full military power, to gain

at. Flight made action.

7. SITUATION DEVELOPMENT

As BLUE flight maneuvered to attack position on the subsequently determined to be a flight of two), two MIGs attack on BLUE lead element from 6 o'clock, apparently. Going into a hard break, BLUE 1 then observed four MIGs about the same position as the first MIG observed. BLUE four, becoming separated from BLUE 3 and 4 at about 10:00 split into two elements and gained pursuit positions. The encounter continued as two on two with continuous maneuver termination with BLUE 3 and 4 commencing egress due to into the clouds. BLUE 1, 3 and 4 fired missiles, with attempting to get MIGs off the other elements' tail, BLUE 4 also fired a SIDEWINDER at a MIG with good tone. entered a cloud. MIGs were observed to fire cannon at SIDEWINDER and two SPARROW missiles were fired.

sighted MIG (which was unsuccessful missile after the one pass. lock, closing from into the flight of light of four MIGs of F-4s. The apparent mutual MIGs disappearing observed, in of missile parameters. looking as the MIG a total of five

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SITUATION DEVELOPMENT (CONTINUED)

EVENT 1-78

Two unguided SAMs crossed in front of lead element as they pursued a MIG, detonating more than a mile away.

8. ORDNANCE

(No. fired/No. hits)

	SPARROW AIM-7E	SIDEWINDER AIM-9B	Cannon	Soviet AAM	Remarks
BLUE 1	0/0	2/0			Fired both missiles in salvo, knowingly out of parameters, and with unresolved tone, in successful attempt to divert MIGs from attack on other element. No bursts observed.
BLUE 2	0/0	0/0			
BLUE 3	2/0	2/0			Fired two SIDEWINDERS, knowingly out of parameters, and with no aural signal, in attempt to divert MIGs from attack on other element. Fired two SPARROWS without lock-on (due to ground clutter). No bursts observed.
BLUE 4	1/0	1/0			Fired SPARROW with no lock-on in attempt to divert MIGs from attack on other element. No burst. Fired SIDEWINDER from good position, good tone. Missile guided, following MIG into clouds. No burst observed.
MIGs			1/0	2/0	Lead observed missile firing in his direction; flight broke hard. Missiles passed considerable distance from flight; unable to determine whether or not they guided. Two MIGs (other than the ones firing missiles) both observed to fire a 3- to 5-sec burst at BLUE 3 & 4 at about the same time.

9. EQUIPMENT PROBLEMS

BLUE 3 & 4 were unable to jettison their centerline tanks and could not feed fuel from them.

While no abnormal equipment problems were experienced in missile firings, it is noteworthy that the tactical situation dictated out-of-parameter launch of seven of the eight missiles.

10. AIRCREW COMMENTS

Experience

Not known. BLUE 1, 2 & 3 aircraft commanders were grade of major; BLUE 4 was a captain; all back seaters were 1st Lt.

Comments on this Encounter

BLUE 1 Front

The orbit area for this mission was between a river and a 3500-ft mountain ridge. The area was selected because of its nearness to the target and because the terrain masking permitted the flight to keep a lookout for MIGs without being concerned about SAMs. Even though QRC-160 pods were carried, flight trained not to rely on them.

The MIGs' tactics seemed to consist of a single firing pass and breakoff.

Never had the opportunity to set up for an attack--there was always another MIG or two positioning themselves for attack at the same time.

It was about a constant 4- to 6-g maneuvering encounter, with the best pass BLUE 1 could ever get on a MIG being about 85° off the tail.

Element integrity was maintained throughout the encounter.

It is not believed that the final MIG was coordinated with the SAMs in an attempt to draw the F-4s into SAM range.

If the F-4s had carried guns, they could have undoubtedly gotten off some reasonable gun attacks.

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AIRCREW COMMENTS (CONTINUED)

EVENT 1-78

The whole engagement took place at such low altitudes and close ranges that lock on was not possible.

BLUE 1 tried to draw the MIGs up to a higher altitude--at one point, with MIGs at 6 o'clock pulling up to 8000 ft and reversing turn--but they wouldn't follow.

It appeared that the first two MIGs were decoys to attract the F-4s' attention while others positioned for an attack--if you see two, there's going to be two more around, was the normal expectancy.

Radar was in a boresight mode the entire time.

The Back was so confused by all of the aircraft in the vicinity that he wasn't interested in the radar.

The Back and his extra set of eyeballs helped "immeasurably."

The MIGs did not maintain element integrity after an initial pass.

A tighter turn capability and more maneuverability in general would have been very helpful.

11. DATA SOURCES

Project Interviews: BLUE Lead Front, 12 Mar 67

Messages, Reports:

366TFW, OPREP-3, 051055Z, FASTEL 113, Feb 67

366TFW, Change 1 to OPREP-3, 051630Z, FASTEL 121, Feb 67

366TFW, Change 2 to OPREP-3, 061140Z, FASTEL 147, Feb 67

12. NARRATIVE DESCRIPTION

BLUE flight of four F-4Cs took off from Danang, refueled on WHITE track, proceeded to TACAN channel 97 and then to an orbit area where they were to provide MIGCAP for an F-105 strike. The orbit was between a river and a mountain ridge in the vicinity of 21°03'N/105°22'E; the F-105 strike, involving about 20 aircraft, took place some 7 mi to the E.

The average elevation of the mountain ridge was approximately 3500 ft. The orbit had been selected in this area because of its nearness to the target and because the terrain masking afforded by the mountains allowed the flight to keep a lookout for MIGs without being too concerned about SAMs.

Each aircraft was carrying a QRC-160 ECM pod and the flight maintained a close-in (about one-half normal spacing) fluid-four formation. Altitude and speed in the orbit were about 3000 ft AGL and 450-kt TAS.

The F-4 fuel management switches for these aircraft had been modified in order to permit a setting which would force the external wing tanks to feed before the wing internal fuel. In this setting, the fuel from the wing external tank would be used first, thereby reducing the asymmetric fuel load as soon as possible. This was a field modification for the squadron to permit operation with full missile load and the QRC-160 pod.

To Just after establishing the orbit and while on a southeasterly heading, BLUE 1 Front observed a single, readily identified, MIG-17 at 10 o'clock, 1000 ft above heading about 285°. He called out the MIG and told the flight to break right, going into a 4-g turn and full military power.

T₁ As the flight rolled out on a northerly heading to set up an attack, the MIG was observed by BLUE 1 to be entering a low cloud formation about 2 to 3 mi ahead and was now also observed to be a flight of two. At about this time, BLUE 1 Back sighted two more MIGs closing from 6 o'clock, low. BLUE 1 Front then looked back and saw them at about 3 to 4000-ft distance, 5 to 6 o'clock, in a tracking situation. At about the same instant Front observed two missiles released by the lead MIG, apparently fired at BLUE 1 or 2. The MIGs then broke down and left. The flight continued a hard (4 to 4-1/2g) right climbing turn. The two missiles were observed to pass low and behind BLUE flight, 2000-ft distant, with no determination as to whether or not they had guided. At about the same time BLUE 1 had seen the two MIGs closing from behind, BLUE 3 or 4 observed four more MIGs closing from the east.

T₂ It was apparently just after this break in response to the missile firings that the elements became separated. In the turn, BLUE 3 observed two MIGs splitting from the flight of four and BLUE 3 and 4 broke into them as the MIGs were turning through their 3 o'clock position and descending.

T₃ As BLUE 3 and 4 tightened their turn to pursue two MIGs, BLUE 1 (with BLUE 2 on his wing) rolled out on a southerly heading and jettisoned centerline tank when his Back sighted the same four MIGs to the east. The lead element (BLUE 1,2) immediately broke right.

T₄ It is not clear what maneuvers the MIGs executed after T₃, but after BLUE 3 & 4 turned through 360° and BLUE 1 & 2 assumed a northerly heading, the two elements met almost head-on with the lead element about 2000 ft above. At this time each element was pursued by two MIGs. Two MIGs were at BLUE 3 & 4's 6 o'clock position, about 4000 ft distance

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NARRATIVE DESCRIPTION (CONTINUED)

EVENT 1-78

(both MIGs firing cannon), and two MIGs were at BLUE 1 & 2's 4 o'clock position, 3000 to 4000 ft distance. Each element leader had advised the other of MIGs on his tail prior to T4. BLUE 3 now fired two SIDEWINDERS with no tone in an attempt to "scare off" the two MIGs behind BLUE 1 & 2. Almost immediately, BLUE 4 fired a single SPARROW, with no lock-on, in a similar attempt. Almost simultaneously BLUE 1 made a 5°-10° diving attack on the MIGs pursuing BLUE 3 & 4, firing two SIDEWINDERS with an unresolved signal due to ground environment. No bursts were observed from any of these firings. There was no report of the missiles having guided or not.

BLUE 3 & 4 continued in a climbing right turn. BLUE 1 & 2 pulled up and continued turning.

T5 After completing about 270° of turn after firing, and still turning, BLUE 3 & 4 sighted two MIGs at their 2 o'clock low position, heading east. (It is believed that these were the two diverted while attacking BLUE 1 and 2.) BLUE 3 and 4 dove into the MIGs from behind.

T6 BLUE 3 fired two SPARROWS with no lock-on due to ground clutter. The MIG underfire broke right and then left. One missile passed 300 to 700 ft behind him and the other 200 ft in front. No bursts were observed. BLUE 3 then broke right and called for an egress due to his low fuel state. BLUE 4 continued following the MIGs.

BLUE 1 & 2, rolling out on a southeasterly heading, observed a single MIG-17, very low, ahead, heading east. They turned left to chase, descending and going into afterburner.

T7 BLUE 4, in position behind the MIGs, and with a good aural tone, fired a single SIDEWINDER. He observed that it tracked properly and when the missile was about 400 to 500 ft from the target the MIG-17, in a diving left turn, went into the clouds at about 1000-ft altitude. No burst was observed. BLUE 4 then turned right and climbed to join BLUE 3.

BLUE 1 and 2 were pursuing a single MIG-17 when two SAMs came across in front of them from 10 o'clock to 2 o'clock. They appeared to have no guidance and posed no threat. They rose, arched to a lower altitude and detonated 1-1/2 to 2 mi away.

BLUE 3 & 4 called that they were departing. BLUE 1, knowing 3 & 4 were having fuel troubles (could not feed from or jettison their centerline tanks), decided to break off his chase and join them.

Flight joined, proceeded to refuel on WHITE track and return to base.

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EVENT 1-78 SUMMARY

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (8 MIGs)	Remarks
	Status	Action				
T0	B1, 2, 3, 4 close-in fluid-four formation, 3000-ft altitude, 450-kt TAS, heading SE, 13,000 lb fuel.	Flight breaks right, 4-g turn, full military power.		Lead calls "MIG-- break right."	Straight and level	B1 Front sees single, readily identified, MIG-17 at 10 o'clock, distance 1 mi, up 1000 ft, heading about 285°.
T1	Rolling out of turn, 4000-ft altitude, 500-kt TAS, northerly heading, full military power.	Continues hard right turn.			Initial MIGs sighted enter clouds. Lead MIG of two at 6 o'clock fires two missiles, then both break down and left.	Single MIG now observed to be flight of two. B1 Back sees two MIGs closing from 6 o'clock, low, less than 1 mi. B3 or 4 see four more MIGs closing from the E.
T2	In hard right turn, altitude 5000 ft, full military power	B3 & 4 break into two MIGs which are splitting from the flight of four.				B3 & 4 observe two MIGs splitting from group of four to the E and descending.
T3	B1 & 2 rolling out on southerly heading, 6000-ft alt, 500-kt TAS, full military power. B3 & 4 about same alt.	B1 jettisons centerline tank, going into right turn after sighting four MIGs.				B1 Back sees four MIGs to E, close by at higher altitude.
T4	B1 & 2 in shallow dive, 500-kt TAS, 6000-ft altitude.	B1 & 2 make a 5°-10° diving attack on MIGs following B3 & 4; B1 fires two SIDEWINDERS at 2000 to 3000-ft range, 60° angle from head-on, unresolved tone, to divert MIGs. No bursts observed.		Elements advise each other of MIGs on the other's tail	Two MIGs pursuing each element of F-4s, firing cannon at B3 & 4. All break off after BLUE missile firings.	Two MIGs at B3 & 4's 6 o'clock, 4000-ft distance. Two MIGs at B1 & 2's 4 o'clock, 3000 to 4000-ft distance. BLUE elements meet almost head-on.

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EVENT 1-78 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (8 MIGs)	Remarks
	Status	Action				
T 4 Cont.	B3 at firing 400-kt TAS, 4000-ft altitude, 4+ g	B3 fires two SIDEWINDERS at MIGs following B1 & 2, 1500 to 2000-ft range, angle-off from head-on 90°-100°, no aural signal, to divert MIGs. No bursts observed.				
	B4 at firing 400-kt TAS, 4000-ft altitude.	B4 then fires one SPARROW at same two MIGs 1500 to 2000-ft range. Interlocks out, radar boresight, no lock-on. No bursts observed.				
		B3 & 4 continue climbing right turn. B1 & 2 pull up in right turn after firing.				
T 5		B3 & 4 make diving attack on newly sighted MIGs.				B3 & 4 sight two MIGs at 7 o'clock, low, heading E. (Believed to be the MIGs that had been pursuing B1 & 2.)
T 6	B3 at firing, 400-kt TAS, 2gs.	B3 fires two SPARROWS, 3000-ft range, angle-off 20°, interlocks out, but radar in boresight, but no lock-on due to ground clutter. No bursts. B3 turns right for egress; B4 follows one of the MIGs.		After firing, B3 calls for egress due to low fuel.	MIG fired upon breaks right, then left.	One missile passed 200 ft in front of target, other 500 to 700 ft behind.
	B1 & 2 altitude about 5000 ft.	B1 & 2 turn to chase MIG and descend, going into afterburner.				B1 & 2, rolling out on southerly heading sights a single MIG-17 ahead, very low, heading E.

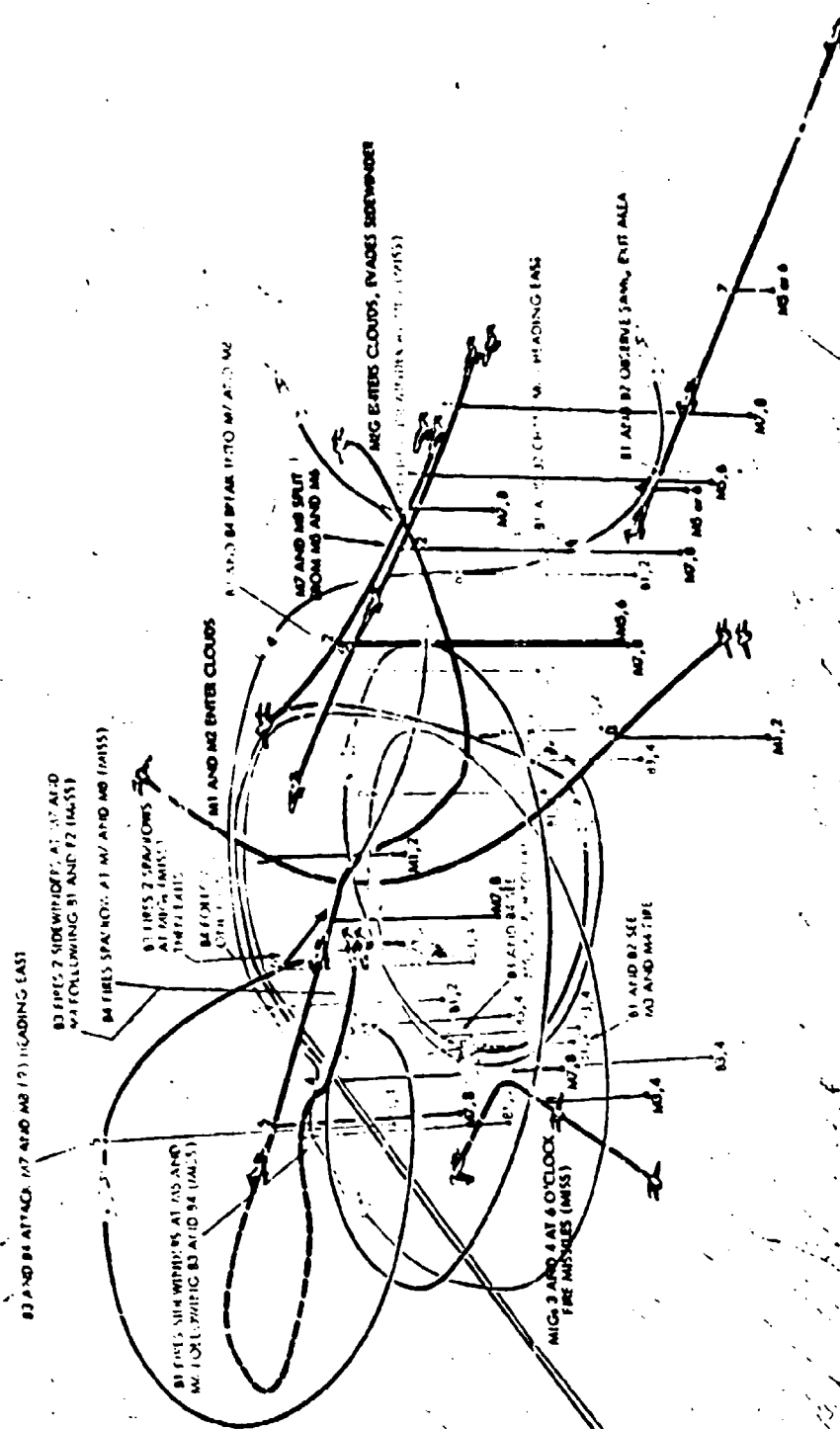
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EVENT 1-78 SUMMARY (Continued)

Time Mark	Action Aircraft (BLUE 1, 2, 3, 4)		Other Friendly	Communications	Enemy Actions (8 MIGs)	Remarks
	Status	Action				
T 7	B4 at firing 450-kt TAS, 3000-ft altitude, 2 gs.	B4 fires one SIDEWINDER, 2000-ft range, behind target (5'), good aural tone, 50-kt overtake. No burst observed. B4 then turns, climbs to join B3.			When missile is 400 to 500 ft from target, MIG, in a diving left turn, enters clouds at about 1000 ft.	Missile observed to track.
	B1 & 2, 2500-ft altitude.	After SAM firing, B1 & 2 break off chase, turn left to join B3 & 4.			Single MIG, going away from B1 & B2	B1 & 2 observe two SAMs cross in front of them from 10 o'clock to 2 o'clock, no threat. detonate 1-1/2 to 2 mi away.

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DEPARTMENT OF THE AIR FORCE
11TH WING



28 June 2001

MEMORANDUM FOR: DEFENSE TECHNICAL INFORMATION CENTER

FROM: 11 CS/SCS (MDR)
1000 Air Force Pentagon
Washington, DC 20330-1000

SUBJECT: Mandatory Declassification Review Request, Air Force Case Number
01-MDR-023

Reference W. Howard Plunkett (Lt Col, USAF Retired) letter, dated 16 April 2001 (attachment 1) requesting a mandatory declassification review of the following documents:

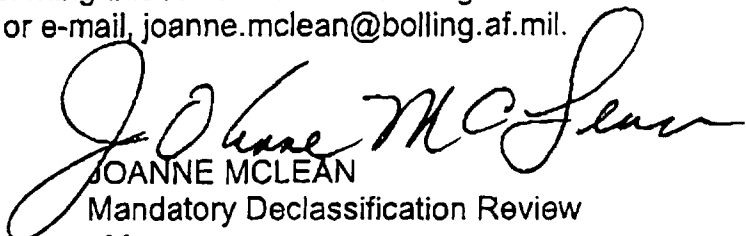
WSEG-116-VOL 1. "Air-to-Air Encounters in South East Asia, Vol. I. F-4 Events Prior to 1 March 1967." DTIC number AD-C003 627

WSEG-116-VOL 2. "Air-to-Air Encounters in South East Asia Vol. II, F-105, Events Prior to 1 March 1967." DTIC number AD-C003 628

WSEG-116-VOL 3. "Air-to-Air Encounters in South East Asia Vol. III. "Events from 1 March 1967 to 1 August 1967 and Miscellaneous Events." DTIC number AD-C003 629

The following documents was reviewed by the appropriate Air Force agencies and document numbers AD-C003 627, AD-C003 628, and AD-C003 629 have been downgraded to UNCLASSIFIED.

Address any questions concerning this review to the undersigned at DSN 426-7265, COMM (703) 696-7265 or e-mail, joanne.mclean@bolling.af.mil.


JOANNE MCLEAN
Mandatory Declassification Review
Manager

1 Attachment
W.H. Plunkett's Letter, 16 Apr 01

cc: W. Howard Plunkett

**REFERRAL from: 11 CS/SCS(MD
R)**

INTERNAL ID: 0503101001

RECEIVED: 03-May-01

REVIEWER: 27

AGENCY ID: 00-MDR-023

SUSPENSE: 17-May-01

RETURNED:

AGENCY: 11 CS/SCS(MDR)

POC: JOANNE MCLEAN

PHONE: () 696-7265

TITLE: 3 DTIC VOLUMES TITLES AIR TO AIR ENCOUNTERS IN
SOUTHEAST ASIA

ISSUE:

CLASSIFICATION: SECRET

DOWNGRADE?: No

ACTION: DECLASSIFY

DOWNGRADE CLASS:

XEMPTION CATEGORY:

RD: No

OPR / EQUITY HOLDER: AIR FORCE

FRD: No

OTHER EQUITIES:

SIOP DATA: No

COMMENTS: AIR FORCE HAS REVIEWED THE DOCUMENTS AND FIND NO
MATERIAL THAT NEEDS TO REMAIN CLASSIFIED.*Material is releasable to the public.**Jean D Hardin, SMSgt,
USAF*

OPTIONAL FORM 88 (7-90)

FAX TRANSMITTAL

8 of pages

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