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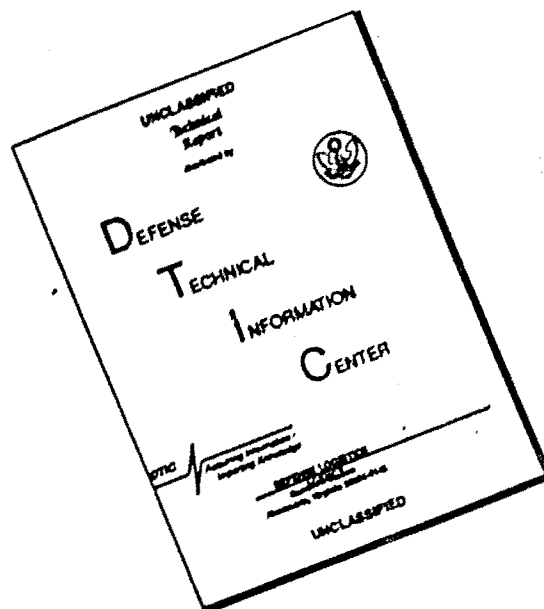
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20. A Quantitative Analysis of Handgun Use During The Evasion and Survival Attempts of Army Air Force Aircrew Members During World War II by Major Joseph R., US Air Force, 96 pages.

↘ This study establishes desirable characteristics of handguns for use during evasion and survival attempts of aircrew members downed in hostile territory. Based on a quantitative analysis of data from World War II evasion reports of U.S. Army Air Force personnel, the investigation revealed that the primary value of a handgun is affording a psychological sense of security. The weapon can also be used for self-defense, killing small game for food, signaling, and coercion. Recommendations are that effective handguns and ammunition should: be light enough for the aircrew members to carry for long periods of time; be securely attached to the evadee so that they will not be lost during bailout or some other activity where recovery would not be possible; be capable of rapid employment; be very accurate; be capable of disabling an opponent with the first shot; be silent so when employed they will not attract the attention of enemy forces or hostile civilians; be capable of killing small game without destroying the meat. Further, training should also include firing at small moving targets to increase the aircrew member's accuracy. ↗

A Quantitative Analysis of Handgun Use During the Evasion and  
Survival Attempts of Army Air Force Aircrew Members During World War II

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U.S. Army Command and General Staff College  
Fort Leavenworth, Kansas 66027

Final report 8 June 1979

(Unclassified) Approved for Public Release: Distribution Unlimited

A Master of Military Art and Science thesis presented to the faculty  
of the U.S. Army Command and General Staff College, Fort Leavenworth,  
Kansas 66027

A QUANTITATIVE ANALYSIS OF HANDGUN USE DURING THE EVASION AND SURVIVAL  
ATTEMPTS OF ARMY AIR FORCE AIRCREW MEMBERS DURING WORLD WAR II

A thesis, presented to the faculty of the U.S. Army  
Command and General Staff College in partial  
fulfillment of the requirements for the  
degree

MASTER OF MILITARY ART AND SCIENCE

by

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1979

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other government agency. (References to this study should include the foregoing statement.)

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## CHAPTER I

### INTRODUCTION

#### BACKGROUND

United States Air Force doctrine stresses each combat aircrew member's responsibility to return to friendly control should he be downed over hostile territory. (4:1/1) These aircrew members constitute an invaluable source of highly trained and uniquely experienced manpower whose services would otherwise be lost. During the Second World War for example, over 2400 men were returned to active duty in the European Theater of Operation, (15:4) almost 700 from the Chinese Theater, and 350 from the Pacific Ocean Area (7:40). Further, evadees can provide valuable intelligence on enemy activities (9:82) while at the same time denying the enemy a source of lucrative intelligence (5:1). To aid the aircrew members in his efforts to return to friendly control, the United States Air Force provides sophisticated Search and Rescue (SAR) forces. Recognizing the possibility that these forces may be unable to penetrate a formidable air defense system, all aircrew members are also provided personal survival and evasion equipment. One item of equipment is the handgun, the subject of this study.

Historically, self-defense has been the driving



force behind the selection of the handgun and ammunition and the type training provided. (16) During World War II, the Army Air Force provided its aircrew members with the standard Army personal defense weapon, the .45 caliber automatic pistol. This pistol was, and is today, regarded by many weapons authorities as excellent for use against human targets. However, its weight and recoil makes the .45 difficult to resight after firing creating an accuracy problem. (2:31)

Today, the United States Air Force issues its combat aircrew members the .38 caliber Smith and Wesson Combat Masterpiece and provides training on man-shaped silhouette targets, emphasizing the ability to place a bullet in the torso of a man. (16) The validity of this position is questionable however.

Recalling the aircrew member's primary responsibility to return to friendly control should he be downed over hostile territory and the probability that SAR forces may not be able to penetrate a high threat air defense system, the aircrew member may be forced to evade and survive for many days. In this situation, any hostile civilian or enemy soldier who becomes aware of the evader's presence could end that evasion. This requires the evadee to make every effort to conceal his presence, and unless specifically briefed to do so, make no contact with civilians. Furthermore, due to the close proximity of enemy forces or hostile



civilians, the evadee may have to leave the landing area rapidly, abandoning most or all of his survival equipment to speed his escape and/or rate of travel. (4:1/5)

Under these circumstances, a handgun could be of value to an evadee, not only for self-defense, but also in securing assistance from civilians or in hunting for food. Therefore, all intended uses for a handgun and ammunition must be established, and acceptable tradeoffs made to select the most effective weapon to aid the downed airman in his efforts to return to friendly control.

#### PURPOSE

The purpose of this study is to determine the possible uses for an aircrew survival and evasion handgun, to identify those factors bearing on those uses, and to make recommendations for characteristics of such a weapon. This information will aid weapons experts in selecting the most effective weapon and ammunition combination.

#### CONSTRAINTS

Source data for this study was World War II evasion narratives. This data was selected because of the similarity between Army Air Force operations during that war and current U.S. Air Force operations.

Data from the Korean and Southeast Asia conflicts was not included. Much of this data remains classified.

However, after reading several evasion narratives of downed aircrew members from those two conflicts, no data was found that would detract from the findings of this study. Because of the large volume of evasion reports, and the lack of supporting documentation on survival equipment and training relating to allied nations' aircrew members, that data was not included.

#### REVIEW OF RELATED SOURCES

In an attempt to determine the basis for the decision to emphasize the self-defense aspect of the issue survival weapon, the author contacted the 3636th Combat Crew Training Wing (Survival) at Fairchild Air Force Base (AFB), Washington. This organization is responsible for the survival and evasion training of all USAF aircrew members. The Life Support Officer there was unable to provide any documentation in support of the historical rationale for weapon selection, but recommended that the Life Support Systems Programs Office of the Air Force Systems Command at Wright Patterson AFB, Ohio be contacted (16). That office is responsible for the development and/or acquisition of all life support and survival and evasion equipment used by aircrew members. They too were unable to provide any documentation for current practices. Both of these organizations indicated the need for such a study and asked that they be furnished a final copy of this report.

The Army Command and General Staff College (CGSC) Library; CGSC Abstracts of Master of Military Arts and Science (MMAS) Thesis and Special Reports, 1964-1976; the Air University Abstracts of Research Reports and Index to Military Periodicals; and the Defense Documentation Center files were then searched to identify unclassified research papers, technical reports, and memoranda on the uses for aircrew survival evasion handguns. This search revealed only two reports. Each is reviewed below.

THE LEUTY STUDY

The first report entitled "A Study of Personal Defense Weapons for U.S. Army Helicopter Pilots," is an unpublished masters thesis written in 1972 by Major Ray S. Leuty, a student at the Army Command and General Staff College.

BACKGROUND The Colt .45 Caliber Automatic Pistol has been the standard personal defense weapon for the United States Army since the early 1900's. However, for several reasons (primarily inaccuracy and weight) most helicopter pilots turned to a variety of personally procured weapons ranging from .44 magnum revolvers to .25 caliber Derringers. In 1965, the .38 caliber revolver became the issue weapon for Army pilots, but it too was found to be less than satisfactory. The Combat Systems Group of the Combat Developments Command, U.S. Army, sponsored Major Leuty's study on personal defense weapons for U.S. Army Aviators.

PURPOSE The purpose of Major Leuty's study was to determine the requirements for a helicopter pilot's personal defense weapon, and what weapon/ammunition combination would best satisfy those requirements.

CONSTRAINTS Personal investigation of all weapons data was not feasible, therefore the opinions of recognized small arms experts were accepted as valid. Further, conclusions and recommendations were made without regard for the costs. Only unclassified sources were referenced.

METHODOLOGY This study examined current literature, ballistic data and helicopter employment doctrine; summarized interviews with combat veteran helicopter pilots and weapons experts; and contained the author's expertise.

FINDINGS Major Leuty found that survival/evasion weapons should be used only in emergency situations. Such uses include self-defense, killing small game, intimidation of the enemy, signaling or marking locations, and providing a sense of psychological security. The weapon should be small, light, easily carried/attached, unobtrusive, capable of quick, easy employment with a high degree of accuracy, and possess adequate stopping power at close ranges. A variety of ammunition (including ball, tracer, flare, and shot loads) would increase pilots' survival expectations.



CONCLUSIONS The Colt Model 1971 Military Pistol firing a 9 millimeter cartridge was determined to be the weapon most capable of meeting U.S. Army helicopter pilots' needs for a survival/evasion handgun.

#### THE PENNEY STUDY

The second report entitled "Aircrew Survival Weapon Use: WWII Data Base" was written in 1977 by Major Robert M. Penney. It was also an unpublished masters thesis for the Army Command and General Staff College.

BACKGROUND The United States Air Force, lacking identified requirements for a survival personal defense weapon, provides its aircrew members with a weapon (.38 caliber handgun) and training intended for use against human targets.

PURPOSE The purpose of this study was to provide an empirical data base for use in determining the requirements to be fulfilled by U.S. Air Force aircrew combat survival weapons.

CONSTRAINTS The study was limited to an investigation of the evasion and survival situation in Western Europe during World War II and only unclassified sources were referenced. The author assumed that a future armed conflict in Western Europe would be as a result of a Warsaw Pact (to include the Soviet Union) invasion; that the citizens of those invaded countries would provide Air Force evadees with assistance similar to that



experienced by Army aircrews during World War II; and, that small wild and/or domestic game would exist in sufficient quantities to offer an evadee the opportunity to provide himself with food by hunting.

METHODOLOGY Evasion debriefs of downed Army Air Force aircrew members were analyzed on a day-by-day basis for actual or potential survival weapon uses. The data was manually tabulated and presented as events per-man-day of evasion.

FINDINGS For reasons explained later, Major Penney found that no evadee actually fired a weapon for any survival or evasion purpose. Thus, the most frequently encountered potential use of a survival weapon was to kill small game for food. This finding was also based on current Air Force evasion policy which requires evadees to avoid contacts with civilians. Since the majority of food consumed by evadees included in this study was procured from civilian sources, future evadees would have to provide much more food for themselves than did their counterparts during World War II. This requirement may be partially filled by increasing the amount of rations in the survival kits, but this potential is limited due to space. The maximum potential use rate for a weapon to fill the food requirement was determined to be one use for each 1.4 man days of evasion. The next most frequent potential

use for a weapon was for psychological benefit with a rate of one use every 13.3 man days of evasion for the first day of evasion and one every 42.2 man days of evasion thereafter. Self-defense was the least quantifiable potential use of a survival weapon with a rate of one use every thirty man days of evasion for the first day and one every 126.3 man days of evasion thereafter. There was also a potential to use a survival weapon for coercion and signaling.

CONCLUSIONS The United States Air Force should procure (for use in Western Europe) an aircrew survival weapon and ammunition optimized for killing small game. Further, survival weapon training should increase accuracy sufficiently for this purpose.

LIMITATIONS OF MAJOR PENNEY'S STUDY Major Penney's finding that no evadee actually fired a weapon for any survival or evasion purpose in the Western European Theater of Operations can be explained in that Intelligence Officers in that theater were advising aircrew members not to carry side-arms because of... "the attitude taken by the Germans toward those who are captured... with side arms". (8) This statement, extracted from a letter dated 21 April 1944, from the Headquarters, Army Air Force Redistribution Station No. 3, Atlantic City, N.J., (responsible for the interrogation of returning evadees and escapees), to the Intelligence Interrogation Branch,

Department of War, went on to say that personnel with handguns in the South Pacific and China-Burma-India Theaters found it advantageous to have them in many instances. (8) This lack of identified actual uses and Major Penney's failure to identify factors affecting the use of a weapon limits the usefulness of his study as a determinant in the following analysis.

#### SCOPE OF THE STUDY

This study will identify actual and potential uses for a survival and evasion handgun based on evasion data from the European Theater of Operations not included in Major Penney's study, and evasion data from all other theaters of operation during World War II. Major Penney's study is available from the sources noted above. Furthermore, the author will attempt to establish those factors which impact on the use of a handgun during survival and evasion in hostile territory, and conclude with recommendations for survival/evasion weapon characteristics.

#### ORGANIZATION OF THE STUDY

Chapter II delineates the research design procedures to include a discussion of data requirements, sources, and analytical techniques. Chapter III summarizes the analysis and discusses implications. Chapter IV contains conclusions and recommendations.

## CHAPTER II

### RESEARCH DESIGN AND PROCEDURES

#### THE DATA AND ITS SOURCE

The sources of the data required for this study were World War II evasion narratives of U.S. Army Air Force aircrew members compiled between 7 December 1941 and 30 August 1945. This historical data was retrieved from microfilmed records stored at the Albert F. Simpson Historical Research Center at Maxwell Air Force Base, Alabama.

The author concentrated primarily on reports of aircrew members who evaded successfully rather than on reports from crew members who were captured. However, Prisoner of War (POWs) debriefs were included where an attempt at evasion had been made. Thus, the debriefs of aircrew members who after bailout or crash landing were immediately surrounded by enemy soldiers or hostile civilians and taken captive, or who were so severely injured that they were unable to move, let alone evade, were discarded. Further, since this study is concerned with the use of a handgun during evasion and survival situations in hostile territory, only those reports were tabulated where it could be positively determined whether or not the evadee had a handgun.



## RESEARCH METHODS

Each debrief was analyzed for pertinent data on handgun use and the factors bearing on its employment. An entry was then made on the Data Worksheet (See Appendix A) reflecting that data. To aid in the identification of the factors bearing on weapon use the following details were established: the evadee's age; officer or enlisted status; if he became a POW; and, the number of evadees in the evasion group. In the case of group evasions, one Data Worksheet was completed for each evadee when the report was specified as a joint debriefing. When the report was from a single evadee who evaded as part of a group, only one Data Worksheet was completed. The theater of operation in which the evasion occurred; and whether the evasion took place in the enemy's homeland, in lands they occupied or in those areas which were still being contested was then established. The author also established if the evadee bailed out of, ditched or crashlanded his aircraft, and whether he was injured in the process. Entries were made if the evadee had a survival/evasion handgun and/or a survival kit and whether or not he had received any survival training.

It is important to know if an evadee had his survival kit for it could have been a source of food and medical items. Without a kit, the evadee would be



forced to acquire food and medical items from civilian sources or by foraging. While the content of survival kits varied greatly depending on the type aircraft, the climate, and theater of operation, most contained the following equipment: first aid items; signaling equipment such as flares and mirrors; a compass and maps; fish line and hooks; and, rations (1 to 3 days supply) and water bag. (7:19-20)

The survival and evasion training provided aircrew members during World War II was fragmented. Each command gave their aircrew members some training which ranged from brief orientation to extensive programs. The majority of training was in the form of films and lectures on Escape and Evasion, Jungle Survival, Water Survival, and Resisting Interrogation. (13:24) There were some formal survival schools, managed by the Army Air Force, however, an insignificant number of aircrew members attended these schools. (12:1)

While other questions could have been asked to aid in the analysis of factors bearing on the use of a survival/evasion handgun, it was determined that the above details were the only ones that could be ascertained with any degree of regularity.

#### DAY-TO-DAY ACTIVITIES

Once the above data was established, the author identified the daily activities of each evadee.

For the purpose of this study, the aircrew member was considered to have begun his evasion on the day he abandoned his aircraft, regardless of the actual time, and to have completed his evasion on the day he was either: accepted by an evasion assistance group, returned to friendly control, interned in a neutral country, or became a Prisoner of War.

The first daily activities the author established were those involved with the acquisition of food, water, medical aid, and clothing. Attempts to acquire those items from such sources as stealing from farmer's fields/homes or using items from the survival kit or foraging for food were kept separate from attempts to coerce assistance from civilians at the point of a gun, and instances where a civilian rendered the assistance without any coercion.

The assumed purpose of a survival weapon was self-defense. The opportunity to use a weapon for self-defense was considered to have occurred whenever an evadee or group of evadees were sighted by enemy soldiers or hostile civilians, whether or not they made an attempt to capture the evadee(s).

Fear of the unknown, of being wounded, captured, or killed can cause some irrational or unusual behavior during evasion or survival attempts. The possession of a survival/evasion handgun might offer an evadee an

increased sense of security during these high stress situations. (1:110-116) The author therefore recognized the need for a weapon any time an evadee indicated a high anxiety level or fear that detection by hostile personnel was imminent.

Finally, all attempts to use a survival/evasion handgun to kill small game for food, as a signaling device, or to mark a position were recorded.

#### TECHNIQUES FOR ANALYZING THE DATA

Once the above data was gathered, the Evadee Data Worksheets were machine read. The data was organized and summarized by special computer programs developed for this study. (See Appendix B for a description and a copy of these programs.) The computer programs were also used to crosstabulate one sub-population with another and to extract daily activities of any one sample for ease in identifying those factors bearing on survival/evasion handgun use. Percentages, averages, and events-per-man-day-of evasion were used in making comparisons of subpopulations.

Events-per-man-day of evasion was computed by dividing the total number of cases for any one event by the total man-days of evasion for that population. For example, assume that five lone aircrew members evaded in the Middle Eastern Theater of Operations. All five

evaded for the first two days before three of them returned to friendly control. The remaining two evaded for one more day before they too returned to friendly control. These five evadees therefore evaded for a total of twelve man-days (five evadees on day one, plus five evadees on day two, and two evadees on day three). Further, assume that these evadees received food from civilians on five different occasions. The events per man-day of evasion would then be .4167 (five cases divided by twelve man-days of evasion).



## CHAPTER III

### THE RESULTS

In developing the data for this study, 771 Army Air Force aircrew members' evasion reports were identified as possible source data. Of these 244 were included in this data base. The remaining 527 were not included as they were either too vague to permit an adequate evaluation; or they originated from aircrew members who had no opportunity to evade; or no determination could be made as to whether or not the evadee had a handgun.

Below are the results of the analysis. Insights gained from the evasion debriefs are included in the discussion of the evadees, their day-to day activities pertaining to handgun use, and the overall factors bearing on the use of handguns.

#### DATA ON THE EVADEES

Table 1 presents a summary of the pertinent data to aid the reader in gaining an insight as to the characteristics of the evadees. By way of narrative background, the mean age of the evadees was 24.4 years. There were 154 officers (63.1%) and 90 enlisted men (36.9%) in the population. Only 88 of the evadees are known to have received some form of survival and evasion training. Thirteen received no training, and 142 for whom no determination could be made.

TABLE 1. THE EVADEES

	ALL EVADEES	EVADEES WITH A HANDGUN	EVADEES WITHOUT A HANDGUN
CATEGORY/NUMBER OF EVADEES	244	145	99
OFFICERS	154	88	66
ENLISTED MEN	90	57	33
TRAINING (SURVIVAL)			
- YES	88	44	44
- NO	13	9	4
- UNKNOWN	143	92	51
EVADEES	236	143	93
POWs	8	2	6
- CAPTURED	4	1	3
- TURNED IN	4	1	3
THEATER OF OPERATION			
- EUROPEAN	6	3	3
- MEDITERRANEAN	55	24	31
- PACIFIC OCEAN AREA	53	32	21
- MIDDLE EASTERN	1	1	0
- CHINA/BURMA/INDIA	129	85	44
BAILED OUT	193	113	80
DITCHED/CRASHLANDED	51	32	19
INJURY			
- NONE	159	95	64
- HEAD	17	11	6
- LEG/FOOT	28	16	12
- ARM	7	4	3
- BODY	5	3	2
- MULTIPLE	28	16	12
GROUP SIZE			
- 1	93	57	36
- 2 OR MORE	151	88	63
SURVIVAL EQUIPMENT			
- YES	158	106	52
- NO	23	15	8
- ABANDONED	16	11	5
- UNKNOWN	20	8	12
- LOST	27	5	22

There were 236 aircrew members who evaded successfully and eight who became POWs. Of the eight POWs, four were captured by enemy soldiers or hostile civilians; while four were turned in to authorities as a result of contacts for assistance.

These evasions occurred in the European, Mediterranean, Middle Eastern, Pacific Ocean Area, and the Chinese Theaters of Operation. In the European Theater, only six evadees were identified who had not been included as part of the data base in Major Penney's study.

There was only one evadee from the Middle Eastern Theater included in this study, while the Mediterranean Theater provided 55 evasions (22.5%). Because of the small numbers of evadees in the European and Middle Eastern Theaters, their data was combined with the data from the Mediterranean Theater. The Pacific Ocean Area accounted for 53 evasions (21.7%). The Chinese Theater, which included Burma, India, and Southeast Asia, was the most active with 129 evasions (52.4%).

Of the aircrew members downed in the five theaters of operation, 193 (79.1%) bailed out of their aircraft, Fifty-one (20.9%) ditched or crash landed. Eighty-five evadees (34.8%) received injuries prior to their evasion activities. Of these, seventeen evadees received injuries to their heads, twenty-eight in the leg or foot, seven in the arm, and five in the body, while twenty-eight evadees

received multiple injuries. The remaining 159 evadees (65.2%) were not injured while abandoning their aircraft; however, five were injured during the course of their evasions. For the most part, the injuries were superficial and did not prevent any individual from evading.

There were, however, several injured airmen who could have become POWs were it not for the fact that they evaded in groups. There were 151 aircrew members (61.9%) who evaded in groups. These groups varied in size from two to eleven members, but the number of evadees in a group did not prove to be important. What was significant was that they could help each other and share available survival equipment.

There were 158 evadees (64.8%) who had some survival equipment while twenty-eight (9.4%) had none. There were sixteen cases (6.6%) where the evadee abandoned his equipment in an attempt to escape capture while another twenty-seven (11.1%) lost theirs during bailout or some other activity where recovery was not possible. Further, there were twenty cases (8.2%) for which no determination could be made.

Of prime importance to this study was availability of a handgun. There were 145 (59.4%) evadees who began their evasions with handguns including eleven who



acquired them from fellow crew members killed in action. There were 51 evadees who did not carry handguns, 42 who lost theirs during bailout or some other activity where recovery was not possible, and six who disposed of their weapons on the ground. Thus, 99 evadees (40.6%) did not have handguns during their evasion attempts.

The evasion attempts of the 244 aircrew members varied in length from one to 246 days. Most evadees, however, had terminated their evasion by the end of the third day. Table 2 presents a frequency distribution for the number of evadees on any one day of evasion through the 21st day. After the 21st day there were no incidences involving handgun use except for its psychological value. The number of evadees who had and did not have handguns on those days is also presented. With this background in mind, a detailed analysis of the evadees daily activities is possible.

#### DAY-BY-DAY EVADEE ACTIVITIES

The daily activities of the evadees centered on securing food and water, clothing, medical aid, providing for self-defense, and gaining a sense of security. Table 3 lists these activities and the number of incidences for each during 1,889 man-days of evasion. The purpose of this portion of the study is to determine the impact of handgun availability/nonavailability on these type activities.

TABLE 2. EVADEES PER DAY OF EVASION

<u>DAY</u>	<u>NUMBER OF EVADEES</u>	<u>PERCENT OF EVADEES NO LONGER EVADING</u>	<u>DID THE EVADEE HAVE A HANDGUN?</u>	
			<u>YES</u>	<u>NO</u>
1	244		145	99
2	153	37.3	95	58
3	121	50.4	77	44
4	94	61.5	62	33
5	79	67.6	54	25
6	71	70.6	48	23
7	59	75.8	37	22
8	56	77.0	34	22
9	50	79.5	30	20
10	47	80.7	28	19
11	46	81.1	27	19
12	39	84.0	21	18
13	36	85.2	18	18
14	34	86.1	17	17
15	32	86.9	15	17
16	32	88.9	15	17
17	29	88.1	13	16
18	29	88.1	13	16
19	28	88.5	12	16
20	28	88.5	12	16
21	27	89.3	11	16

TABLE 3. EVADEE ACTIVITIES

<u>ACTIVITIES</u>	<u>INCIDENCES *</u>
. FOOD/WATER	
FORCED FOOD/WATER	1
ACQUIRED FOOD/WATER	245
GIVEN FOOD/WATER	189
KILLED SMALL GAME	9
STAYED WITH FAMILY	891 days
. CLOTHING	
ACQUIRED CLOTHING	3
GIVEN CLOTHING	40
. MEDICAL AID	
ACQUIRED MEDICAL AID	8
GIVEN MEDICAL AID	19
. SELF DEFENSE	39
. SENSE OF SECURTY	97
. SIGNAL/MARKER	19

\* Number of incidences for each activity during the  
1,889 man-days of evasion.

## FOOD AND WATER

One of the most important daily activities for each evadee was obtaining food. There was only one evadee who used the handgun to coerce some food from an isolated Italian farm family. While his efforts were successful, the family was so enraged that his presence was reported to the local military authorities. Subsequently, a search was initiated that almost resulted in his capture. There were 245 incidences where evadees secured food either from the survival rations found in their survival kits or by foraging. Table 4 lists the number of incidences by day of evasion. Most evadees made every effort to ration their food supply, however, they did eat regularly, usually one or two times a day. Survival rations were the primary source of acquired food during the first three or four days of evasion. Survival rations found in the evadee's kits included the D-type (chocolate candy) and the C and K type (a complete meal). After the fourth day, evadees began to forage for food.

By far the greatest single source for foraged food was vegetable gardens. This involved risking detection by civilians, usually as a result of aroused dogs. In these situations the handgun proved to have a significant psychological value, for the evadee who possessed a weapon was far more likely to approach an inhabited area than one who did not. On day six, for example,



TABLE 4. ACQUIRED FOOD

DAY OF EVASION	NUMBER OF EVADEES	NUMBER OF CASES	DID THE EVADEE HAVE A HANDGUN?	
			YES	NO
1	244	24	17	7
2	153	34	32	2
3	121	20	19	1
4	94	22	17	5
5	79	24	23	1
6	71	17	15	2
7	59	20	18	2
8	56	16	13	3
9	50	13	12	1
10	47	10	10	1
11	46	9	8	1
12	36	7	6	1
13	36	2	2	0
14	34	3	3	0
15	32	3	2	1
16	32	2	1	1
17	29	2	1	1
18	29	2	1	1
19	28	1	0	1
20	28	1	0	1
21	27	1	0	1
* NO INCIDENCES				
26	23	4	4	0
27	23	4	4	0
28	23	4	4	0
TOTAL		245	212 (86.5%)	33 (13.5%)

nine of the seventeen incidences involved foraging near inhabited areas. Of the nine evadees, at least seven had a handgun. On day eight, five of eight foragers had handguns.

There were, of course, other sources of foraged food. Such items as native plants, coconuts, potatoes of various types, rice, and fishing were frequently encountered. No evidence was found to support any handgun use in foraging for food from these sources with the

exception of one evadee who attempted to shoot a coconut out of a tree. (He missed.)

There were 189 incidences where evadees were given food by civilians. Table 5 lists the number of incidences by day of evasion. The menus varied greatly from elaborate meals to such items as rice, cheese, and eggs.

Here too the handgun had a significant psychological value to the evadee. While no attempt was made to distinguish between those contacts initiated by an evadee and those initiated by a civilian, it can be seen that of the 189 contacts, 135 (71.4%) involved evadees with handguns. Thus, evadees with a handgun were far more likely to contact a civilian or allow a civilian to contact them.

In many incidences, civilians also provided food for the evadee to use during his continued evasion. This was especially true in China. The most common items provided were eggs, cooked meats, and garden vegetables. It is also interesting to note that while most of the contacts for food were made during the first five days, tapering off to one on day eleven, there was a significant proportional increase in the number of contacts on days fourteen and fifteen. This was due primarily to the fact that survival rations had run out and the evadees were having little luck killing small game.

TABLE 5. GIVEN FOOD BY CIVILIANS

<u>DAY OF EVASION</u>	<u>NUMBER OF EVADEES</u>	<u>NUMBER OF CASES</u>	<u>DID THE EVADEE HAVE A HANDGUN?</u>	
			<u>YES</u>	<u>NO</u>
1	244	55	30	25
2	153	27	16	11
3	121	26	20	6
4	94	22	18	4
5	79	17	13	4
6	71	5	2	3
7	59	8	7	1
8	56	6	6	0
9	50	2	2	
10	47	3	3	
11	46	1	1	
12	39	0	0	
13	36	1	1	
14	34	1	1	
14	34	4	4	
15	32	4	4	
16	32	2	2	
17	29	1	1	
18	29	1	1	
19	28	0	0	
20	28	3	3	
21	27	1	1	
TOTAL		<u>189</u>	<u>135</u> (71.4%)	<u>54</u> (28.6%)

There were only nine incidences where evadees attempted to kill small game with a handgun. Table 6 lists the number of incidences by day of evasion. For the most part these efforts were unsuccessful, because the bullet usually destroyed the animal. One evadee attempted to kill a bird and found nothing but feathers. (10:25/1199) Another used his .45 to kill frogs. The only parts left were the legs which was just as well, for they were the only items the evadee really wanted. (10:23/1093)

TABLE 6. KILLING SMALL GAME FOR FOOD		
<u>DAY OF EVASION</u>	<u>NUMBER OF EVADEES</u>	<u>NUMBER OF INCIDENCES</u>
1	244	0
2	153	1
3	121	0
4	94	2
5	79	0
6	71	0
7	59	0
8	56	2
9	50	4
	TOTAL	<u>9</u>



There was one other problem associated with hunting in hostile territory. On several occasions, associated noise attracted the attention of enemy forces who were searching for the evadee. No evadee was captured however.

Of the 1,889 man-day-of-evasion in the data base of this study, evadees spent 891 or 47.16% of those days living with families or units other than an evasion assistance group. Table 7 lists the number of evadees staying with families by day of evasion. During this time all physical necessities were provided for the evadee. For these evadees, the lack of a handgun (54.1%) seemed to be the determining factor in their decision to defer the risks associated with the continued high stress of evasion without a handgun by remaining with their initial civilian contact. For example, on day one there were twenty-seven evadees staying with families, of which, seventeen did not have handguns. On day seventeen, the difference was even more evident. Of the eighteen evadees who stayed with families, fourteen did not have handguns.

The acquisition of water was not as much a problem for evadees as was the acquisition of food. For the most part the evadees had water with them when they were downed. This source was supplemented by rainwater, wells, and

TABLE 7. EVADEES STAYING WITH FAMILIES

<u>DAY OF EVASION</u>	<u>NUMBER OF EVADEES</u>	<u>NUMBER OF CASES</u>	<u>DID THE EVADEE HAVE A HANDGUN?</u>	
			<u>YES</u>	<u>NO</u>
1	244	27	10	17
2	153	37	17	20
3	121	38	17	21
4	94	32	16	16
5	79	21	7	14
6	71	26	13	13
7	59	19	6	13
8	56	22	6	16
9	50	24	8	16
10	47	26	9	17
11	46	25	8	17
12	39	24	7	17
13	36	18	10	8
14	34	15	7	8
15	32	11	4	7
16	32	19	4	15
17	29	18	4	14
18	29	22	8	14
19	28	12	7	5
20	28	13	8	5
21	27	14	9	5
* (DATE OMITTED)				
120 TOTAL	2	2 89	1 409(45.9%)	1 482(54.1%)

streams. No data could be found to support handgun use in the acquisition of water except in conjunction with those occasions when civilians were approached for general assistance.

#### CLOTHING

There were three sources of clothing available to evadees; items found in the survival kits, improvised items, and clothing acquired from civilians. Items in survival kits were extremely limited (a pair of socks, a pair of gloves, and a hat); therefore, clothing acquired from this source was not tabulated. Three incidences of evadees improvising or acquiring clothing did occur. One evadee used his parachute to make clothes. He also used his Mae West to fabricate a pair of shoes to replace the ones lost during bailout. The two others acquired clothing from a fellow aircrew member killed during egress or found clothes in a field.

All three of these evadees had handguns. However, no statements or other data was found that would support a contention that handguns played any part in the above efforts. For the most part, airmen evaded in the clothing they were wearing at the time they abandoned their aircraft unless they were fortunate enough to acquire clothing from friendly civilians.

There were forty incidences of evadees being given clothing by civilians, the intent of which was

to aid aircrew members in their evasion efforts by making them less conspicuous than they would be in their flight suits. Table 8 lists the number of incidences by day of evasion.

It is interesting to note that in most of these incidences, food and medical aid (if required) were also offered to the evadee. While no attempt was made to determine the primary cause of contacting civilians (gaining food, clothing, or medical aid), the psychological value of the handgun in contacts with civilians was reconfirmed, in that 57.5% of the incidences involved evadees with handguns. This approximates the percentage of evadees who possessed handguns, the difference of 1.9% being statistically insignificant due to the small number of cases.

TABLE 8. CLOTHING ACQUIRED FROM CIVILIANS				
DAY OF EVASION	NUMBER OF EVADEES	NUMBER OF CASES	DID THE EVADEE HAVE A HANDGUN?	
			YES	NO
1	244	21	12	9
2	153	7	6	1
3	121	5	2	3
4	94	5	2	3
5	97	3	2	1
6	71	2	0	2
9	50	1	0	1
13	36	1	1	0
	TOTAL	40	23 (57.5%)	17 (42.5%)



It is interesting to note that only forty aircrew members acquired civilian clothes to aid in their evasion. The remaining aircrew members evaded with the clothing they were wearing when they abandoned their aircraft. Many of the 204 evadees expressed varying degrees of apprehension about this prospect - depending on whether or not they had handguns. There is, however, no empirical data for correlation other than insight gained from reading the evasion reports.

#### MEDICAL AID

Eighty-five airmen received injuries abandoning their aircraft and five during evasion. These injuries consisted primarily of cuts, bruises, burns, sprains and/or fractures. Of these, twenty-seven evadees received some form of first aid from survival kits, improvised first aid care, or received assistance from civilians.

Eight evadees used items found in their survival first aid kits or improvised with items found in nature such as: water mixed with ash for dysentery, oils for burns, and leaves for bandages. Five of these evadees had handguns. No statements or other data supports a contention that those weapons played any part in first aid efforts.

Nineteen evadees received first aid from civilian sources. Table 9 lists the number of incidences by day of evasion. The care received ranged from treatment by doctors in the cases of two evadees (one in Italy and

the other in China) to exotic native cures (in the Philippines).

Handguns played no major role in these efforts. Based on several statements by the evadees, securing medical aid seemed to be the main consideration, well worth risking capture. In fact, most of the evadees in this group had no weapon (68.4%).

TABLE 9. FIRST AID ACQUIRED FROM CIVILIANS

<u>DAY OF EVASION</u>	<u>NUMBER OF EVADEES</u>	<u>NUMBER OF CASES</u>	<u>DID THE EVADEE HAVE A HANDGUN?</u>	
			<u>YES</u>	<u>NO</u>
1	244	10	1	9
2	153	2	1	1
3	121	1	1	0
4	94	0	0	0
5	79	1	1	0
6	71	0	0	0
7	59	3	1	2
* (NO CASES)				
13	36	1	1	0
* (NO CASES)				
19	<u>28</u>	<u>1</u>	<u>0</u>	<u>1</u>
TOTAL		19	6 (31.7%)	13 (68.4%)

#### SELF-DEFENSE

A handgun was used or had the potential of being used for self defense in thirty-nine instances. Table 10 lists the number of incidences by day of evasion.

The opportunity to use a handgun for self-defense was considered to have existed whenever an evadee or group of evadees were sighted by enemy soldiers or hostile civilians whether or not an attempt was made by them to capture the evadee(s), and whether or not the evadee had a handgun. Most of these incidences occurred during the first day of evasion while enemy soldiers were still in the area searching for downed aircrew members.

TABLE 10. HANDGUN USE FOR SELF-DEFENSE

DAY OF EVASION	NUMBER OF EVADEES	NUMBER OF CASES	DID THE EVADEE HAVE A HANDGUN?	
			YES	NO
1	244	26	17	9
2	153	5	4	1
3	121	1	1	0
4	94	0	0	0
5	79	3	3	0
* (NO CASES)				
8	56	1	0	1
* (NO CASES)				
11	46	3	3	0
TOTAL		39	28 (71.8%)	11 (28.2%)

There were eight incidences where handguns were actually fired. In four incidences evadees fired a total of eight shots at enemy soldiers or hostile civilians in an effort to escape capture. One group of four evadees

in China came upon some apparently friendly natives who sold them peasant jackets and food, and brought in a "Chinese Doctor" to treat an evadee's foot. Anxiety was first aroused when the theft of two pistols was discovered. Shortly thereafter, the airmen were informed that they were going to be held for the local Japanese authorities. Immediately the evadees threatened the Chinese with their remaining pistol and departed. They had traveled about a mile when they heard shots and saw flashlights moving toward them. They were soon discovered in the long grass and fired upon. The evadees returned the fire, forcing the pursuers to take cover, which allowed the evadees to make good their escape. (10:22/1366)

In all but one of the remaining incidences, the results were the same. The pursuers were usually 100 to 200 yards away and good cover was nearby. The shots forced the attackers to take cover offering the evadees an opportunity to escape. In only one case, the evadee was not able to escape, was captured by a hostile group of Chinese civilians, and subsequently was turned over to the Chinese Army who returned him to friendly forces. (10:23/0113) The remaining four incidences resulted in the deaths of seven Japanese soldiers and two natives.

In one of these cases, an aircrew member, who had been surviving in the New Guinea jungle for three



days, befriended some natives. They took him to their village where he was fed. Everything was going well until the arrival of other natives that night who brow-beat the villagers into an ugly mob. They approached the evadee waving knives and carrying bows and arrows. He fired two shots, killing two of the natives. He then ran for the jungle and evaded capture. (10:23/1216)

There was another incidence of an airman down in China who was being pursued by two Japanese soldiers. He came to an open area of rice paddies where a Chinese farmer was working. He called to the farmer for help but received no response. As the two soldiers approached the field, the evadee hid in a stack of straw next to the farmer. The two soldiers probed the other stacks with their bayonets. When they came to the farmer, they stopped to talk with him. When the farmer would not tell the Japanese where the evadee was, they began to beat him with the butts of their rifles. At this point the evadee came out of the stack and shot both of the Japanese with his .45. With the aid of the farmer, the evadee escaped. (10:22/1439)

In a third case, an evadee on a mountain trail in China, at night, came face to face with a Japanese soldier only fifteen to eighteen feet away. The evadee quickly drew his gun and shot the soldier. Unfortunately this attracted the attention of nearby soldiers. Only

a few hundred yards further down the trail the evadee again came face to face with another soldier whom he promptly dispatched with one shot. (10:23/1443)

In all of these cases the handgun was employed only in extreme emergencies of a life threatening nature. The opponents were face to face, yards apart. It then became a matter of who could get off the first disabling shot.

#### SENSE OF SECURITY

As noted earlier, the possession of a handgun offers an evadee an increased sense of security when he is fearful of the unknown, of being wounded, captured or killed. Therefore, the "need" for a weapon was assumed anytime an evadee expressed anxiety or felt that detection by the enemy or hostile civilian(s) was imminent. There were 97 such incidences. Table 11 lists the number of incidences by day of evasion.

Over fifty percent of these instances occurred during the first day of evasion due to the presence of enemy soldiers searching for the downed aircrew member. One evadee in China, for example, was being pursued by Japanese soldiers who at one point approached within fifty feet of where he lay in a damp rice paddy. He lay hidden there for two hours. At midnight the evadee escaped to the mountains where he found some shelter and dozed off. It was still dark when he awoke. He then started down the mountain. Dropping over a ledge, the

evadee landed between two sleeping Japanese soldiers. His first instinct was to use their bayonet on them, but on second thought (not wishing to risk the chance of their awakening and sounding an alarm) decided against that action.

TABLE 11. SENSE OF SECURITY				
<u>DAY OF EVASION</u>	<u>NUMBER OF EVADEES</u>	<u>NUMBER OF CASES</u>	<u>DID THE EVADEE HAVE A HANDGUN?</u>	
			<u>YES</u>	<u>NO</u>
1	244	49	29	20
2	153	20	15	5
3	121	9	5	4
4	94	3	0	3
5	79	3	3	0
6	71	3	3	0
7	59	2	2	0
8	56	1	0	1
9	50	1	1	0
10	47	0	0	0
11	46	3	3	0
* (NO CASES)				
17	29	1	1	0
18	29	0	0	0
19	28	1	0	1
20	28	0	0	0
21	27	1	1	0
TOTAL		<u>97</u>	<u>63</u> (64.9%)	<u>34</u> (35.1%)

Departing the area, the evadee was seeking cover under some bushes when he almost stepped on a third sleeping Japanese soldier. Feeling that the area was "uncomfortably full" of enemy soldiers, he moved farther down the path only to come upon a fourth soldier sleeping near the path. Approximately 100 yards further down the path, and almost at wit's end, the evadee heard a loud rustling in the bushes. At this point he felt his capture was imminent. He stopped, sat down, lit a cigarette and said "Oh ... you win!" After finishing the cigarette and finding himself still at liberty, he went on his way only to come upon "the enemy", a cow. (10:22/1238)

The evadee did not have a handgun, but during his debriefing stated that he would have greatly appreciated one on several occasions. This thought was shared by many of the evadees who found themselves in similar situations without a handgun. (10:22/1306; 1357)

Further, there were evadees who, after making contact with a civilian, were asked to wait in a particular place for the arrival of an evasion assistance group. Not sure they could trust the civilians not to report them to the authorities, many of them experienced a great deal of anxiety. Those evadees who did not have a handgun usually did not stay in the area to find out. Those who had handguns generally stayed, but with the gun at the ready. This alone accounts for a number of



evadees who, because they had a handgun, were more willing to accept some anxiety and take the risks necessary to return to friendly control.

#### SIGNALING

Handguns were used for signaling nineteen times. All the incidences during the first two days of evasion were by aircrew members trying to get together with their crew. The remaining nine incidences were equally divided between that purpose and trying to attract the attention of low flying aircraft, with no success.

There was of course a problem associated with using the handgun to signal in hostile territory. On several occasions, the sound of the weapon attracted not only the attention of the evadee's fellow crew members, but also the attention of enemy forces searching for the evadees.

#### OTHER USES

There were several other uses identified for a handgun during survival and evasion situations in hostile territory. One evadee destroyed his aircraft by firing six shots through the gas tanks to set it on fire. (10:23/0080) Two other evadees in China gave up their handguns because they did not want to be caught with them. (10:23/0025) Four others traded them. Then there were incidences where two evadees managed to accidentally shoot themselves; one in the foot and the other

in the back. No details were given on how this feat was accomplished. (10:23/0379; 0420)

Based on the above analysis, it can be seen that the primary value of a handgun is the psychological sense of security it affords the evadee. When one reviews the data contained in Tables 3 thru 11, summarized in Table 12, this value of the handgun is reinforced.

TABLE 12. EVADEE ACTIVITIES AND HANDGUN USE			
	INCIDENCES FOR: ALL EVADEES	EVADEES WITH A HANDGUN	EVADEES WITHOUT A HANDGUN
NUMBER OF EVADEES/%	244/100%	145/59.4%	99/40.6%
<u>ACTIVITIES</u>			
. FOOD/WATER			
FORCED FOOD/WATER	1	1/100.0%	0
ACQUIRED FOOD/WATER	245	212/86.5%	33/13.5%
GIVEN FOOD/WATER	189	135/71.4%	54/28.6%
KILLED SMALL GAME	9	9/100.0	0
STAYED WITH FAMILY	891	409/45.9%	482/54.1%
. CLOTHING			
ACQUIRED CLOTHING	3	3/100.0%	0
GIVEN CLOTHING	40	23/57.5%	17/42.5%
. MEDICAL AID			
ACQUIRED MEDICAL AID	8	5/62.5%	3/37.5%
GIVEN MEDICAL AID	19	6/31.7%	13/68.4%
. SELF DEFENSE	39	28/71.8%	11/28.2%
. SENSE OF SECURITY	97	63/64.9%	34/35.1%
. SIGNAL/MARKER	19	19/100.0%	0

Of the evadees who acquired food by foraging near inhabited areas, most had a handgun. Further, 71.4% of those given

food and 57.5% of those given clothing by civilians had handguns. In short, evadees who possessed a handgun were more inclined to take the calculated risks necessary to survive, evade, and return to friendly control. Evadees without a handgun were more likely to stay with a family where their needs were provided for, or evade without contacting civilians. The handgun was also used for self-defense, to kill small game, and to signal fellow crew members. Now that the uses of a handgun have been established, a discussion of the factors bearing on the actual use of a handgun is in order.

#### FACTORS BEARING ON THE USE OF A HANDGUN

One factor bearing on the use of a handgun has already been identified - the sound of the weapon attracted the attention of enemy soldiers and/or hostile civilians. There are, however, three other factors that bear on the use of a handgun. They include the size of the evasion group, the theater of operation, and the equipment used to secure the handgun to the evadee.

There were 151 who evaded in a group of two or more of which 87 (57.6%) had a handgun. Of the 93 air-crew members who were lone evadees, 58 (62.4%) had a handgun. The data and evasion narratives indicated that the possession of a handgun by any (one or more) member of an evasion group tended to provide a psychological sense

of security to all members of the group. This was seen in their willingness to approach civilians for needed assistance. There was, however, one situation where a group handgun did not provide a sense of security to all members of the group. This occurred on those occasions when the group came in contact with enemy soldiers or hostile civilians. Under those conditions, the evasion reports indicated that the members of the group who did not have a handgun expressed a high degree of anxiety and helplessness at not being able to influence the situation. (10:23/0930)

#### THEATER OF OPERATION

In examining the data on evadee activities by theater of operation in Table 13, an attempt was made to determine what effect cultural/racial differences had on the character of the evasions and handgun use. The data indicates that the handgun was of a significant psychological value to an evadee where there was a racial difference between him and the civilian population.

The Chinese theater of operation had the highest proportion of handguns per evadee and the greatest number of contacts for assistance which supports the increased psychological value of a handgun. It is also interesting to note that the Chinese theater had the lowest rate of evadees staying with a family. From this it can be seen



TABLE 13. EVADEE ACTIVITY BY THEATER OF OPERATION			
THEATER	<u>MEDITERRANEAN</u>	<u>CHINESE</u>	<u>PACIFIC OCEAN AREA</u>
NUMBER OF EVADEES	62	129	53
MAN DAYS OF EVASION	185	1006	698
ACTIVITIES			
. FOOD/FORCED			
FOOD/WATER	1/.0005	0	0
ACQUIRED FOOD/WATER	1/.0005	140/.1392*	104/.1490
GIVEN FOOD/WATER	17/.0919	126/.1252	46/.0659
KILLED SMALL GAME	0	8/.0080	1/.0014
STAYED WITH FAMILY	101/.5459	408/.4056	382/.5473
. CLOTHING			
ACQUIRED CLOTHING	0	1/.0010	2/.0029
GIVEN CLOTHING	9/.0486	27/.0268	4/.0057
. MEDICAL AID			
ACQUIRED MEDICAL AID	0	5/.0050	3/.0043
GIVEN MEDICAL AID	5/.0270	6/.0060	8/.0115
. SELF DEFENSE	6/.0324	21/.0209	12/.0172
. SENSE OF SECURITY	12/.0649	56/.0557	29/.0415
. SIGNAL/MARKER	0	11/.0109	8/.0115
* EVENTS PER-MAN-DAY OF EVASION			

that the Chinese were very willing to aid an evadee by providing him with food, but were not willing to have them stay in their homes. Evasion reports indicated that there really were no places to hide an evadee in a small village where Japanese soldiers could not find them. In Italy, on the other hand, evadees were able to live in towns and be seen in public with less chance of being detected

Forty-two airmen lost their handguns during bail-out or some other activity where recovery was not possible. All weapons were lost for the same reason: the inability to securely attach the weapon to the evadee's person. There was no standard method for attaching the handgun to an individual during World War II. Some carried them in their pockets, others in their belts and some in holsters.

## CHAPTER IV

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The United States Air Force has long recognized the necessity to provide its combat aircrew members with a handgun to aid in efforts to return to friendly control should they be downed over hostile territory. Lacking empirical data on potential uses for such a weapon, the handgun and ammunition selected and the training provided have historically been designed to provide self-defense for the downed airman. However, if such a weapon is to effectively aid the evadee, it must also be optimized for other uses.

The purpose of this study has been to determine the uses for an aircrew survival and evasion handgun, to identify those factors bearing on its use, and to make recommendations as to the characteristics such a weapon should possess. This information will aid weapons experts in selecting the optimum weapon and ammunition combination.

In developing the data for this study, 244 (of 771 screened) World War II evasion reports of U.S. Army Air Force airmen were used. Data from the Korean and Southeast Asian conflicts was not included because much remains classified. However, after reading several

evasion narratives of downed aircrew members from those two conflicts, no data was found that would detract from findings of this study.

#### SUMMARY OF THE FINDINGS

The primary value of a handgun, for use during survival and evasion attempts in hostile territory, was the psychological sense of security it afforded the evadee. A summary of the data (Table 12) indicates that evadees who possessed handguns were far more inclined to take calculated risks necessary to survive, evade, and return to friendly control. Those risks included foraging for food near inhabited areas and approaching civilians for food, water, and clothing where there was a potential of coming in contact with hostile civilians or enemy soldiers. Under these circumstances, evadees felt more secure in the knowledge that they had a handgun to help extricate themselves, if necessary. Evadees without handguns were more likely to stay with a family where their needs were provided for; thus, avoiding the possibility of a confrontation with hostile civilians or enemy soldiers.

There were 39 instances (Table 12) where the handgun was used, or had the potential of being used, for self-defense. The handgun was actually fired in only eight of these cases. Four evadees fired at enemy soldiers or hostile



civilians in an effort to escape capture. Pursuers were usually 100 to 200, or more, yards away with good cover nearby. The shots, then, forced the attackers to take cover long enough to offer the evadee(s) an opportunity to escape.

The remaining four cases resulted in the deaths of seven enemy soldiers and two hostile natives. In each of these cases, the evadee employed his handgun only in extreme, life threatening emergencies. The opponents usually found themselves face to face a few yards apart. Resolution became a matter of who could get off the first disabling shot. Most of these cases occurred during the first day of evasion while enemy soldiers were searching for the downed aircrew member.

There were nine occasions where evadees attempted to kill small game with a handgun. In most of the cases, these efforts were unsuccessful; either because the animal was disintegrated by the impact of the bullet or the evadee was unable to hit the target due to its size. Most of the attempts occurred after survival kit food ran out, usually after the fourth day.

On nineteen occasions aircrew members used their handguns for signaling. Most of the cases occurred on the first two days of evasion while evadees were trying to get together with their crew. Several evadees attempted to attract the attention of low flying aircraft, without success.

There were three other identified uses for a handgun. One evadee used the handgun to coerce an isolated farm family to provide food. While his efforts were successful, his presence was reported and a search was initiated that almost resulted in his capture. Another evadee used his handgun to destroy his aircraft by fire. Four others traded their handguns in exchange for assistance from civilians.

There was one potentially serious problem associated with the employment of a handgun in hostile territory. On almost every occasion, the sound of the weapon attracted the attention of enemy forces who were searching for the evadee(s). While this increased the number of contacts, as a direct result no evadees were captured.

The size of the evasion group and the theater of operation also had an impact on handgun use. Possession of a handgun by any one member of an evasion group tended to provide a psychological sense of security to all members of the group for all activities, with the exception of those occasions when the group came in contact with enemy soldiers or hostile civilians. The data also indicates that the handgun was of significant psychological value in those theaters where there was a racial difference between the evadee and the civilian population.

Finally, the handgun must be securely attached to the evadee. Forty-two evadees lost their handguns during bailout or some other activity where recovery was not possible.

#### CONCLUSIONS

Based on the above findings, the author concludes that:

- a. For the first two or three days of evasion, the handgun will be used to provide for a psychological sense of security and the self-defense of the evadee.
- b. After the fourth or fifth day the evadee will have to depend substantially on his handgun to aid in foraging for food or in killing small game.

#### RECOMMENDATIONS

##### FOR REQUIRED HANDGUN CHARACTERISTICS

Based on the above conclusions, handgun and ammunition chosen for use during survival and evasion situations by U.S. Air Force personnel downed in hostile territory should possess the following characteristics:

- a. be light enough for aircrew members to carry for long periods of time;
- b. be able to be securely attached to the evadee so that they will not be lost during bailout or some other activity where recovery would not be possible;
- c. be capable of rapid employment in those

situations where there is a sudden face-to-face confrontation with an enemy:

- d. be very accurate;
- e. be less noisy, so when employed there would be less of a chance of attracting the attention of (other) enemy forces or hostile civilians;
- f. be capable of disabling an opponent with the first shot, for there may not be an opportunity to get off a second one;
- g. be capable of killing small game without destroying it.

#### FOR TRAINING

Currently the United States Air Force trains its aircrew members on human-shaped, stationary targets, which supports the conclusion of self-defense and sense of security, but to be of maximum value this training must include firing at much smaller, moving targets. This will increase the aircrew member's ability to kill small game for food and, in fact, increase his overall shooting ability.

#### JOINT SERVICE IMPLICATIONS

This study reconfirms, using the empirical data of World War II, Major Ray Leuty's conclusions regarding personal defense weapons for helicopter pilots. It is apparent that both the Army and Air Force could use the same weapon to accomplish their objectives. Contact



with United States Navy survival agencies should also be made to enhance interoperability.

APPENDIX A

## QUESTIONS AND DATA WORKSHEETS

The data extracted from the evaders debriefs, based on the following questions, was entered on the IBM H 45352 machine readable answer sheet for ease of input to the computer programs. An explanation of the answer sheet and coded entries follows:

### Item

A: The last two digits of the microfilm roll on which the report in question can be found.

B: The film frame on which the report in question starts.

C: The age of the evadee.

D: Number of people, including the evadee, in the evasion group.

E: Was the evadee an officer or an enlisted man?

A = Officer

B = Enlisted

F: Did the evadee become a POW?

A = No

B = Yes

G: The theater of operation (See map on page 60 )  
in which the evasion occurred.

A = European

B = Mediterranean

C = Pacific Ocean Area

D = Mid East

E = China, India, Burma, and SEA

F = Others

H: Within which territory did the evasion take place?

A = Enemy territory

B = Territory occupied by enemy forces

C = Combat Territory

I: Was the evadee injured?

A = No

B = On the head

C = In the leg/foot

D = In the arm

E = On the body

F = Multiple injuries

J: Did the evadee bail out of his aircraft or did he ditch/crashland with it?

A = Bailed out

B = Ditched/crashland

K: Did the evadee have a survival kit?

A = Yes

B = No

C = The evadee abandoned his kit.

D = Unknown

E = Lost

L: Did the evadee have a handgun?

A = Yes



B = No

C = He disposed of it

D = Acquired one

E = Unknown

F = Lost

M: Did the evadee receive any survival training?

A = Yes

B = No

C = Unknown

N: A mark in this column denotes a new day of evasion.

O: Entries reflect all attempts to acquire:

1 = Food/water

2 = Medical aid

3 = Clothing

from sources other than direct contact with civilians and without the use of a survival weapon. Sources include items stolen from former fields/home or use of survival equipment carried by aircrews, etc.

P: Entries reflect all attempts to force assistance from civilians for:

1 = Food/water

2 = Medical aid

3 = Clothing

Q: Entries reflect all assistance given on evadee as a result of direct contacts with civilians to include:

1 = Food/water

2 = Medical aid

3 = Clothing

R: Entries reflect all opportunities to use a weapon in self defense (i.e. sighted by enemy soldiers).

S: Entries reflect occasions when the evadee experienced an increased threat to his freedom and might receive psychological benefit from the possession of a weapon (i.e. fear that detection by the enemy was imminent).

T: Entries reflect all attempts to use a weapon to kill small game.

U: Entries reflect all attempts to use a survival weapon as a signaling device or to mark a position.

V: Entries reflect a day in which some or all his physical necessities were provided for the evadee by other than an evasion assistance group.

Referring to the sample answer sheet one can see that the evasion report in question can be found on micro-film 14 (Item A) starting on frame number 0028 (B). The evadee was 25 years old (C) and was alone during his evasion (D). He was an officer (E) and an evadee (F) in the Mediterranean Theater of Operations (G) while in enemy occupied territory (H). The evadee was injured in the leg or foot (I), bailed out of his aircraft (J), no references were made to his survival kit (K), he had

a weapon (L), and no reference was made to any survival training he may have received (M).

On the first day of evasion (N), the evadee received food on three different occasions as a result of contacts with civilians (Q-1), and he received a change of clothing on one of those occasions (Q-3). He had one opportunity where he could have used the survival weapon in self defense (R), and had two occasions when he experienced an increased threat to his freedom and would have received psychological benefit from the possession of a survival weapon (S). Further, some of the evadee's needs were provided for by other than an evasion assistance group (V). On his second day of evasion (N line 4), he received all his food (Q-1) from civilians and had one occasion when he experienced an increased threat to his freedom and would have received psychological benefit from the possession of a survival weapon (S).

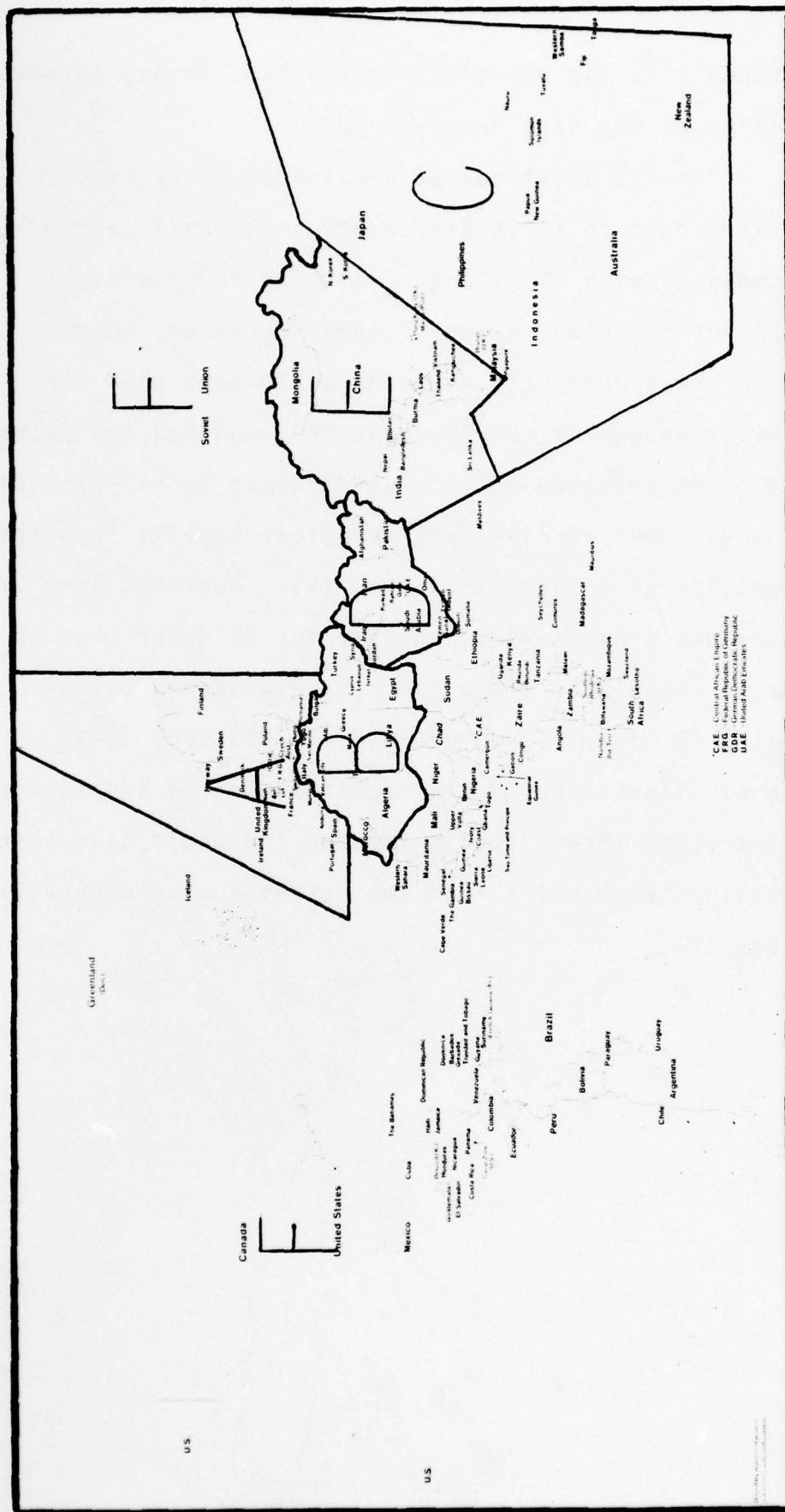


FIGURE B-1 THEATER OF OPERATIONS





APPENDIX B

## COMPUTER PROGRAMS

### PROGRAM ONE

The first computer program was developed by Thomas L. Barger of the Systems Division, Directorate of Automation, U.S. Army Command and General Staff College. This program summarized and reformatted the data extracted from the IBM machine readable answer sheets. An example of the summarized and reformatted data follows:

140028251AABBCADAC 100000030112001100000010001000

Using the codes and narrative example in Appendix A as an aid, an identification of the data can be made.

CODES	A	B	C	D	E	F	G	H	I	J	K	L	M
-------	---	---	---	---	---	---	---	---	---	---	---	---	---

DATA	14/0028/28/1/A/A/B/B/C/A/D/A/C
------	--------------------------------

	O	P	Q
--	---	---	---

CODES	N/1	2	3/1	2	3/1	2	3/R/S/T/U/V/
-------	-----	---	-----	---	-----	---	--------------

DATE FOR

DAY ONE	1/0/0/0/0/0/0/3/0/1/1/2/0/0/1/
---------	--------------------------------

DATE FOR

DAY TWO	./0/0/0/0/0/0/0/1/0/0/0/1/0/0/1
---------	---------------------------------

This data then becomes the data file for Computer Program Two.

```

00001 IDENTIFICATION DIVISION.
00002 PROGRAM-ID.
00003 EVADEES.
00004
00005 AUTHOR.
00006 THOMAS L BARGER.
00007 DATE-WRITTEN.
00008 10 JANUARY 1979.
00009 REMARKS.
00010 THIS PROGRAM IS WRITTEN FOR MAJ JOSEPH
00011 BREAH, US AIR FORCE SECTION, CGSC. IT CONVERTS
00012 DATA TAKEN FROM MARK SENSE FORMS FOR USE BY
00013 SPSS. THE DATA CONCERNS ESCAPE AND EVASION OF
00014 ALLIED PILOTS DURING WORLD WAR II.
00015
00016 ENVIRONMENT DIVISION.
00017 INPUT-OUTPUT SECTION.
00018 FILE-CONTROL.
00019 SELECT INFILE ASSIGN TO EEDATA.
00020 SELECT OUTFILE ASSIGN TO SPSSIN-FZ.
00021
00022 DATA DIVISION.
00023 FILE SECTION.
00024 FD INFILE
00025
00026 01 IN-RECORD.
00027 05 IN-10-DATA-1 PIC 9(9).
00028 05 IN-10-DATA-2 PIC X(14).
00029 05 IN-REMAINING-DATA.
00030 10 IN-GROUP-NUM OCCURS 100 TIMES.
00031 15 IN-DAY-NUMBER PIC 9.
00032 15 IN-REST-OF-GROUP PIC 9(4).
00033
00034 FD OUTFILE
00035 01 OUT-RECORD
00036
00037 WORKING-STORAGE SECTION.
00038 77 NUM-CASES
00039 77 MAX-NUM-DAYS
00040 77 MIN-NUM-DAYS
00041 77 DAY-NUM
00042 77 SUB1
00043 77 SUB2
00044 77 SUB3
00045 77 FIRST-RECORD
00046 01 CONCAT-REC.
00047 05 CONCAT-PART-1
00048 05 CONCAT-PART-2
00049 05 CONCAT-PART-3
00050 01 FINAL-REC.
00051 05 FINAL-10-DATA-1
00052 05 FINAL-10-DATA-2
00053 05 FINAL-REC-TABLE.
00054 10 FINAL-DAILY-ACTIVITY OCCURS 120 TIMES PIC X(15).
00055 01 GROUP-REC.
00056 05 GROUP-DATA OCCURS 100 TIMES PIC 9(5).

```





AO 0113

EVADEES

00114  
00115  
00116  
00117

ADD 1 TO NUM-CASES.  
3000-EXIT.  
EXIT.

001210  
001220  
001230  
001240

0037

## PROGRAM TWO

The second computer program was developed by Edward D. Arendt of the Data Processing Field Office, US Army Training and Doctrine Command. This program computed the frequency distributions, crosstabulated populations and extracted the day-to-day activities of any one population or subpopulation for ease in identifying those factors bearing on survival/evasion handgun use. This program also tabulated the total number of events in any one category and the events-per-man-day of evasion.

```

1  PROGRAM EVADE(INPUT=65,OUTPUT=65,DATA=193/1830,DETAIL=512,
   X TAPES=INPUT,TAPE6=OUTPUT,TAPE10=DATA,TAPE22=DETAIL)
   IMPLICIT INTEGER(A-Z)
   DIMENSION INDEX(501)
5  COMMON /KEYS/ KEY(500,3),NCASE
   COMMON /NAMES/ EDIT,FREQ,CROSS,SELECT,END,NAMES(174)
   COMMON /DETAIL/ DET(15,120)
   COMMON /CARD/ CARD(80)
   COMMON /NUMERIC/ AGES(20),GROUPS(10),NAGES,NORPS
   COMMON /PULL/ PULL(500)
   CALL OPENHS(22,INDEX,501,0)
   CALL READATA
5  OPT=WORD(1,2,ZZ)
   IF(OPT.EQ.FREQ) GO TO 10
   IF(OPT.EQ.CROSS) GO TO 20
   IF(OPT.EQ.SELECT) GO TO 30
   GO TO 40
10 CALL ANAL1
   GO TO 5
20 CALL ANAL2
   GO TO 5
30 CALL ANAL3
   GO TO 5
40 CALL CLOSMS(22)
   STOP
   END

```



```

1  BLOCK DATA
COMMON /NAMES/ EDIT,FREQ,CROSS,SELECT,END,
X CLASNM(2,12),KEYNM(2,6,10),DETNM(2,15)
5  DIMENSION KNM(120)
EQUIVALENCE (KEYNM(1,1), KNM(1))
DATA (EDIT=4REDIT),(FREQ=4RFREQ),(CROSS=5RCROSS)
X (SELECT=6RSELECT),(END=3REND)
10 DATA CLASNM /
1 10H OFF/EM , 3ROFF ,
2 10H EVA/POW , 3REVA ,
3 10H THEATER , 7RTHEATER ,
4 10H ZONE , 4RZONE ,
5 10H INJURY , 6RINJURY ,
6 10HBAIL/DITCH , 4RBAIL ,
7 10HSURV EQUIP , 4RSURV ,
8 10H WEAPON , 3RWPN ,
9 10H TRAINING , 3RTNG ,
A 10H CAPT/TURN , 4RCAPT ,
B 10H AGE , 3RAGE ,
C 10HGROUP SIZE , 3RGRP /
20 DATA (KNM(1), I= 1,48)/
1 10H OFFICER , 3ROFF ,
2 10H ENLISTED , 2REN ,
3 10H EVADEE , 2REV ,
4 10H POW , 3RPOW ,
5 10H EUROPE , 3REUR ,
6 10H MEDITER , 3RMED ,
7 10H PACIFIC , 3RPAC ,
8 10H MID EAST , 2RME ,
9 10H CIB/SEA , 3RSEA ,
X 10H OTHER , 5ROTHER ,
1 10HENEMY TERR , 2REN ,
2 10HOCUP TERR , 3ROCC ,
3 10HCOMBAT TER , 4RCOMB ,
4 10HFRNOLY TER , 4RFNOD ,
35 DATA (KNM(1), I=49,84)/
5 10H NONE , 4RNONE ,
6 10H HEAD , 4RHEAD ,
7 10H LEG/FOOT , 3RLEG ,
8 10H ARM , 3RARM ,
9 10H BODY , 4RBODY ,
X 10H MULTIPLE , 4RMULT ,
1 10HBAILED OUT , 4RBAIL ,
2 10HCRASH LAND , 5RCRASH ,
3 10H YES , 3RYES ,
4 10H NO , 2RNO ,
5 10H ABANDONED , 5RABAND ,
6 10H UNKNOWN , 3RUNK ,
7 10H LOST , 4RLOST ,
50 DATA (KNM(1), I=85,120)/
8 10H YES , 3RYES ,
9 10H NO , 2RNO ,
X 10HDISPOSE OF , 4RDISP ,
1 10H ACQUIRED , 3RACO ,
2 10H UNKNOWN , 3RUNK ,
3 10H LOST , 4RLOST ,
55 4 10H YES , 3RYES

```

BLOCK DATA BLKDAT. 73/73 OPT=1

5 10H NO : 2RNO : 600  
 6 10H UNKNOWN : 3RUNK : 600  
 7 10H CAPTURED : 4RCAPT : 600  
 8 10H TURNED IN : 4RTURN : 600 /  
 DATA DETNM /  
 1 10H NUMBE : 10HR OF CASES  
 2 10H ACQUIRED : 10HFOOD/WATER  
 3 10H ACQUIRED M : 10H MEDICAL AID  
 4 10H ACQUIRE : 10H CLOTHING  
 5 10H FORCED : 10HFOOD/WATER  
 6 10H FORCED M : 10H MEDICAL AID  
 7 10H FORCE : 10H CLOTHING  
 8 10H GIVEN : 10HFOOD/WATER  
 9 10H GIVEN M : 10H MEDICAL AID  
 X 10H GIVE : 10H CLOTHING  
 1 10H SE : 10H DEFENSE  
 2 10H SENSE O : 10H SECURITY  
 3 10H KILLED : 10H SMALL GAME  
 4 10H SIG : 10H MAL/MARKER  
 5 10H STAYED V : 10H WITH FAMILY  
 END

60

65

70

75

```

1  INTEGER FUNCTION WORD(ISTART,NEXT,CODE)
   IMPLICIT INTEGER (A-Z)
   COMMON / CARD/ CARD(80)
   CARD HOLDS 80 CHAR CARD IMAGE (80R1)
5  RETURN CODE=1 WORD=SERIES OF LETTERS (R FORMAT)
   CODE=2 WORD=SERIES OF DIGITS (I INTEGERIZED)
   CODE=3 WORD=3TH CHARACTER NOT BLANK OR COLON
   BEGIN SCAN AT POSITION ISTART. RETURN NEXT POSITION.
10  CODE=0
   WORD = 0
   DO 10 J=START,80
   X=CARD(J)
   IF(X.EQ.558 .OR. X.EQ.0) GO TO 10
   IF(X.LT.338) GO TO 100
   IF(X.LT.458) GO TO 200
   GO TO 300
100 CONTINUE
   NEXT=81
   RETURN
   BREAK OUT A WORD
   C 100 CODE=1
   NLET=0
   DO 110 NEXT=J,80
   X=CARD(NEXT)
   IF(X.GT.328 .OR. X.EQ.0) RETURN
   NLET=NLET+1
   IF(NLET.GT.10) GO TO 150
   WORD=SHIFT(WORD,6)*X
110 CONTINUE
120 WRITE (6,121)
121 FORMAT (" NO TERMINATOR FOUND")
   GO TO 160
150 WRITE(6,151) WORD
151 FORMAT(" WORD GT 10 CHAR STARTS",A10)
160 WRITE(6,161) CARD
161 FORMAT(" BAD CARD IS",A,80R1)
   CODE=0
   RETURN
   BUILD A NUMBER
   C 200 CODE=2
   DO 210 NEXT=J,80
   X=CARD(NEXT)
   IF(X.GT.448 .OR. X.LT.338) GO TO 220
210 CONTINUE
   GO TO 120
   C 220 NO DIG=NEXT-J
   POWER=1
   NOWDIG=NEXT
   DO 230 J=1,NO DIG
   NOWDIG=NOWDIG-1
   DIGIT=CARD(NOWDIG)-338
   WORD=WORD*(DIGIT*POWER)
   POWER=POWER*10
55 230 CONTINUE
   RETURN

```

FUNCTION WORD 73/73 OPT=1 PAGE 2

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C ONE SPECIAL CHARACTER  
300 CODE=J  
WORD=CARD(J)  
NEXT=J.1  
RETURN  
END

60



```

1  SUBROUTINE READATA
   IMPLICIT INTEGER (A-Z)
   COMMON /KEYS/ KEY(500,3), NCASE
   COMMON /DETAIL/ DET(15,120)
   COMMON /NAMES/ EDIT, FREQ
   COMMON /CARD/ CARD(80)
   COMMON /NUMERIC/ AGES(20), GROUPS(10), NAGES, NGRPS
   COMMON /PULL/ PULL(500)
   DIMENSION IX(4), AX(14)
   LOGICAL EDIT
   EDIT=.F.
   READ(5,5) CARD
   5  FORMAT(80R1)
   IF(WORD(1,2,ZZ).NE.EDIT) GO TO 10
   EDIT=.T.
   READ(5,5) CARD
   10 REVIND 10
   NCASE=0
   50 CONTINUE
   READ(10,1010) IX, AX, DET
   IF(EOF(10)) 100,55
   55 NCASE=NCASE+1
   KEY(NCASE,2)=IX(3)
   KEY(NCASE,3)=IX(4)
   PACK=0
   DO 60 J=1,9
   60 PACK=SHIFT(PACK,6)*AX(J)
   KEY(NCASE,1)=SHIFT(PACK,6)*AX(12)
   CALL WRITMS(22,DET,1800,NCASE,-1)
   IF(EDIT) CALL EDITDTA(IX,AX,DET,NCASE)
   GO TO 50
C 100 CONTINUE
C
   DO 110 J=1,110
   110 PULL(J)=999
   DO 115 J=1,30
   115 AGES(J)=999
   DO 120 J=1,NCASE
   N=KEY(J,2)+1
   M=KEY(J,3)+101
   PULL(N)=0
   PULL(M)=0
   120 CONTINUE
   NAGES=0
   DO 130 J=1,100
   IF(PULL(J)) 130,135,130
   135 NAGES=NAGES+1
   130 CONTINUE
   AGES(NAGES)=J-1
   NGRPS=0
   DO 140 J=101,110
   IF(PULL(J)) 140,145,140
   145 NGRPS=NGRPS+1
   GROUPS(NGRPS)=J-101
   140 CONTINUE
   RETURN

```

SUBROUTINE READATA 73/73 OPT=1

FTN 4.6.460

03/15/79 13.26.10

PAGE 2

1010 FORMAT(12.15.12.11.14R1.120(15111))  
END

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

58 1 40 CD 58 TOTAL RECORD LENGTH IS GREATER THAN 137 CHARACTERS. IT MAY EXCEED THE I/O DEVICE CAPACITY.

SUBROUTINE ANAL1 73/73 OPT=1

```

1      SUBROUTINE ANAL1
      COMMON /CARD/ CARD(80)
      .C
5      WRITE (6,100)
      CALL RPTN(2)
      CALL RPTN(3)
      DO 10 IC=1,10
      CALL RPTA(IC)
10     CONTINUE
      READ(5,5) CARD
      IF (EOF(5)) 30,20
30     CARD(1)=IRE
      CARD(2)=JRN
      CARD(3)=IRD
      CARD(4)=IR
20     CONTINUE
      RETURN
      5 FORMAT(80R1)
      END

```

```

1      SUBROUTINE RPTA(IC)
      IMPLICIT INTEGER (A-Z)
      COMMON /KEYS/ KEY(500,3), NCASE
      COMMON /DETAIL/ NUMB(50), COUNT(50), NNUMB, MEAN
      COMMON /NAMES/ SKIP(5), CLASNM(2,12), KEYNM(2,6,10)
      REAL MEAN
      KEY(CASE, CLASS) = SHIFT(KEY(CASE, 1), 6 * CLASS), AND, 778
      C
      DO 10 J=1,6
10      COUNT(J)=0
      C
      DO 20 J=1, NCASE
      IX=KEY(J, IC)
      COUNT(IX)=COUNT(IX)+1
15      CONTINUE
      C
      WRITE(6, 1000) CLASNM(1, IC)
      DO 25 J=1,6
      IF (KEYNM(1, J, IC) .EQ. 0) GO TO 26
25      CONTINUE
26      J=J-1
      WRITE(6, 1001) (KEYNM(I, L, IC), L=1, J)
      WRITE(6, 1002) (COUNT(L), L=1, J)
      WRITE(6, 1003)
      RETURN
      ENTRY RPTN
      INAH=IC+9
      CALL PULLN(IC)
      WRITE(6, 1000) CLASNM(1, INAH)
      WRITE(6, 1005) CLASNM(1, INAH), (NUMB(L), L=1, NNUMB)
      WRITE(6, 1006) (COUNT(L), L=1, NNUMB)
      WRITE(6, 1007) CLASNM(1, INAH), MEAN
      WRITE(6, 1003)
      RETURN
1000  FORMAT(1H0, "FREQUENCY DISTRIBUTION FOR ", A10)
1001  FORMAT(1H0, 10H CLASS =, 6(1X, A10))
1002  FORMAT(1H0, 10H # CASES =, 6(11))
1003  FORMAT(13(7))
1005  FORMAT(1H0, A10, 2015)
1006  FORMAT(1H0, 10H # CASES =, 2015)
1007  FORMAT(1H0, 6H MEAN, A10, 2H =, F6.2)
      END

```



```

1  SUBROUTINE PULLN(IC)
   IMPLICIT INTEGER(I-Z)
   COMMON /KEYS/ KEY(500,3),NCASE
   COMMON /DETAIL/ NUMX(50),CNTX(50),NNUMB,MEAN,NUMB(50),COUNT(50)
   REAL MEAN
   DO 10 J=1,50
     NUMB(J)=999
     COUNT(J)=0
     NNUMB=0
10  C
     DO 100 J=1,NCASE
       NN=KEY(J,IC)
       DO 20 K=1,50
         IF (NUMB(K).EQ.999) GO TO 30
         IF (NUMB(K).EQ. NN) GO TO 40
20  CONTINUE
30  NNUMB=NNUMB+1
40  COUNT(K)=COUNT(K)+1
100 CONTINUE
   C
   SORT ASCENDING NUMB TO NUMX, CARRY COUNTS ALONG
   DO 200 J=1,NNUMB
     MIN=999
     DO 210 K=1,NNUMB
       IF (NUMB(K).GT.MIN) GO TO 210
       MIN=NUMB(K)
       NMN=K
210  CONTINUE
     NUMX(J)=NUMB(NMN)
     CNTX(J)=COUNT(NMN)
     NUMB(NMN)=999
200  CONTINUE
   C
   CALCULATE MEAN
   TOTAL=NCT=0
   START=1
   IF (NUMX(1).EQ.0) START=2
   DO 300 J=START,NNUMB
     TOTAL=TOTAL+NUMX(J)*CNTX(J)
     NCT=NCT+CNTX(J)
300  CONTINUE
   MEAN=FLOAT(TOTAL)/FLOAT(NCT)
   RETURN
   END

```

```

1  SUBROUTINE ANAL3
   LOGICAL ANY
   WRITE(6,1000)
5  1000 FORMAT(1H1.3(1).#SELECTION CRITERION IS ALL CASES FOR WHICH#)
   CALL SELECT(ANY)
   IF(ANY) CALL REPORT3
   RETURN
   END

```

```

1 SUBROUTINE SELECT(ANY)
  IMPLICIT INTEGER (A-Z)
  COMMON / NAMES/ ED1,FREQ,CROSS,SLCT,END,CLASNM(2,12),KEYNM(2,6,10)
  COMMON / KEYS/ KEY(500,3),NCASE
  COMMON /PULL/ PULL(500)
  LOGICAL PULL,ANY
  COMMON /CARD/ CARD(80)
  COMMON /DETAIL/ CAT(50)
  DATA (OPEN=IR1),(CLOSE=IR1),(ALL=3RALL),(DASH=IR-),
  CKEY(CASE,CLASS)=SHIFTKEY(CASE,1),6*CLASS),AND,778
  ANY=.F.
  DO 1 J=1,NCASE
    1 PULL(J)=.F.
    C CARD IN BUFFER,SKIP "SELECT",CHECK FOR "("
    X=WORD(1,START,CODE)
    10 IF (WORD(1,START,CODE) .NE. OPEN) GO TO 7000
    C GET THE CLASS NAME
    25 START=NEXT
    CNAME=WORD(START,NEXT,CODE)
    IF (CNAME.EQ.ALL) GO TO 2000
    DO 30 CLASS=1,12
      IF (CNAME.EQ.CLASNM(2,CLASS)) GO TO 40
    30 CONTINUE
    40 DO 41 J=1,50
      41 CAT(J)=0
      NCAT=0
    C CHECK FOR NUMERIC KEYS
    IF (CLASS.GT.10) GO TO 3000
    C BREAK OUT ALPHA KEYS
    45 START=NEXT
    DKEY=WORD(START,NEXT,CODE)
    IF (CODE.NE.1) GO TO 70
    DO 50 J=1,6
      IF (DKEY.EQ.KEYNM(2,J,CLASS)) GO TO 60
    50 CONTINUE
    GO TO 7000
    60 NCAT=NCAT+1
    CAT(NCAT)=J
    GO TO 45
    C GROUP DEFINES. SELECT MEMBERS AND LIST CRITERION
    70 IF (NCAT.EQ.0) GO TO 7000
    IF (DKEY.NE.CLOSE) GO TO 7000
    C
    ANY=.T.
    DO 80 J=1,NCAT
      DO 80 K=1,NCASE
        IF (CKEY(K,CLASS).EQ.CAT(J)) PULL(K)=.T.
    80 CONTINUE
    WRITE(6,88) CLASNM(1,CLASS),(KEYNM(1,CAT(1),CLASS),L=1,NCAT)
    88 FORMAT(1H ,A10,3H 15,6(1X,A10))
    GO TO 4000
    C SELECT "ALL" CASES
    2000 ANY=.T.
    DO 2010 J=1,NCASE
      2010 PULL(J)=.T.
    WRITE(6,2012)

```

2012 FORMAT(' ALL CASES SELECTED')

```

60      C      GO TO 4500
        C      SELECT ON NUMERIC KEYS
        C      3000 START=NEXT
        C      PRE-READ AND CHECK FOR NUMERIC
        C      3001 NUM1=WORD(START, NEXT, CODE)
        C      IF(CODE, NE, 2) GO TO 7000
        C      START=NEXT
        C      PRE-READ AND CHECK FOR ANOTHER NUMERIC
        C      CHECK=WORD(START, NEXT, CODE)
        C      IF(CODE, NE, 2) GO TO 3010
        C      NCAT=NCAT+1
        C      CAT(INCAT)=NUM1
        C      GO TO 3001
        C      CHECK FOR RANGE, IF FOUND GET SECOND NUMERIC AND SET
        C      3010 IF(CHECK, NE, DASH) GO TO 3500
        C      START=NEXT
        C      NUM2=WORD(START, NEXT, CODE)
        C      IF(CODE, NE, 2) GO TO 7000
        C      DO 3 040 J=NUM1, NUM2
        C      NCAT=NCAT+1
        C      3040 CAT(INCAT)=J
        C      READ UP FOR MORE NUMBERS OR END OF LIST
        C      START=NEXT
        C      CHECK=WORD(START, NEXT, CODE)
        C      IF(CODE, EQ, 2) GO TO 3001
        C      GO TO 3600
        C      SET LAST NUMERIC
        C      3500 NCAT=NCAT+1
        C      CAT(INCAT)=NUM1
        C      CHECK FOR LEGAL CLOSE, SET UP LIST
        C      3600 IF(CHECK, NE, CLOSE) GO TO 7000
        C      ANY=.T.
        C      WRITE(6, 3602) CLASHN(1, CLASS), (CAT(I), I=L, NCAT)
        C      3602 FORMAT('H A10.3H IS,3014)
        C      CLASS=CLASS-9
        C      DO 3620 J=1, NCAT
        C      DO 3620 K=1, NCASE
        C      IF(KEY(K, CLASS), EQ, CAT(J)) PULL(K)=.T.
        C      3620 CONTINUE
        C      GO TO 4000
        C      GROUP SELECTED, CHECK FOR MORE
        C      4000 START=NEXT
        C      CHECK=WORD(START, NEXT, CODE)
        C      IF(CODE, EQ, 0) GO TO 4500
        C      GO TO 10
        C      READ UP NEXT CARD
        C      4500 READ(5, 5) CARD
        C      5 FORMAT(80R1)
        C      IF (EOF(5)) 5000, 4600
        C      4600 CHECK=WORD(1, NEXT, CODE)
        C      IF(CHECK, EQ, OPEN) GO TO 25
        C      RETURN
        C      ENDFILE---STICK IN END CARD
        C      5000 CARD(1)=IRE
        C      CARD(2)=IRN

```



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FTN 4.6.460

SUBROUTINE SELECT 73/73 OPT=1

115

CARD(3)=1RD  
CARD(4)=1R  
RETURN

7000 WRITE(6,7001) START,CARD

7001 FORMAT('TROUBLE AFTER COL "12," OF CARD",80R1)

IF(ANY) WRITE(6,7002)

7002 FORMAT(' KNOWN CRITERIA WILL BE USED')

GO TO 4500

END

120



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FTN 4.6-460

SUBROUTINE REPORT3 73/73 OPT=1

```
DO 130 J=2,15
130 WRITE(6,1007) DETNAM(1,J),DETNAM(2,J),NCOL
1 .(PRINT(L,J),L=START,STOP),AVE(J)
END
```

60

```

1  SUBROUTINE CROSS(WANT)
   IMPLICIT INTEGER (A-Z)
   COMMON /CARD/ CARD(80)
   DIMENSION WANT(112)
   DATA (OPEN=IRI), (CLOSE=IRI)
   C  CARD IN BUFFER, SKIP "CROSS", CHECK FOR "("
   X=WORD(1), START, CODE)
   IF (WORD(1), START, CODE).NE.OPEN) GO TO 7000
   C  GET NAMES, FIRST IS DOMINANT
   WANT=0
   50  START=NEXT
   NAME=WORD(1), START, CODE)
   IF (CODE.NE.1) GO TO 2000
   DO 100 CLASS=1,12
   IF (NAME.EQ.CLASSNM(2,CLASS)) GO TO 110
   100  CONTINUE
   GO TO 7000
   110  WANT=NAME+1
   IF (WANT.GT.12) GO TO 2000
   WANT(WANT)=CLASS
   GO TO 50
   2000  IF (WANT.LI.2) GO TO 7000
   DO 2010 J=2, WANT
   IF (WANT(J).GT.10) GO TO 3000
   2010  CONTINUE
   2012  WRITE(6,2012) (CLASSNM(1,WANT(L)), L=1, WANT)
   C  READ UP NEXT CARD
   2500  READ(5,5) CARD
   5  FORMAT(80R1)
   IF (EOF(5)) 2600, 2700
   2600  CARD(1)=1R
   CARD(2)=1R
   CARD(3)=1R
   CARD(4)=1R
   2700  RETURN
   C
   3000  WRITE(6,3001) CLASSNM(1,WANT(J))
   3001  FORMAT(1H1,"NUMERIC CLASS ",A10," CAN NOT BE SECONDARY CROSS")
   DO 3010 K=J, WANT
   3010  WANT(K)=WANT(K+1)
   WANT(WANT)=0
   WANT=NAME+1
   GO TO 2000
   7000  WRITE(6,7001) START, CARD
   7001  FORMAT(1H1," CROSS TROUBLE AFTER COL",13," WITH CARD",80R1)
   WANT(1)=0
   GO TO 2500
   END

```



```

1  SUBROUTINE BUILD(CAT,LIN)
   IMPLICIT INTEGER (A-Z)
   COMMON /KEYS/ KEY(500,3),NCASE
   COMMON /NAMES/ EDI,FREQ,CROSS,SLCT,END,CLASNM(2,12),KEYNM(2,6,10)
5  COMMON /DETAIL/ DETAIL(6,60),DETIN(22,60)
   COMMON /NUMERIC/ AGE(20),GRP(10)
   DIMENSION CAT(12),WHERE(10),NUM(20)
   DATA (BLANK=10H)
   DO 5 J=1,60
5  DETAIL(J)=BLANK
   DETAIL(2)=10H  NUMBER
   DETAIL(2,2)=10H  OF CASES
   DO 10 J=1,10
10  WHERE(J)=0
   LIN=2
   DO 30 J=2,11
   CL=CAT(1)
   IF (CL.EQ.0) GO TO 40
   WHERE(CL)=LIN
   DETAIL(LIN,1)=CLASNM(1,CL)
   DO 20 J=1,6
   IF (KEYNM(1,J,CL).EQ.0) GO TO 30
   LIN = LIN+1
   DETAIL(LIN)=KEYNM(1,J,CL)
20  CONTINUE
30  CONTINUE
   C
40  CL=CAT(1)
   DETAIL(2,1)=CLASNM(1,CL)
   IF (CL.GT.10) GO TO 5000
   DO 50 J=1,6
50  DETAIL(2,J)=KEYNM(1,J,CL)
   DO 60 J=2,8
   DO 60 J=3,8
60  DETAIL(J,1)=0
   C
   DO 500 CA=1,NCASE
   KEY=KEY(CA,1)
   COL=SHIFT(KEE+6*CL).AND.778
   COL=COL+2
   IF (COL.GT.8) GO TO 500
   DETAIL(COL,2)=DETAIL(COL,2)+1
   DO 400 CCL=1,10
   IF (WHERE(CCL).EQ.0) GO TO 400
   POINT=SHIFT(KEE+6*CCL).AND.778
   IF (POINT.GT.6) GO TO 400
   LI=WHERE(CCL)+POINT
   DETAIL(COL,LI)=DETAIL(COL,LI)+1
400  CONTINUE
500  CONTINUE
   RETURN
5000 DO 5010 J=1,LIN
   DETIN(1,J)=DETAIL(1,J)
   DETIN(2,J)=DETAIL(2,J)
   DO 5010 J=3,22
5010 DETIN(1,J)=0
   IF (CL.EQ.12) GO TO 5025

```

```
60      DO 5020 J=1,20
          5020 NUM(J)=AGE(J)
          GO TO 5035
        5025 DO 5030 J=1,10
          5030 NUM(J)=GRP(J)
        5035 CONTINUE
          CLA=CL-9
        5040 DO 5040 J=1,20
          5040 DETN(J,2)=NUM(J)
          DO 5500 CS=1,NCASE
            DATA=KEY(CS,CLA)
            DO 5100 J=1,20
              IF (DATA.EQ.NUM(J)) GO TO 5101
            5100 CONTINUE
            5101 COL=J+2
            DETN(COL,2)=DETN(COL,2)+1
            KEE=KEY(CS,1)
            DO 5400 J=1,10
              IF (WHERE(J).EQ.0) GO TO 5400
              POINT=SHIFT(KEE,6*J).AND.778
              IF (POINT.GT.6) GO TO 5400
              LI=WHERE(J)+POINT
              DETN(COL,LI)=DETN(COL,LI)+1
            5400 CONTINUE
            5500 CONTINUE
          RETURN
        END
```

```

1      SUBROUTINE REPORT2(CAT,NLIN)
      IMPLICIT INTEGER (A-Z)
      COMMON /DETAIL/ DETAIL(60),DET(22,60)
      COMMON /N MES/ ED1,FREQ,CROSS,SLCT,END,CLASNM(2,12),KEYNM(2,6,10)
      COMMON /NUMERIC/ AGE(20),GRP(10)
      DATA (BLANK=10H)
      IF(CAT.GT.10) GO TO 100
      DO 10 J=1,6
      IF(KEYNM(1,J,CAT).EQ.0) GO TO 11
      10 CONTINUE
      11 COL=J+1
      WRITE(6,1001) (DETAIL(L,1),L=1,COL)
      WRITE(6,1002) (DETAIL(L,2),L=1,COL)
      DO 50 LIN=3,NLIN
      IF(DETA(L,LIN).EQ.BLANK) GO TO 40
      WRITE(6,1003) (DETAIL(L,LIN),L=1,COL)
      GO TO 50
      40 WRITE(6,1004) (DETAIL(L,LIN),L=1,COL)
      50 CONTINUE
      1001 FORMAT(1H0,A10,1X,A10,2H =,3X,6(1X,A10))
      1002 FORMAT(1H0,A10,1X,A10,2H =,3X,6(11))
      1003 FORMAT(1H0,A10,1X,A10,5X,6(11))
      1004 FORMAT(1H ,A10,1X,A10,5X,6(11))
      RETURN
      C
      25 100 IF(CAT.GT.11) GO TO 115
      DO 110 J=1,20
      IF(AGE(J).EQ.999) GO TO 111
      110 CONTINUE
      111 COL=J+1
      115 DO 120 J=1,10
      IF(GRP(J).EQ.999) GO TO 121
      120 CONTINUE
      121 COL=J+1
      150 WRITE(6,1101) (DET(L,1),L=1,COL)
      WRITE(6,1101) (DET(L,2),L=1,COL)
      DO 160 J=3,NLIN
      IF(DETN(1,J).EQ.BLANK) GO TO 155
      WRITE(6,1102) (DETN(L,J),L=1,COL)
      GO TO 160
      155 WRITE(6,1103) (DETN(L,J),L=1,COL)
      160 CONTINUE
      1101 FORMAT(1H0,A10,1X,A10,2H =,3X,20(14))
      1102 FORMAT(1H0,A10,1X,A10,5X,20(14))
      1103 FORMAT(1H ,A10,1X,A10,5X,20(14))
      END

```

SUBROUTINE ANAL2 73/73 OPT=1

```
1  SUBROUTINE ANAL2
   IMPLICIT INTEGER (A-Z)
   DIMENSION CAT(12)
   DO 10 J=1,12
5    CAT(J)=0
   CALL CROSS(CAT)
   IF (CAT(1).EQ.0) RETURN
   CALL BUILD(CAT,NLIN)
   CALL REPORT2(CAT,NLIN)
10  RETURN
   END
```



## THE OUTPUT OF PROGRAM TWO

Three basic input cards were used to produce the data from this program based on the class of the data requested and the key(s) to the subpopulation(s) of that class. For example, theater of operation would be a class of data and Middle East would be the key to a subpopulation of that class. An explanation of each class and key and their abbreviations follows:

<u>CLASS</u>	<u>KEY</u>
AGE = Age of the evadee	0-99
GRP = Number of people in the evasion group.	0 - 9 or more
OFF = Was the evadee an officer or an enlisted man?	OFF = OFFICER EM = ENLISTED
EVA = Did the evadee become a POW?	EV = Remained an evadee POW = Became a POW
THEATER = The theater of operation in which the evasion occurred.	EUR = European MED = Mediterranean PAC = Pacific Ocean Area ME = Mid East SEA - China, India, Burma, and Southeast Asia OTHER = All other areas

ZONE = Within which territory did the evasion take place?	EN = Enemy Territory
	OCC = Territory occupied by enemy forces.
	COMB = Combat Territory
INJURY = Was the evadee injured?	NONE = No injuries
	HEAD = On the head
	LEG = In the leg/foot
	ARM = In the arm
	BODY = On the body
	MULT = Multiple injuries
BAIL = Did the evadee bail out of his aircraft or did he ditch/crashland with it?	BAIL = Bailed out
	CRASH = Ditched/crashlanded
SURV = Did the evadee have a survival kit?	YES
	NO
	ABAND = The evadee abandoned his kit.
	UNK = Unable to determine
	LOST = The evadee lost it and was unable to recover it.
WPN = Did the evadee have a handgun?	YES
	NO
	DISP = He disposed of it
	ACQ = He acquired one

UNK = Unable to determine  
 LOST = He lost it and was  
 unable to recover it.  
 TNG = Did the evadee re-  
 ceive any survival  
 training?  
 YES  
 NO  
 UNK = Unable to determine  
 CAPT = Of those who become  
 POW's were they cap-  
 tured by enemy forces or  
 turned in by civilians?  
 CAPT = Captured  
 TURN = Turned in  
 ALL = All classes of data

The first input card used was FREQ. This develops  
 the frequency distributions for all classes. An example  
 of a frequency distribution can be seen below:

TABLE B-1.		
FREQUENCY DISTRIBUTION FOR OFF/EM		
CLASS = OFFICER ENLISTED		
# CASES =	154	90

The second input card used was CROSS. This  
 developed the crosstabulation of one population with  
 one or more others. Numeric classes such as age or  
 group size could appear only in the first position and  
 thus could not be crosstabulated with each other. The  
 input card for the example sighted in Table C-1 was  
 as follows: CROSS (OFF THEATER). An example of  
 that table follows:

TABLE B-2. CROSSTABULATION DATA		
OFF/EM =	OFFICER	ENLISTED
NUMBER OF CASES =	154	90
THEATER EUROPE =	5	1
MEDITER=	34	21
PACIFIC=	35	18
MID EAST=	0	1
CIB/SEA=	80	49
OTHER =	0	0

The final input card used was SELECT. This developed the detailed day-by-day tabulation of evadees' activities for all cases which fall into the classes and keys selected. For example, SELECT (ALL) produces a table that included all evadees, while SELECT (THEATER EUR) produced a table that included only those cases where the evasion occurred in the European Theater of Operation. An example of that table with explanations follows:



TABLE B-3. EXAMPLE OF SELECT DATA

SELECTION CRITERION IS ALL CASES FOR WHICH  
THEATER IS EUROPE

NUMBER OF CASES SELECTED = 6<sup>1</sup>

DAYS	1	2	3	TOTAL EVT/MD
NUMBER OF CASES	6 <sup>2</sup>	1	1	8 <sup>3</sup>
ACQUIRED FOOD/WATER	0	0	0	0 0.0000
ACQUIRED MEDICAL AID	0	0	0	0 0.0000
ACQUIRED CLOTHING	0	0	0	0 0.0000
FORCED FOOD/WATER	0	0	0	0 0.0000
FORCED MEDICAL AID	0	0	0	0 0.0000
FORCED CLOTHING	0	0	0	0 0.0000
GIVEN FOOD/WATER	2 <sup>4</sup>	1	0	3 <sup>5</sup> .3750 <sup>6</sup>
GIVEN MEDICAL AID	1	0	0	1 .1250
GIVEN CLOTHING	2	0	0	2 .2500
SELF DEFENSE	3	0	0	3 .3750
SENSE OF SECURITY	4	0	0	4 .5000
KILLED SMALL GAME	0	0	0	0 0.0000
SIGNAL/MARKER	0	0	0	0 0.0000
STAYED WITH FAMILY	0	0	0	0 0.0000

- 1 Number of evadees in the population.
- 2 Number of evadees evading on that day of evasion.
- 3 Total man-day of evasion.
- 4 Number of times that event occurred on that day of evasion.
- 5 Total number of times that event occurred.
- 6 Events per man-day of evasion.

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## BIBLIOGRAPHY

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