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CLASSIFICATION CHANGES

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FROM: confidential

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AUTHORITY

30 Jan 1963, DoDD 5200.10, 26 Jul 1962; AFMC ltr, 19 Feb 2002

AD NUMBER

ADB971840

CLASSIFICATION CHANGES

TO

confidential

FROM

secret

AUTHORITY

30 Jan 1954, DoDD 5200.10, 26 Jul 1962

Air Proving Ground

Letter Report

Test Conducted at Eglin A.F.B. Florida

PROJECT NO. APG/ADB/21-A

SUBJECT: Letter Report On Relative Aerial Combat Of The F-84E Versus The F-86A Capability

DATE

30 January 1951

COPY NO.

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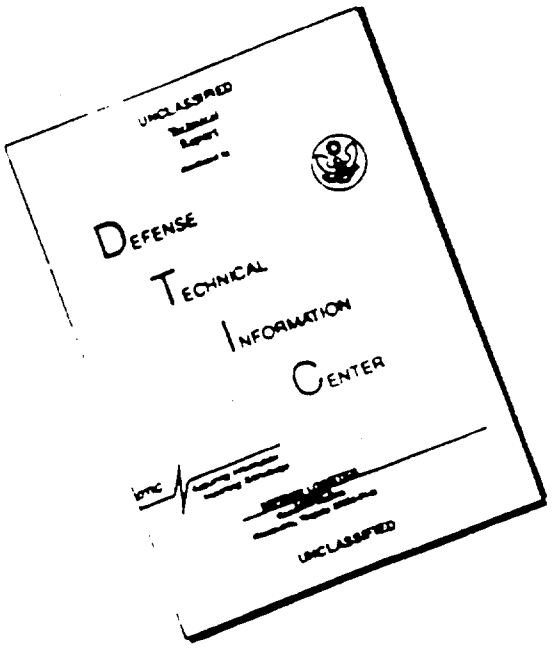

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HEADQUARTERS
AIR PROVING GROUND
Eglin Air Force Base, Florida

30 January 1951

SUBJECT: Letter Report on Relative Aerial Combat Capability of the F-84E Versus the F-86A (Project No. APG/ADB/21-A).

TO: Director of Requirements
Headquarters, USAF
Washington 25, D. C.

1. The following are results of an evaluation conducted at the Air Proving Ground to determine the relative aerial combat capabilities of the F-84E against the F-86A. The F-86A was used to simulate the MIG-15 Russian-built sweptwing fighter whose appearance and performance are quite similar to that of the F-86A.

2. DESCRIPTION: The aircraft used on this project were the F-86A and the F-84E-15. The F-84E-15's were new aircraft that had just arrived from the factory. The -15 model is slightly different from the previous -1 F-84 model in that the elevator gear box has been modified to reduce stick forces approximately 30%. This reduction in elevator stick forces received very favorable comment from all participating pilots. The F-84's were equipped with the A-1C Sight and the F-86A's had the Mark 18 Sight. All tracking was done with fixed reticles.

3. DISCUSSION:

a. Procedure:

(1) Individual performance capabilities of each aircraft were investigated and results charted in comparative curves on climb, acceleration, deceleration, maximum speed, and turning radius.

(2) Five pilots with fighter combat experience and considerable time in the F-84 and F-86 participated in the aerial combat evaluation. The investigations were varied by starting combat with the F-84E at an advantage, disadvantage, and on equal terms with the F-86A. The test included combat at altitudes of 5,000, 20,000, and 35,000 feet. Each aircraft was instrumented with a gun sight camera in order to evaluate tracking accuracy and range of each engagement in which one of the pilots was successful in making a firing pass.

b. Results:

(1) Performance Capabilities:

(a) An inspection of Figure 1 of the inclosed performance charts reveals the marked superiority of the F-86A over the F-84E in maximum speed. In fact, the cruise speed of the F-86A is higher than the limiting Mach of the F-84E. Even with two 120-gallon external tanks, the F-86 has an advantage in maximum speed over a clean F-84E.

(b) The dive brakes of the F-86A are much more effective than those of the F-84, which provide the F-86 with quite an advantage in deceleration (Figure 2, Inclosure 1) and dive capabilities.

(c) Acceleration of the F-84E and F-86A to maximum speed from best climbing speed was determined. (Sea level curves indicate acceleration shortly after becoming airborne.) The acceleration curves (Figure 3, Inclosure 1) for the two aircraft follow the same general slope. If at any time the F-86A speed is reduced to that of the F-84E, the F-86A does not have sufficient acceleration advantage to pull away quickly from the F-84E.

(d) The one item in which the performance of the F-84 is quite similar to that of the F-86 is in turning characteristics (Figure 4, Inclosure 1). The two are so closely matched in that field that the advantage lies with the pilot who is capable of getting the maximum turning performance from his airplane. This was verified in the test by one pilot who consistently out-turned his opponent, regardless of which one of the two types of aircraft he was flying.

(2) Aerial Combat:

(a) In those engagements where the F-84 was placed in an advantageous position, the pilots were able to make a successful firing pass if the F-86 pilot elected to remain at altitude and attempt evasive action. However, the F-86 could always break off contact by extending dive brakes and entering a steep dive. In these cases the F-84 pilot could not press his advantage to a kill as he could not

follow the F-86 in the dive. When the F-86 pilot did remain at altitude the F-84 pilot was able to press his attack to a satisfactory firing range and track the F-86 for as many as 15 to 20 seconds through whatever maneuvers the F-86 pilot attempted.

(b) In the engagements where the F-84 was placed on the defense, the F-86 pilot was able to make successful firing passes. At certain speed ranges as indicated on the turning chart (Figure 4, Inclosure 1), the F-84 was capable of pulling ahead of the sighting line of the F-86 and eventually approach a firing position if speeds were held in that range. However, if speeds continued to decrease during the turns, the F-86 finally entered a speed range where its turning radius was less than that of the F-84E. This proved to be fatal for the F-84 pilot, for he had no successful means of breaking off combat.

(c) When engagements were started on equal terms, the F-86 consistently gained the initial advantage below 20,000 feet but the F-84 was more successful above that altitude. These findings applied in almost all cases where the pilots were of equal fighter skill. However, the pilot mentioned in paragraph 3b(1)(d) was able to gain the initial advantage in all of his engagements under these conditions regardless of which type aircraft he was flying.

(d) A very important factor that must be considered when evaluating air-to-air combat capabilities of the two aircraft is pilot tracking efficiency in each aircraft. Pilots stated that tracking while flying in the F-84 was much easier and more effective. The F-86A was reported to be too sensitive to control movement, resulting in a great deal of difficulty in trying to effectively track a maneuvering target. The F-84 appeared to be the more stable platform. The superior tracking accomplished by pilots in the F-84 over that done in the F-86 was borne out by analysis of the gun sight film taken during all firing passes. Inclosure 2 presents representative comparative charts of tracking errors existing in passes made in the F-84 and F-86 for two of the participating pilots. These charts clearly show

the superior tracking capabilities of a pilot flying an F-84 as compared to his capabilities in the F-86A. In fact, many feet of the film obtained during the F-86 tracking passes were not even assessed due to the large mil error that existed. A greater amount of assessable film was obtained from the F-84 tracking passes, although the amount of film expended in both types of aircraft was approximately the same.

(e) All pilots reported that the F-84E had superior handling characteristics in high "G" turns and that when stalls were encountered the F-84 merely shuddered, recovered, and continued to fly. The F-86 was quite different, in that the airplane gave very slight warning and if the stall was severe the aircraft snapped either right or left (no preference) and lost altitude. This immediately gave the F-84 pilot an opportunity which he was capable of exploiting into a kill.

4. CONCLUSIONS:

a. The F-86A has a sufficient advantage in speed and dive performance to make and break, at will, air combat with the F-84E.

b. Turning characteristics of the two types of aircraft are very similar.

c. Effective tracking is much easier to accomplish in the F-84E than in the F-86A.

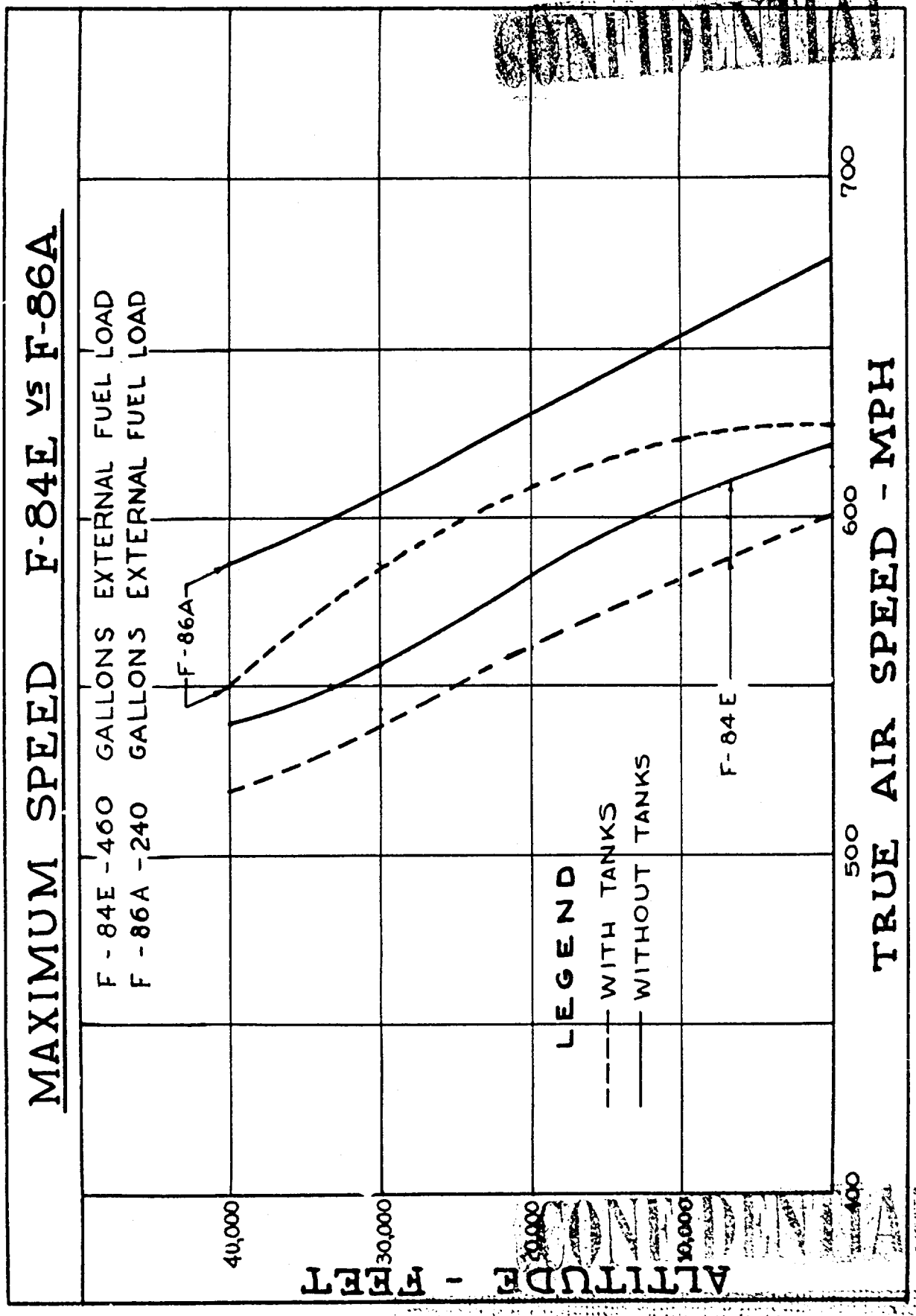
d. Handling characteristics of the F-84E in high "G" turns are superior to those of the F-86A.

e. A kill in air combat in a level plane engagement between aircraft with performance capabilities similar to the F-86A and F-84E will be dependent upon pilot skill.

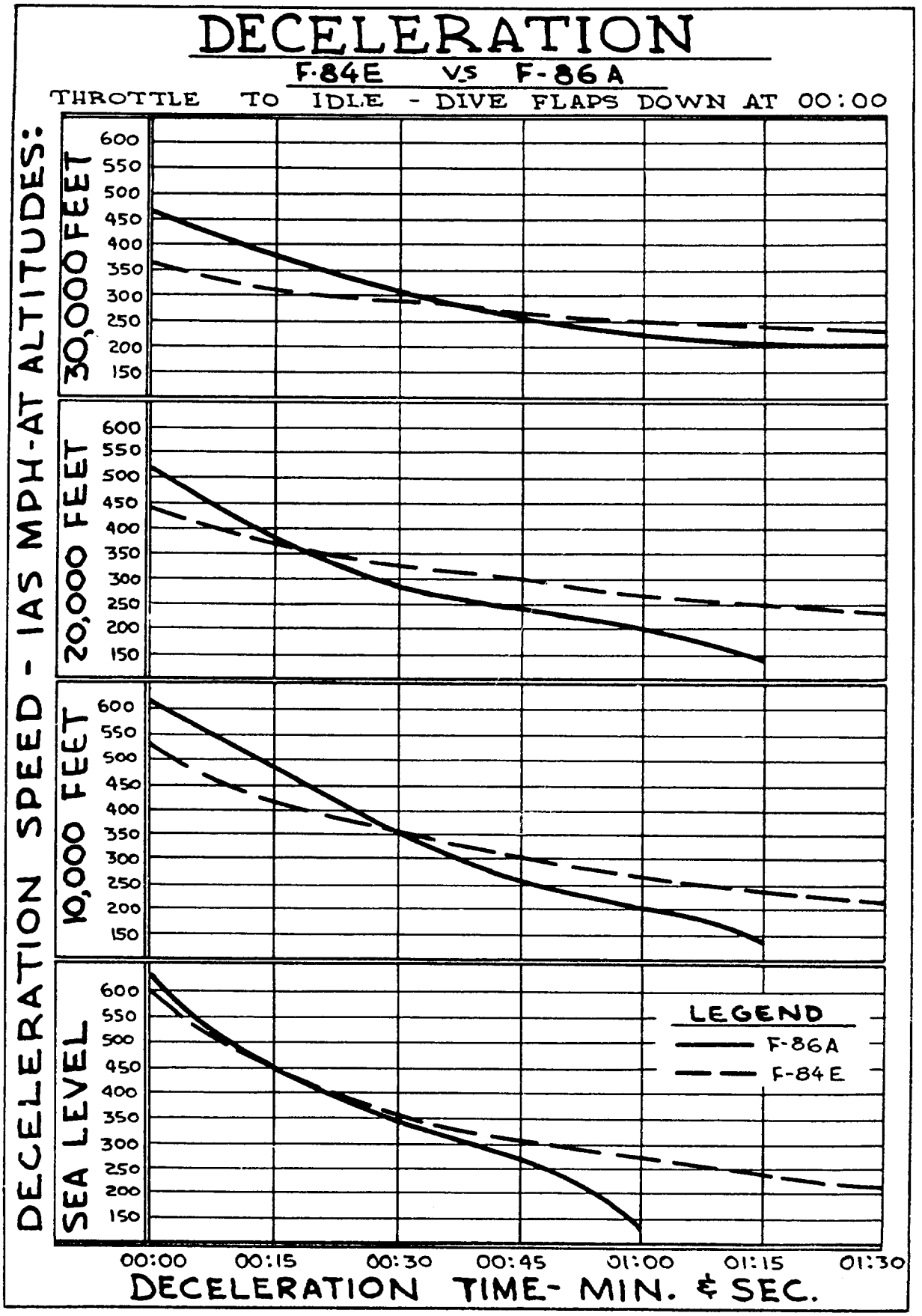
FOR THE COMMANDING GENERAL:

STUART P. WRIGHT
Brigadier General, USAF
Deputy Commanding General

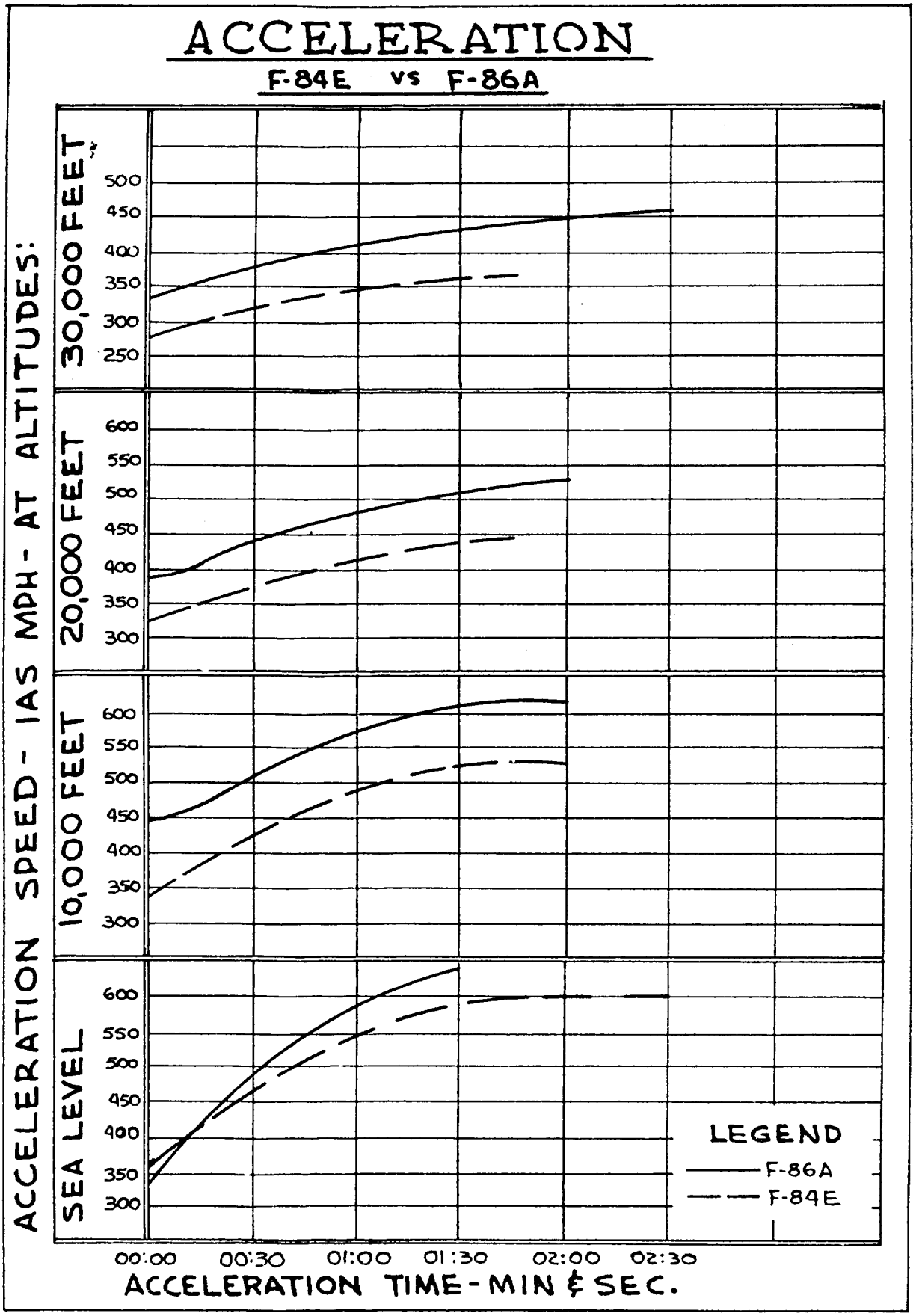
2 Incls
1-Performance Charts
2-Tracking Error



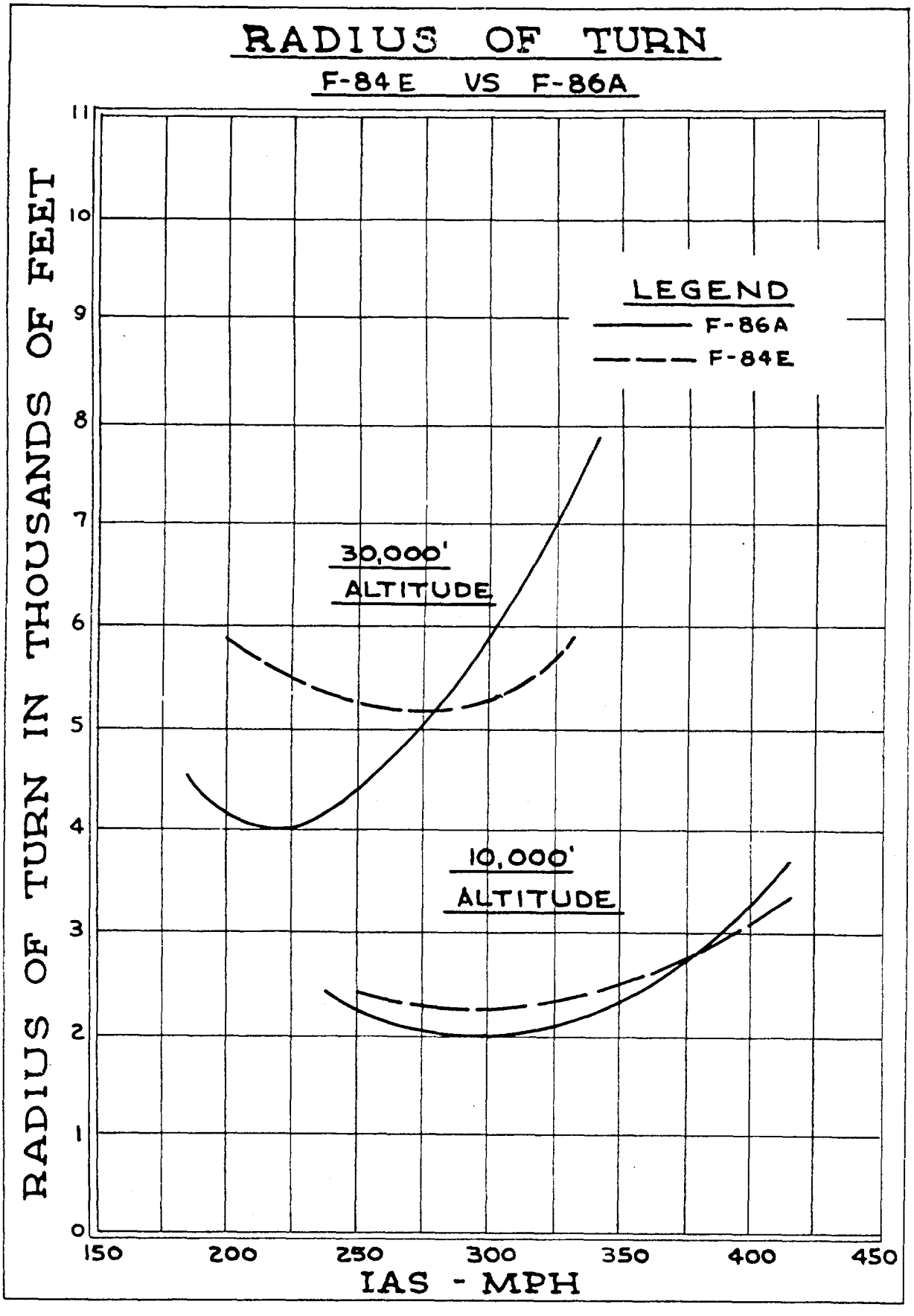
Inclosure 1, Figure 1.



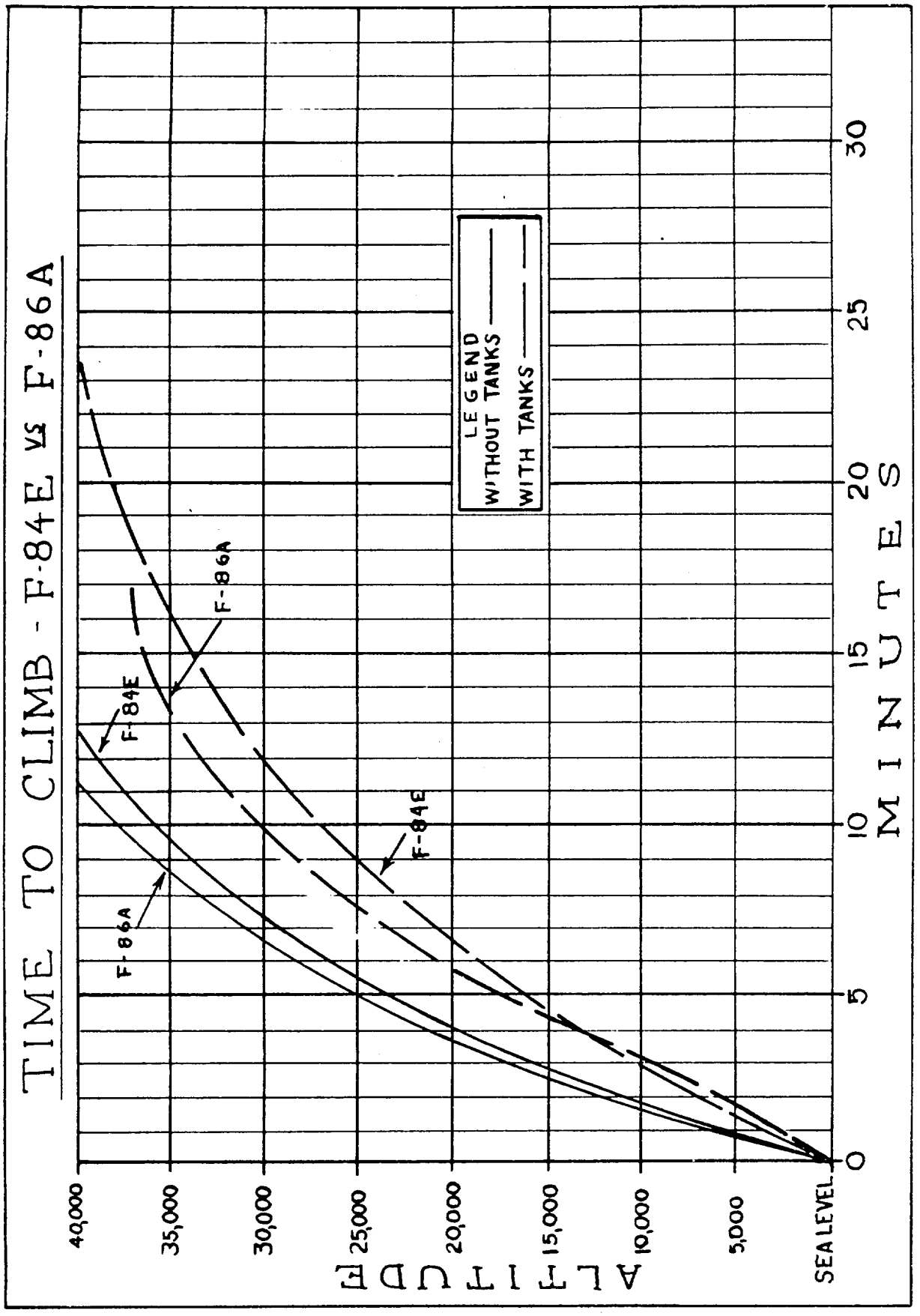
Inclosure 1, Figure 2.



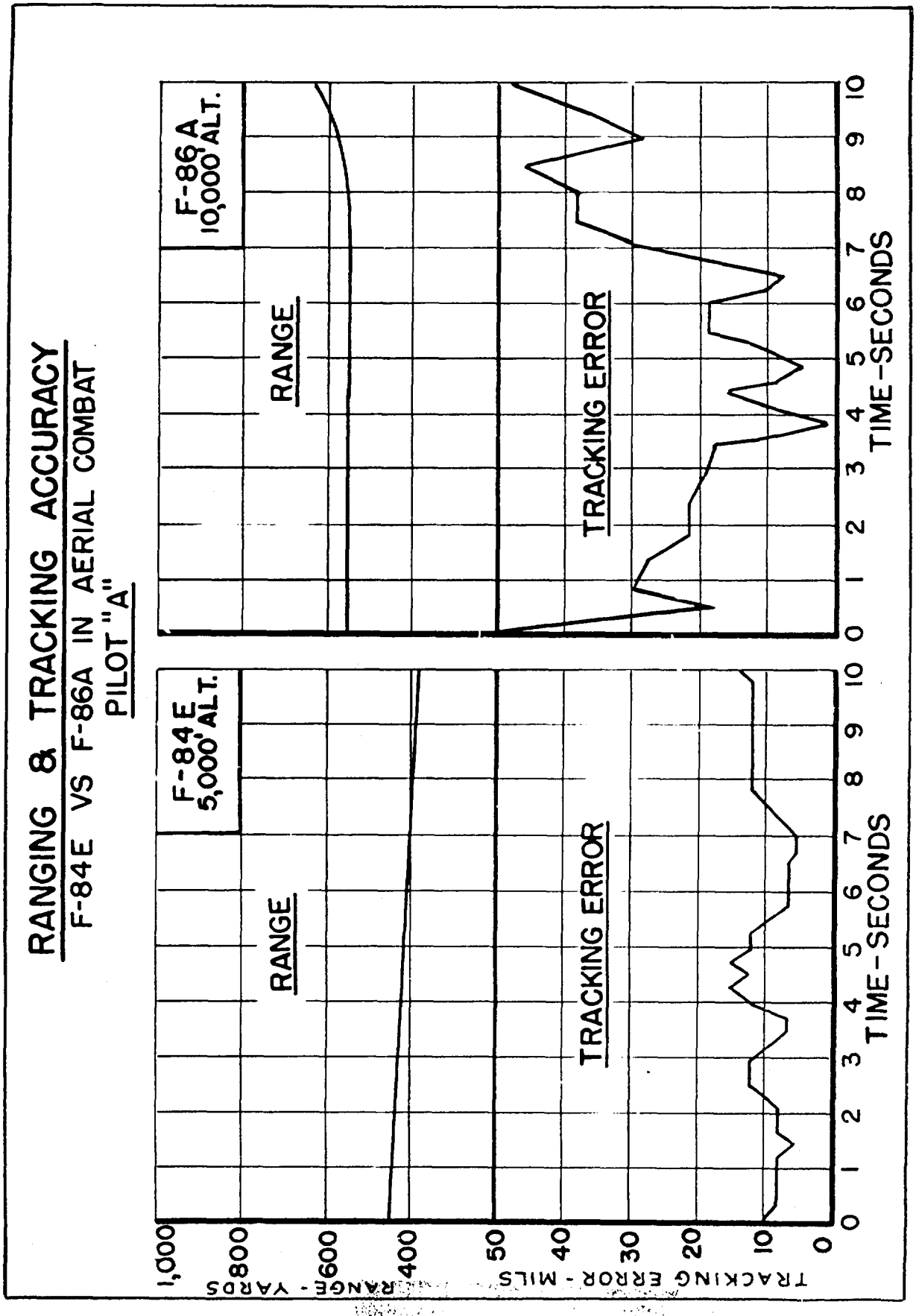
Inclosure 1, Figure 3.



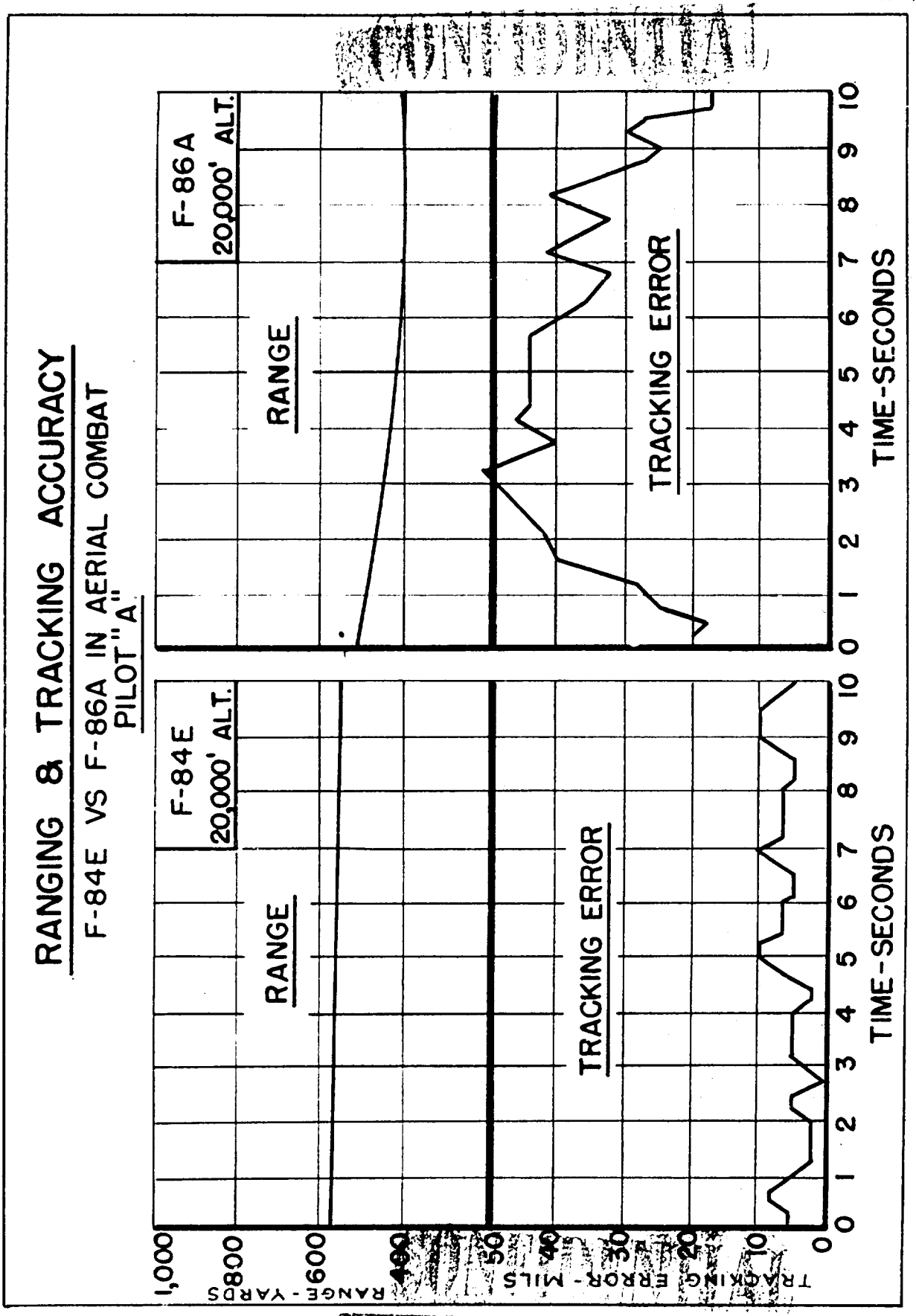
Inclosure 1, Figure 4.



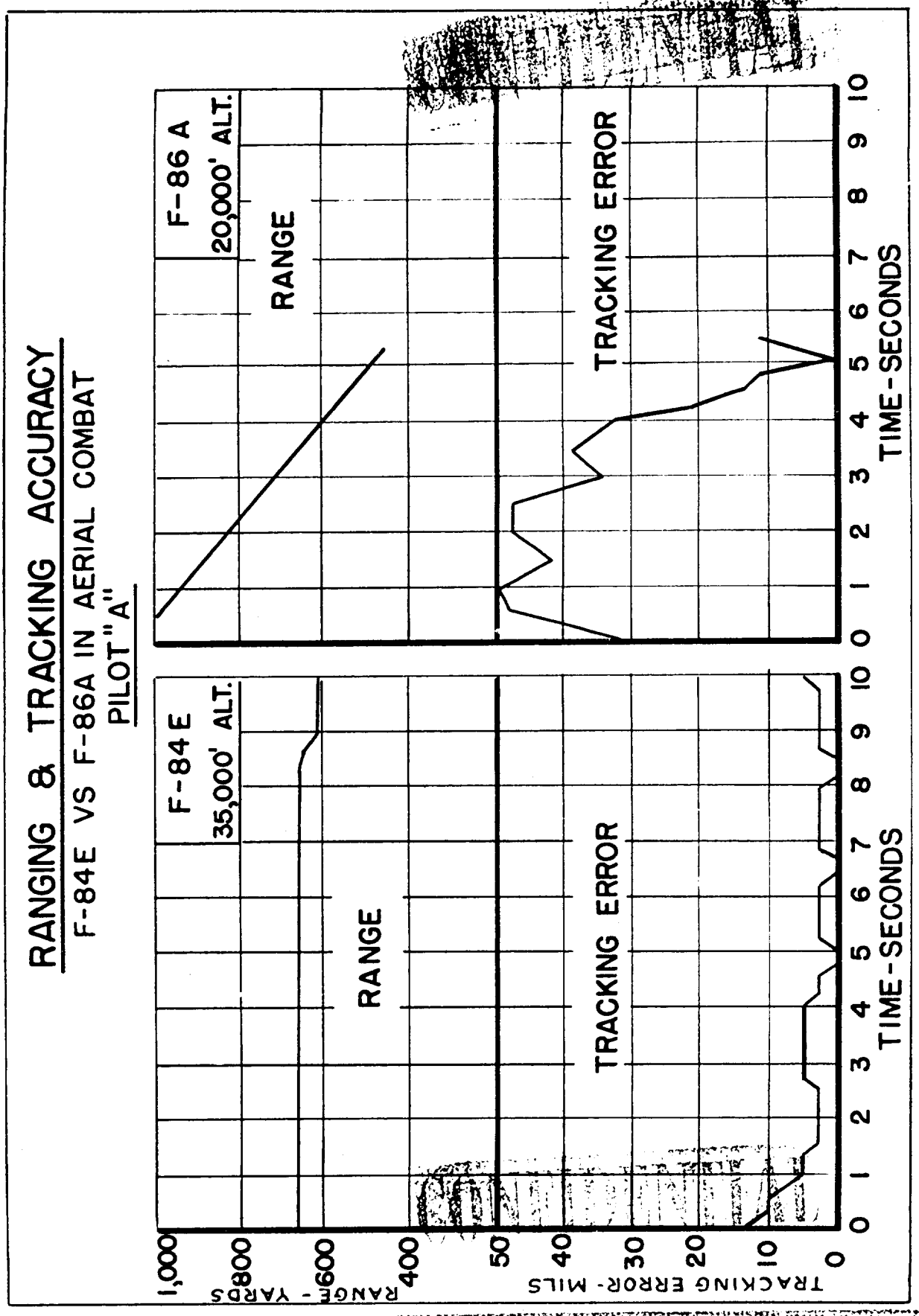
Inclosure 1, Figure 5.


RANGING & TRACKING ACCURACY
F-84E VS F-86A IN AERIAL COMBAT
PILOT "A"
F-84E
5,000' ALT.
F-86A
10,000' ALT.
RANGE
TRACKING ERROR
RANGE - YARDS
TRACKING ERROR - MILS
TIME-SECONDS
1,000
800
600
400
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10

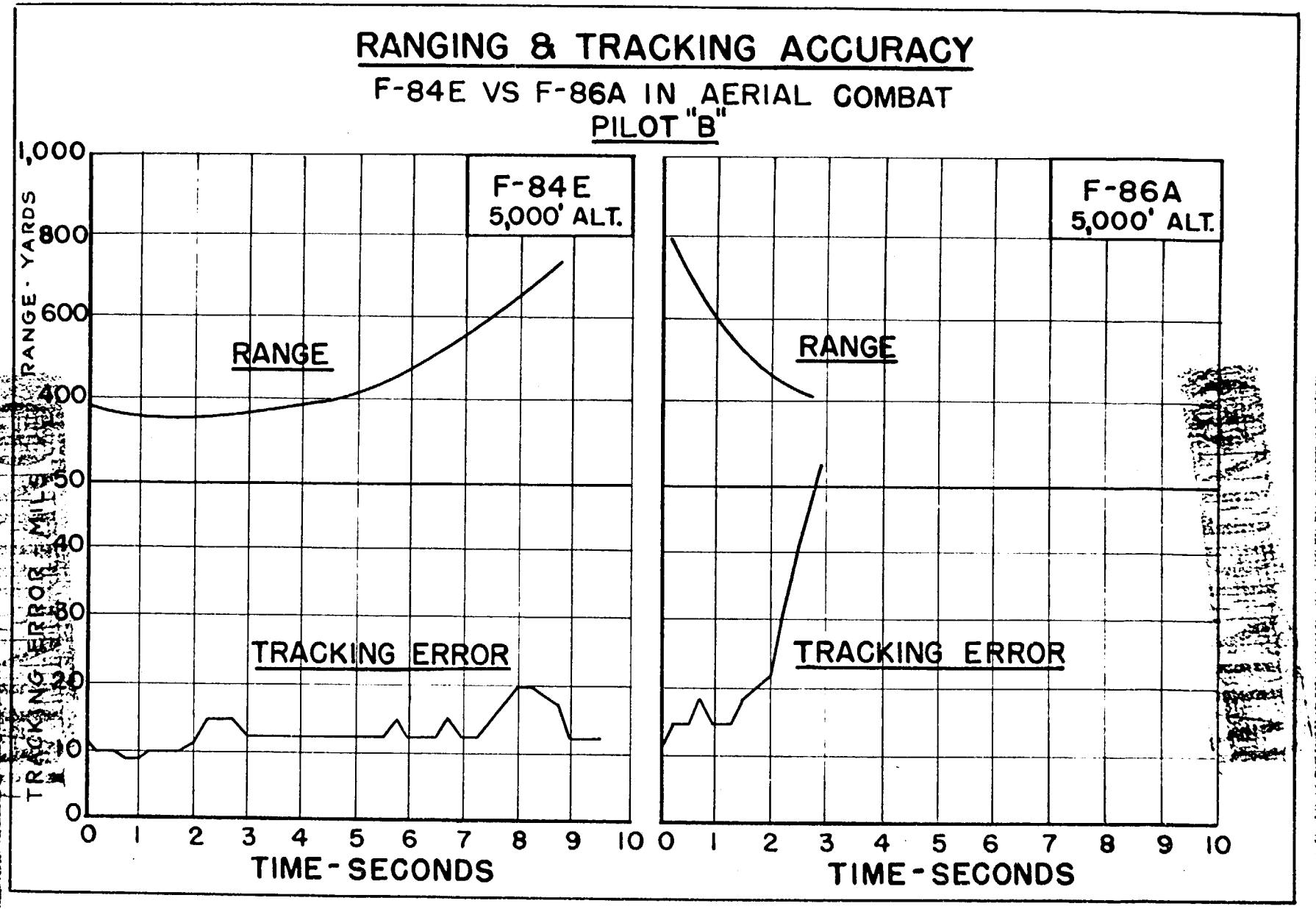
Inclosure 2.



Inclosure 2, Page 2.



Inclosure 2, Page 3.


RANGING & TRACKING ACCURACY
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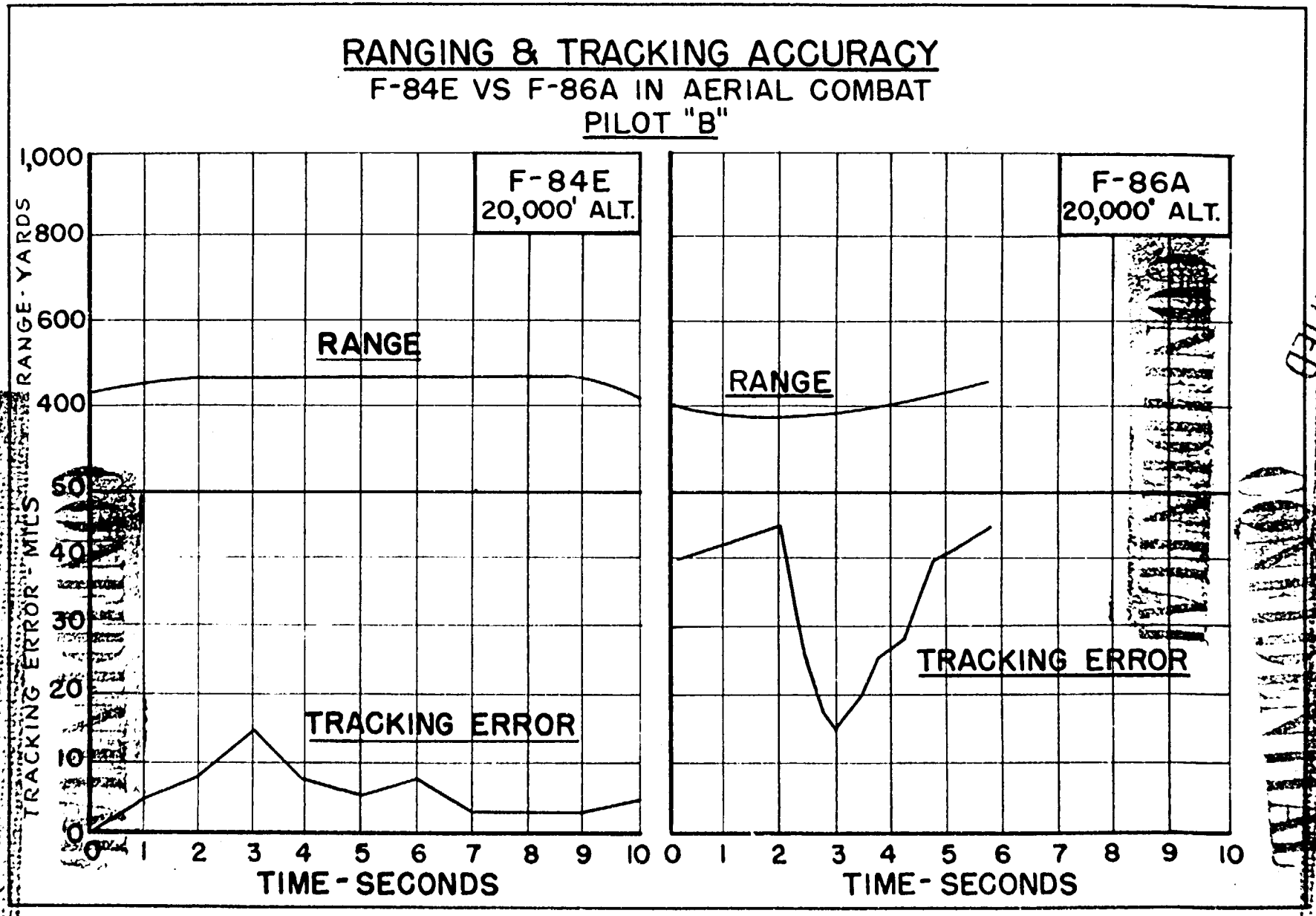
TIME - SECONDS



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

FEB 19 2002

MEMORANDUM FOR DTIC/OCQ (ZENA ROGERS)
8725 JOHN J. KINGMAN ROAD, SUITE 0944
FORT BELVOIR VA 22060-6218

FROM: AFMC CSO/SCOC
4225 Logistics Avenue, Room S132
Wright-Patterson AFB OH 45433-5714

SUBJECT: Technical Reports Cleared for Public Release

References: (a) HQ AFMC/PAX Memo, 26 Nov 01, Security and Policy Review, AFMC 01-242 (Atch 1)

(b) HQ AFMC/PAX Memo, 19 Dec 01, Security and Policy Review, AFMC 01-275 (Atch 2)

(c) HQ AFMC/PAX Memo, 17 Jan 02, Security and Policy Review, AFMC 02-005 (Atch 3)

1. Technical reports submitted in the attached references listed above are cleared for public release in accordance with AFI 35-101, 26 Jul 01, *Public Affairs Policies and Procedures*, Chapter 15 (Cases AFMC 01-242, AFMC 01-275, & AFMC 02-005).

2. Please direct further questions to Lezora U. Nobles, AFMC CSO/SCOC, DSN 787-8583.

Lezora U. Nobles

LEZORA U. NOBLES
AFMC STINFO Assistant
Directorate of Communications and Information

Attachments:
1. HQ AFMC/PAX Memo, 26 Nov 01
2. HQ AFMC/PAX Memo, 19 Dec 01
3. HQ AFMC/PAX Memo, 17 Jan 02

cc:
HQ AFMC/HO (Dr. William Elliott)

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

NOV 2 6 2001

MEMORANDUM FOR HQ AFMC/HO

FROM: HQ AFMC/PAX

SUBJECT: Security and Policy Review, AFMC 01-242

1. The following material has been reviewed for security and policy IAW AFI 35-101, Chapter 15. It is cleared for public release:

   a. "Investigation of A-4 Sight in F-86E Airplane, 18 July 1952, DTIC No. AD-473 192

   b. Operational Suitability Test of Open Gun Ports for F-86 Aircraft, 31 August 1949, DTIC No. AD-B971 411

   c. Letter Report on Relative Aerial Combat of the F-84E Versus the F086A Capability, 30 January 1951, DTIC No. AD-B971 840.

2. Two reports require clearance from other organizations. Hypoxia and Undetermined Jet Accidents," will be reviewed by 311th Human Systems Wing, and "RCAF Ejection Experience," will be forward to Air Staff for coordination with RCAF.

3. If you have any questions, please call me at 77828. Thanks.

JAMES A. MORROW
Security and Policy Review
Office of Public Affairs

Attachment:
Your Ltr 26 November 2001

26 November 2001

MEMORANDUM FOR: HQ AFMC/PAX
Attn: Jim Morrow

FROM: HQ AFMC/HO

SUBJECT: Releasability Reviews

1. Please conduct public releasability reviews for the following attached Defense Technical Information Center (DTIC) reports:

   a. *Investigation of A-4 Sight in F-86E Airplane*, 18 July 1952; DTIC No. AD- 473 192.

   b. *Operational Suitability Test of Open Gun Ports for F-86 Aircraft*, 31 August 1949; DTIC No. AD-B971 411.

Cleared AFMC 01-259

   c. *Hypoxia and Undetermined Jet Accidents*, 19 October 1956; DTIC No. AD-115 661.

   d. *Letter Report On Relative Aerial Combat Of The F-84E Versus The F-86A Capability*, 30 January 1951; DTIC No. AD-B971 840.

Cleared AFMC 01-260

   e. *RCAF Ejection Experience, 1952-1961*, 1965; DTIC No. AD-465 171.

2. These attachments have been requested by Dr. Kenneth P. Werrell, a private researcher.

3. The AFMC/HO point of contact for these reviews is Dr. William Elliott, who may be reached at extension 77476.

JOHN D. WEBER
Command Historian

5 Attachments:
a. DTIC No. AD- 473 192
b. DTIC No. AD-B971 411
c. DTIC No. AD- 115 661
d. DTIC No. AD-B971 840
e. DTIC No. AD- 465 171