

# MCDONNELL *Aircraft Corporation*

Classification cancelled or changed

to Unclass, by authority of  
L. Sanders memo  
typy per dated 11/15/68  
Engr Library 11/26/68

F3H-G  
F3H-(H)

MULTI-MISSION CAPABILITIES

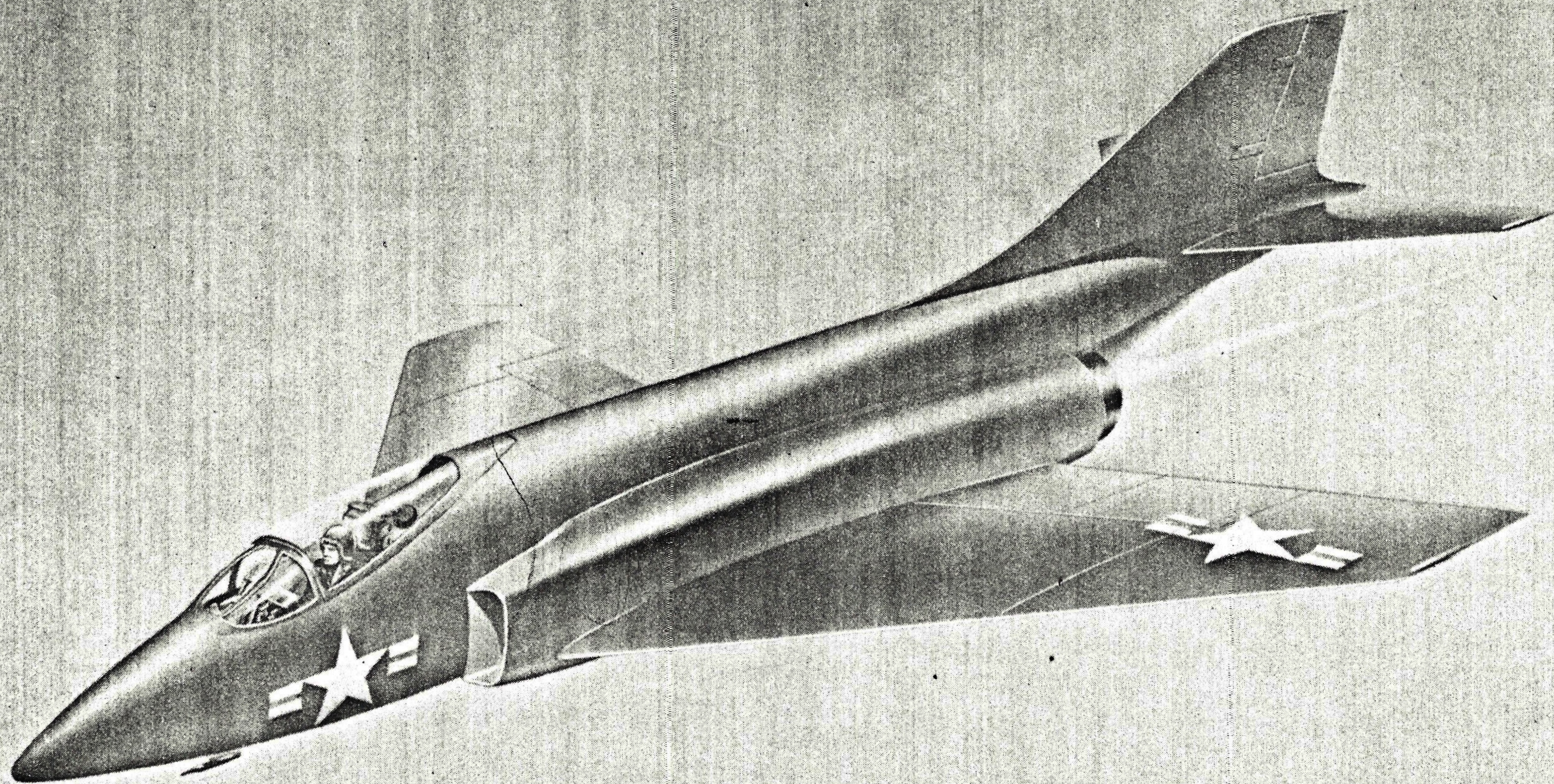
WITH

QUICK-CHANGE NOSE

GROUP-4  
DOWNGRADED AT 3 YEAR INTERVALS  
DECLASSIFIED AFTER 12 YEARS

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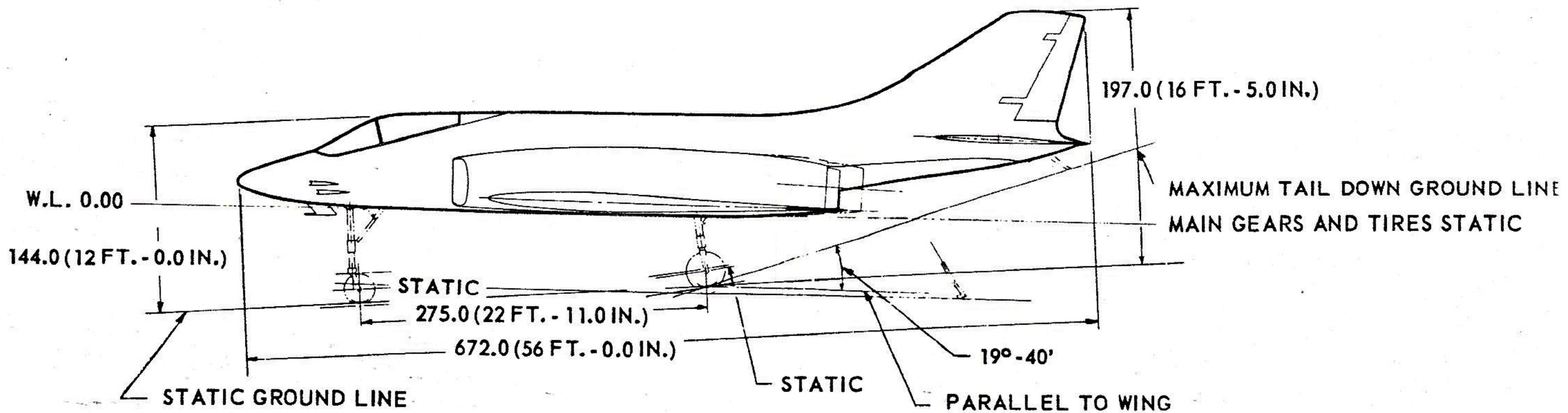
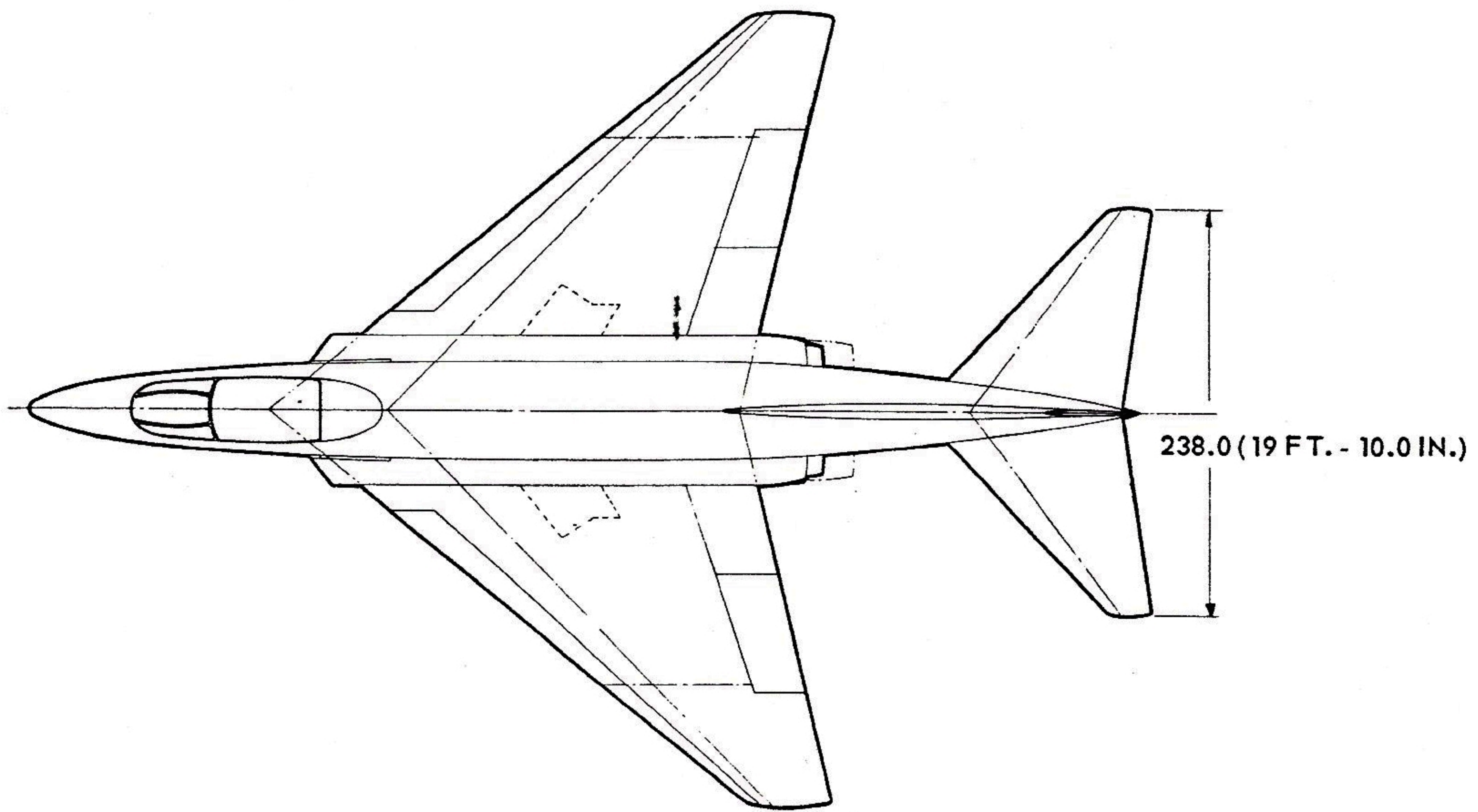
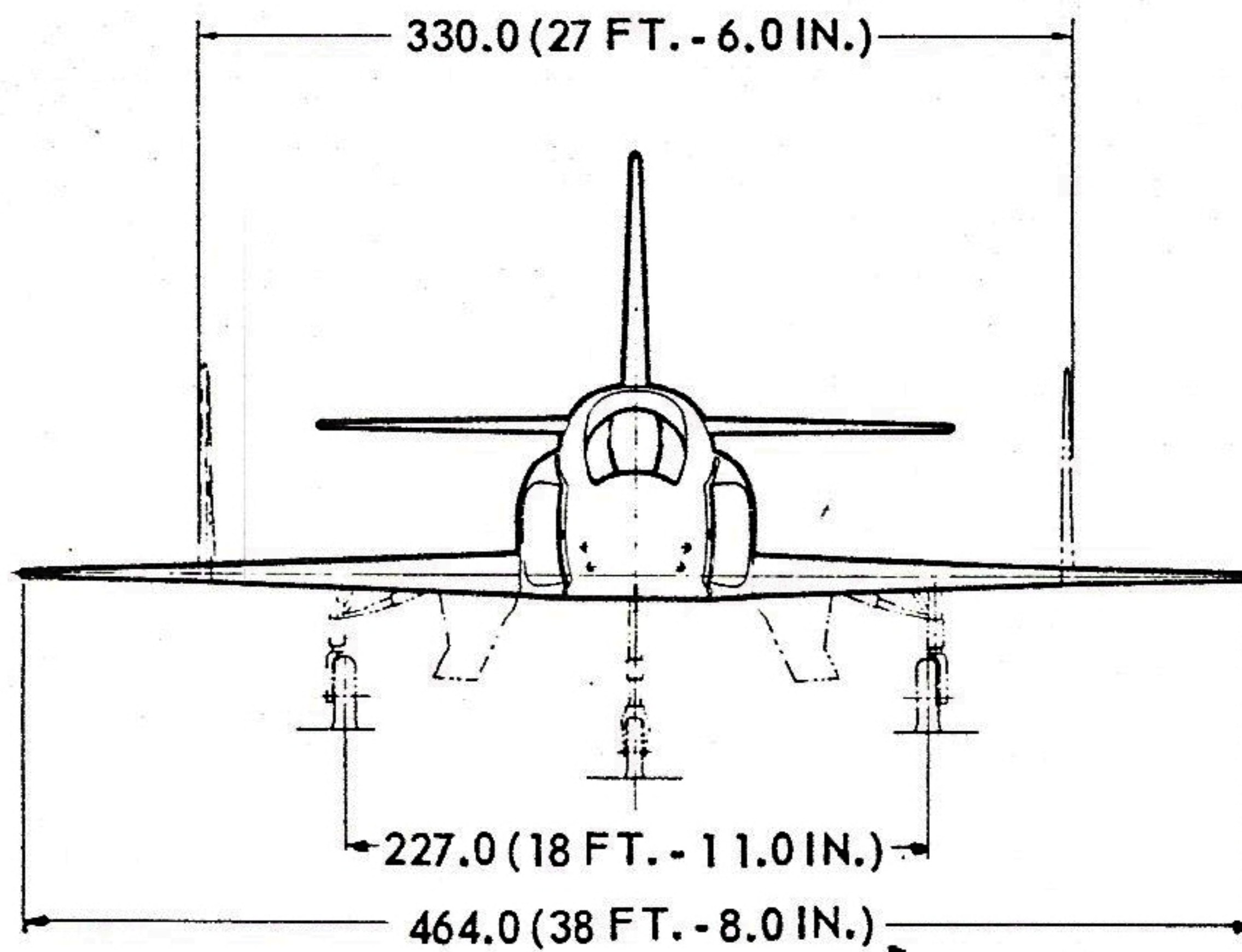


GROUP - 4  
RECLASSIFIED AT 3 YEAR INTERVALS  
DECLASSIFIED AFTER 12 YEARS

MCDONNELL F3H- G

# F3H - G

## GENERAL ARRANGEMENT



## CONTENTS

	<u>Page</u>
INTRODUCTION . . . . .	1
BASIC ADVANTAGES . . . . .	2
DESCRIPTION OF NOSE VERSIONS . . . . .	4
Stores Carrying Capability Chart.	5
Jet Attack . . . . .	6
All-Weather Attack Fighter. . . . .	7
Photographic Reconnaissance . . . . .	8
Day Interceptor . . . . .	9
All-Weather Interceptor . . . . .	10
Ferret-Electronic Countermeasures	11
Two-Place Version . . . . .	12
NOSE ASSEMBLY ATTACHMENT . . . . .	13
CARRIER AIR GROUP COMPOSITION . . . . .	14
NOSE STOWAGE . . . . .	15
INTERIOR ARRANGEMENT . . . . .	16

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## INTRODUCTION

Presented herein is a study of various nose assemblies that are designed for quick interchangeability on the McDonnell F3H-G airplane. This study shows the many advantages derived from such a configuration.

In addition to the advantages specifically pointed out in this report for the interchangeable nose concept, a major savings in defense dollars can be realized by reducing the number of basic types which are manufactured. This of course, comes about through the reduction in man hours to construct the aircraft through the "learning curve" effect on the larger numbers of the same basic type. Obviously, a given number of aircraft can be procured much more cheaply if all are of the same basic design rather than several completely different designs, each with a single mission capability. If substantial quantities of aircraft are procured, the effect of the "learning curve" is so powerful that it will more than compensate for the multi-mission aircraft size and weight, which is greater than some of the single mission aircraft such as the Day Interceptor.

These nose assemblies can be easily interchanged during an overnight maintenance period on either land or carrier, with a minimum of special ground handling equipment. It is estimated that four men could accomplish the nose configuration change within eight hours. With such a program for interchangeability, it is shown on page 14 that the total number of aircraft assigned to a Carrier Air Group might be reduced from 74 to 69, providing more room on the carrier hangar deck even after allowance for storage of alternate nose assemblies.

## BASIC ADVANTAGES

of

### Designing Aircraft With Nose Assemblies Integrally Functional For Rapid Interchangeability

#### 1. OPERATIONAL FLEXIBILITY -

A greater number of varied missions may be scheduled and flown with a fewer number of assigned aircraft in a particular theater.

#### 2. MAINTENANCE SIMPLICITY -

By having the majority of aircraft assigned to a particular Carrier Air Group or Marine Aircraft Group of the same basic airframe - regardless of mission specialty - the familiarity with aircraft and maximum utilization of common ground handling equipment will result in simplified and efficient maintenance.

#### 3. SUPPLY EFFICIENCY -

Stockpiling of Section "B" parts and material would be greatly decreased in forward areas because of common usage, and the variety and number of reserve aircraft assigned to a rear area or base pool could be greatly reduced.

#### 4. RETROFIT CAPABILITY -

Should military developments change the mission requirements for this type aircraft during its service life, a completely new nose and cockpit assembly may be speedily designed and produced to fulfill the special mission requirements as they arise. A minimum of manufacturing lead time from design conception would be required to place a new type nose into production, and a resultant new special mission aircraft into service at a very low cost as compared to designing a completely new airplane or modifying a larger part of an existing type.

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The new special mission nose assemblies may then be shipped for field installation, or squadron airplanes can be returned to the factory for retrofit. In either case, the time the airplane is not available to the operating unit is a matter of days, rather than months.

5. O & R WORK LOAD REDUCTION -

With additional nose assemblies available in operating areas, less aircraft will require O & R repair of Class "B" damage, since the damaged nose assemblies can be repaired at an O & R shop while the airplane continues in service with a spare nose installed.

6. PLANNING VERSATILITY -

Planning for deployment and logistical support of special mission aircraft will be greatly simplified, enabling higher echelon planners to be more versatile in their special mission planning. Short notice change in allocation of special mission aircraft types can be made to meet unforeseen military situations by use of the quick-change nose.

## DESCRIPTION OF NOSE VERSIONS

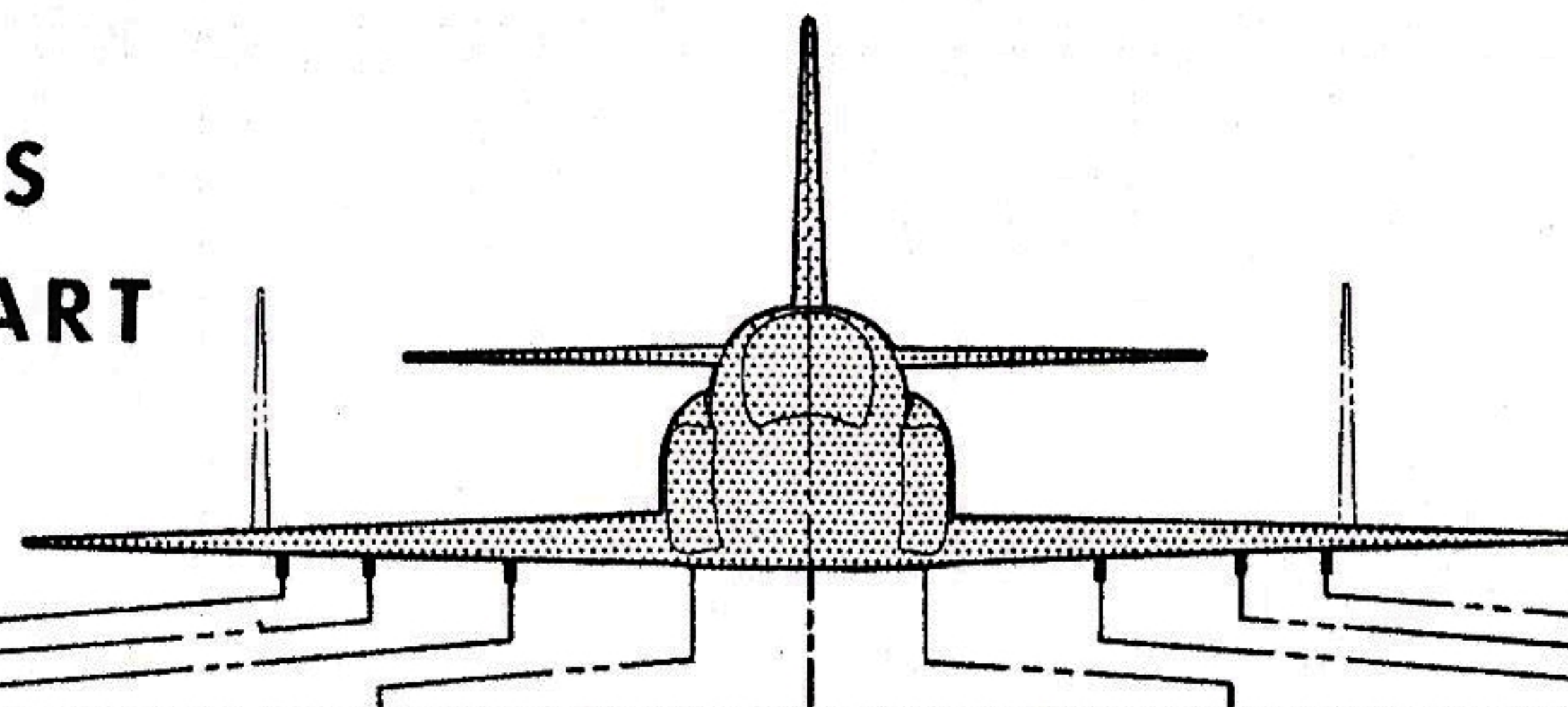
In designing the F3H-G airplane for interchangeable nose assemblies, particular emphasis was placed on enabling a quick conversion in the field from one nose configuration to another. To facilitate this change, the airplane aft of the splice at Fuselage Station 173.50 is identical for all versions, and requires no modifications or detailed adjustments other than the normal control, electrical and hydraulic quick disconnects at the splice.

Some of the various nose assemblies possible for aircraft interchangeability are shown in profile on pages 6 through 10.

On page 5 is shown the basic external stores carrying capabilities of the F3H-G airplane with any one of the alternate noses.

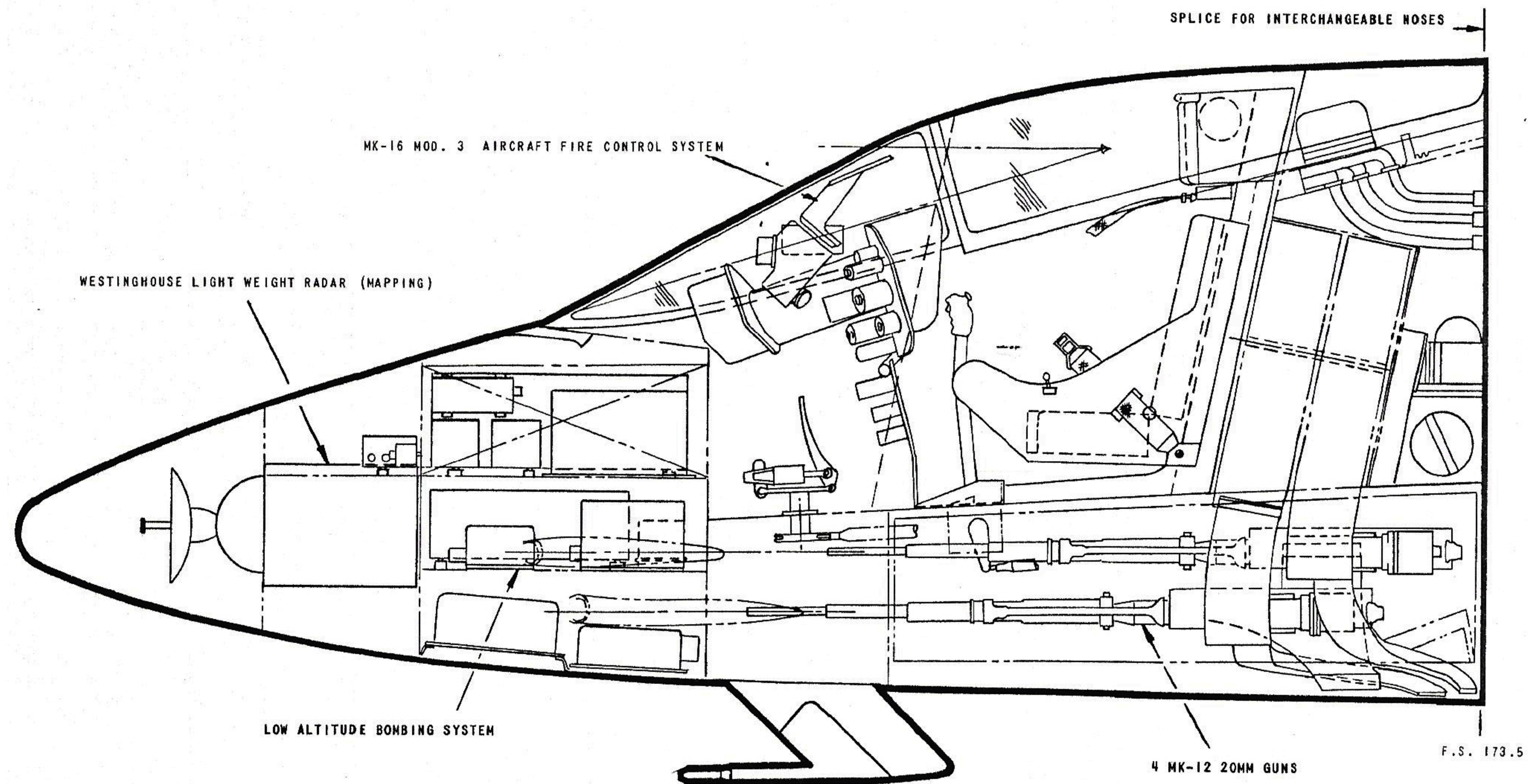
# F3H- G EXTERNAL STORES CARRYING CAPABILITY CHART

~~RESTRICTED DATA~~  
ATOMIC ENERGY ACT - 1946



STORES	STA. 9 - B.L. 158.0	STA. 8 - B.L. 134.0	STA. 7 - B.L. 88.0	STA. 6 - B.L. 35.0	STA. 5 - AIRPLANE	STA. 4 - B.L. 35.0	STA. 3 - B.L. 88.0	STA. 2 - B.L. 134.0	STA. 1 - B.L. 158.0	TYPE RACK
100 LB. G.P. BOMB 82-0-12 (AN-M30A1)										AERO 15A
220 LB. G.P. BOMB 82-0-132 (AN-M88)										AERO 15A
250 LB. G.P. BOMB 82-0-60 (AN-M57A1)										AERO 15A
500 LB. G.P. BOMB AFF AD1117 (AN-M6441)										AERO 15A
250 LB. L.D. BOMB BUORD SK. 239588										AERO 15A
500 LB. L.D. BOMB BUORD 239590										AERO 15A
1000 LB. L.D. BOMB BUORD 239552										AERO 62A
2000 LB. L.D. BOMB BUORD 239589										AERO 62A
MK 7 SPECIAL STORE										MAC
"SUPERSONIC SEVEN" USAF SK. 7155-1										MAC
MK 8 SPECIAL STORE										MAC
MK 11 SPECIAL STORE										MAC
MK 12 SPECIAL STORE										MAC
5.0" HYAR ROCKET BUORD 655884										AERO 15A
AERO 6A PKG. (7-2.75" ROCKETS)										AERO 15A
AERO 7A PKG. (19-2.75" ROCKETS)										AERO 15A
AERO 10A PKG. (4-5.0" ROCKETS)										AERO 15A
MK 77 FIRE BOMB BUORD 434201										AERO 15A
AERO 14B SPRAY TANK										AERO 62A
SPARROW MISSILE										DOUGLAS UNIVERSAL LAUNCHER
POD - LOOSE EQUIPMENT										AERO 62A
300 GAL. FUEL TANK USAF B/P X53J942										AERO 62A
500 GAL. FUEL TANK MOD "SUPERSONIC SEVEN" SHAPE										MAC

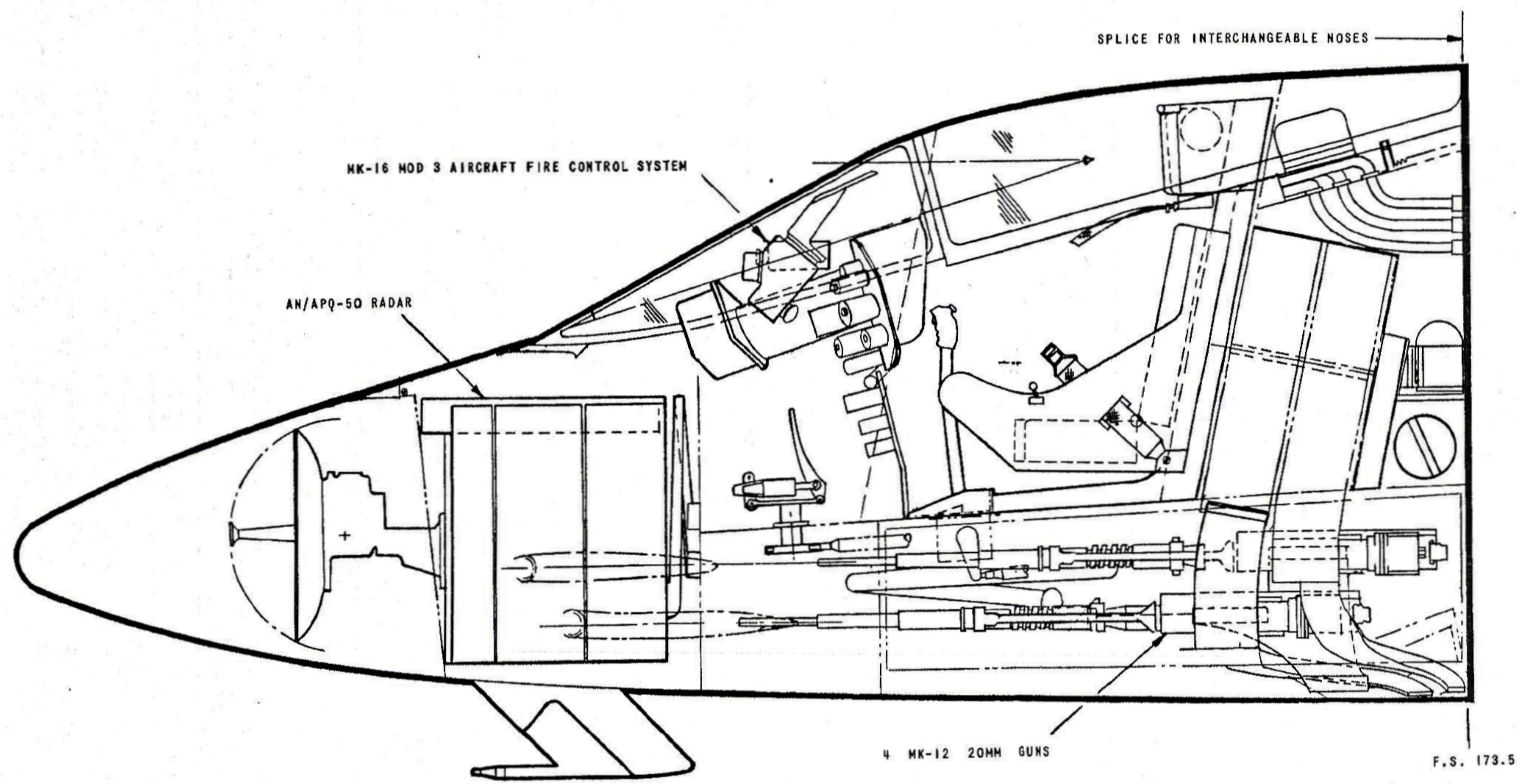
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**JET ATTACK** - Incorporates the basic four 20mm guns and provisions for external stores with simplified search and mapping equipment for accurate attack. A radar ranging feature for defensive air-to-air combat is included. The following may be incorporated in place of the four 20mm guns:

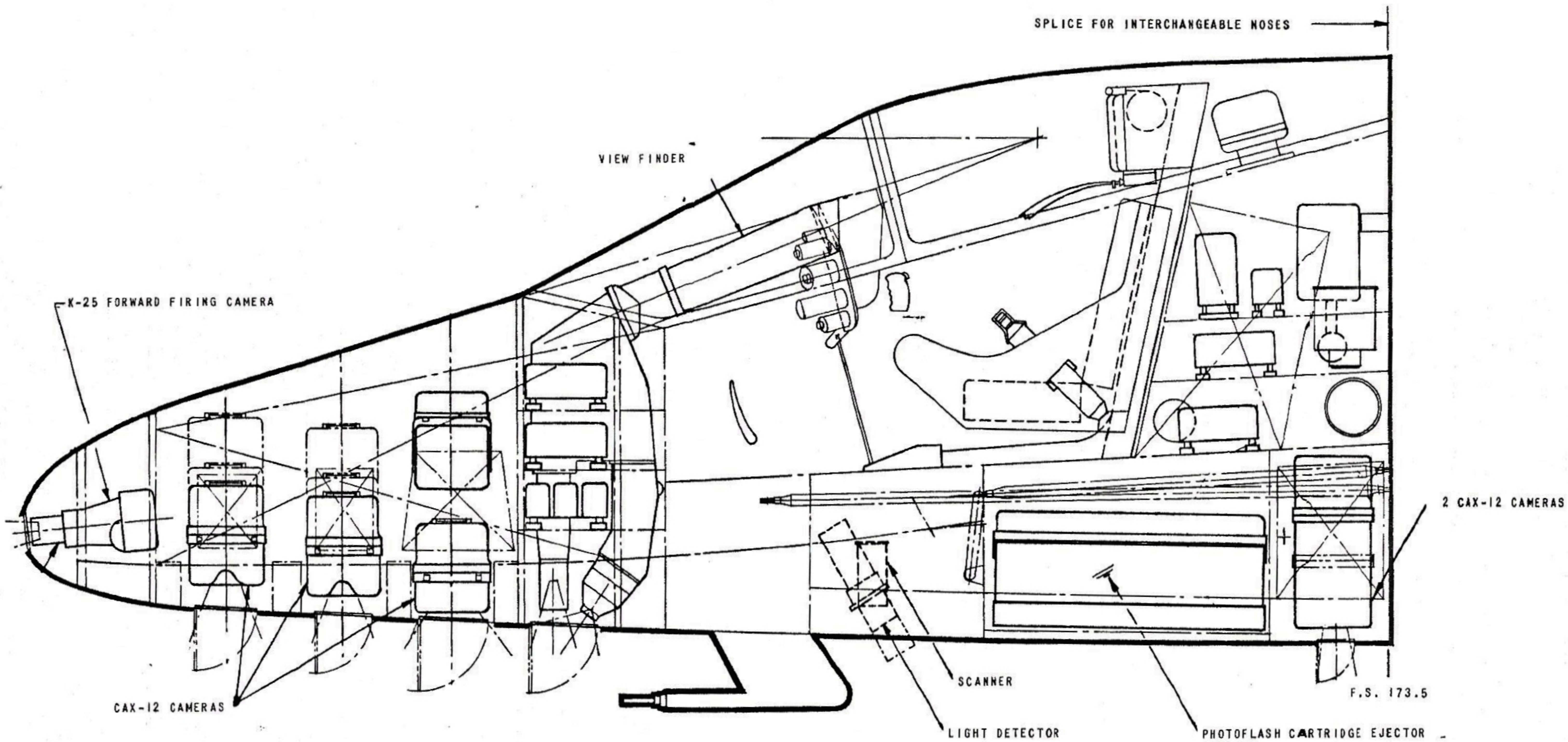
- 1) 56 two-inch FFAR on retractible racks
- 2) Two 20mm guns plus IFR probe
- 3) 28 two-inch FFAR plus IFR probe

**F3H-G  
JET ATTACK**



ALL-WEATHER ATTACK FIGHTER - This airplane incorporates APQ-50 radar for search, track and fire control and four MK-12 20mm guns and 600 rounds of ammunition for a high performance fighter configuration. Addition of nine store racks completes the attack version, permitting the delivery of a multiple combination of stores and special weapons at distant targets through inclement weather from ship or shore.

**F3H-G**  
**ALL-WEATHER ATTACK FIGHTER**

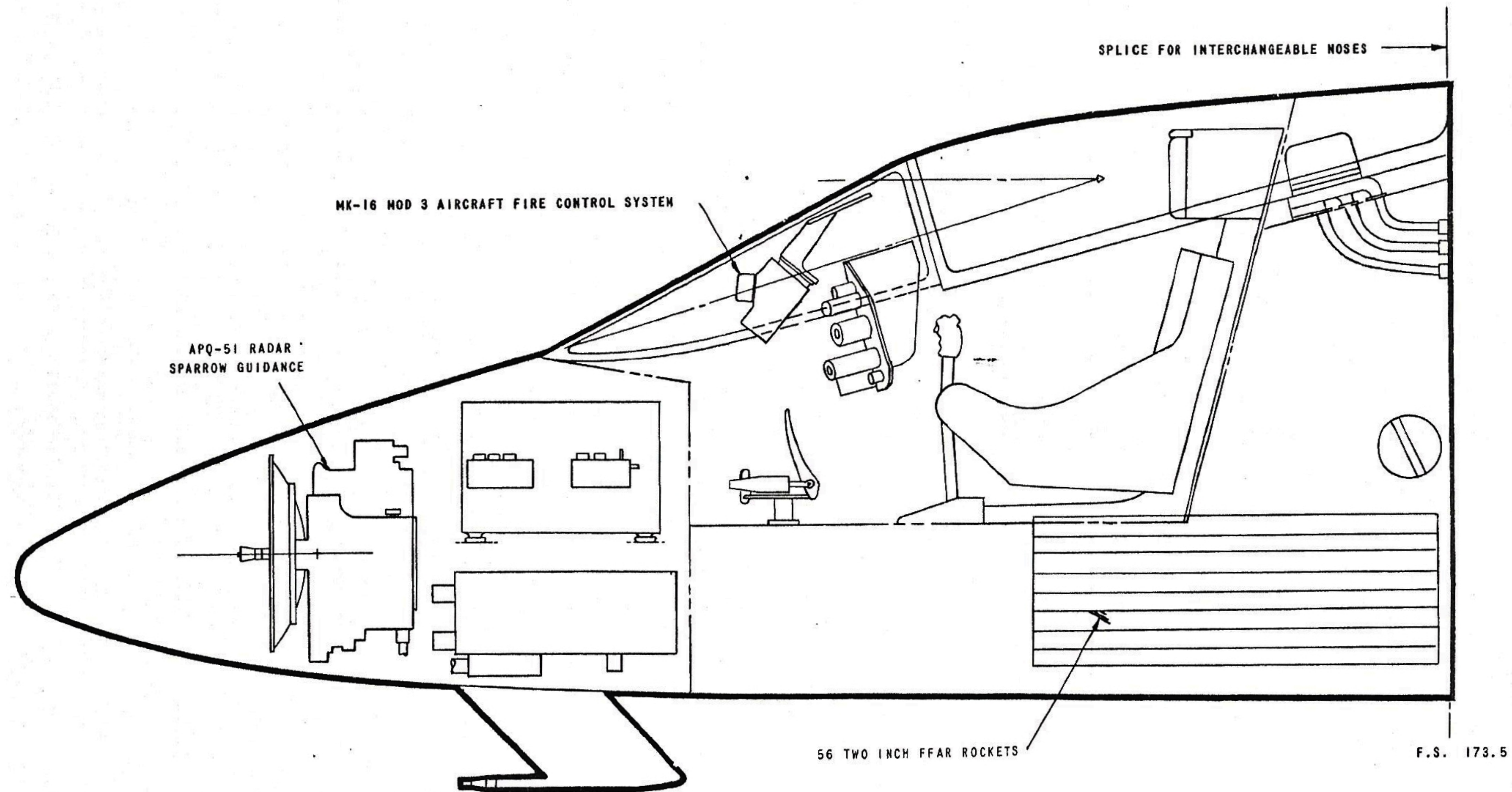


**PHOTOGRAPHIC RECONNAISSANCE** - Incorporates the latest camera equipment and control for coverage of all required day or night photographic missions. Normal camera complement includes five CAX-12 cameras and one K-25 forward firing camera with complete provisions for alternate use of night cameras and photo flash cartridges.

Photographic capabilities include:

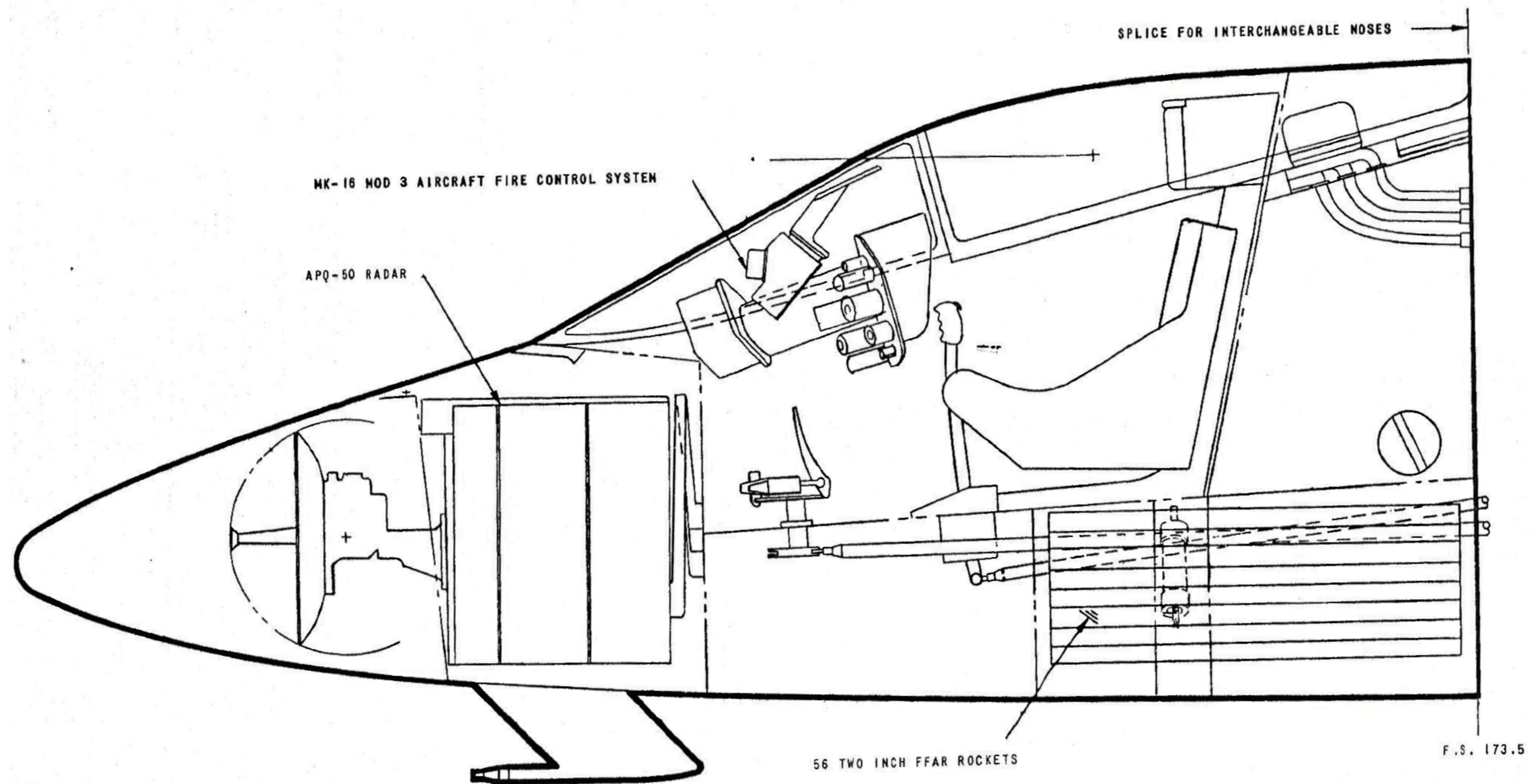
- 1) Strike damage assessment through a forward firing nose station.
- 2) Photo-reconnaissance through forward and aft rotatable stations.
- 3) Tri-metragon mapping from horizon.
- 4) Detail altitude coverage through the aft split vertical station.

**F3H-G**  
**PHOTOGRAPHIC**  
**RECONNAISSANCE**



DAY INTERCEPTOR, SPARROWS AND ROCKETS - Includes APQ-51 radar for missile and rocket control in delivering six Sparrow missiles mounted externally, and 56 two-inch FFAR (Gimlet) folding fin rockets carried internally on retractable rocket racks.

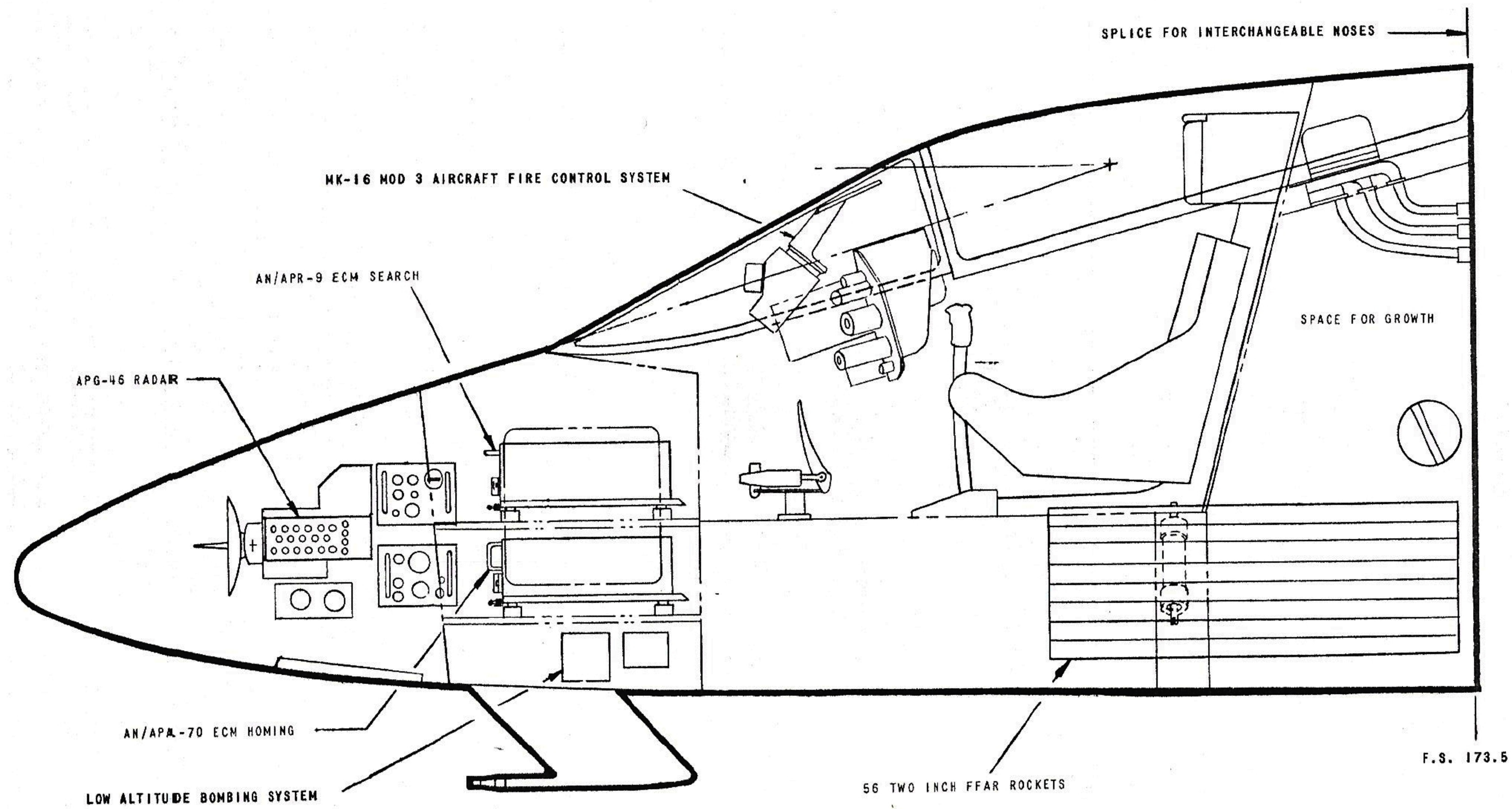
**F3H-G  
DAY INTERCEPTOR**



ALL-WEATHER INTERCEPTOR, ROCKETS - With APQ-50 radar for all-weather capability and rocket control. This version incorporates the internal installation of 56 two-inch rockets, and nine store racks for carrying any combination of external rocket packages.

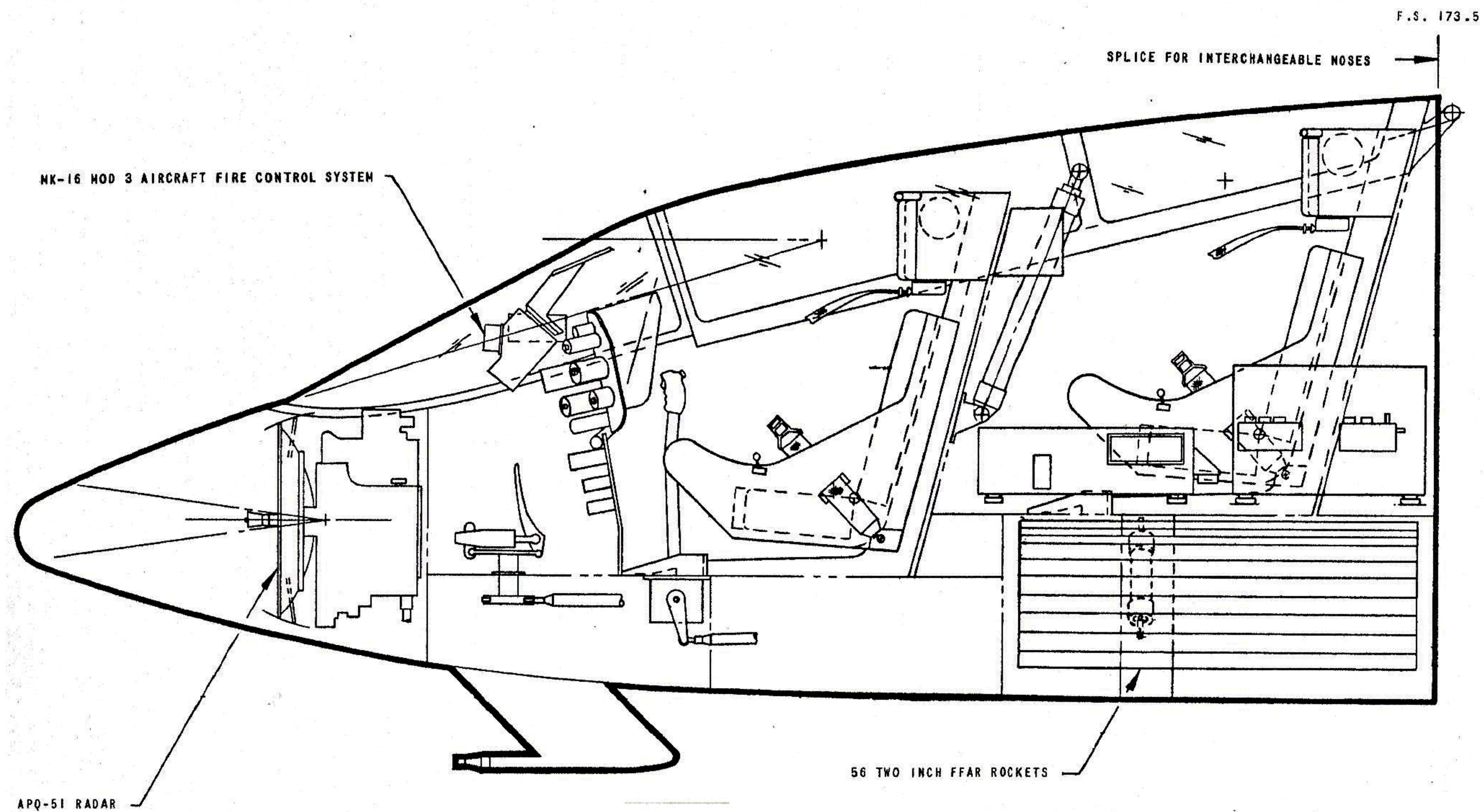
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**F3H-G**  
**ALL-WEATHER INTERCEPTOR**



**FERRET-ELECTRONIC COUNTERMEASURES-** Specially equipped with electronic countermeasures gear including APG-46 radar, AN/APR-9 receiver, and AN/APA-70 homing set to permit the detection, location, identification and elimination of enemy radar installations. Airplane armament consists of 56 two-inch FFAR rockets carried internally on retractible rocket racks and provisions for a varied combination of external stores.

**F3H-G  
FERRET  
ELECTRONIC COUNTERMEASURES**



TWO-PLACE VERSION - Converts the basic airframe, unchanged in length, to a two-seat version. Some of the many uses of a two-seat version are:

- 1) For flight or electronics familiarization training
- 2) To carry an Air Strike Coordinator
- 3) For electronic countermeasures search and strike.

Specialized equipment and armament shown in the drawing above is that for the strike coordinator mission utilizing APQ-51 Radar for fire control of 56 two-inch FFAR rockets.

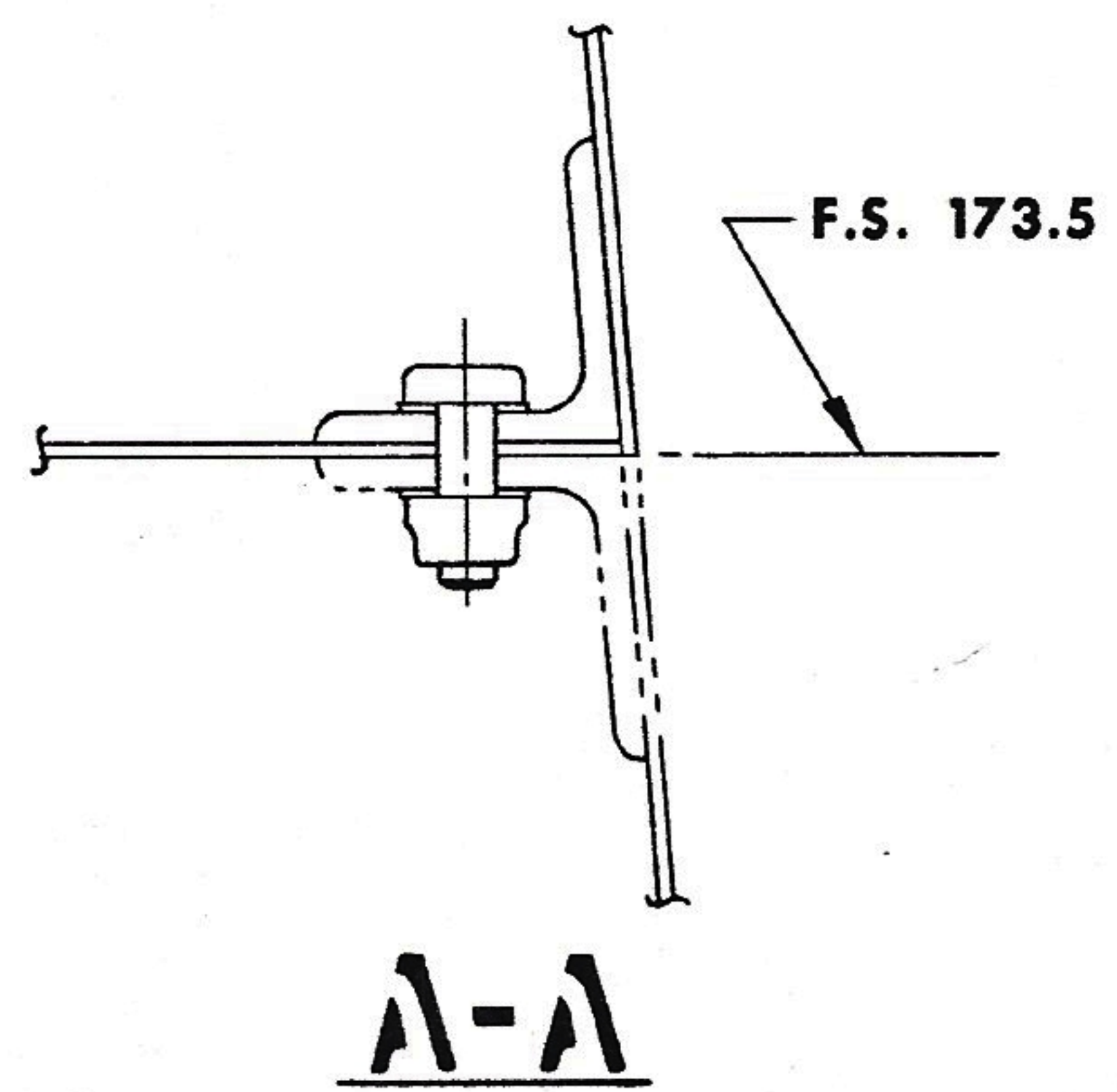
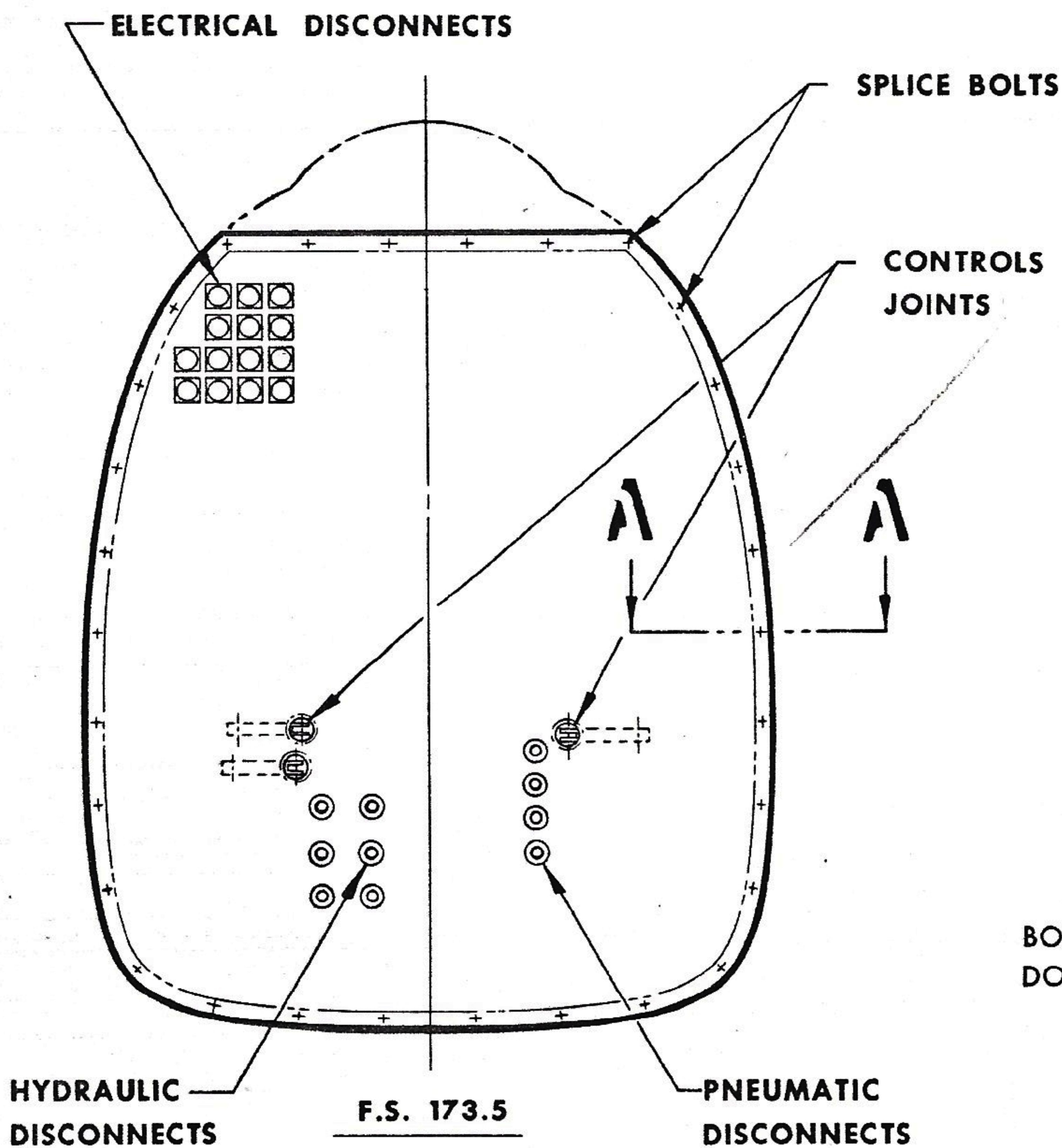
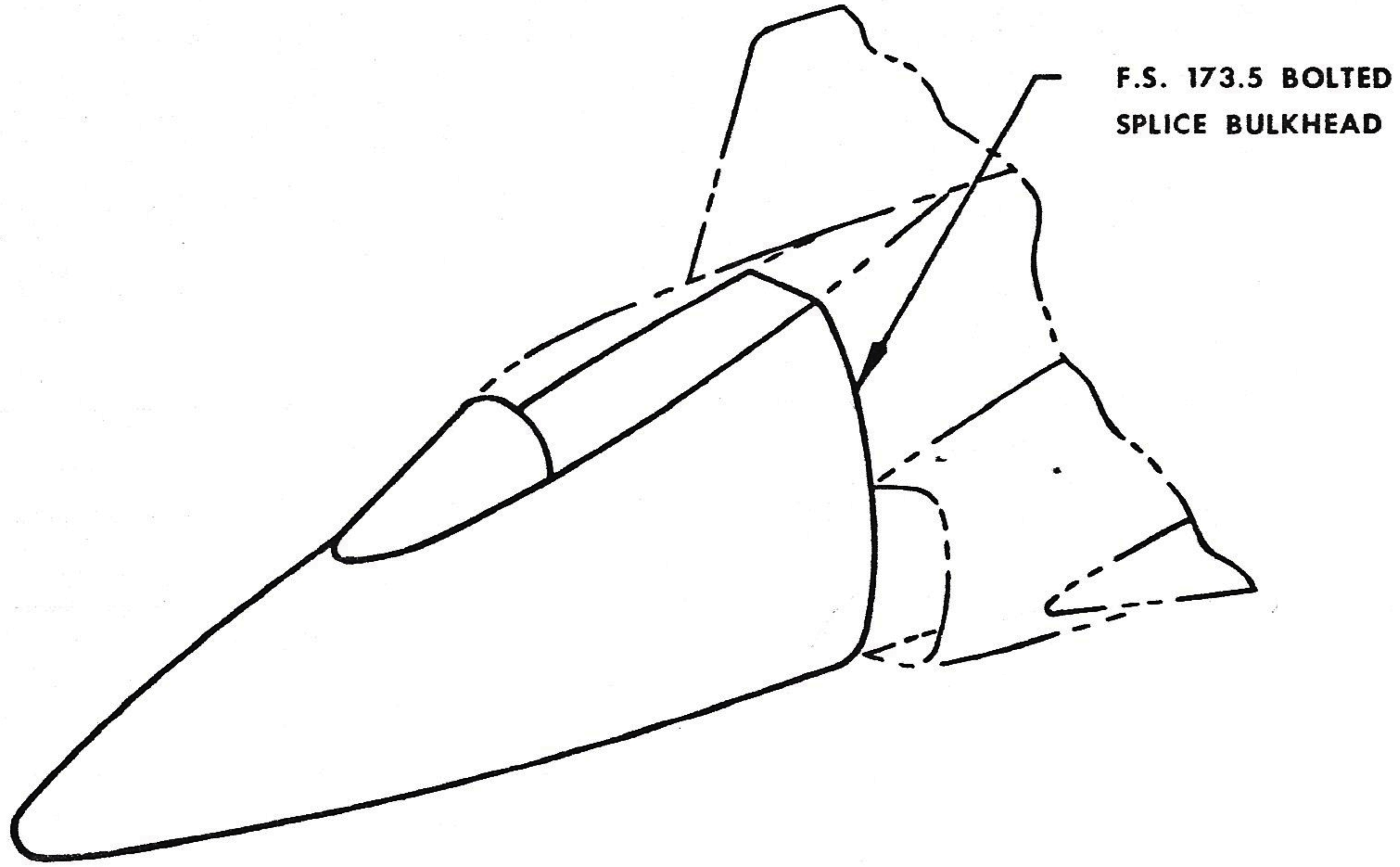
**F3H-G**

**TWO PLACE VERSION**

# F3H - G

## NOSE ASSEMBLY ATTACHMENT

THE INTERCHANGEABLE NOSE ASSEMBLY IS ATTACHED TO THE AIRFRAME WITH APPROXIMATELY 30 BOLTS. IT IS ESTIMATED THAT 4 MEN COULD CHANGE NOSE ASSEMBLIES WITHIN 8 HOURS ABOARD A CARRIER OR AT AN ADVANCED BASE.



TYPICAL STRUCTURAL ATTACHMENT  
BOLTS ACCESSIBLE THROUGH EXISTING ACCESS DOORS, NOSE GEAR WELL, EQUIPMENT BAY, ETC.

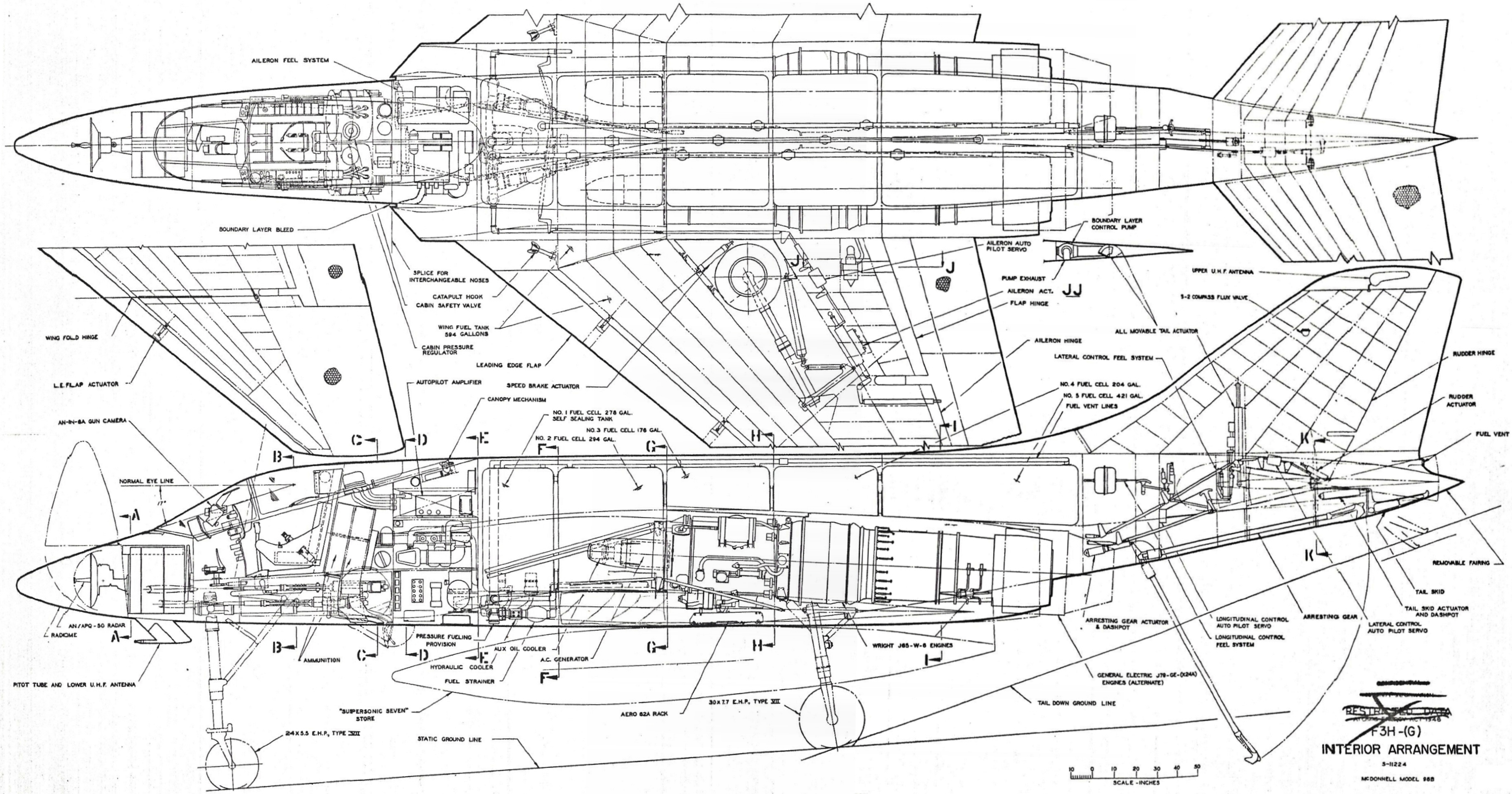
### CARRIER AIR GROUP COMPOSITION

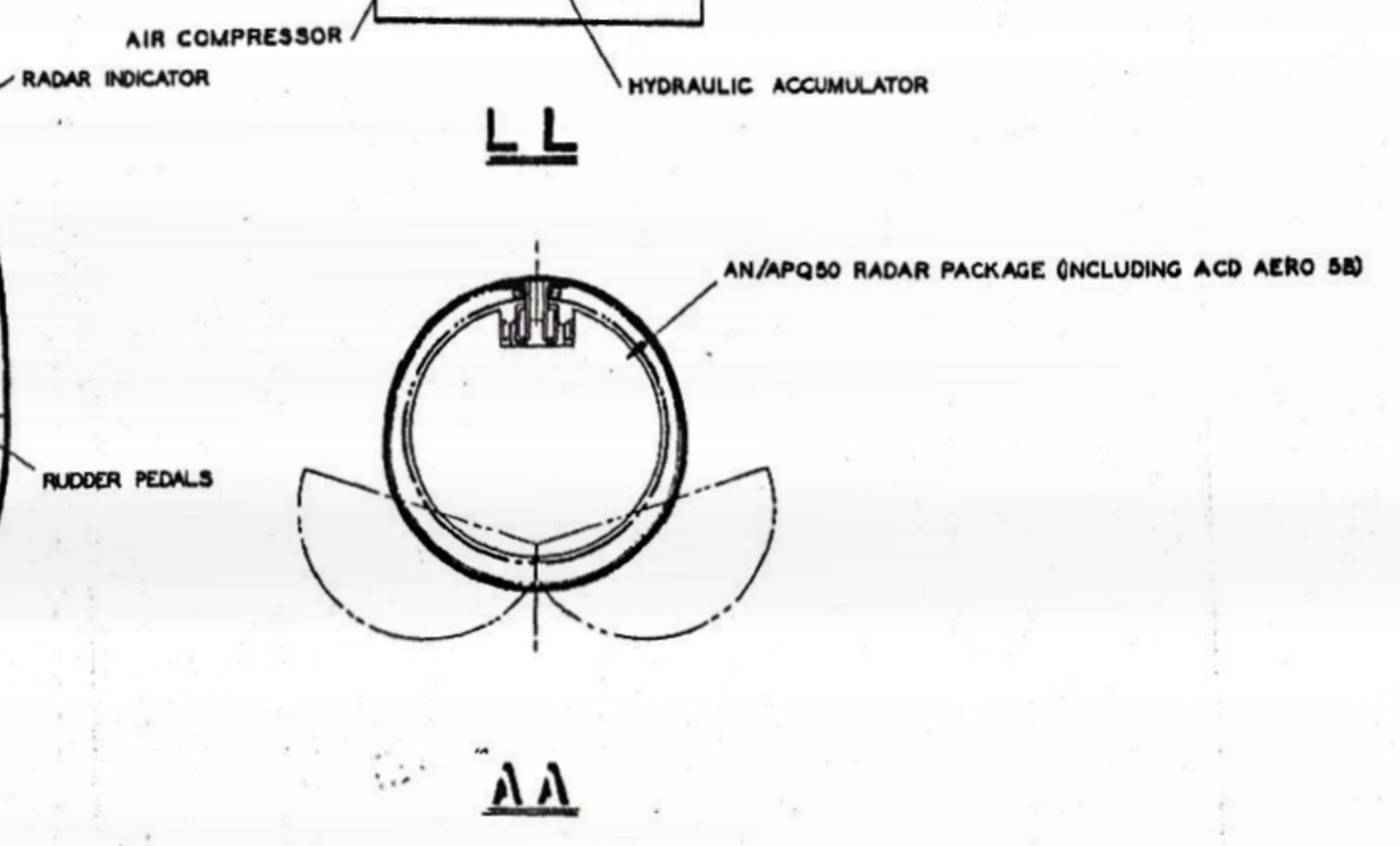
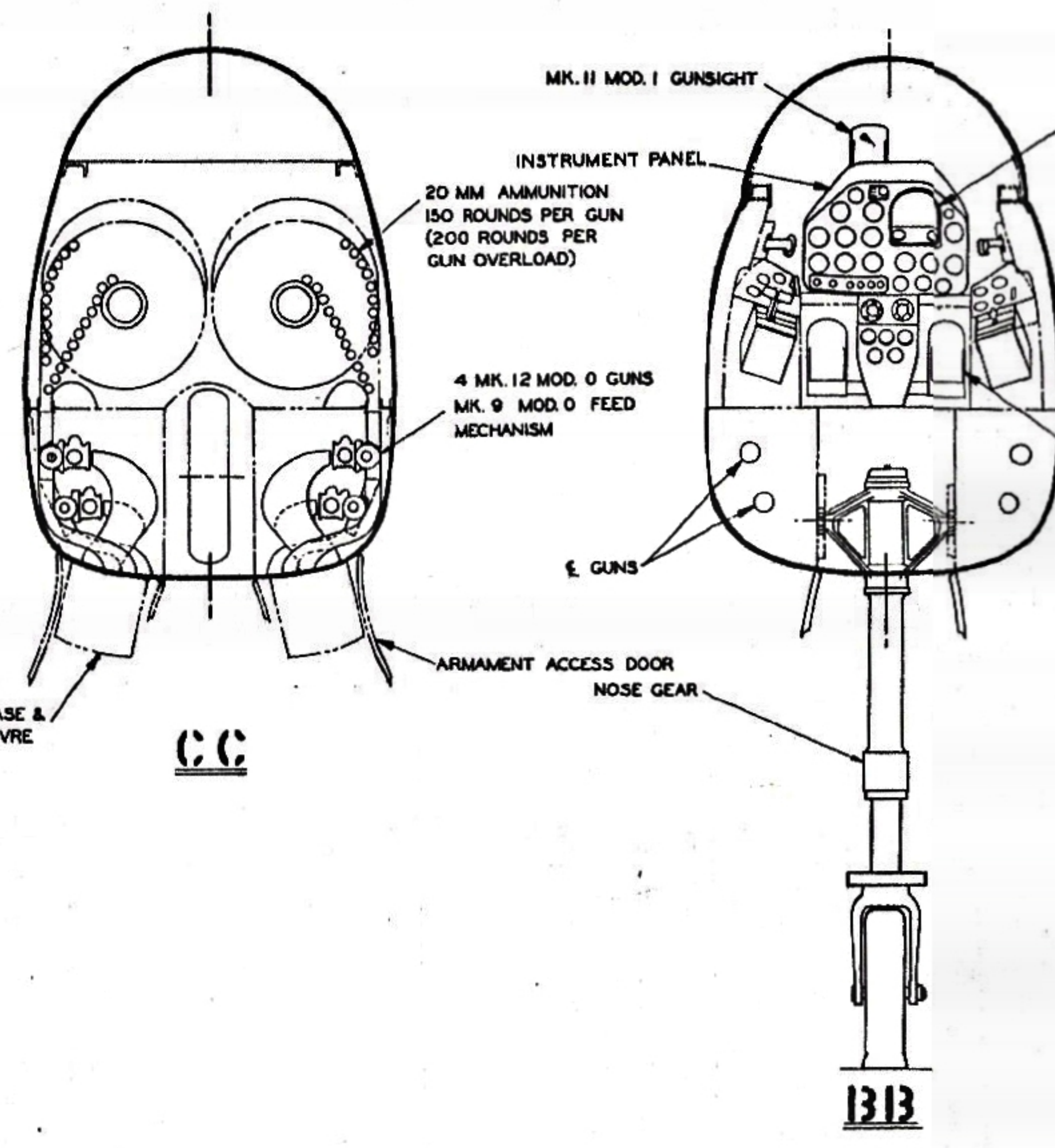
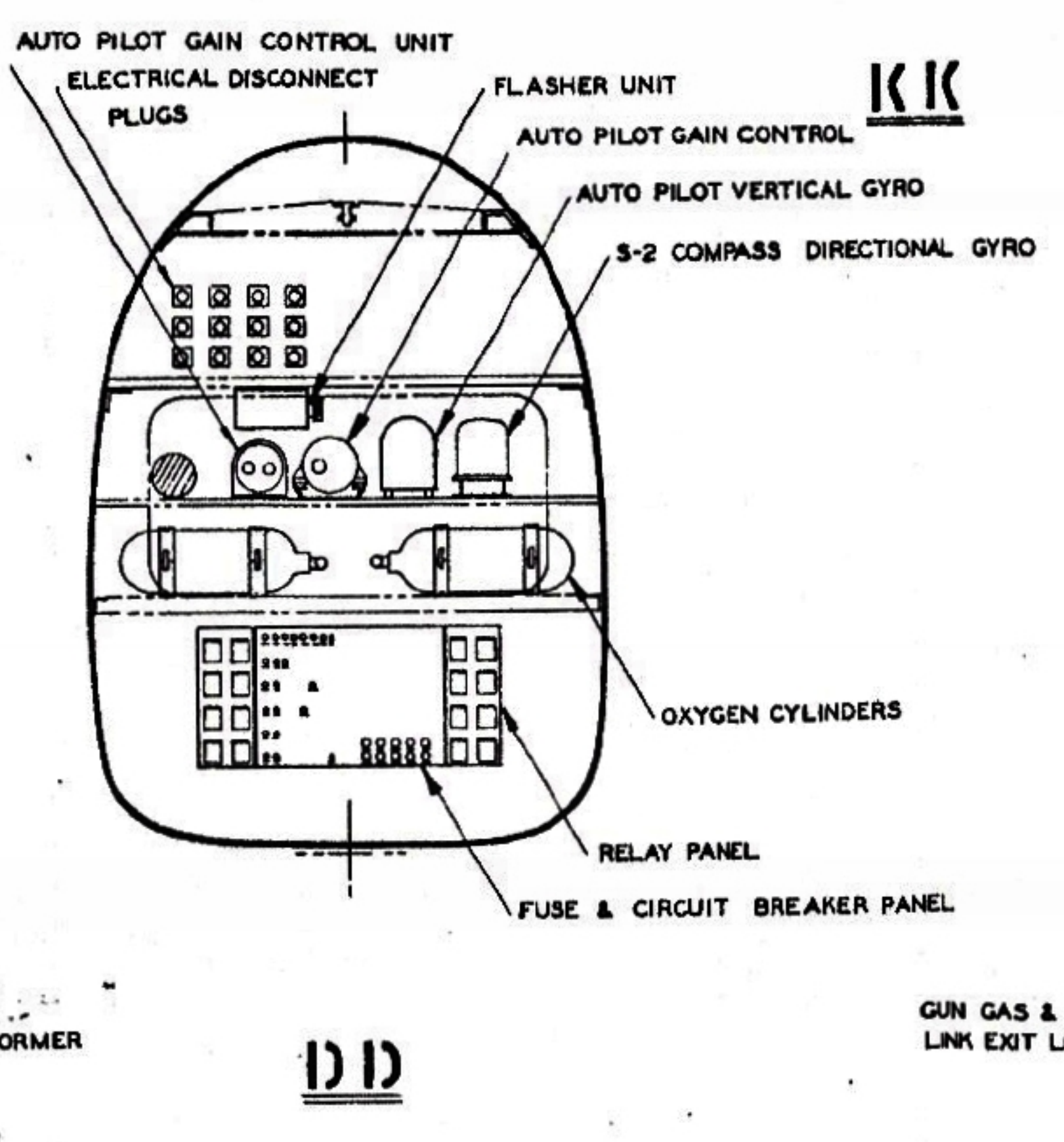
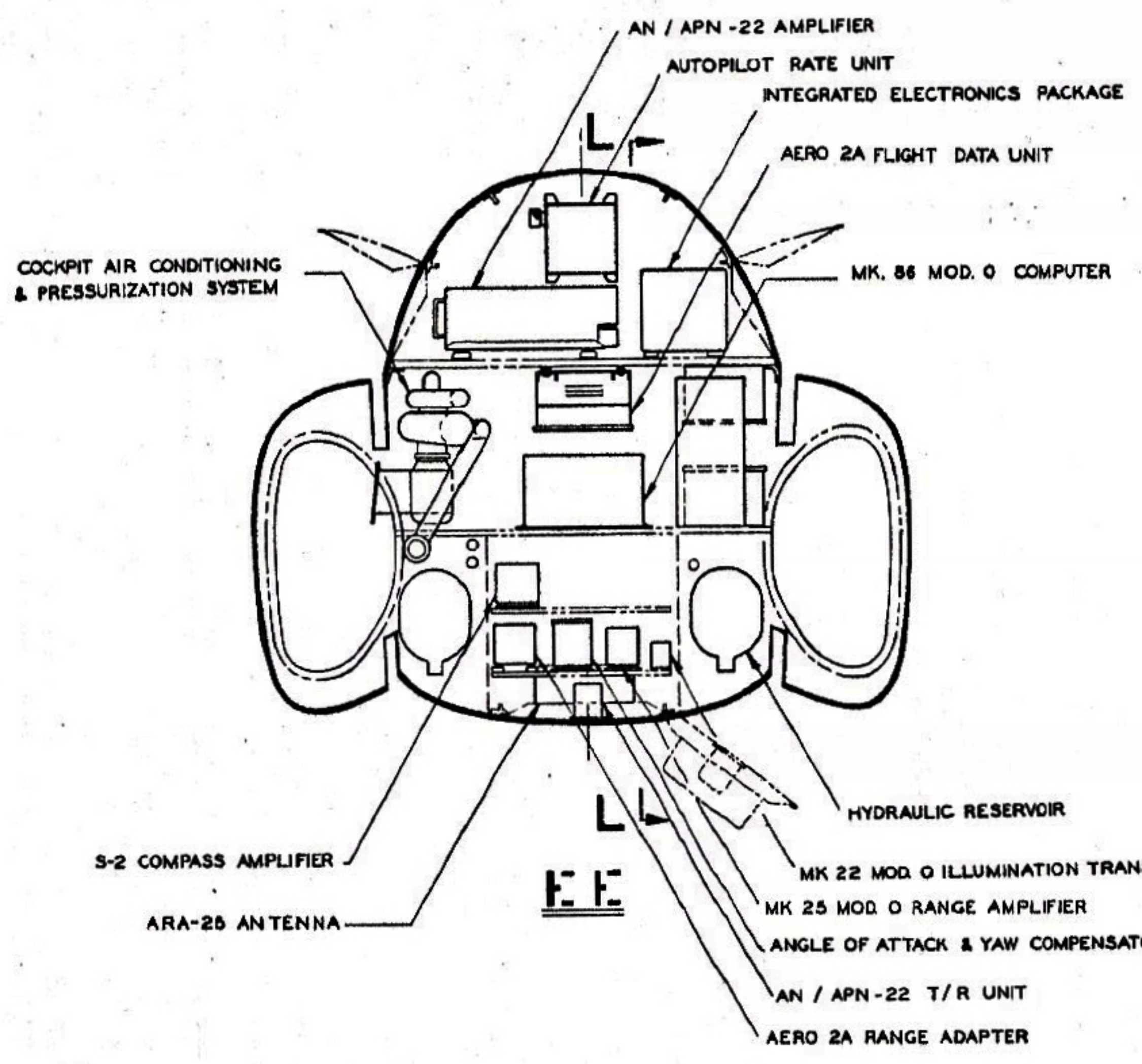
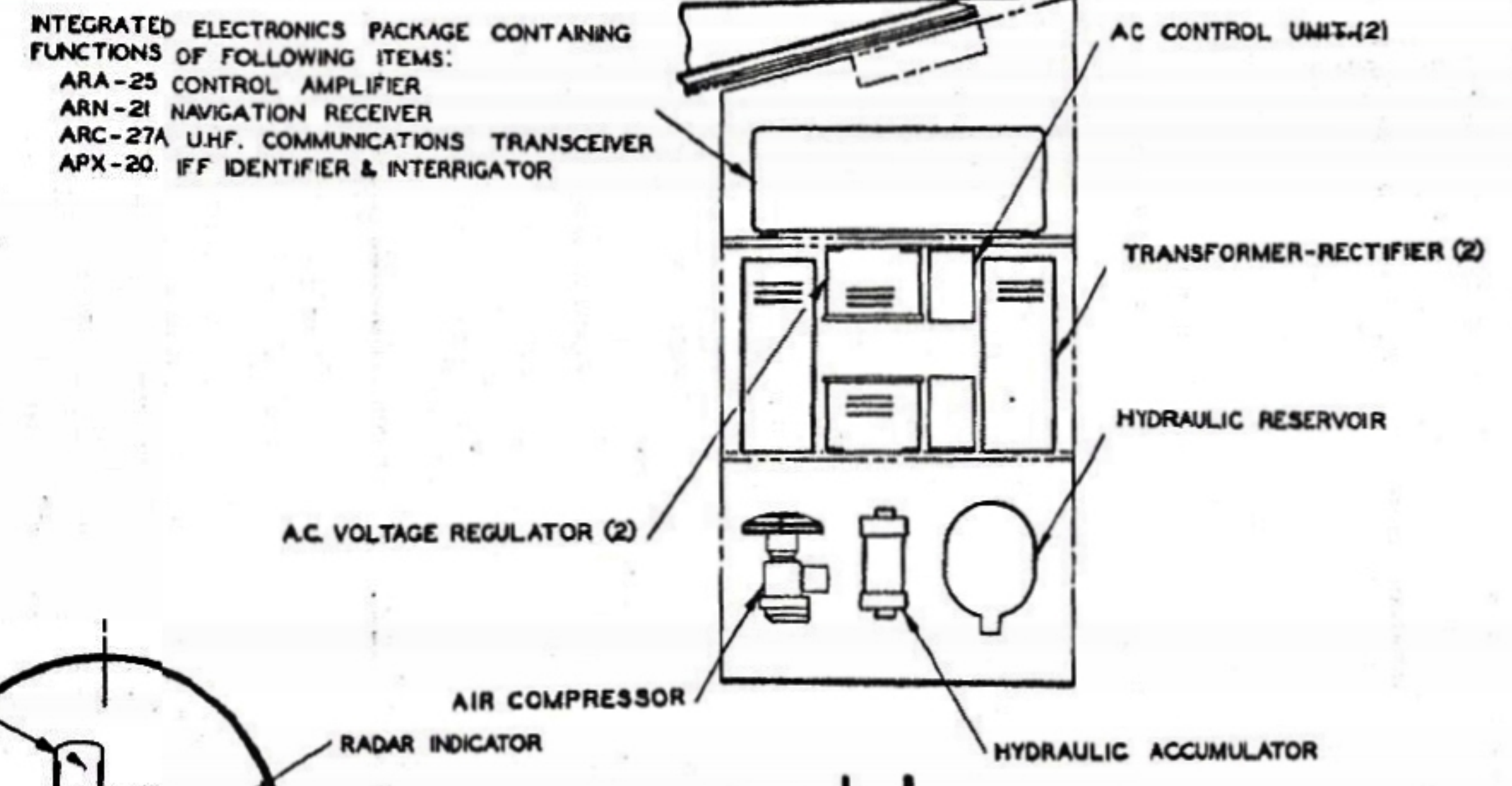
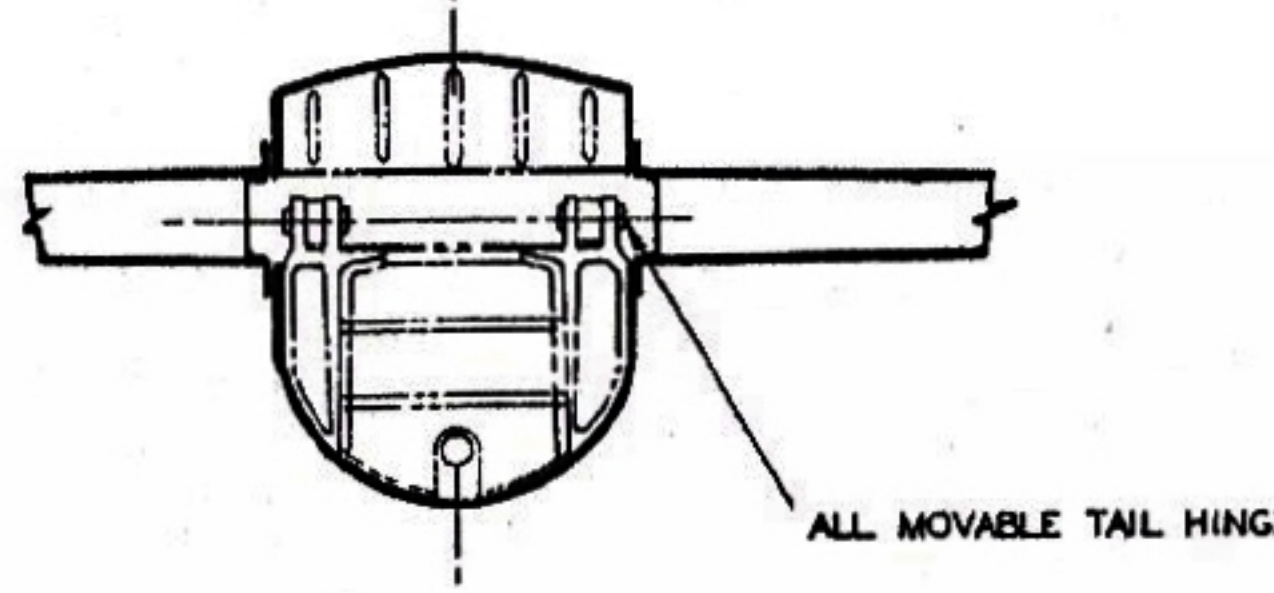
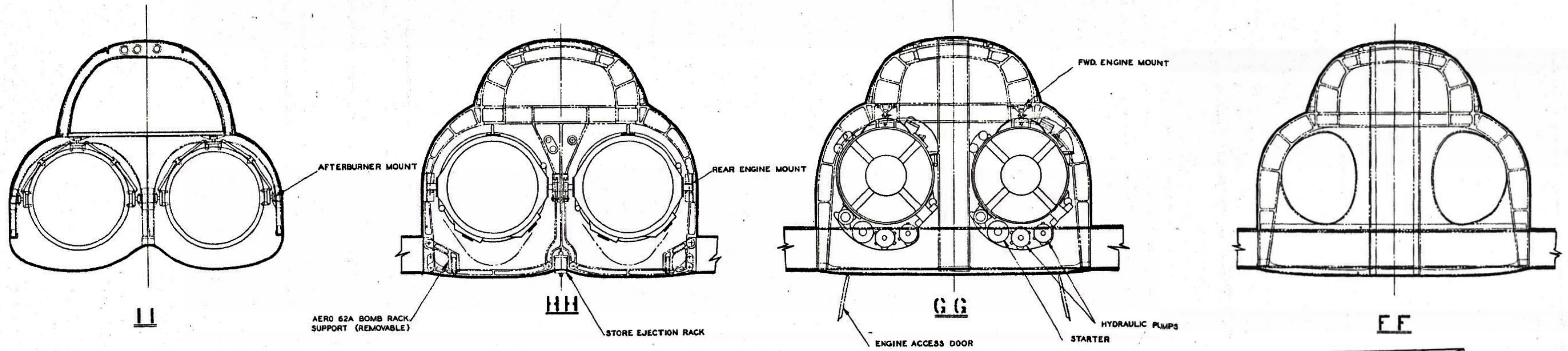
To illustrate the advantages of having multi-mission type aircraft available with the interchangeable nose concept, the table below has been prepared. This table shows that with the interchangeable nose concept, it is possible to have fewer total aircraft aboard and still provide the Task Force Commander with greater flexibility in meeting changing tactical situations.

For example, if air opposition is heavy and Fleet defense is of primary importance, the Task Force Commander could quickly increase his all-weather interceptor strength by 250% at a sacrifice of 60% in his attack strength. On the other hand, if complete air superiority is established, the Task Force Commander can quickly convert his all-weather interceptors to straight jet attack aircraft and increase his striking potential in that type by 40%.

AIRCRAFT TYPE	TYPICAL ASSIGNMENT WITH SINGLE MISSION A/C	TYPICAL ASSIGNMENT WITH AIRCRAFT HAVING MULTI-MISSION CAPABILITY THROUGH NOSE INTERCHANGE		
		MULTI-MISSION TYPE	SINGLE MISSION TYPE	ADDITIONAL INTERCHANGE NOSES
Jet Attack	22	20		8
A/W Attack Fighter	12	10		8
Photo Recon.	4	3		4
A/W Interceptor	8	8		12
Day Interceptor	8		8	
Day Fighter	12		12	
A.E.W.	4		4	
Night Attack	4		4	
TOTAL TYPES		41	28	32
TOTAL AIRCRAFT	74	69		

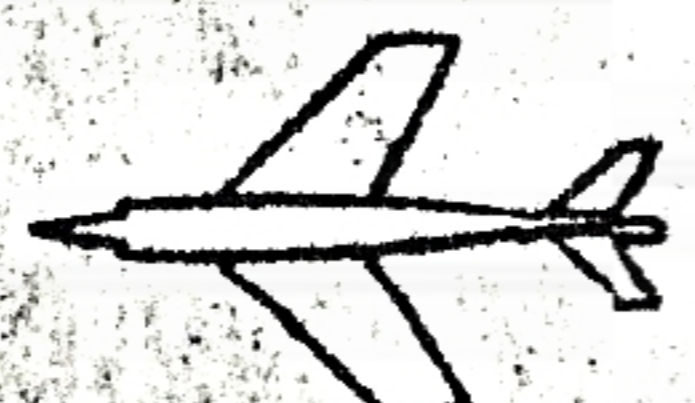
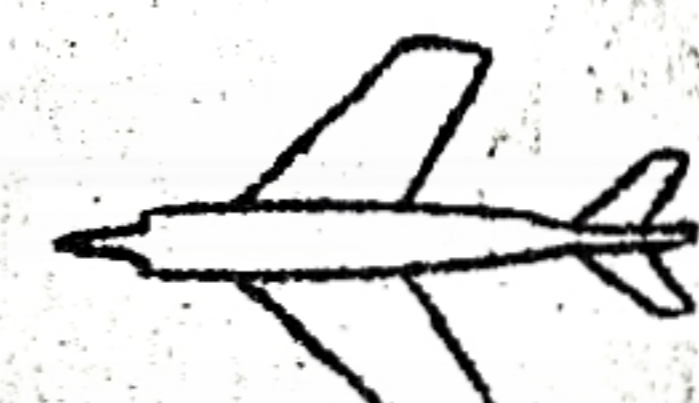
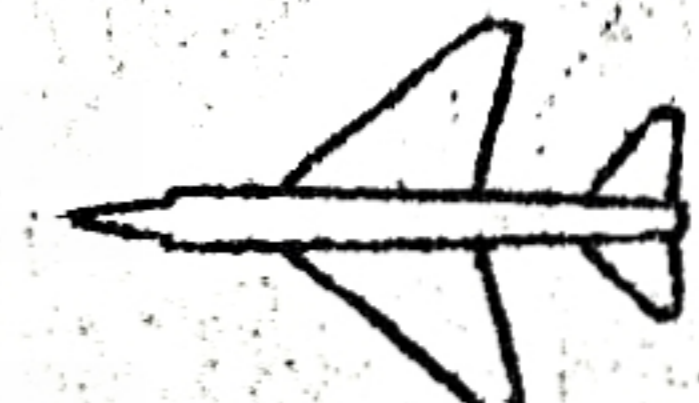









PERFORMANCE SUMMARY - F3H DEVELOPMENT STUDIES

1. MODEL	F3H-2E		F3H-(C)	F3H-(E)	F3H-(G)	F3H-(H)
2. ENGINE(S)	ONE J71-A-2	ONE J71-A-600 B30	ONE J67	ONE J67	TWO J65-W-6	TWO J79 (X-2) A
3. ENGINE RATINGS - MIL. LBS.	10,200	11,000	13,200	13,200	7,600	9,292
4. AFTERBURNER, LBS.	14,500	15,500	21,500	21,500	11,000	14,346
5. WING AREA, SQ. FT.	442	442	458	450	530	530
6. WING SPAN, FT.	35.33	35.33	36.3	36.75	38.6	38.6
7. WING SWEEP @ C/4, DEG.	45	45	45	45	45	45
8. WING THICKNESS, % CHORD	8.6/6.4	8.6/6.4	8.6/6.4	5.0	5.0 (MEAN)	5.0 (MEAN)
9. ASPECT RATIO	2.82	2.82	2.88	3.0	2.82	2.82
10. TAPER RATIO	.523	.523	.513	.16	.16	.16
11. OVERALL LENGTH, FT.	59.45	59.45	59.1	56	56	56
12. TAKEOFF GROSS WEIGHT, LBS.	30,939	30,739	32,143	32,057	34,692	33,932
13. COMBAT GROSS WEIGHT, LBS. (4)	27,202	27,002	28,613	28,500	30,552	30,834
14. COMBAT WING LOADING, LBS./SQ.FT.	61.7	61.1	62.5	63.1	57.6	58.2
15. LANDING GROSS WEIGHT (20% FUEL), LBS.	23,108	22,908	23,387	23,050	24,885	24,125
16. AMPR WEIGHT, LBS.	13,525	13,525	13,502	13,222	12,534	12,534
17. TOTAL FUEL (6.5 LB./GAL.), GAL./LBS.-INTERNAL	1506/9789	1506/9789	1663/10810	1703/11070	1886/12259	1886/12259
18. -OVERLOAD					2486/16159	2486/16159
19. MAX. SPEED AT SEA LEVEL (MAX.PWR.), KTS/M	632/.956	636/.962	692/1.05	700/1.06 <sup>(2)</sup>	661/1.00 <sup>(2)</sup>	661/1.00 <sup>(2)</sup>
20. 35,000 FT. KTS/M	563/.976	568/.988	860/1.49	973/1.69	875/1.52	1133/1.97
21. 45,000 FT. KTS/M	539/.94	551/.958	780/1.36	920/1.60	805/1.40	1081/1.88
22. MAX. SPEED AT SEA LEVEL (MIL.PWR.), KTS/M	592/.896	600/.908	628/.95	667/1.01	641/.97	654/.99
23. 35,000 FT. KTS/M	524/.911	531/.924	569/.99	564/.98	581/1.01	598/1.04
24. RATE OF CLIMB AT SEA LEVEL (MAX.PWR.), FPM	16,680	19,180	34,250	37,200	32,800	44,100
25. 35,000 FT. FPM	5,200	6,350	13,000	13,700	11,600	16,600
26. COMBAT CEILING - MIL. PWR., FT.	38,500	40,700	45,600	45,650	46,800	49,200
27. MAX. PWR., FT.	48,200	49,690	55,150	55,450	55,500	59,200
28. STALL SPEED @ T.O. G.W., KTS. (POWER OFF)	114	114	114	127	118 <sup>(3)</sup>	117 <sup>(3)</sup>
29. LANDING APPROACH SPEED KTS., (.7 C <sub>Lmax</sub> )	118	116	116	129	119 <sup>(3)</sup>	118 <sup>(3)</sup>
30. MAX. WT. WHICH CAN BE CATAPULTED (C11 CATAPULT, 10 KN. WIND, LAUNCHING SPEED = V <sub>SL</sub> + 10 KNOTS)	41,000	41,000	41,000	37,500	42,800 <sup>(3)</sup>	42,800 <sup>(3)</sup>
31. MAX. WT. WHICH CAN BE ARRESTED (MK-7 ARRESTING GEAR, 155 FT. RUNOUT, 25 KN.WIND, V <sub>APP</sub> = 1.2V <sub>S</sub> - 25 KNOTS) { DECEL 5.5 G 6.0 G	29,400 31,700	29,400 31,700	30,500 33,000	23,500 25,500	30,800 <sup>(3)</sup> 33,300 <sup>(3)</sup>	30,800 <sup>(3)</sup> 33,300 <sup>(3)</sup>
32. COMBAT RADIUS <sup>(1)</sup> (MIL-C-5011A), N.A.MI.-INTERNAL (2 - 300 GAL. TANKS)-OVERLOAD	374	380	400	400	400 652	210 514
						
						

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NOTES: (1) SEE NEXT PAGE FOR MISSION SUMMARY (2) ENGINE LIMITATION (3) INCLUDES BOUNDARY-LAYER CONTROL ON FLAP LEADING EDGE  
 (1) COMBAT GROSS WEIGHT HERE DEFINED AS GROSS WEIGHT AT BEGINNING OF COMBAT

MISSION SUMMARY

MODEL F3H-(G)

MODEL F3H-(H)

FIGHTER COMBAT MISSIONS

- (a) Internal Fuel Only
- (b) With 2-300 Gal. External Tanks

RADIUS NA.MI.	DECK CYCLE* TIME, HRS.	RADIUS NA.MI.	DECK CYCLE TIME, HRS.
400	1.90	210	1.14
652	2.88	514	2.33
833	3.25	917	3.36
772	3.11	-	-
713	2.95	-	-
653	2.79	-	-
1217	4.74	1364	5.31
706	2.79	-	-
1034	3.84	-	-

SPECIAL STORES DELIVERY

Supersonic Seven (Mk-7)

- (c) 15,000 ft. Drop
- (d) Sea Level Drop
- (e) 100 Mile S.L. Approach and Drop
- (f) 200 Mile S.L. Approach and Drop
- (g) 15,000 Ft. Drop, Refueled by F3H Buddy
- (h) Standard Mk-7, 15,000 Ft. Drop

PHOTOGRAPHIC MISSION

- (i) High Altitude Reconnaissance With 2-300 Gal. External Tanks

COMBAT AIR PATROL AT 25,000 FT.

No Combat Time

- (j) Internal Fuel Only
- (k) With 2-300 Gal. External Tanks

20 Min. Combat at 35,000 Ft.

- (l) Internal Fuel Only
- (m) With 2-300 Gal. External Tanks

DECK CYCLE * TIME, HRS.	DECK CYCLE TIME, HRS.
3.57	-
4.52	-
2.08	-
3.16	-

\* Loiter Time of 20 Min. not included.

~~RESTRICTED DATA~~

~~ATOMIC ENERGY ACT 1946~~

~~RESTRICTED DATA~~