

NAVAIR 00-110AF14-1

Classified by ~~NAVPERS 14-1000 WTC 27R1~~
Subject to ~~USC 18-11052~~
~~Declassification Authority~~ at Two
Year Intervals
~~Declassification Authority~~ 1980

Standard Aircraft Characteristics

NAVY MODEL F-14A AIRCRAFT

(TITLE UNCLASSIFIED)

CLEARED
FOR OPEN PUBLICATION

Charles A. Greene
MAR 16 1993

CONGRESSIONAL AND
PUBLIC AFFAIRS OFFICE
NAVAL AIR SYSTEMS COMMAND

This Manual Supersedes NAVAIR 00-110AF14-1 Dated July 1974
Which Should Be Destroyed In Accordance With
Applicable Security Regulations

*This publication shall not be carried in aircraft on combat missions or when
there is a reasonable chance of its falling into the hands of an unfriendly
nation, unless specifically authorized by the "Operational Commander."*

PUBLISHED BY DIRECTION OF THE
COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND

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DECLASSIFIED

APRIL 1977

UNCLASSIFIED

CLASSIFICATION (CONTROLLED) BY ~~NAVPER 14-1000 WTC 27R1~~
ON ~~3-4-85~~ *3-4-85* *in fall* *declassified* *by* *NAVAIR 720*
NAVY AIR SYSTEMS COMMAND
DEPARTMENT OF THE NAVY



STANDARD AIRCRAFT CHARACTERISTICS (U)

F-14A TOMCAT

GRUMMAN

~~NAVAL SECURITY INFORMATION~~
Unauthorized disclosure subject to criminal sanctions

ALL INQUIRIES CONCERNING DATA
IN THIS CHART SHOULD BE DIRECTED
TO NAVAIR, CODE AIR-53012

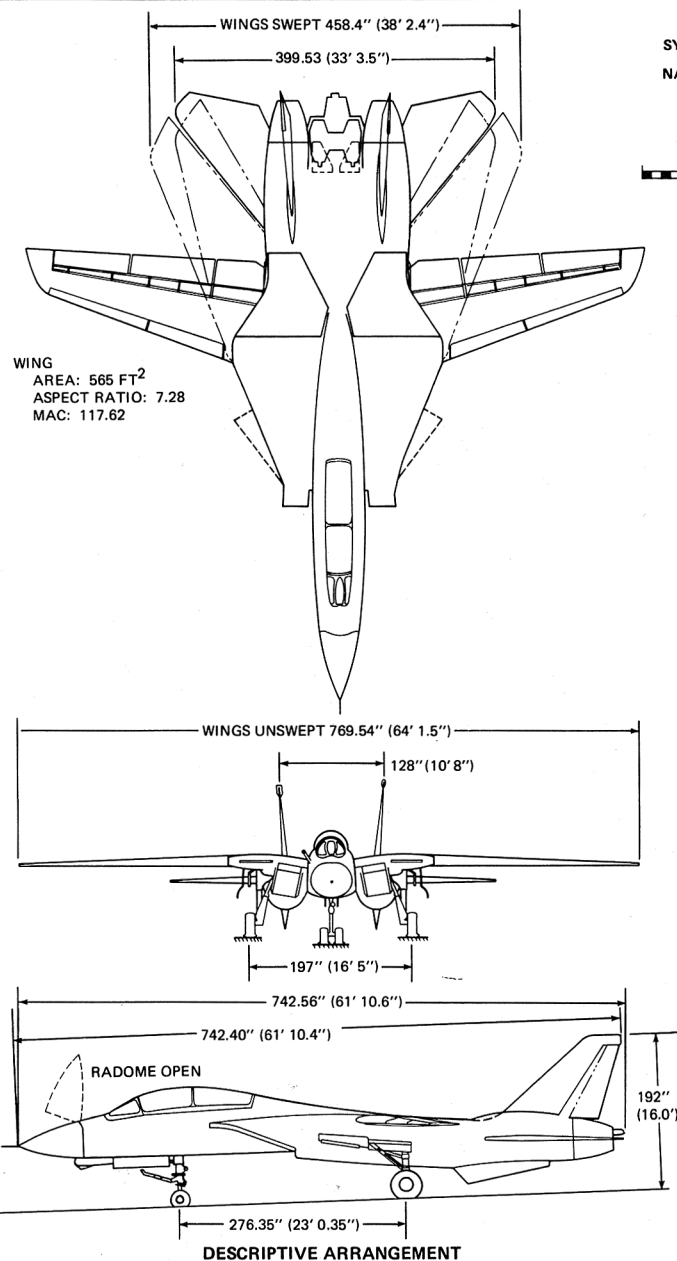
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Subject to GDS of F-11652
Automatically Downgraded at Two
Year Intervals
Declassified on December 31, 1980~~

STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/4A (Rev. 7-65)

APRIL 1977

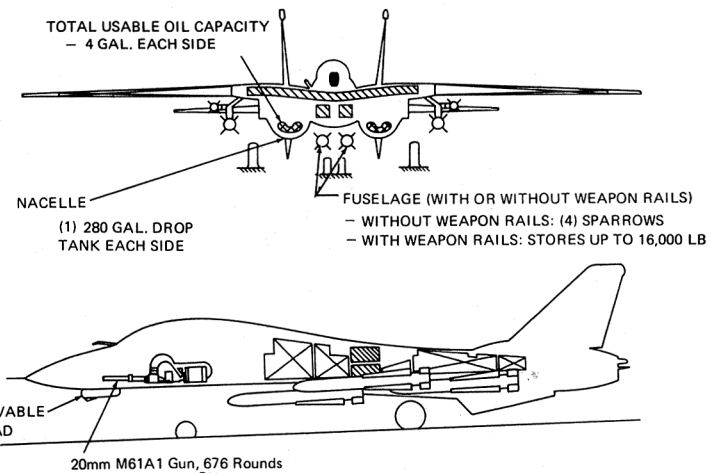
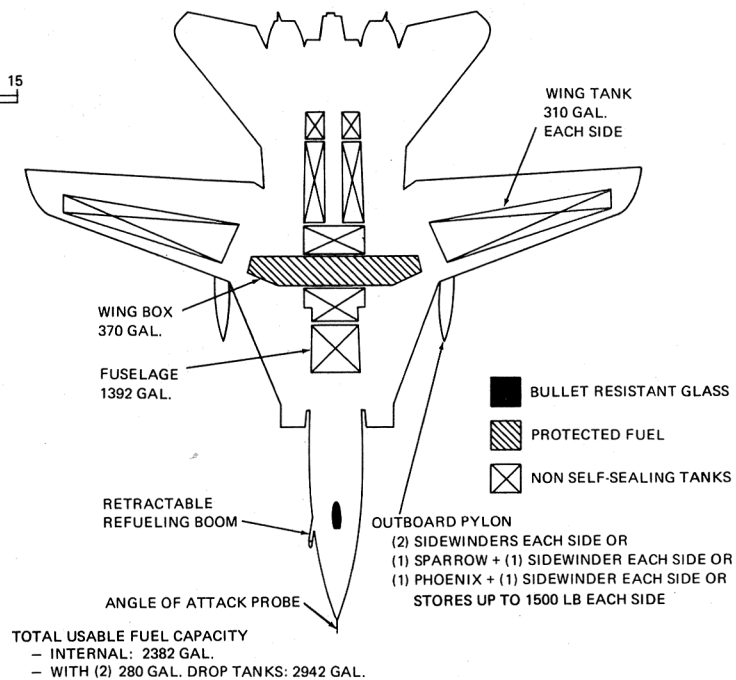
DECLASSIFIED

F-14A



NAVAL AIR
SYSTEMS COMMAND
NAVY DEPARTMENT

0 5 10 15
SCALE, FT



ARMAMENT AND TANKAGE

STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/48 (Rev. 7-65)

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS																																															
Number and Model _____ (2) TF30-P-412A Manufacturer _____ Pratt & Whitney Engine Specification Number _____ N-6191, 30 May 1972 Type _____ Twin-Spool Axial-Flow Turbofan Augmentation _____ Modulated A/B Length with A/B _____ (Operating Temp, Nozzle in A/B Position) _____ 223.59 in. Diameter (Operating Temp.) _____ 50.5 in. Dry Weight _____ 3971 lb Nozzle Type _____ Translating C-D Iris				<p>The F-14A is a carrier-based, variable-sweep-wing, all-weather, two-man, tandem cockpit, high-performance weapons system. Two afterburner-equipped turbofan engines are mounted in podded nacelles, permitting adaptation to future powerplant requirements.</p> <p>The primary roles of air superiority and fleet air defense are achieved by the incorporation of an integrated airborne missile control system and specially designed weapon rails. Other electronic devices are incorporated to fulfill additional alternate missions.</p> <p>A Mach/Sweep programmer provides wing sweep for optimum performance and maneuvering throughout the entire operating range of the aircraft without pilot attention. Control about all three axes is achieved by irreversible hydraulically actuated surfaces. Symmetric movement of the all-movable horizontal tail surfaces provides longitudinal control. Lateral control is provided by spoilers and asymmetric movement of the horizontal tail surfaces. Twin rudders are used for directional control.</p> <p>High-lift devices consist of simply pivoted single-slotted trailing edge flaps and conventional leading edge slats. The flaps and slats in conjunction with the glove vanes, housed in the leading edge of the wing glove, are also used as maneuvering aids during subsonic and transonic flight. Increased maneuverability and specific excess power (P_S) in supersonic flight is provided by automatic extension of the glove vanes. Deceleration control is provided by conventional speed brakes located on the upper and lower surfaces of the aft fuselage.</p> <p>A wing oversweep position results in an optimized spotting factor of 1.54 based on 145 A-7 aircraft. Nose tow catapulting is used. A retractable boom is provided for in-flight refueling.</p>		<table border="1"> <thead> <tr> <th colspan="2">LOADINGS</th> <th>LB</th> <th>L.F.</th> </tr> </thead> <tbody> <tr> <td colspan="2">Empty (Actual Weight)</td> <td>39,037</td> <td></td> </tr> <tr> <td colspan="2">Basic Fighter Escort</td> <td>40,445</td> <td></td> </tr> <tr> <td colspan="2">Flight Design Gross Weight</td> <td></td> <td></td> </tr> <tr> <td>Fighter</td> <td></td> <td>49,548</td> <td>6.5N_Z</td> </tr> <tr> <td>Attack</td> <td></td> <td>57,685</td> <td>*7.5N_Z</td> </tr> <tr> <td colspan="2">Maximum Takeoff</td> <td></td> <td></td> </tr> <tr> <td>Field/Catapult</td> <td></td> <td>74,349</td> <td>**4.6N_X</td> </tr> <tr> <td colspan="2">Maximum Landing</td> <td></td> <td></td> </tr> <tr> <td>Arresting</td> <td></td> <td>51,830</td> <td>6.6N_Z</td> </tr> <tr> <td>Field</td> <td></td> <td>60,029</td> <td></td> </tr> </tbody> </table> <p>*Leading edge sweep greater than 55° **Catapult horizontal tow force is not to exceed 213,000 lb limit load</p>				LOADINGS		LB	L.F.	Empty (Actual Weight)		39,037		Basic Fighter Escort		40,445		Flight Design Gross Weight				Fighter		49,548	6.5N _Z	Attack		57,685	*7.5N _Z	Maximum Takeoff				Field/Catapult		74,349	**4.6N _X	Maximum Landing				Arresting		51,830	6.6N _Z	Field		60,029	
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<p>DIMENSIONS</p> <p>WING</p> <p>Area (Reference) _____ 565 sq ft Unswep Leading _____ Edge Sweep _____ 20° Span _____ 64.13 ft MAC _____ 117.62 in. Incidence at B.L. 96.3 _____ +0.74° Dihedral _____ -1°50' Swept Leading _____ Edge Sweep _____ 68° Span _____ 38.2 ft Overswept Leading _____ Edge Sweep _____ 75° Span _____ 33.29 ft</p> <p>LENGTH _____ 61.9 ft HEIGHT _____ 16 ft TREAD _____ 16.4 ft</p>				<p>ORDNANCE</p> <p>GUN</p> <p>Vulcan _____ M61A1 (676 rounds)</p> <p>MISSILES</p> <p>Sparrow _____ AIM-7E, AIM-7F Sidewinder _____ AIM-9D, G, & H Phoenix _____ AIM-54A</p> <p>BOMBS</p> <p>Gen Purpose _____ MK-81, MK-82, MK-83, MK-84 MK-81 W/MK-14, MK-82 W/MK-15, MK-40 W/MAU-91A/B Cluster _____ MK-20 Mod-2, CBU-59/B Practice _____ MK-76</p> <p>ROCKET PACKAGES _____ LAU-10A/A, FLARES _____ MK-45</p> <p>FUEL TANKS _____ FPU-1/A (280 gal)</p> <p>LAUNCHERS _____ LAU-92/A (AIM-7), LAU-7A-3 (AIM-9), LAU-93/A (AIM-54)</p> <p>BOMB RACKS _____ BRU-10, BRU-24, BRU-25 MULTI-ADAPTERS _____ MAK-79C/A37B Triple Ejector Rack _____ A/A37B-5</p> <p>FUEL TANK JETTISON MECHANISM _____ MXU-611/A</p>																																																	

STANDARD AIRCRAFT CHARACTERISTICS, NAVIERS FORM 13100/48 (Rev. 7-65)

PERFORMANCE SUMMARY

TAKEOFF LOADING CONDITION	①	③	⑤	⑦	⑨
	HI-HI-HI (1) M61A1 20MM GUN	FIGHTER ESCORT (4) SPARROWS + (1) M61A1 20MM GUN	FLEET AIR DEFENSE (6) PHOENIX + (1) M61A1 20MM GUN + (2) 280-GAL. DROP TANKS	DECK LAUNCHED INTCP (4) SPARROWS + (1) M61A1 20MM GUN + (2) 280-GAL. DROP TANKS	FERRY RANGE (1) M61A1 20MM GUN + (2) 280-GAL. DROP TANKS
TAKEOFF WEIGHT lb	57,646	59,649	70,700	64,076	62,076
Fuel internal/external (JP-5) lb/lb	16,200	16,200	16,200/3,800	16,200/3,800	16,200/3,800
Payload lb	378	2,378	6,288	2,378	378
Wing loading (Based on Ref. area) lb/sq ft	102.0	105.6	125.1	113.4	109.9
Stall speed — power off kn	115	117	127	121	119
Takeoff run at S.L. — calm (A) ft	2,290	2,400	3,170	2,690	2,560
Takeoff run at S.L. — 25 kn wind (A) ft	1,490	1,560	2,130	1,760	1,670
Takeoff to clear 50 ft — calm (A) ft	3,070	3,210	4,100	3,560	3,400
Max speed/altitude (A) kn/ft	610/S.L.	607/S.L.	562/10,000	590/S.L.	595/S.L.
Rate of climb at S.L. (A) fpm	10,000	9,600	6,550	8,500	8,850
Time: S.L. to 20,000 ft (A)/(B) min	2.6/0.52	2.7/0.57	4.5/0.82	3.1/0.62	3.0/-
Time: S.L. to 30,000 ft (A)/(B) min	5.1/0.96	5.5/0.98	9.6/1.47	6.1/1.08	6.0/-
Service ceiling (100 fpm) (A) ft	41,600	40,700	35,100	38,800	39,400
Combat range n mi	1,556	1,483	1,381(C)	1,830(C)	1,914(C)
Average cruising speed kn	407	408	405	409	408
Cruising altitude(s) ft	35,400/40,100	34,800/39,200	31,100/35,600	33,400/39,000	33,900/39,800
Combat radius/mission time n mi/hr	739/3.71	447/2.23	150/2.42	167/0.62	—
Average cruising speed kn	407	408	406	407/1,033	—
Ferry Range n mi	—	—	—	—	1,831(D)
Loiter time @ 35,000 ft hr	—	—	1.60	—	—
COMBAT LOADING CONDITION	②	④	⑥	⑧	⑩
		MISSILES RETAINED	TANKS OFF MISSILES RETAINED	TANKS OFF MISSILES RETAINED	TANKS RETAINED
COMBAT WEIGHT lb	51,166	53,166	62,240	55,616	54,076
Engine power	MAX A/B	MAX A/B	MAX A/B	MAX A/B	MAX A/B
Fuel lb	9,720	9,720	12,000	12,000	12,000
Combat speed/combat altitude (B) (E) kn/ft	1,176/35,000	926/10,000	934/35,000	1,170/45,000	—
Rate of climb/combat altitude (B) fpm/ft	28,000/35,000	36,200/10,000	10,300/35,000	11,200/45,000	—
Combat ceiling (500 fpm)/speed (B) ft/kn	58,500/1,030	56,800/1,030	48,400/803	55,400/1,030	52,600/1,030
Rate of climb at S.L. (B) fpm	47,400	45,300	33,500	43,100	43,300
Max speed at S.L. (B) kn	794	792	701	781	662
Max speed/altitude (B) (E) kn/ft	1,170/40,000	1,170/50,000	975/45,000	1,170/50,000	1,038/35,000
Time: S.L. to 40,000 FT (B) min	1.56	1.62	2.16	1.71	—
LANDING WEIGHT lb	43,341	45,387	52,637	45,757	44,206
Fuel lb	1,895	1,941	2,397	2,141	2,130
Stall speed — power off/approach power kn/kn	101/95	103/97	110/105	103/98	101/96
Landing distance — ground roll/over 50 ft obstacle ft/ft	2,500/3,450	2,600/3,550	2,900/3,900	2,600/3,550	2,530/3,500

NOTES

SPOTTING: A total of 94 airplanes can be accommodated in a safe parking area on the flight & hangar decks of a CVA-59 class angled deck carrier.

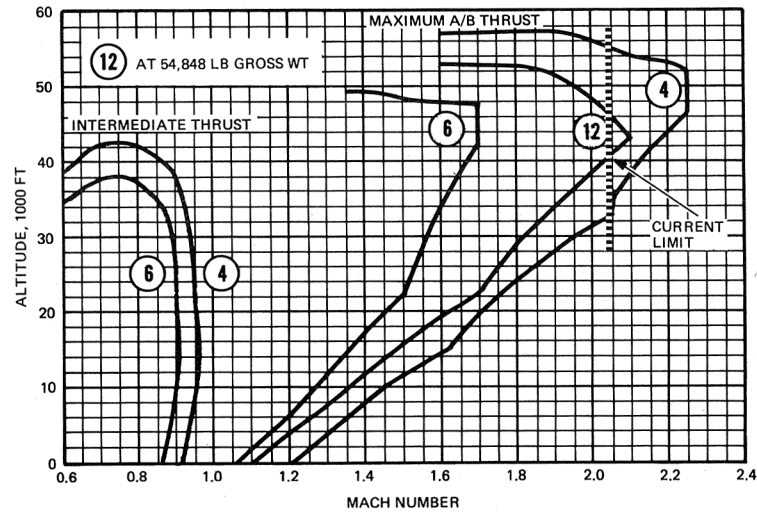
PERFORMANCE BASIS: Flight Test

- (A) Intermediate Thrust
 (B) Max A/B Thrust
 (C) Drop Tanks Symmetrically Dropped When Empty
 (D) Drop Tanks Retained
 (E) Current Limit, Maximum Mach = 2.04

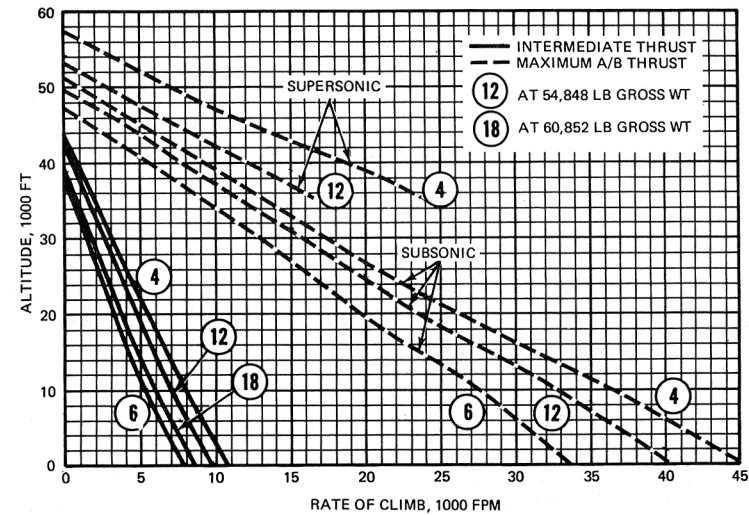
STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100-4 D (Rev. 7-65)

STANDARD AIRCRAFT CHARACTERISTICS, NAVPERS FORM 13100/4G (REV. 7-65)

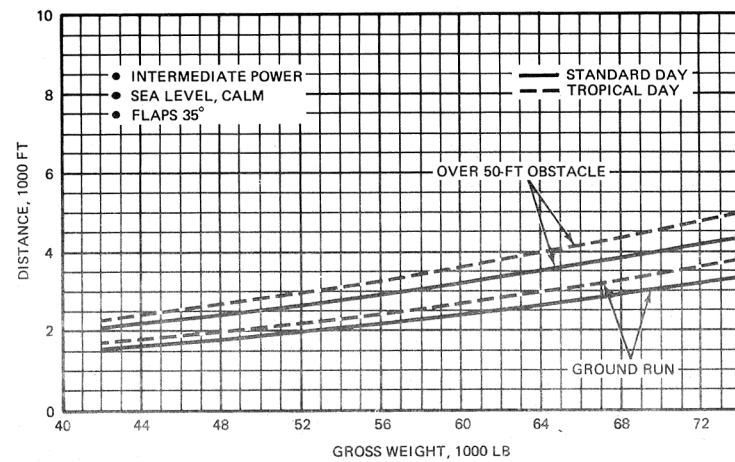
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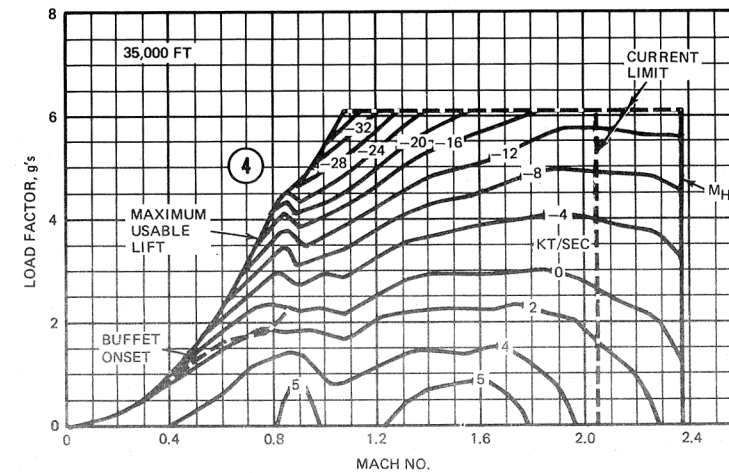
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TAKEOFF

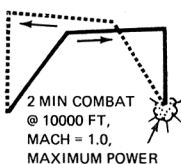
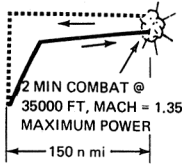
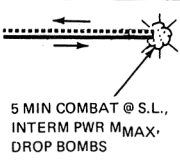
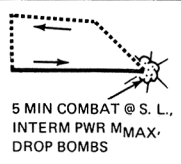
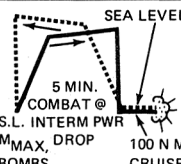



MANEUVERABILITY



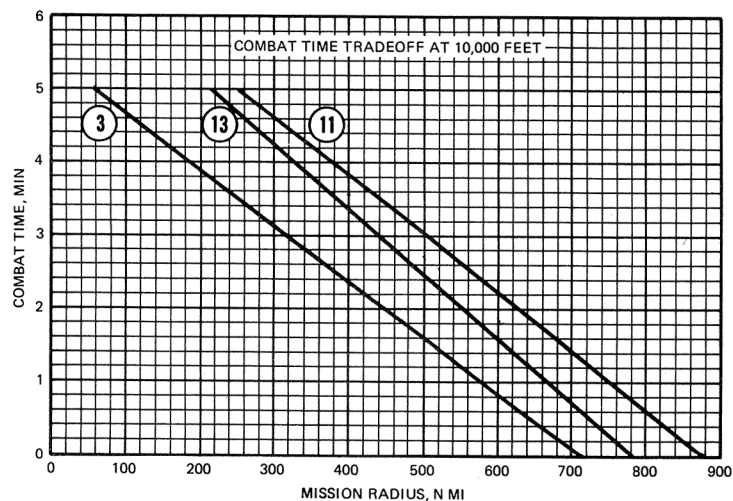
○ LOADING CONDITION COLUMN NUMBER

MISSION SUMMARY — ALTERNATE LOADINGS

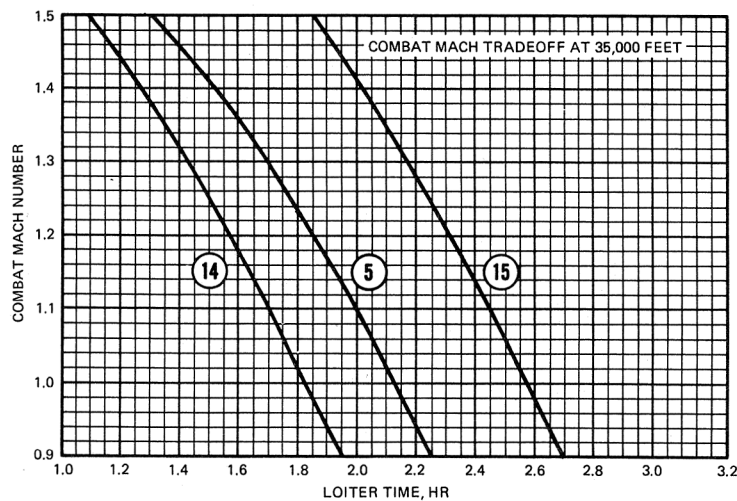
		FIGHTER ESCORT		FLEET AIR DEFENSE		LO - LO - LO		LO - LO - HI		HI - LO - LO - HI		CLOSE SUPPORT	
													
EXTERNAL STORE LOADING	TOWG	COMBAT RADIUS, n mi	MISSION TIME, hr	LOITER TIME AT 35,000 FT, hr	MISSION TIME, hr	COMBAT RADIUS, n mi	MISSION TIME, hr	COMBAT RADIUS, n mi	MISSION TIME, hr	COMBAT RADIUS, n mi	MISSION TIME, hr	COMBAT RADIUS, n mi	MISSION TIME, hr
⑪ (4) Sparrows + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	64,076	630	3.12										
⑫ (4) Sparrows + (1) M61A1 20MM Cannon + (4) Sidewinders	61,328	389	1.96										
⑬ (4) Sparrows + (4) Sidewinders + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	65,758	554	2.77										
⑭ (4) Phoenix + (1) M61A1 20MM Cannon	63,456			1.34	2.14								
⑮ (4) Phoenix + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	67,886			2.10	2.90								
⑯ (6) MK-82 Snakeyes + (1) M61A1 20MM Cannon	62,588					317	2.57	395	2.57	441	2.54	441	3.17
⑰ (6) MK-82 Snakeyes + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	67,018					408	3.25	516	3.31	616	3.39	610	4.00
⑱ (14) MK-82 Snakeyes + (1) M61A1 20MM Cannon	67,332					306	2.46	377	2.43	413	2.40	393	2.94
⑲ (14) MK-82 Snakeyes + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	71,762					394	3.12	493	3.13	577	3.20	552	3.72
⑳ (8) MK-83 Lo Drag + (1) M61A1 20MM Cannon + (2) 280 Gallon Drop Tanks	71,508					405	3.18	511	3.21	645(A) 576(B)	3.38(A) 2.85(B)	580	3.84
Notes: Drop tanks symmetrically dropped when empty (A) 50 N Mi S.L. Cruise (B) 50 N Mi S.L. MACH = .8 Dash													

STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100-41 (Rev. 7-65)

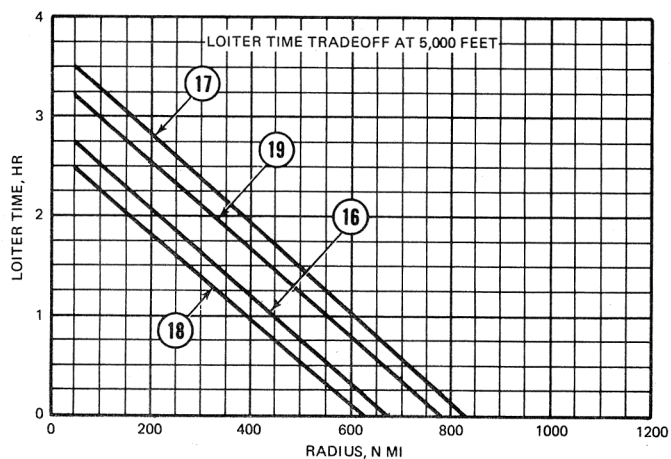
FIGHTER ESCORT



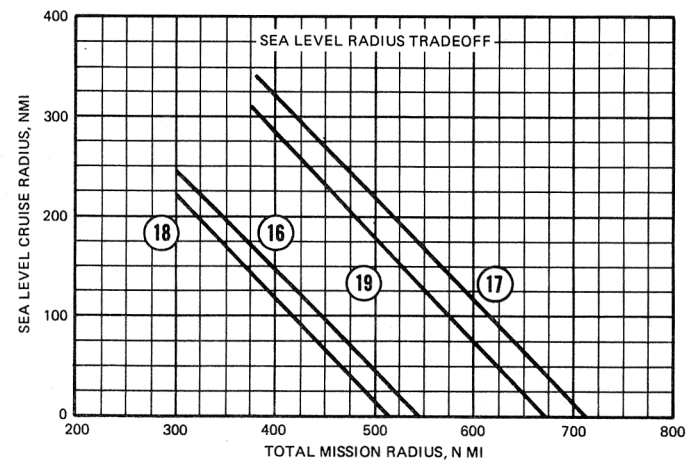
FLEET AIR DEFENSE



CLOSE SUPPORT

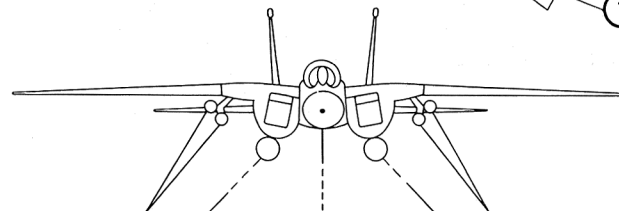
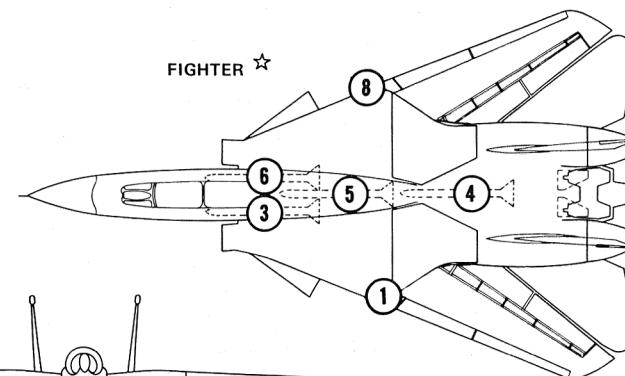
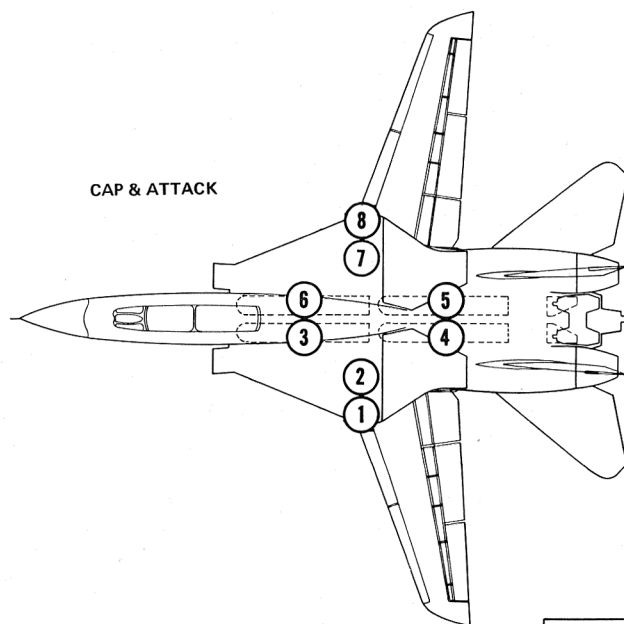


HI-LO-LO-HI



○ LOADING CONDITION COLUMN NUMBER

STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/4G (REV. 7-65)



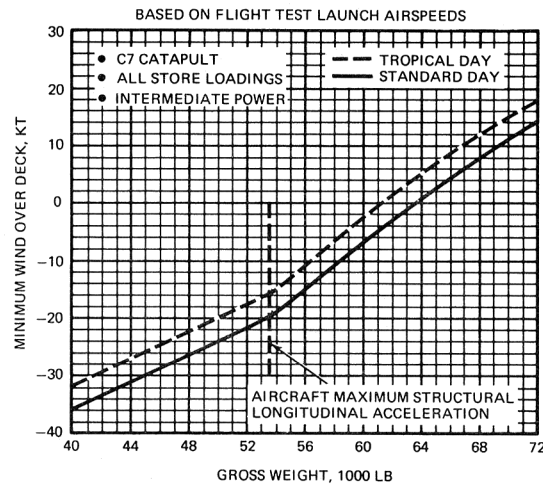
STORE STATION	8	7	6	5	4	3	2	1	TOTAL
MISSILES									
AIM-7E/F (Sparrow) ☆	1		1	1	1	1		1	6
AIM-9D,G,H (Sidewinder)	2							2	4
AIM-54/A (Phoenix)	1		1	1	1	1		1	6
BOMBS									
MK-81 (Lo & Hi Drag)			4	3	3	4			14
MK-82 (Lo & Hi Drag)			4	3	3	4			14
MK-83 (Lo Drag)			3	1	2	3			9
MK-84 (Lo Drag)			1	1	1	1			4
MK-40 (Destructor)			2	1	1	2			6
MK-20 (Rockeye)			2	1	1	2			6
CBU-59/B (APAM)			2	1	1	2			6
MK-76 (Practice)			4	4	4	4			16
FLARES									
MK-45			3	4	4	3			14
ROCKETS									
LAU-10A/A			1			2			3
FUEL TANKS									
FPU-1/A (280 Gal.)		1					1		2
MULTI-ADAPTER									
A/A37B-6(TER-7)			1			1			2

PLUS INTERNAL M61A1 20-MM GUN/676 RDS

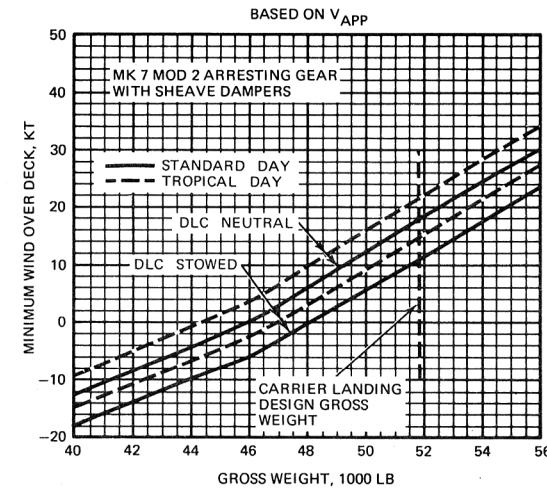
STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/4B (Rev. 7-65)

DECLASSIFIED

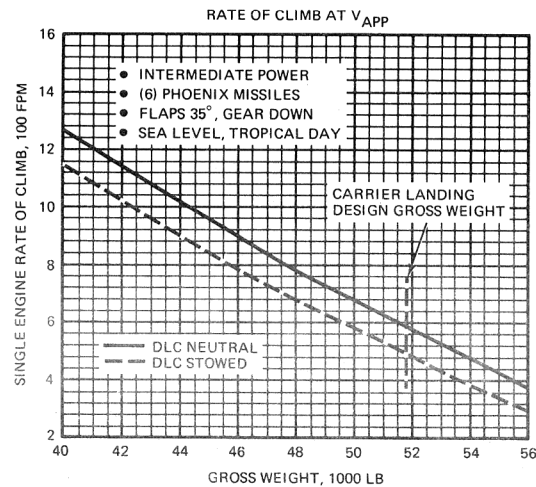
MINIMUM WIND OVER DECK FOR CATAPULTING



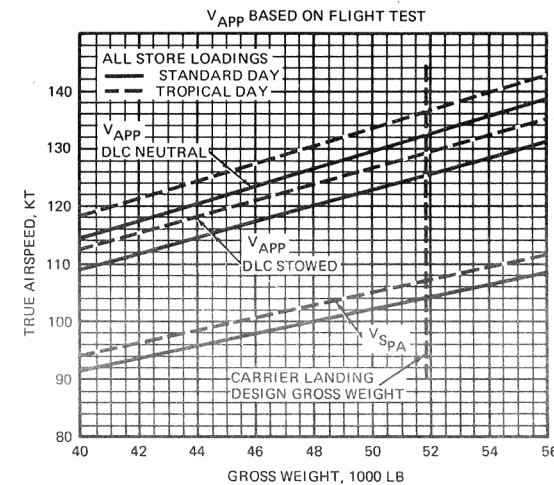
MINIMUM WIND OVER DECK FOR ARRESTING



SINGLE ENGINE RATE OF CLIMB



CARRIER APPROACH SPEEDS



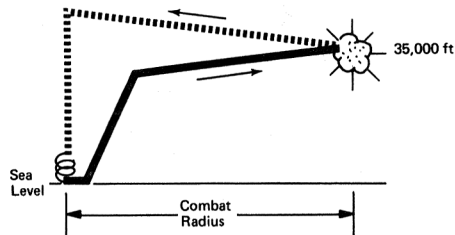
(A) These curves should be used for planning purposes only. Actual catapult and arresting gear operation should be in accordance with applicable Aircraft Technical Orders, and Catapult and Arresting Gear Bulletins.

(B) Flap deflection for catapulting and landing = 35° .

(C) DLC = Direct Lift Control.

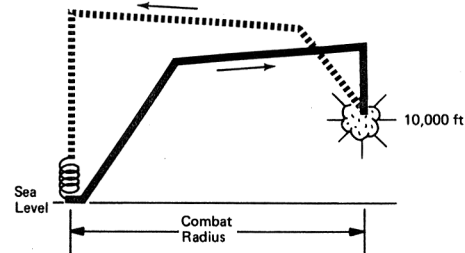
STANDARD AIRCRAFT CHARACTERISTICS, NAVPERS FORM 13100/4G (REV. 7-65)

HI-HI-HI



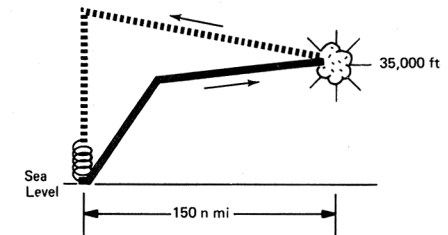
- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum-range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Combat: 5 min at 35,000 ft altitude intermediate power M_{max} (stores on, no distance gained)
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used.
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

FIGHTER ESCORT



- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power.
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to 10,000 ft: No distance gained or fuel used
- Combat: 2 min at max A/B power at $M = 1.0$.
- Climb at intermediate power climb from 10,000 ft to best cruise altitude
- Cruise back at maximum range speed at optimum cruise altitude.
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

FLEET AIR DEFENSE

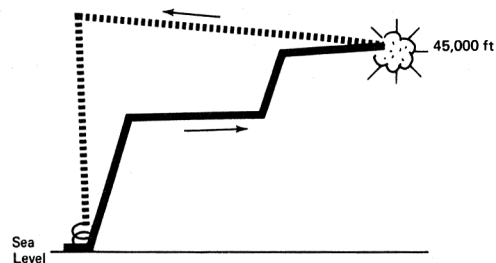


- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Loiter at maximum endurance speed at 35,000 ft (no distance gained)
- Accelerate at 35,000 ft from maximum endurance speed to $M = 1.35$ at max A/B power (no distance gained)
- Combat: 2 min at $M = 1.35$ at max A/B power
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

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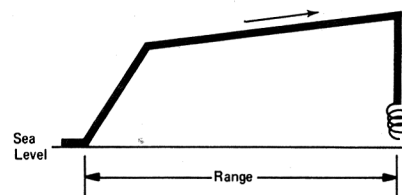
SERVICE

DECK-LAUNCHED INTERCEPT



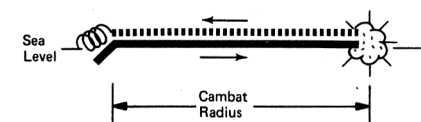
- Warmup, taxi, takeoff: 5 min with max continuous power and 1 minute max A/B power at sea level static
- Climb with max A/B $M=1.8$ and 45,000 ft altitude. (Drop external fuel tanks when empty)
- Dash: Dash out at $M=1.8$ and 45,000 ft
- Combat: 2 min at $M=1.8$ and 45,000 ft
- Cruise back at max range speed at optimum cruise altitude
- Descend to sea level; no distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level

FERRY OR COMBAT RANGE



- Warmup, taxi, takeoff: 5 min at sea level static with max continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at max range speed at optimum cruise altitude.
- Descend to sea level; no distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level

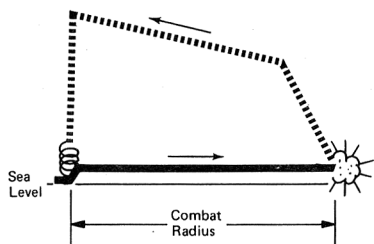
LO-LO-LO



- Warmup, taxi, takeoff: 5 min at sea level static with max continuous power
- Cruise out at max range speed at sea level (Drop external fuel tanks when empty)
- Combat: 5 min at sea level intermediate power, M_{max} (Stores on, no distance gained.) Stores dropped after combat
- Cruise back at max range speed at sea level
- Reserve: 5% of initial fuel plus 20 min at max endurance speed at sea level

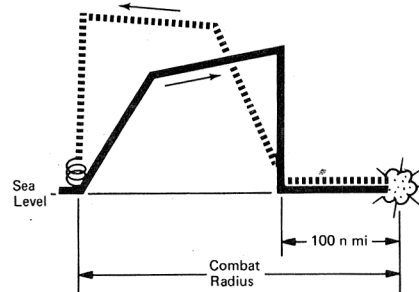
STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/4G (REV. 7-65)

LO-LO-HI



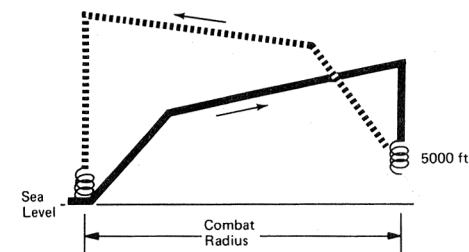
- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Cruise out at maximum range speed at sea level (drop external fuel tanks when empty)
- Combat: 5 min at sea level intermediate power M_{max} . Stores dropped after combat
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

HI-LO-LO-HI



- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to sea level when 100 n mi from target (no fuel used, no distance gained)
- Cruise out at sea level at maximum-range speed to target
- Combat: 5 min at sea level intermediate power M_{max} . (Stores on, no distance gained) Stores dropped after combat
- Cruise back at sea level at maximum-range speed to a point 100 n mi from target
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum-range speed at optimum-cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

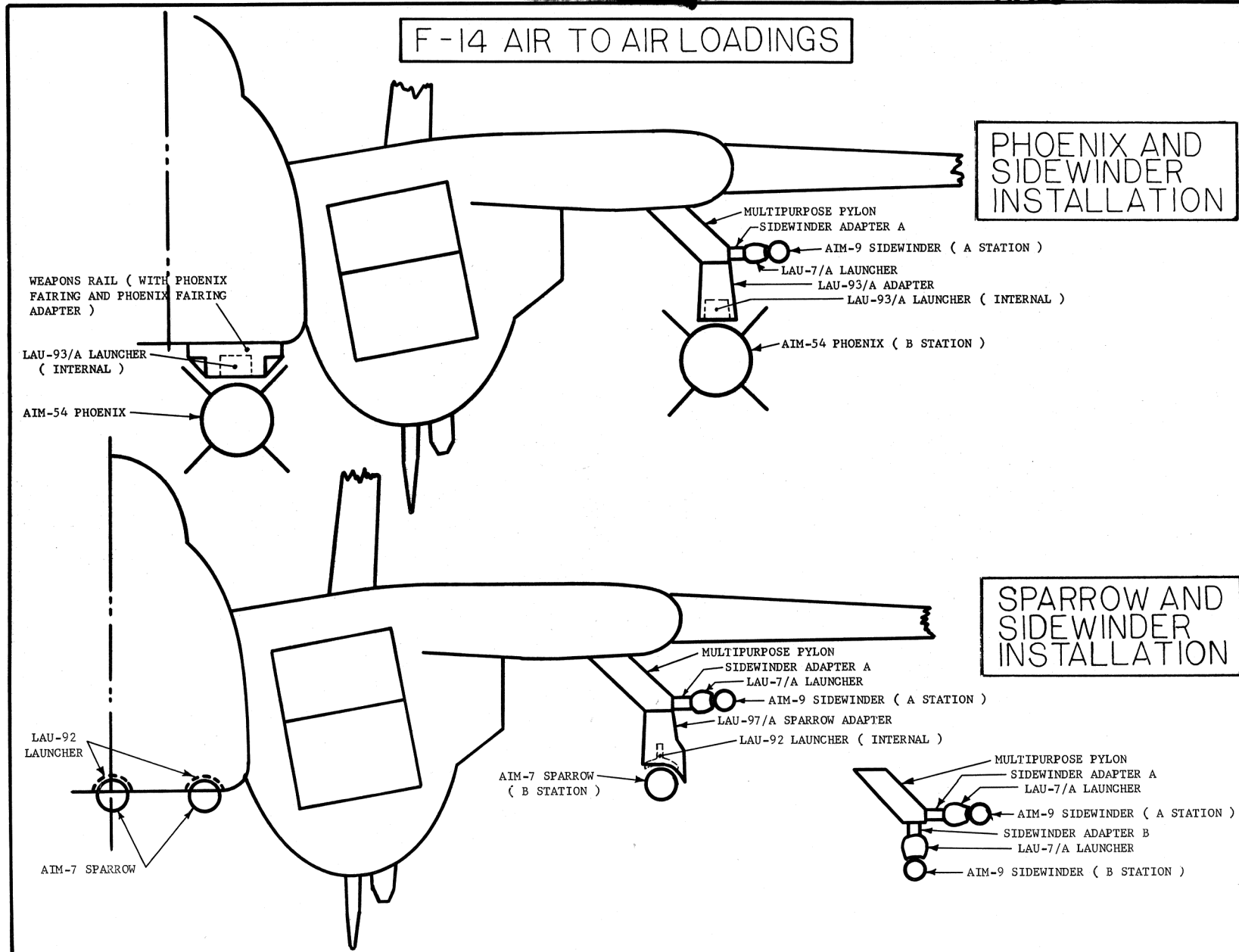
CLOSE SUPPORT



- Warmup, taxi, takeoff: 5 min at sea level static with maximum continuous power
- Climb on course to optimum cruise altitude with intermediate power
- Cruise out at maximum range speed at optimum cruise altitude (drop external fuel tanks when empty)
- Descend to 5000 ft (no fuel used, no distance gained)
- Loiter 1 hr at maximum endurance speed at 5000 ft (stores on no distance gained) Stores dropped at end of loiter
- Climb on course to optimum cruise altitude with intermediate power
- Cruise back at maximum range speed at optimum cruise altitude
- Descend to sea level: No distance gained or fuel used
- Reserve: 5% of initial fuel plus 20 min at maximum endurance speed at sea level

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SERVICE



APRIL 1977

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