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BY T.G. Hill ON 12/10/96

NAVAIR 00-110AA7-3

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GROUP 4 DOCUMENT
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DOD DIR 5200.10

Standard Aircraft Characteristics

NAVY MODEL A-7C AIRCRAFT

(TITLE UNCLASSIFIED)

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

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SERVICE

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



STANDARD AIRCRAFT CHARACTERISTICS

A-7C

(PRATT & WHITNEY TF30-P-8 ENGINE)

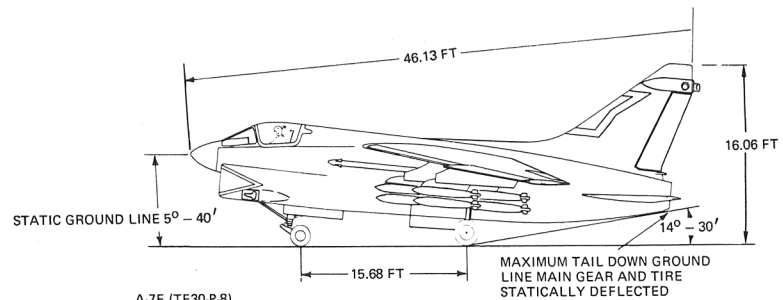
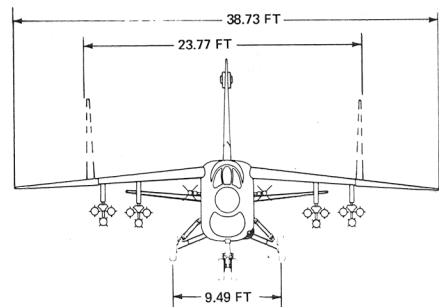
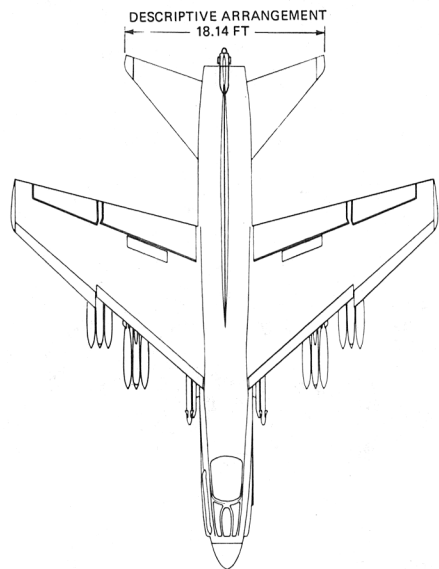
VOUGHT AERONAUTICS DIVISION
LTV AEROSPACE CORPORATION
DALLAS TEXAS

NOTE: NAVAIR NOTICE 13100 DTD
15 JUNE 1971 REDESIGNATED THE
A-7E (TF30-P-8) THE A-7C. IN
THESE CHARTS THE TWO DESIGNA-
TIONS ARE INTERCHANGEABLE.

APRIL 1972

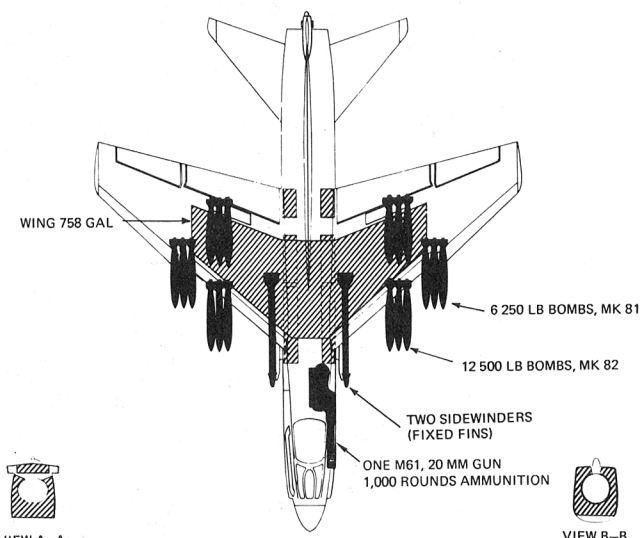
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A-7C

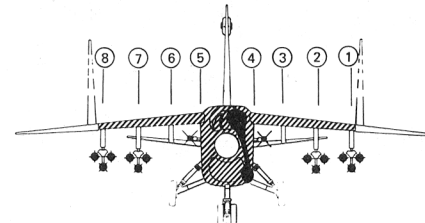


A-7E (TF30-P-8)

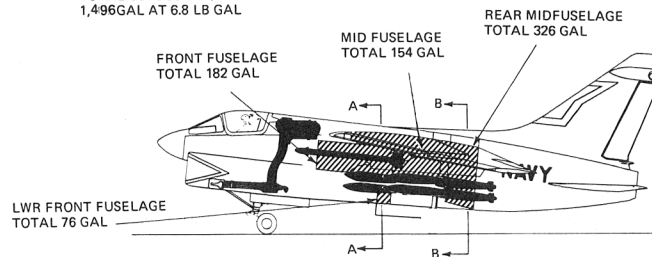
ARMAMENT AND TANKAGE



WET PYLONS - 1 AND 3, 6 AND 8



- ARMAMENT
- FUEL CELLS
TOTAL USABLE CAPACITY
1,496 GAL AT 6.8 LB GAL



STANDARD AIRCRAFT CHARACTERISTICS, NAVWEP FORM 13100/4F (Rev. 7-65)

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

ELECTRONICS	
Communications Encoder	Juliet 28
Heading Mode System	
Data Link	AN/ASW-25A
UHF Radio Receiver-	
Transmitter	AN/ARC-51A
Radio Set Control	C-8191/ARC
Switching Unit	SA-1652/ARC
Freq Channel Ind	ID-1660/ARC
UHF ADF	AN/ARA-50
UHF Receiver	AN/ARR-69A
Doppler Radar System	AN/APN-190(V)
Radar Beacon	AN/APN-154
2-Inch Remote Attitude	
IND System	
Air Data Computer	CP-953/AJQ
IFT Transponder	AN/APX-72
TACAN	AN/ARN-52(V)
Intercom	AN/AIC-25
Automatic Flight Control	
System	AN/ASW-30(V) 1
Roll/Pitch Trim System	
Nose Gear Steering	
System	
Approach Power	
Compensating System	AN/ASN-54 (V)
Angle-of-Attack System	
Head-Up Display	AN/AVQ-7 (V)
Radio Command Control	
Transmitter	AN/ARW-77
Forward-Looking Radar	AN/APQ-126(V)
Electrical Fusing System	AN/AWW-2B
Armament Monitor	
and Control	A/A24B-4 (V)
Shrike Signal Conditioner	
(SIDS)	
Radar Altimeter	AN/APN-141(V)
Inertial Measurement Set	AN/ASN-90(V)
Nav/WD Digital Computer	AN/ASN-91(V)
Armament Stations	
Control Unit	C-8185/AWE
Interference Blanker	MX-8253/A
Destruct Initiator	MX-7832/ASQ
Destruct Battery	
Countermeasures Receiver-	
Transmitter	AN/ALQ-100
ECM Warning Receiver	AN/APR-27
ECM Warning Receiver	AN/APR-25(V)
Countermeasures	
Dispenser Set	AN/ALE-29A
Integrated ECM Control	
Projected Map Display Set	AN/ASN-99
ADS (Altitude Reporting)	
AAU-19 Servoed Altimeter	
AIMS	
MK 12 Computer	KIT-1/TSEC
Inflight Monitor	TS 1843/APX
Indicator	AAU-19/A

MISSION AND DESCRIPTION

The A-7E is a single-place, carrier-based, turbofan, light attack airplane developed from the A-7B. The airplane is designed to provide high attack utility and flexibility for close support and interdiction missions by virtue of a large number of external store stations to provide ordnance loading capacity and freedom of ordnance choice, a large internal fuel capacity to make external fuel unnecessary for most missions, while retaining a maximum number of stations for armament, an excellent overload capability in terms of wind-over-deck requirements, flying qualities, and structural integrity. Features to expedite maintenance and airplane turnaround are important A-7E design characteristics.

The A-7E has fixed wing incidence and a high-lift system composed of leading edge flaps and single slotted trailing edge flaps. Lateral control is provided by outboard ailerons and inboard spoilers. Superior stability and control qualities over the entire aircraft speed envelope, including transonic, are features of the A-7E.

A stick steering autopilot is provided to augment the weapon system capability. An approach power compensator provides automatic speed control for carrier landing.

In addition to the basic A-7B features, the A-7E provides a high accuracy flexible weapons delivery system, an M61 Vulcan cannon, a head-up display to aid the pilot during weapons delivery, enroute, and terrain following and landing modes.

Weapon delivery improvements include a new all-weather type radar, digital weapon delivery and navigation computer, inertial quality platform, head-up display, projected map display, a new air data computer, and a new roll stabilized doppler radar system.

POWER PLANT

Engine	TF30-P-8 (1 - 67 aircraft)
Type	Turbofan
Manufacturer	Pratt & Whitney
Length	127.58 Inches
Diameter	42.4 Inches
Specification	N-1832 (31 May 1963)
Compressor and	
Fan	Axial Flow
Tail Pipe/Nozzle	Fixed
Specification Thrust Ratings	
(Sea Level Static)	
Military	12,200 Pounds
(30 Minute Limit)	
Normal	9,600 Pounds

DIMENSIONS

<u>Wing:</u>	
Area	375 Sq Ft
Span: Maximum	38.73 Ft
Folded	23.77 Ft
Aspect Ratio	4
Sweep 1/4 Chord	35°
MGC	130.08 In
Length	46.13 Ft
Height	16.06 Ft
Maximum Tread	9.49 Ft

WEIGHTS

Loading	TF30-P-8 Pounds
Empty	17,569
Basic	18,250*
Design	29,575
Combat	27,443*
Max T.O. (Overload)	42,000*
Max T.O. (Normal)	35,890
Max Ldg (Carrier)	25,300

*Includes 284 pounds Engine Armor

FUEL AND OIL

Gal	No. Tanks	Location	Self-Sealing
Main Cluster:			
Fuselage			
182	2	Left and Right Forward	No
154	2	Mid	No
76	1	Main Sump	Yes
326	1	Fuselage: Aft Bladder Transfer System	Partial
Wing: Integral Transfer System			
758	1		No
1,496			
Usable Fuel Capacity 1,496 Gal			
Fuel Specification MIL-J-5624F			
Fuel Grade JP-5			
OIL			
Engine Oil Tank (total) 5 Gal			
(useable) 4 Gal			
Oil Specification MIL-L-23699			

ORDNANCE

No.	Description	Location
1	20 MM Aircraft Gun, M61	Lower Front Fuselage
500	(Normal) Rounds of 20 MM Ammunition	
1,000	(Max)	
<u>External</u>		
2	Fuselage Pylons for Single Sidewinders or LAU-33 A/A	
	2 Round Zuni Launchers (360-lb capacity)	
6	Wing Mounted Pylons (3 per side), 4 - 3,500-lb capacity (2 wet), 2 - 2,500-lb capacity (wet)	

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STANDARD AIRCRAFT CHARACTERISTICS, NAVPERS FORM 13100/4J (Rev. 7-65)

TAKEOFF LOADING CONDITION		① HI-HI-HI MISSION CLEAN AIRPLANE	② PRIMARY ATTACK MISSION 6 MK 81 SNAKEYES	③ PRIMARY ATTACK MISSION 12 MK 81 SNAKEYES	④ 5,000 FT LOITER MISSION 12 MK 82 AND 6 MK 81 BOMBS	⑤ DEEP STRIKE MISSION 1 MK 28 AND 3-300-GAL TANKS	⑥ FERRY MISSION 2-300-GAL TANKS
Takeoff weight	lb	28,945	31,512	33,557	38,212	38,727	33,929
Fuel – internal/external	lb/lb	10,172/0	10,172/0	10,172/0	10,172/0	10,172/6,120	10,172/4,080
Payload ¹	lb	0	1,800	3,600	7,500	2,000	0
Wing loading	lb/sq ft	77.2	84.0	89.5	101.9	103.3	90.5
Stall speed – power – off	kn	128	132	136	146	146	138
Takeoff grd run/over 50 ft obs – calm 59°F ² SL	ft/ft	3,020/4,240	3,650/5,160	4,210/6,000	5,690/8,240	5,860/8,300	4,350/6,260
Takeoff grd run/over 50 ft obs – calm 89.6°F ² SL	ft/ft	3,750/5,360	4,580/6,590	5,310/7,780	7,220/11,020	7,320/11,080	5,490/8,150
MRT max speed/altitude	kn/ft	587/SL	538/12,500	529/14,000	470/8,000	530/8,500	554/8,000
MRT rate of climb at SL	fpm	8,097	6,214	4,940	3,760	4,300	5,500
MRT time: SL to 20,000 ft ³	min	4.0	5.0	6.3	9.5	7.1	5.2
MRT time: SL to 30,000 ft ³	min	6.8	11.3	–	–	–	10.9
MRT service ceiling (100 fpm)	ft	40,500	34,420	31,020	25,240	29,750	34,780
Combat range	nmi	2,303	1,554	1,294	946	2,576	2,565
Average cruising speed	kn	473	415	405	377	435	440
Cruising altitude(s)	ft	38,492/44,483	31,605/38,222	27,771/34,635	20,964/27,525	25,355/38,774	32,052/41,251
Combat radius/mission time ⁴	nmi/hr	1,058/4.55	641/3.39	567/3.08	360/2.86	1,117/5.19	–
Average cruising speed	kn	473	426	421	390	434	–
IFR refuel radius / ⁶ mission time ⁴		1,754/7.53	1,168/6.09	1,026/5.49	704/4.85	–	–
Fuel transferred/distance from base	lb/nmi	5,372/1,144 ⁷	5,472/774 ⁸	5,202/640 ⁹	5,100/466 ¹⁰	–	–
Acceleration at CES at 89.6°F ²	ft/sec/sec	3.91	3.09	2.45	1.35	1.33	2.29
COMBAT LOADING CONDITION ¹⁴		⑦	⑧	⑨	⑩	⑪	⑫
Combat weight	lb	24,876	27,443	29,488	34,143	32,210	28,228
Engine power		Military	Military	Military	Military	Military	Military
Fuel	lb	6,103	6,103	6,103	6,103	9,775	8,551
Combat speed/combat altitude	kn/ft	563/22,500	525/SL	510/SL	471/5,000	525/SL	–
Rate of climb/combat altitude	fpm/ft	5,100/22,500	6,580/SL	5,760/SL	3,600/5,000	5,470/SL	–
Combat ceiling (500 fpm)	ft	41,600	35,100	31,400	25,300	31,600	37,600
Rate of climb at SL	fpm	8,220	6,580	5,760	4,480	5,470	6,750
Max speed at SL	kn	588	525	510	467	525	549
Max speed/altitude	kn/ft	588/SL	540/13,500	532/15,000	473/9,000	533/9,500	556/8,000
Landing weight ¹¹		19,810	20,613	20,877	21,669	21,199	20,680 ¹²
Fuel	lb	1,037	1,073	1,091	1,129	1,388	1,287
Stall speed – power off/appr power	kn/kn	105/102	107/104	108/105	110/106	108/105	107/104
Dist grd roll ¹³ / over 50 ft obs	ft/ft	2,630/3,585	2,721/3,676	2,753/3,708	2,825/3,780	2,740/3,695	2,733/3,688

Notes:

- ¹ Payload is droppable ordnance. Does not include 500 rounds of ammunition or external fuel tanks.
- ² Military thrust.
- ³ Climb times consider weight reduction due to fuel used.
- ⁴ Mission time excludes time for warmup and takeoff and 20-minute loiter at sea level.
- ⁵ Cycle time is mission time +20-minute loiter at sea level.
- ⁶ Refuel radius is determined with refueling to full internal fuel capacity of 10,172 pounds. Refueling altitude is cruise ceiling with full internal fuel.
- ⁷ Refuel altitude is 38,126 ft.
- ⁸ Refuel altitude is 30,298 ft.
- ⁹ Refuel altitude is 26,414 ft.
- ¹⁰ Refuel altitude is 19,535 ft.
- ¹¹ 283 lb ammunition retained.
- ¹² 283 lb ammunition and external fuel tanks retained.
- ¹³ Antiskid braking.
- ¹⁴ Combat loading performance includes stores and ammunition.

A-7C

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SUPPLEMENTARY MISSIONS

MISSION LOADINGS FUEL - GAL TAKEOFF WT - LB	100 NMI IN AND OUT		200 NMI IN AND OUT		LO-LO-LO		5,000 FT LOITER		HI-HI-HI	
	R/A NMI	• TIME HR	R/A NMI	• TIME HR	R/A NMI	• TIME HR	R/A NMI	• TIME HR	R/A NMI	• TIME HR
1 MK 28 1,496 GAL INT 31,189, a = 3.285 FT/SEC ² ...	767	3.68	652	3.47	469	3.45	730	4.15	941	4.14
1 MK 28 1,496 GAL INT 900 GAL EXT 38,727, a = 1.357 FT/SEC ² ...	1142	5.60	1055	5.46	720	5.15	1,085	6.00	1,296	6.04
6 MK 81 SE 1,496 GAL INT 31,512, a = 3.183 FT/SEC ²	639	3.39	546	3.42	430	3.31	592	3.81	798	3.85
6 MK 81 SE 1,496 GAL INT 1,200 GAL EXT 41,542, a = 0.910 FT/SEC ²	993	5.45	920	5.32	694	5.15	923	5.78	1,115	5.80
6 MK 82 SE 1,496 GAL INT 33,072, a = 2.726 FT/SEC ²	604	3.25	516	3.10	417	3.21	543	3.60	742	3.62
6 MK 82 SE 1,496 GAL INT 1,200 GAL EXT ... 43,102, a = 0.736 FT/SEC ²	938	5.20	869	5.08	673	5.00	858	5.48	1,055	5.54
20 MK 82 SE 1,496 GAL INT ... 42,083, a = 0.842 FT/SEC ²	372	2.33	326	2.30	318	2.49	253	2.39	443	2.49
12 MK 82 6 MK 81 2 MK 84 1,496 GAL INT ... 42,700, a = 0.775 FT/SEC ²	386	2.36	338	2.32	328	2.51	268	2.44	460	2.55

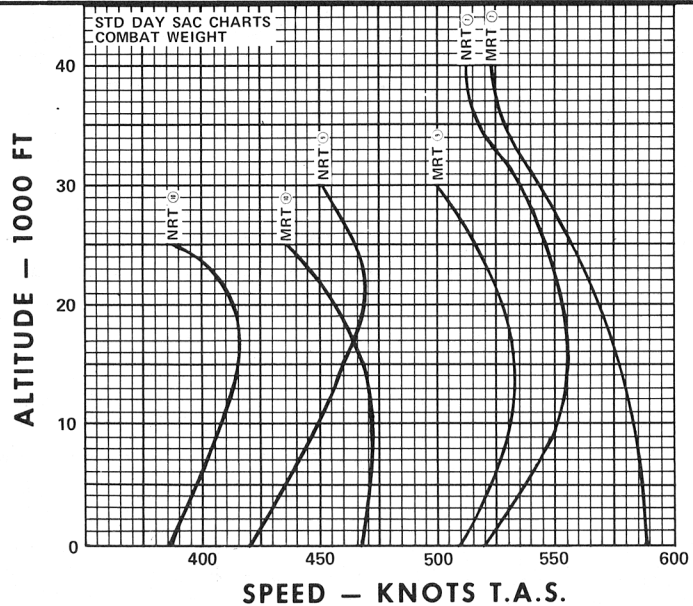
NOTES

- MISSION TIME: EXCLUDES TIME FOR WARMUP AND TAKEOFF AND 20-MINUTE LOITER TIME
- BCS: BEST CRUISE SPEED
- ACCELERATION AFTER CATAPULT AT 0.85 C_{L,max} AT 89.6°F, MILITARY THRUST
- FOR PERFORMANCE INFORMATION ONLY. MAXIMUM TAKEOFF WEIGHT RESTRICTED TO 42,000 POUNDS

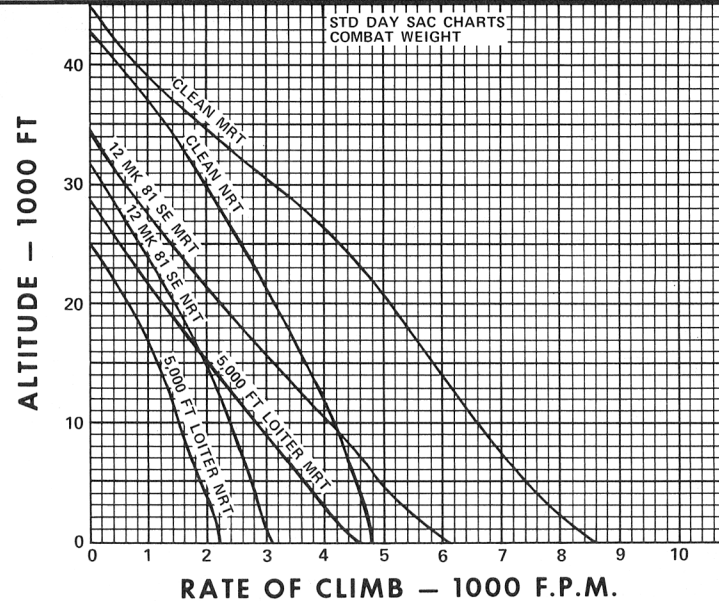
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STANDARD AIRCRAFT CHARACTERISTICS, NAVWEPS FORM 13100/4F (Rev. 7-65)

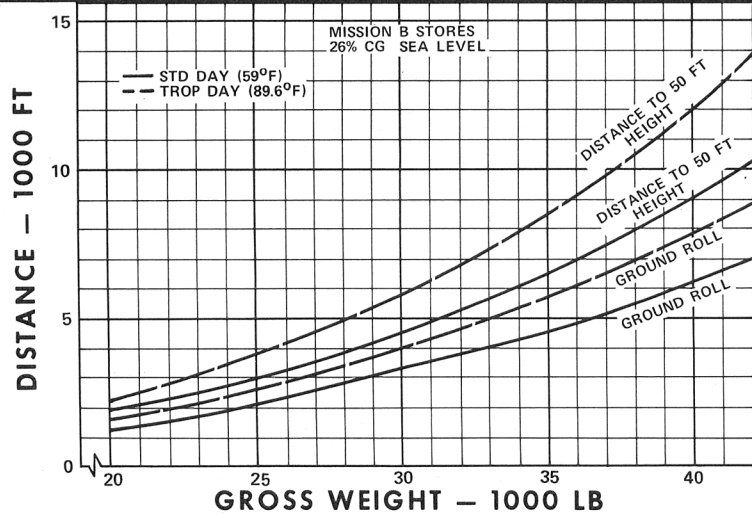
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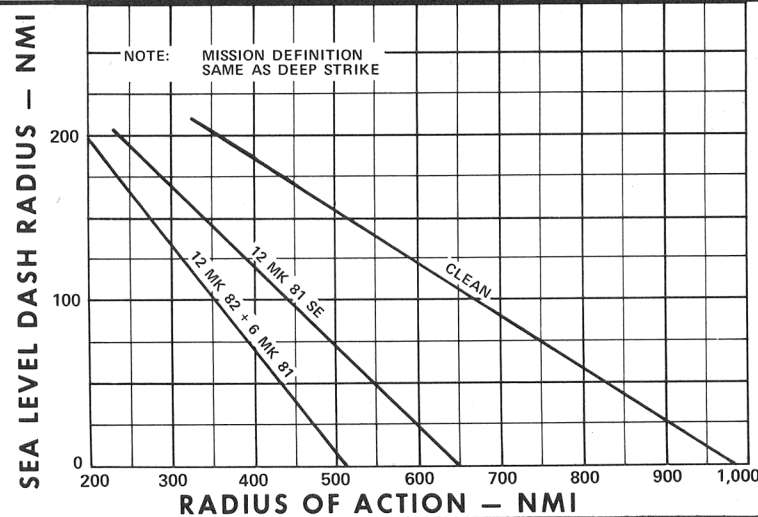
CLIMB



TAKE-OFF



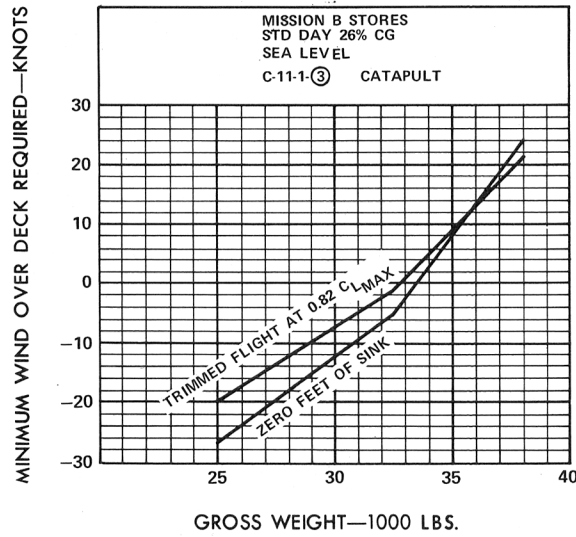
COMBAT RADIUS



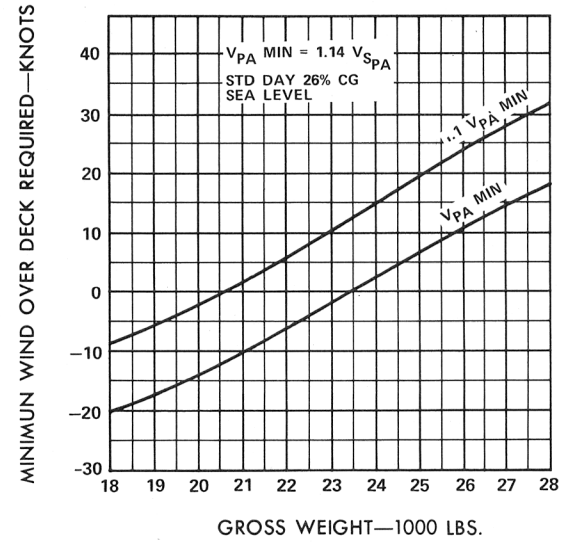
○ LOADING CONDITION COLUMN NUMBER - TF30-P-8 ENGINE

CARRIER SUITABILITY

MINIMUM WIND OVER DECK REQUIRED FOR CATAPULTING VS. GROSS WEIGHT

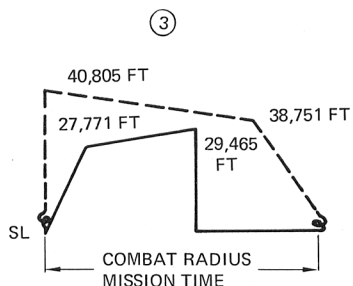


MINIMUM WIND OVER DECK REQUIRED FOR ARRESTING VS. GROSS WEIGHT



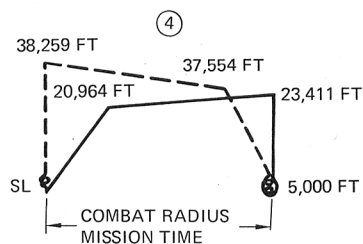
PRIMARY ATTACK MISSION
(12 MK 81 SE)

Warmup, taxi, takeoff: 5 min SL NRT
Climb: on course to opt cruise alt with mil thrust
Cruise out: at speed for max range at opt cruise alt
Descend: to SL (no fuel used, no distance gained)
Run in: 200 NMI at SL at speed for max range
Combat: 5 min at MRT (stores on, no dist gained) drop bombs
Climb: on course to opt cruise alt with mil thrust
Cruise back: at max range speed at opt alt
Reserve: 5% of initial fuel +20 min at max endurance speed at SL



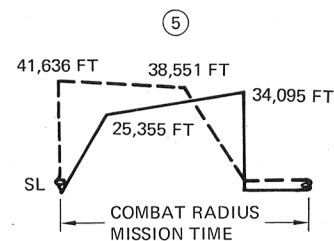
5000 FT LOITER MISSION

Warmup, taxi, takeoff: 5 min SL NRT
Climb: on course to opt cruise alt with mil thrust
Cruise out: at max range speed at opt cruise alt (drop fuel tanks when empty)
Descend: to 5,000 ft (no fuel used, no dist gained)
Loiter: 1 hour at max end. speed (no dist gained) stores dropped at end of loiter
Climb: on course to opt cruise alt with mil thrust
Cruise back: at max range speed at opt alt
Reserve: 5% initial fuel +20 min at max endurance speed at SL



DEEP STRIKE MISSION

Warmup, taxi, takeoff: 5 min SL NRT
Climb: on course to opt cruise alt with mil thrust
Cruise out: at max range speed at opt cruise alt (drop fuel tanks when empty)
Descend: to SL when 50 NMI from target (no fuel used, no dist gained)
Run in: 50 NMI at V_{max} at MRT
Combat: 5 min at MRT (stores on, no dist gained) drop bombs
Run out: 50 NMI at V_{max} at MRT at SL
Climb: on course to opt cruise alt with mil thrust
Cruise back: at max range speed at opt alt
Reserve: 5% initial fuel +20 min at max endurance speed at SL



Note:
Mission Time: Excludes time for warmup and takeoff and 20-minute loiter time
Cycle Time: Mission time +20 minutes SL loiter

○ LOADING CONDITION COLUMN NUMBER

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

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

HI-LO-LO-HI MISSION

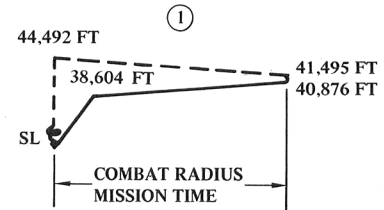
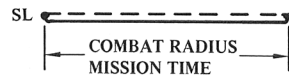
Warmup, taxi, takeoff: 5 min SL NRT
 Climb: on course to opt cruise alt with mil thrust
 Cruise out: at max range speed at opt cruise alt (drop fuel tanks when empty)
 Descend: to SL when 100/200 NMI from target (no fuel used, no dist gained)
 Cruise: at max range speed at SL (drop fuel tanks when empty)
 Combat: 5 min at MRT (stores on, no distance gained)
 Drop stores
 Cruise: at max range speed at SL to a point 100/200 NMI from target
 Climb: on course to opt cruise alt with mil thrust
 Cruise back: at max range speed at opt alt
 Reserve: 5% initial fuel +20 min at max endurance speed at SL

LO-LO-LO MISSION

Warmup, taxi, takeoff: 5 min SL NRT
 Climb: at max range speed at SL (drop fuel tanks when empty)
 Combat: 5 min at MRT (stores on, no distance gained)
 Drop stores
 Cruise: at max range speed at sea level
 Reserve: 5% initial fuel +20 min at max endurance speed at SL

HI-HI-HI MISSION

Warmup, taxi, takeoff: 5 min SL NRT
 Climb: on course to opt cruise alt with mil thrust
 Cruise out: at max range speed at opt cruise alt (drop fuel tanks when empty)
 Combat: 5 min at MRT (stores on, no dist gained) at alt for max mach no.
 Drop stores
 Cruise back: at max range speed at opt alt
 Reserve: 5% initial fuel +20 min at max endurance speed at SL



Note:
 Mission Time: Excludes time for warmup and takeoff and 20-minute loiter time
 Cycle Time: Mission time +20 minutes SL loiter

LOADING CONDITION COLUMN NUMBER

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