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NAVAIR 00-110AA4-2

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DOD DIR 5200.10

# Standard Aircraft Characteristics

NAVY MODEL

A-4B

AIRCRAFT

(TITLE UNCLASSIFIED)

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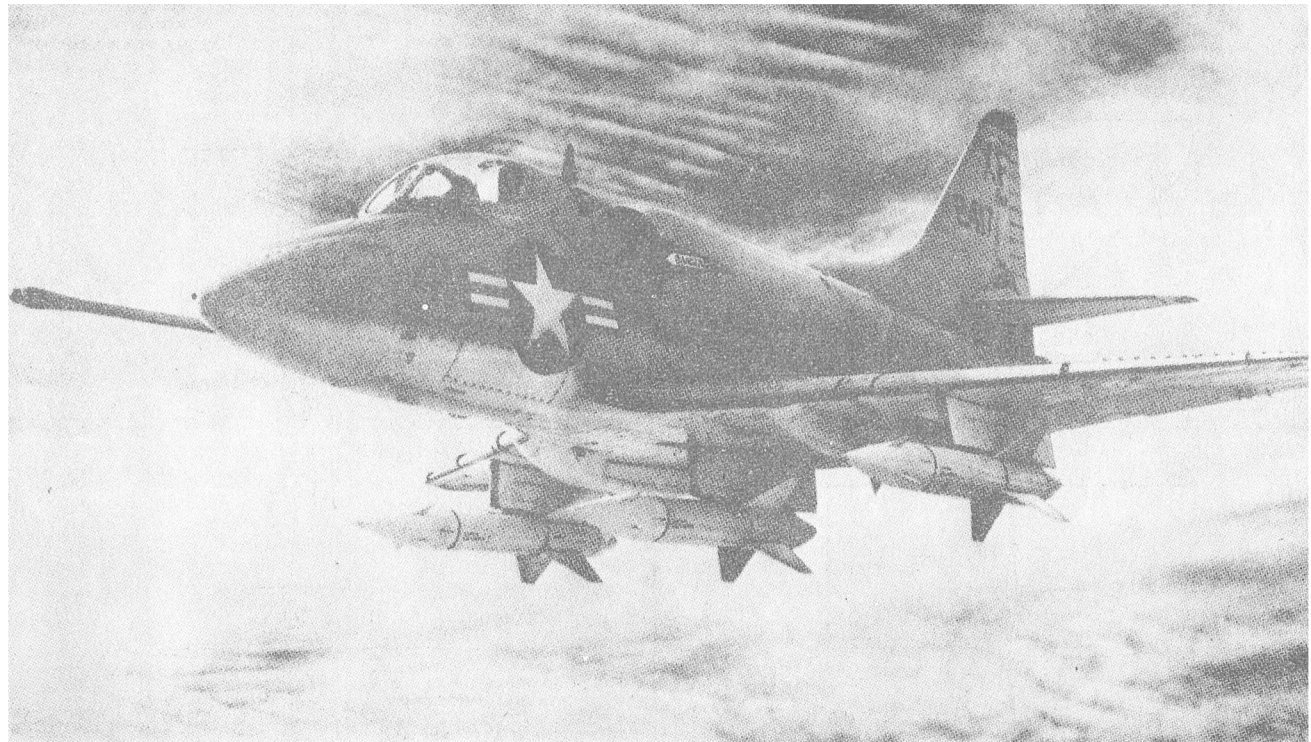
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**A**

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# STANDARD AIRCRAFT CHARACTERISTICS

## A-4B SKYHAWK

DOUGLAS AIRCRAFT COMPANY, INC., EL SEGUNDO DIVISION

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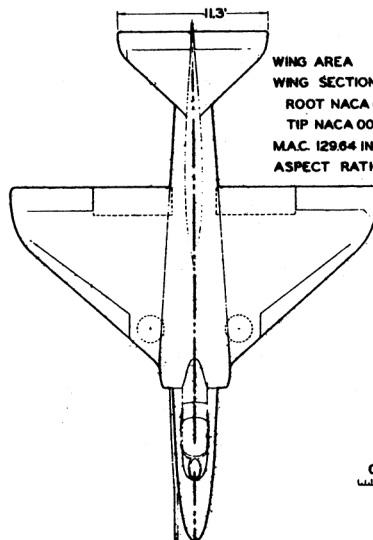
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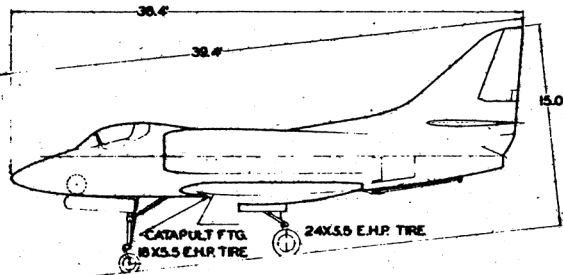
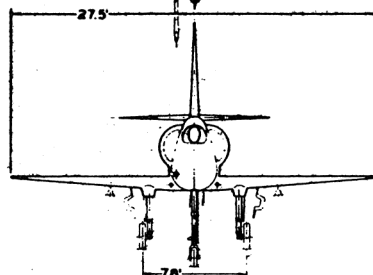
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SERVICE

WING AREA 280 SQ. FT.  
 WING SECTION:  
 ROOT NACA 0008-U-230875(X230)  
 TIP NACA 0005-.825-50-0787(X230)  
 MAC 129.64 IN.  
 ASPECT RATIO 2.91



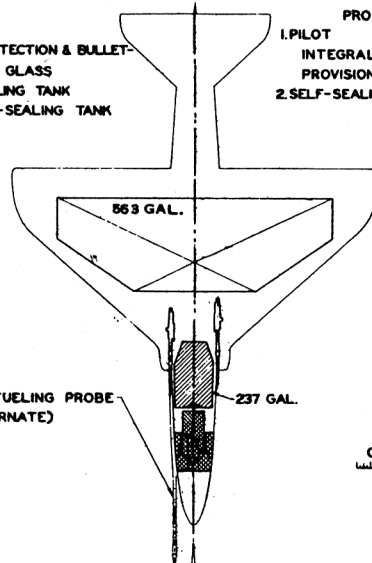
0 5 10 FT.  
 SCALE



DESCRIPTIVE ARRANGEMENT

PROTECTION:  
 1. PILOT  
 INTEGRAL 29 LBS.  
 PROVISIONS 125 LBS.  
 2. SELF-SEALING CELL 107 LBS.

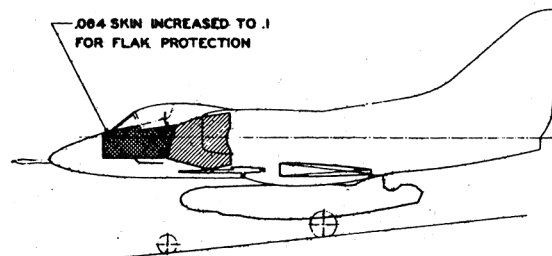
FLAK PROTECTION & BULLET-RESISTANT GLASS  
 SELF-SEALING TANK  
 NON-SELF-SEALING TANK



0 5 10 FT.  
 SCALE

STORES UP TO 1750 LB (UP TO 2240 LB. WITH ROLL RESTRICTIONS)

STORES UP TO 3575 LB EACH ON 2-20MM GUNS 100RDS/GUN



ARMAMENT & TANKAGE

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NAVAIR OO-110AA4-2

SERVICE

POWER PLANT	MISSION AND DESCRIPTION	WEIGHTS																											
No. & Model (1) J65-W-16A Axial Flow Turbojet Without Afterburner Mfr. - Wright Aeronautical Spec No. WAC N890-B Length .....113 in. Deameter ..... 31 in. <b>RATINGS</b> MIL. 8300 RPM 7700 lbs. Norm. 8030 RPM 6780 lbs.	The A4D-2 airplane is a lightweight, high-performance, carrier-based, jet-powered attack airplane designed for dive, glide and loft bombing and interdiction. The airplane is also capable of Bullpup missile attacks and in-flight refueling as a tanker or a receiver. It can operate from CVS and CVA type carriers.	<table border="1"> <thead> <tr> <th>Loadings</th> <th>Weight</th> <th>L.F.</th> </tr> </thead> <tbody> <tr> <td>Empty</td> <td>9146</td> <td></td> </tr> <tr> <td>Basic</td> <td>10032</td> <td></td> </tr> <tr> <td>Flight Des.</td> <td>12504</td> <td>7.0</td> </tr> <tr> <td>Combat</td> <td>15359</td> <td>5.7.</td> </tr> <tr> <td>Max. T. O.</td> <td>22500</td> <td>3.9</td> </tr> <tr> <td>Max.Land.(Arrest)</td> <td>13000</td> <td>6.7</td> </tr> <tr> <td>(Airfield)</td> <td>16000</td> <td>5.5</td> </tr> </tbody> </table>	Loadings	Weight	L.F.	Empty	9146		Basic	10032		Flight Des.	12504	7.0	Combat	15359	5.7.	Max. T. O.	22500	3.9	Max.Land.(Arrest)	13000	6.7	(Airfield)	16000	5.5			
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Max.Land.(Arrest)	13000	6.7																											
(Airfield)	16000	5.5																											
<b>ORDNANCE</b>	The arrangement is conventional with all-metal semi-monocoque structure and three-spar low aspect-ratio wing. Landing gear, flaps and speed-brakes are hydraulically operated. An electrically operated fully adjustable stablizer is used to trim throughout the normal flight range. The aileron, elevator, and rudder systems are hydraulic-power operated. Manual control is provided for emergencies.	<b>FUEL AND OIL</b>																											
Fuselage: 6-Mk.81 Mod 1 6-Mk.82 Mod.1 1-Mk.83 Mod. 2 or 3 1-Mk.84 Mod.1 1-Mk.57 (500 lb.) 1-Mk.12 (1050 lb.) 1-Mk.105(1500 lb.) 1-Mk.7 (1660 lb.) 1-Mk.28 (2025 lb.) 1-Mk.91 (3500 lb.) 1-Aero 14B 1-mk.79 Mod.0 (1000#) or 1-150galDAC fuel tk. 1-ASM-N-7A Bullpup 1-ASM-N-7A Bullpup 1-pkg.(7)2.75"Aero 6A-1 1-pkg.(19)2.75"Aero 7D 1-pkg.(4)5.00"Aero 10D 1-Aero 5Aprac.bomb cont. 1-150 gal. (DAC) 1-300 gal. (DAC) 1-NAVPAC unit 1-Inflight Refueling store - 300 gallon Wing: 12-Mk.81 Mod.1 2-Mk.82 Mod.1 2-Mk.83 Mods. 2 or 3 2-150 gal. DAC 2-300 gal. DAC 2-Mk.79 Mod.0 or 2-150 gal. DAC fuel tanks 2-pkgs(7)2.75"Aero 6A-1 2-pkgs.(19)2.75"Aero 7D 2-pkgs.(4)5.00"Aero 10D 2-ASM-N-7A Bullpup Guns: 2 Fixed 20mm-100 RDS/ Gun	This airplane does not have folding wings. The aft section of the fuselage is readily removable to permit quick engine change.	<table border="1"> <thead> <tr> <th>Gal.</th> <th>No. Tanks</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>563</td> <td>1</td> <td>Wing</td> </tr> <tr> <td>237</td> <td>1</td> <td>Fuselage</td> </tr> </tbody> </table> In-flight fueling provided. Fuel Spec .....MIL-F-5624 or MIL-F-5572			Gal.	No. Tanks	Location	563	1	Wing	237	1	Fuselage																
Gal.	No. Tanks	Location																											
563	1	Wing																											
237	1	Fuselage																											
	Pressure fueling is provided.	<b>OIL</b> 3.2 gal. mounted on engine Oil Spec .....MIL-L-7808 4.0 gal. after ASC-118 incorp.																											
	DEVELOPMENT	<b>ELECTRONICS</b>																											
	First Flight ..... March 1959 Service Use ..... July 1957	AN/ASQ-17 Electronic Control Central providing the following: <table border="1"> <thead> <tr> <th>Function</th> <th>Equivalent to</th> </tr> </thead> <tbody> <tr> <td>UHF Comm.</td> <td>AN/ARC-27</td> </tr> <tr> <td>IFF</td> <td>AN/APX-6B</td> </tr> <tr> <td>SIF</td> <td>AN/APA-89</td> </tr> <tr> <td>UHF ADF</td> <td>AN/ARA-25</td> </tr> </tbody> </table> Self Contained Navigation AN/ASN-19A (Dead Reckoning Computer) TACAN AN/ARN-21 LABS AFRO. 18 Store Arming T-249 Bullpup(System) ASM-N-7A			Function	Equivalent to	UHF Comm.	AN/ARC-27	IFF	AN/APX-6B	SIF	AN/APA-89	UHF ADF	AN/ARA-25															
Function	Equivalent to																												
UHF Comm.	AN/ARC-27																												
IFF	AN/APX-6B																												
SIF	AN/APA-89																												
UHF ADF	AN/ARA-25																												
	<b>DIMENSIONS</b>	<b>External Store (NAVPAC)</b>																											
	Span .....27.5 ft. Length .....40.1 ft. Height ..... 15.0 ft. Max. Tread ..... 7.8 ft. Turn. Rad. (Nose) ..... 20.5 ft. Wing Area .....260 sq. ft.	Marker-Beacon Rec.. AN/ARN-12 VOR Rec ..... AN/ARN-14																											

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SERVICE

## PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION	(1) SEA LEVEL STORE DELIVERY 1 - MK 28	(3) SEA LEVEL STORE DELIVERY 1 - MK 28 2- 300 GAL. TANKS	(5) CLOSE AIR SUPPORT 6- 500 LB BOMBS 2- 1000 LB BOMBS	(7) CLOSE AIR SUPPORT 12- 250 LB BOMBS 1- 300 GAL. TANK	(9) CLOSE AIR SUPPORT 1- 300 GAL. TANK 2- ASM-N-7A BULLPUP	
TAKE-OFF WEIGHT	lb.	17,535	22,130	20,746	21,126	19,038
Fuel - Internal/External (JP-5)	lb.	5440/None	5440/4080	5440/None	5440/2040	5440/2040
Payload	lb.	2025	2025	5000	3000	1100
Wing loading	lb./sq.ft.	67.4	85.1	79.8	81.3	73.2
Stall speed - power-off	kn.	119	136	132	142	126
Take-off run at S.L. - calm	ft.	2660	5280	4300	5480	3300
Take-off run at S.L. - 25 kn. wind	ft.	1790	3810	3010	4010	2250
Take-off to clear 50 ft. - calm	ft.	4140	7550	6320	7680	4990
Max. speed/altitude	kn./M/ft.	563/.86/4000	526/.82/10,000	492/.78/15,000	485/.77/14,000	533/.83/10,000
Rate of climb at S.L.	fpm	6800	4550	4600	4600	5600
Time: S.L. to 20,000 ft.	min.	3.7	6.1	5.8	6.1	4.6
Time: S.L. to 30,000 ft.	min.	6.6	12.6	12.5	13.0	9.1
Service ceiling (100 fpm)	ft.	40,200	32,700	32,700	32,100	36,900
Combat range	n.mi.	870	1440	500	870	1180
Average cruising speed	kn.	431	431	411	416	427
Cruising altitude(s)	ft.	35,100/39,800	30,100/39,200	30,800/35,000	30,200/37,400	33,500/40,800
Combat radius / Mission time	n.mi./hr.	200/1.0	550/2.6	70/1.5	250/2.3	340/2.6
Average cruising speed	kn.	432	431	302	423	431
IFR-Radius/Mission Time K(A)	n.mi./hr.		890/4.6			
IFR-Fuel Transferred/Distance (A)	lb/n.mi.		3940/434			
COMBAT LOADING CONDITION	(2) STORE RETAINED	(4) TANKS DROPPED STORE RELEASED	(6) BOMBS RELEASED	(8) TANKS DROPPED BOMBS RETAINED	(10) TANK DROPPED MISSILES RETAINED	
COMBAT WEIGHT	lb.	15,359	15,625	13,570	18,905	16,817
Engine power		Military	Military	Military	Military	Military
Fuel	lb.	60% Internal	Full Internal	60% Internal	Full Internal	Full Internal
Combat speed/combat altitude	kn./M/ft.	563/.85/SL	562/.85/SL	553/.85/5000	493/.76/5000	546/.84/5000
Rate of climb/combat altitude	fpm/ft.	7950/SL	7800/SL	7900/5000	4800/5000	5900/5000
Combat ceiling (500 fpm)	ft.	41,800	41,300	43,700	33,900	38,800
Rate of climb at 35,000 ft.	fpm	2800	2600	3300	-	1700
Max. speed at 35,000 ft.	kn./M	515/.89	516/.90	516/.90	-	503/.87
Max. speed/altitude	kn./M/ft.	564/.86/4000	565/.87/5000	554/.86/9000	498/.79/15,000	547/.85/9000
LANDING WEIGHT	lb.	11,007	11,342	11,263	11,536	11,332
Fuel	lb.	937	1157	957	1071	1055
Stall speed - power-off/appr.pwr.	kn./kn.	94/90	96/91	95/91	96/92	96/91
Dist. - Ground run/over 50 ft.	ft./ft.	2780/3495	2860/3575	2845/3560	2915/3630	2860/3575

## NOTES

(A) One Buddy air fueling - fuel transferred at 30,000 ft. altitude.

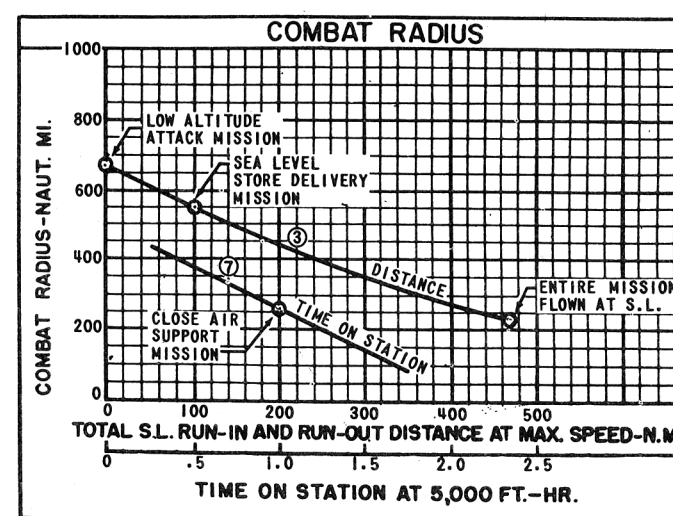
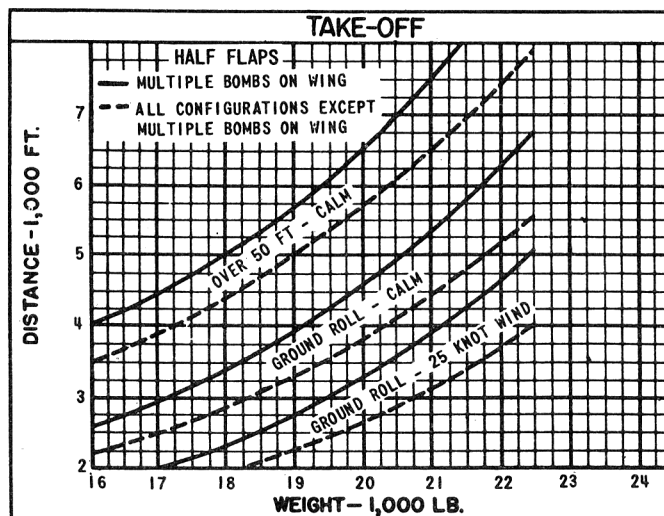
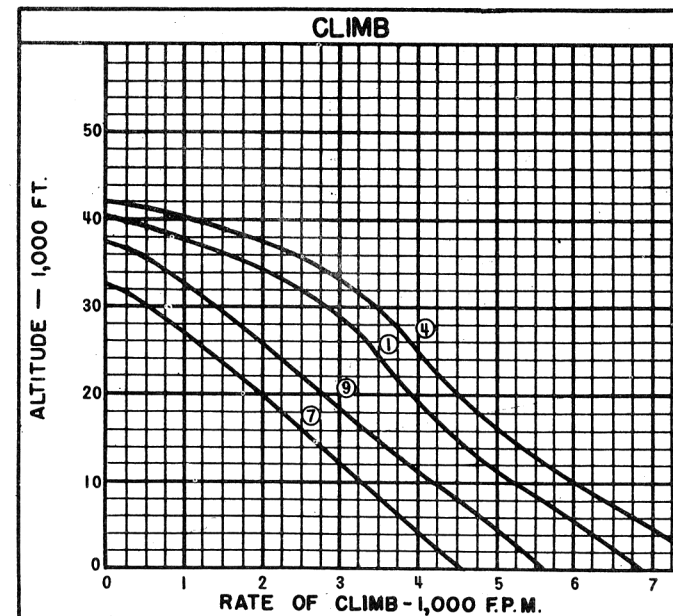
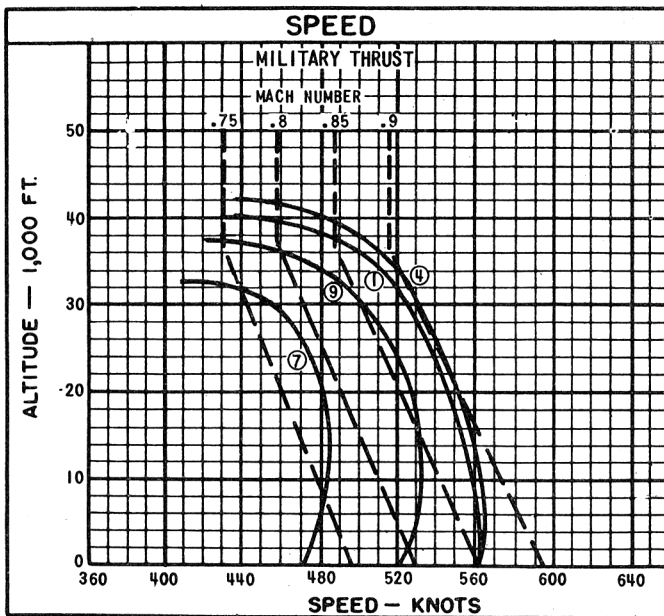
(B) All loadings include air refueling probe, guns and ammunition.

(C) Performance Basis: Contractor and NATC Flight Test Data on Models A4D-1, -2, and -2N aircraft.

(D) Operational Spotting: A total of 106 aircraft with refueling probes can be accommodated in a landing spot on the flight and hangar decks of a CVA-19 class angled deck carrier.

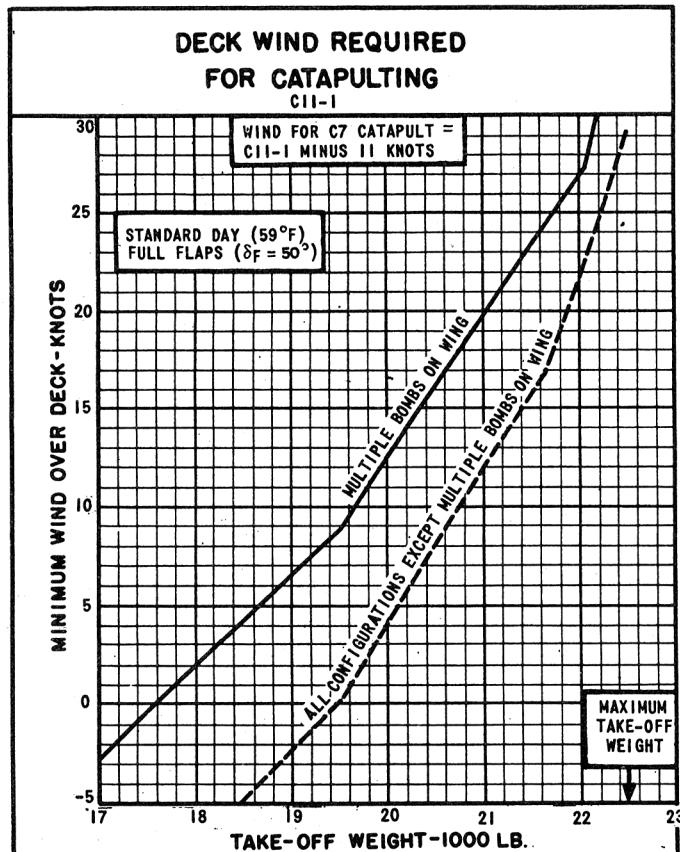
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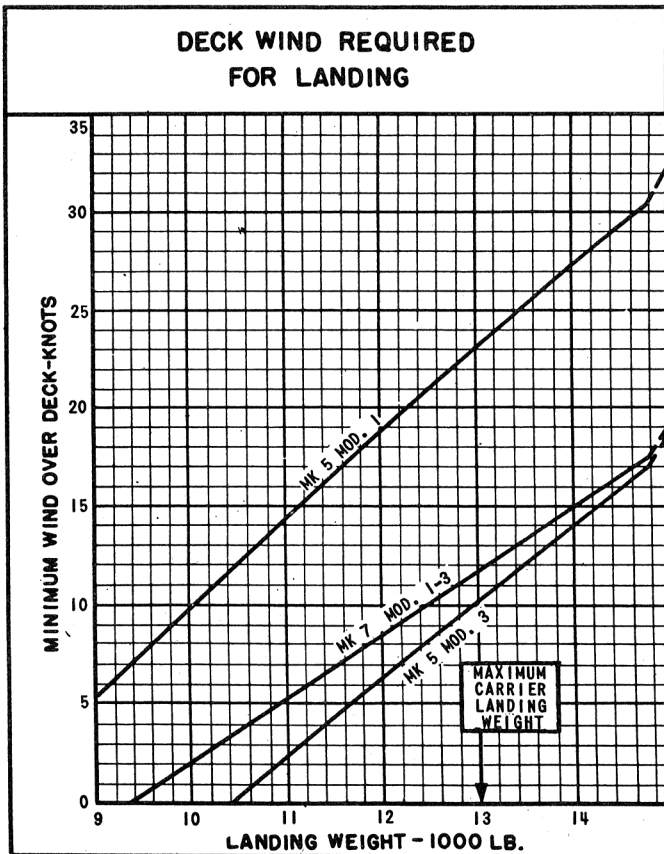


○ DENOTES LOADING CONDITION COLUMN NUMBER

CARRIER SUITABILITY



Catapult takeoff speeds based on launching bulletin No. 8-36D except where limited by excess thrust. Below a takeoff weight of 19,500 lb on the C11-1 catapult and 19,300 lb on the C7 catapult, the catapult end speed is limited by a maximum peak acceleration of 5.08g. Above these takeoff weights the catapult end speed is limited by a maximum tow force of 94,400 lb.



Approach speed based on speeds recommended in the flight handbook as approved by NATC and corresponds to  $1.23V_{S,L}$  without wing stores.

Engaging speed limited by airplane strength based on 76,000 lb horizontal hook load above a weight of 14,786 lb and 5.14g maximum horizontal load factor below a weight of 14,786 lb.

Good for all configurations.

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# NOTES

## S. L. STORE DELIVERY COMBAT RADIUS MISSION

START ENGINES, T.O. AND ACCELERATE: Fuel for 5 minutes sea level, normal static thrust.

CLIMB-OUT: At maximum rate of climb with military thrust, on course to optimum cruise altitude or cruise ceiling whichever is lower.

CRUISE-OUT: At speed for maximum range at optimum cruising altitude or cruise ceiling (Drop tanks when empty).

DESCEND: To S.L. (no fuel consumed - no distance covered).

RUN-IN: At S.L. for 50 n.mi. at maximum speed with military thrust. Drop bombs.

COMBAT: For 5 minutes at sea level maximum speed with military thrust (no distance covered).

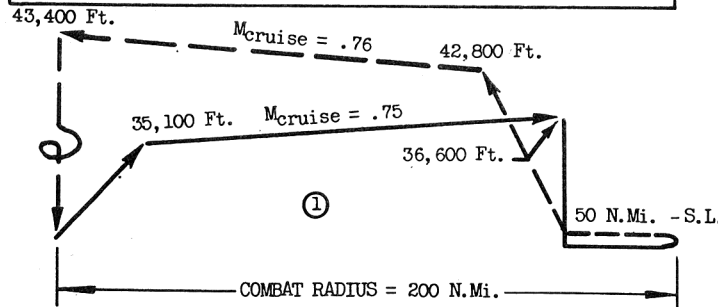
RUN-OUT: At S.L. for 50 n.mi. at maximum speed with military thrust.

CLIMB-BACK: At maximum rate of climb with military thrust, on course to optimum cruise altitude.

CRUISE-BACK: At speed for maximum range at optimum cruising altitude.

DESCEND: To S.L. (no fuel consumed - no distance covered).

RESERVE AND LANDING: 5% initial fuel load plus fuel for 20 minutes at sea level at speed for maximum endurance.



## CLOSE AIR SUPPORT COMBAT RADIUS MISSION

START ENGINES, T.O. AND ACCELERATE: Fuel for 5 minutes sea level, normal static thrust.

CLIMB-OUT: At maximum rate of climb with military thrust, on course to optimum cruise altitude or cruise ceiling whichever is lower.

CRUISE-OUT: At speed for maximum range at optimum cruising altitude or cruise ceiling (Drop tanks when empty).

DESCEND: To 5,000 ft altitude (no fuel consumed - no distance covered).

HOLD ON STATION: For one hour at maximum endurance speed at 5,000 ft altitude then drop bombs.

CLIMB-BACK: At maximum rate of climb with military thrust, on course to optimum cruise altitude.

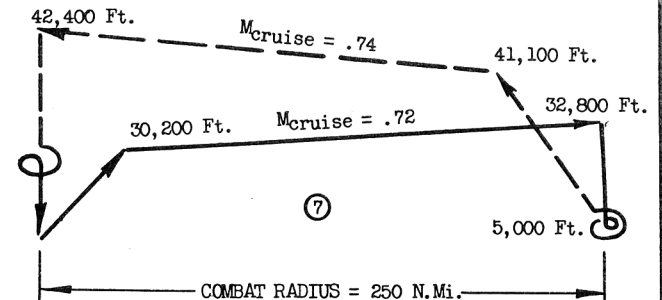
CRUISE-BACK: At speed for maximum range at optimum cruising altitude.

DESCEND: To sea level (no fuel consumed - no distance covered).

RESERVE AND LANDING: 5% initial fuel load plus fuel for 20 minutes at sea level at speed for maximum endurance.

Mission Time: Excludes warmup, take-off & reserve fuel

Cycle Time: Excludes warmup and take-off fuel



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