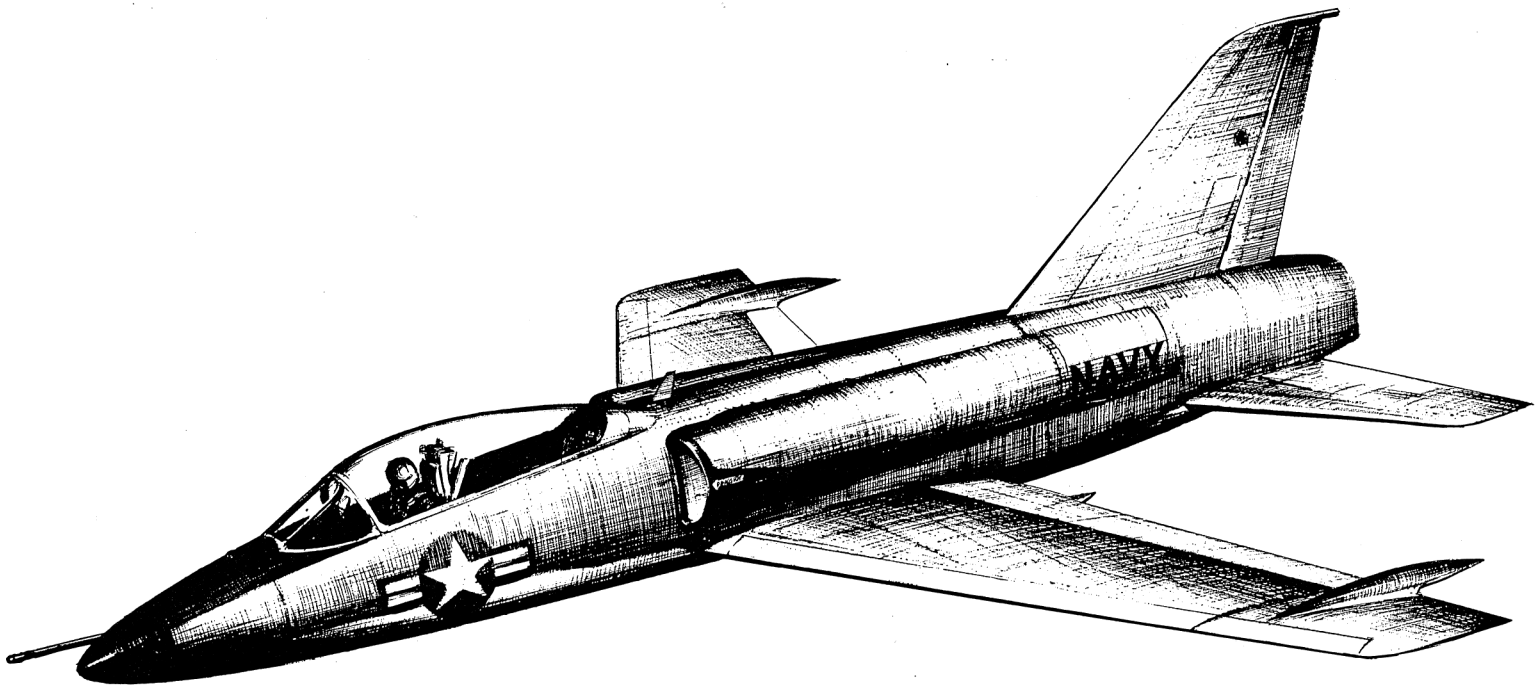
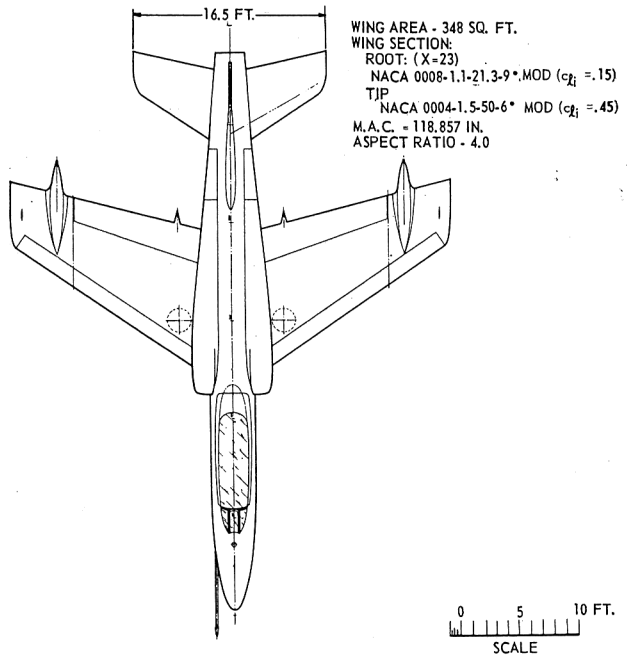
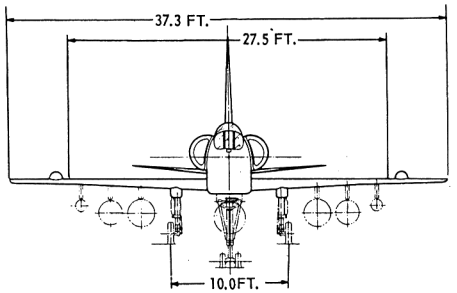


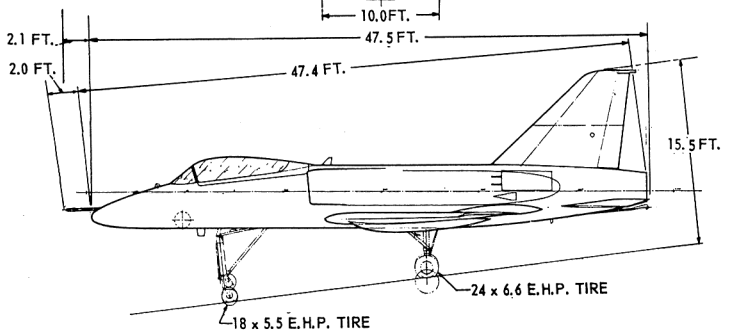
STANDARD AIRCRAFT CHARACTERISTICS

A4D-4 ATTACK AIRPLANE

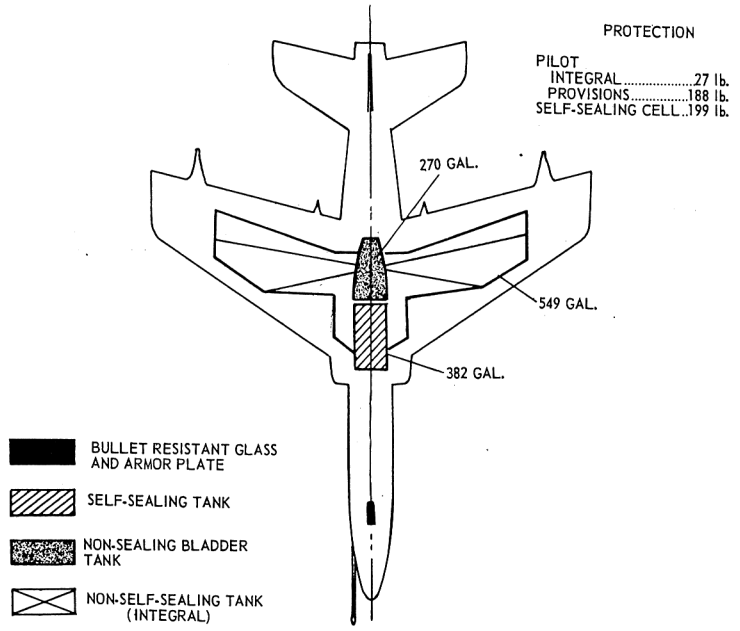
DOUGLAS AIRCRAFT COMPANY, INC., EL SEGUNDO DIVISION

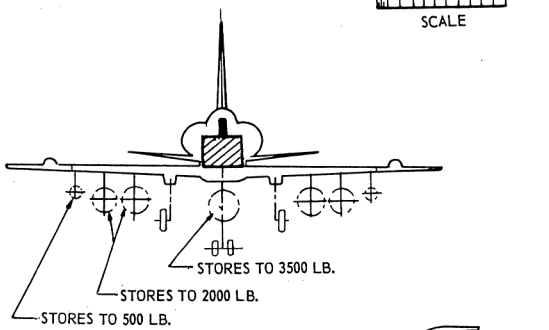


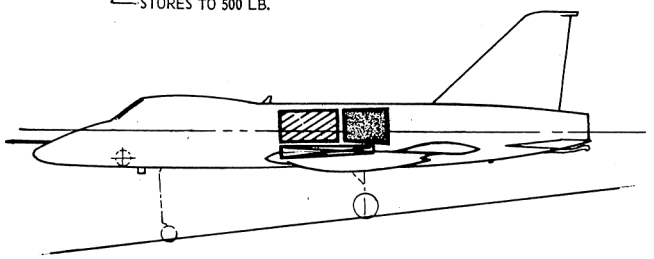




DESCRIPTIVE ARRANGEMENT







ARMAMENT & TANKAGE

ORDNANCE

CENTERLINE STATION

SPECIAL WEAPONS: Mk. 28, 28 Retarded, 91, 43, 105, TX43X1, Lodestar
G.P. BOMBS: Mk. 81, 82, 83, 84
MISSILES: DAC Model 742 (or Equiv.), Bullpup, Corvus
ROCKETS: Aero 7D Dispenser
Aero 10D Dispenser
GUNS: Mk. 11 or Vulcan 20mm Pods
FUEL: Aero 1A 150 Gal. or 300 Gal. Tank, DAC 400 Gal. Tank In-flight Fueling Store
MISC: Mk. 79 Fire Bomb, Aero 8A Practice Dispenser, Aero 14B Spray Tank, Aero 5A Flare Dispenser, DECM Package, ASW Package

WING STATION 90

SPECIAL WEAPONS: Mk. 28, 28 Retarded, 43, 105, TX43X1, Lodestar
G.P. BOMBS: Mk. 81, Mk. 82, Mk. 83
MISSILES: Bullpup, Corvus, DAC Model 742 (or Equiv.)
ROCKETS: Aero 7D Dispenser
Aero 10D Dispenser
GUNS: Mk. 11 or Vulcan 20mm Pods
FUEL: Aero 1A, 150 or 300 Gal. Tank
DAC 400 Gal. Tank
MISC: Mk. 79 Fire Bomb, Aero 5A Flare Dispenser DECM Package (right side only)

WING STATIONS 121 & 151

G.P. BOMBS: Mk. 81, 82
MISSILES: Bullpup
ROCKETS: Aero 7D Dispenser
MISC: Aero 5A Flare Dispenser (Station 121 only)

MISSION AND DESCRIPTION

The A4D-4, an advancement of the A4D series, is designed specifically for long-range attack under all weather conditions. The primary mission is low-altitude delivery of a special weapon. In-flight fuel receiving equipment is installed and provisions are made for carrying a tanker store.

The A4D-4 is a single-place, swept-wing airplane powered by a single turbojet engine. The all-metal, semi-monocoque fuselage is essentially one piece, with removable tail cone. IR suppression is provided in the tail cone. The longer fuselage accommodates additional electronics equipment and internal fuel. A large bubble canopy provides excellent visibility.

Alternate missions can be accomplished with a wide variety of conventional and special weapons carried on seven external stations. The A4D-4 is well suited for close air support, interdiction, armed reconnaissance, and pre-strike sweeps against enemy defense installations and parked aircraft.

The three-spar wing has manually-folded tips for carrier operation. Control surfaces extending from the wing root to fold line act differentially as ailerons and symmetrically as flaps. Leading-edge slats are mechanically actuated with the flaps.

The rudder, ailerons and horizontal stabilizer are actuated by a tandem hydraulic system. A wind-driven pump provides emergency hydraulic power. Electrical power is provided by an alternator with engine-mounted constant-speed drive. Emergency electrical power is by a wind-driven generator.

New features include: dead-reckoning navigation computation with inputs from an astrotracker and doppler radar; improved terrain clearance; and automatic navigation corrections from radar fixes.

WEIGHTS

Loadings	Gross Lbs.	L.F.
Empty	12,702	
Basic	13,165	
Flight		
Design	20,086	7.0
Combat	20,086	7.0
Catapult		
Design	28,000	5.0
Landing		
Basic	18,454	
Emer.	20,086	

DIMENSIONS

Wing:
MAC ..... 118.857 in.
Sweepback ..... 30°
Area ..... 348 sq.ft.
Span ..... 37.33 ft.
Span (folded) 27.5 ft.
Length ..... 47.5 ft.
Height ..... 15.5 ft.
Tread ..... 10 ft.

POWER PLANT

No. & Model J52-P-6
Mfr. ..... Pratt & Whitney
Eng. Spec. No. ... N-1731 (7-17-57)
Type ..... Turbojet
Compr. ..... Two-Rotor, Multi-Stage Axial Flow
Length ..... 104.6 in.
Diameter ..... 32.0 in.
Weight ..... 2005 lb.

RATINGS

Sea Level Static

	Thrust, lb.
Take-off	8500
Military	8500
Normal	7500

ELECTRONICS

Navigation & Terrain Clearance Radar ..... AN/APG-53A (Mod.)
CNI Package AN/ASQ-19
AJB-3 Gyro Platform & LABS System
ASN-19 Navigation Computer
ALR-15 ECM Receivers
Air Data Sensors
AVN-1 Star-Tracker
Doppler Radar
Optical Sight
Auto-Pilot

FUEL AND OIL

Gal.	No. Tanks	Location
547	1 (Integral)	Wing
384	1 (Self-seal)	Fuselage
270	1 (Ripram Bladder)	Fuselage
600	2 (Drop)	Ext. Wing

Tanker and Receiver Provisions
Fuel Grade JP-5
Fuel Spec MIL-F-7914

OIL

Capacity ..... 5.0 gal.
Oil Spec MIL-F-7808

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		(1) BASIC ATTACK ONE SPECIAL WEAPON	(4) LONG RANGE ATTACK ONE SPECIAL WEAPON 2-300 GAL. TANKS	(5) EXTENDED RANGE ATTACK ONE SPECIAL WEAPON 2-400 GAL. TANKS	(6) MISSILE ATTACK FIVE ASM-N-7 (BULLPUPS)	
TAKE-OFF WEIGHT	lb.	23,350	28,000	29,484	24,475	
Fuel (JP-5)	lb.	8160	12,240	13,600	8160	
Payload	lb.	2025	2025	2025	2700	
Wing loading	lb./sq.ft.	67	81	85	70	
Stall speed - power-off	kn.	111	127	131	119	
Take-off run at S.L. - calm	ft.	2220	3670	4140	2660	
Take-off run at S.L. kn. wind	ft.	1440	2540	2920	1760	
Take-off to clear 50 ft. - calm	ft.	3240	4980	5530	3780	
Max. speed/altitude (A)	kn./ft.	558/5000	523/12,000	510/15,000	498/20,000	
Rate of climb at S.L. (A)	fpm	5860	3980	3580	3830	
Time: S.L. to 20,000 ft. (A)	min.	4.3	7.0	8.2	7.5	
Time: S.L. to 30,000 ft. (A)	min.	8.2	14.9	19.0	16.1	
Service ceiling (100 fpm) (A)	ft.	40,500	34,000	32,200	34,400	
Combat range	n.mi.	1660	2170	2380	1040	
Average cruising speed	kn.	460	460	460	420	
Cruising altitude(s)	ft.	38,600-44,600	33,000-45,200	31,700-45,200	34,000-39,200	
Combat radius	n.mi.	680	1000	1105 (B)(E)	415 (F)	
Average cruising speed	kn.	460	460	460	440	
Mission time	hr.	3.1	4.5	5.0	2.4	
Cycle time	hr.	3.4	4.8	5.3 (B)(E)	2.7	
COMBAT LOADING CONDITION		(2) 60% FUEL ONE SPECIAL WEAPON				
COMBAT WEIGHT	lb.	20,086				
Engine power		MILITARY				
Fuel	lb.	4896				
Combat speed/combat altitude	kn./ft.	554/S.L.				
Rate of climb/combat altitude	fpm/ft.	6770/S.L.				
Combat ceiling (500 fpm)	ft.	41,900				
Rate of climb at S.L.	fpm	6770				
Max. speed at S.L.	kn.	554(M = .84)				
Max. speed/altitude	kn./ft.	517(M=.90)/35,000				
LANDING WEIGHT (20% Fuel, No Weapon)	lb.	(3) 14,797				
Fuel	lb.	1632				
Stall speed - power-off	kn.	89				
Stall speed - with approach power	kn.	86				

NOTES

(A) Military thrust

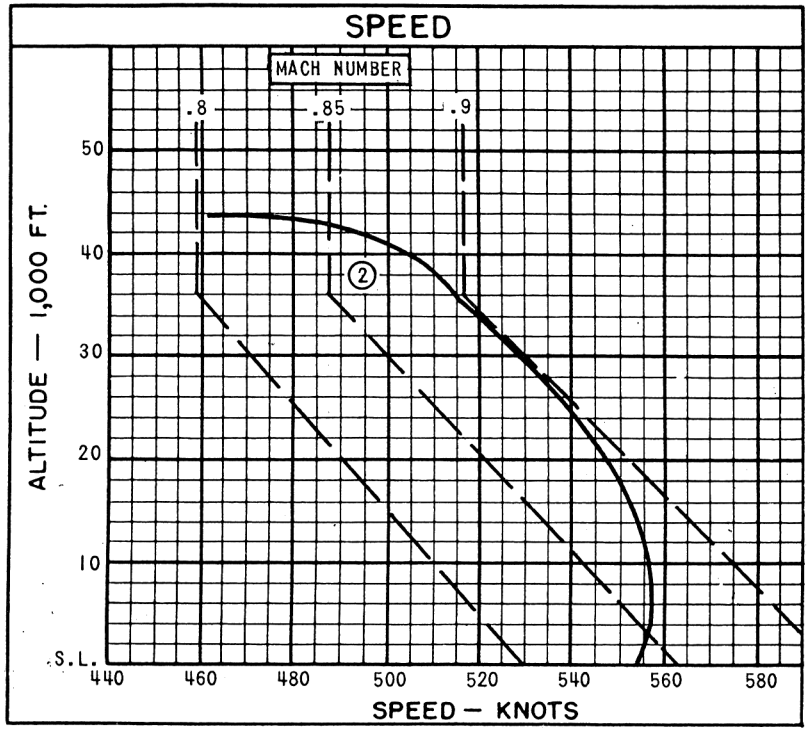
(B) With one refueling outbound from an A4D-4 tanker, combat radius is 1500 n.mi. and cycle time is 7.0 hours.

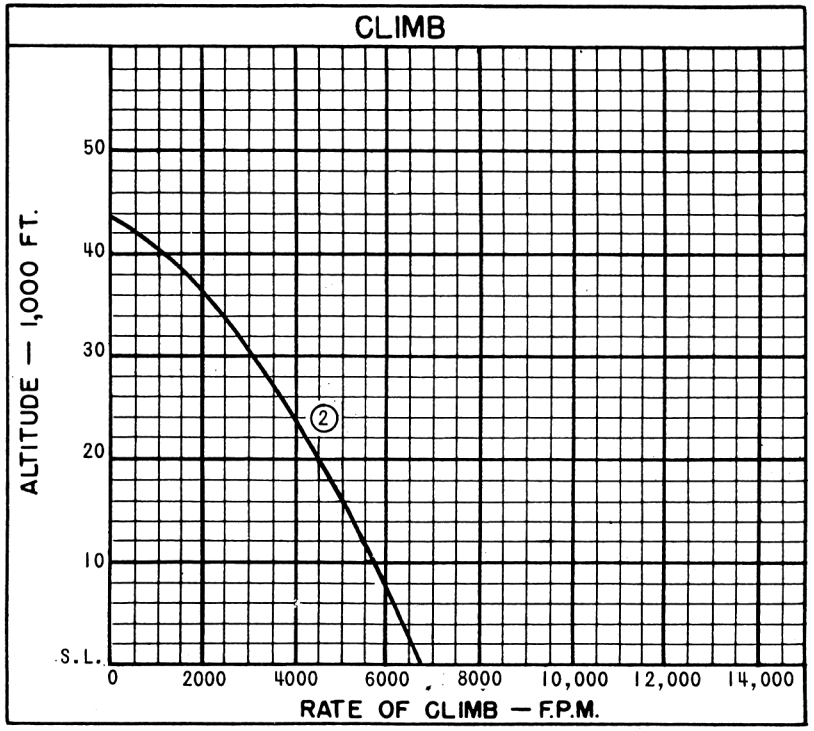
(C) Performance Basis: Estimated data based on A4D-2 wind tunnel and flight tests and A4D-4 wind tunnel tests. Combat range and radius are based on engine specification fuel consumption data increased 5%.

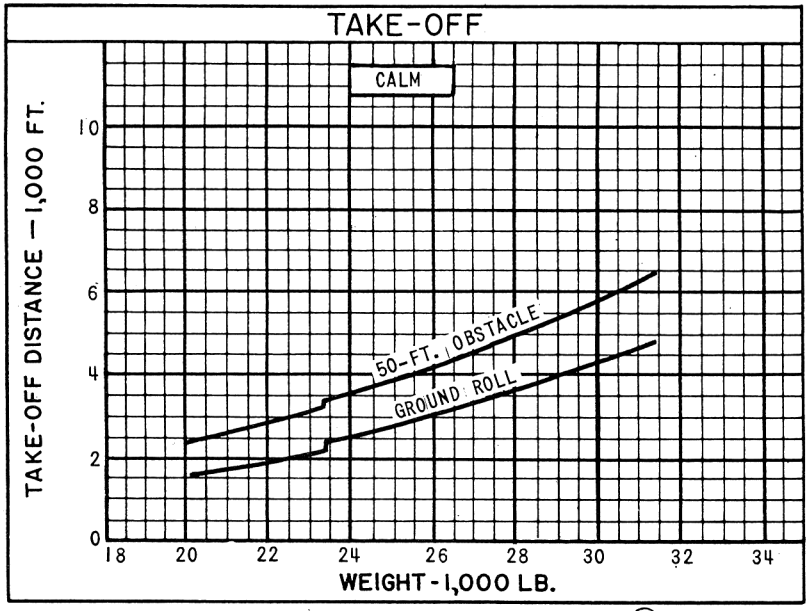
(D) Spotting: A total of 20 airplanes can be accommodated in a landing spot 96 ft. wide and 200 ft. long.

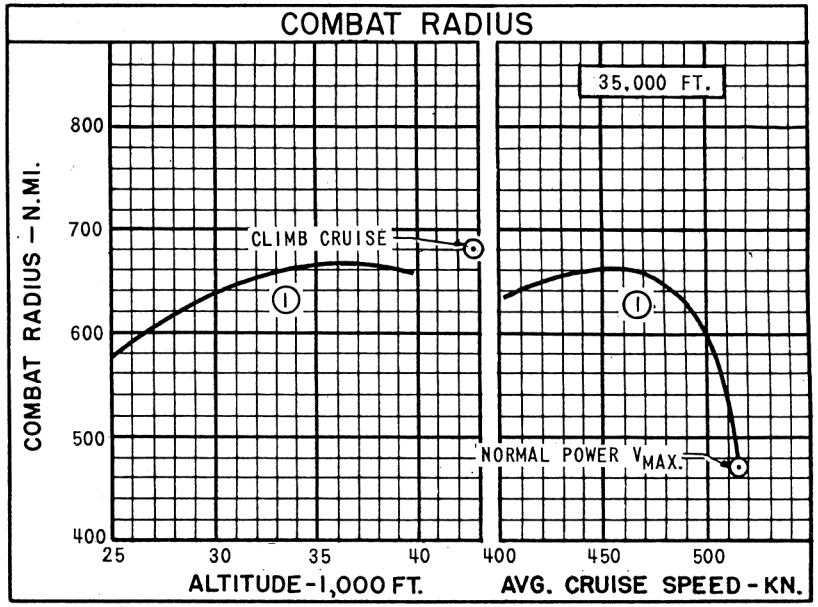
(E) Combat radius with 300 n.mi. run-in and 300 n.mi. run-out at sea level is 780 n.mi.; cycle time is 4.7 hours. Combat radius with sea level cruise all the way is 575 n.mi. and with one in-flight fueling is 785 n.mi.

(F) Close support mission with 0.5 hour loiter at 300 knots and 5000 feet at the target.



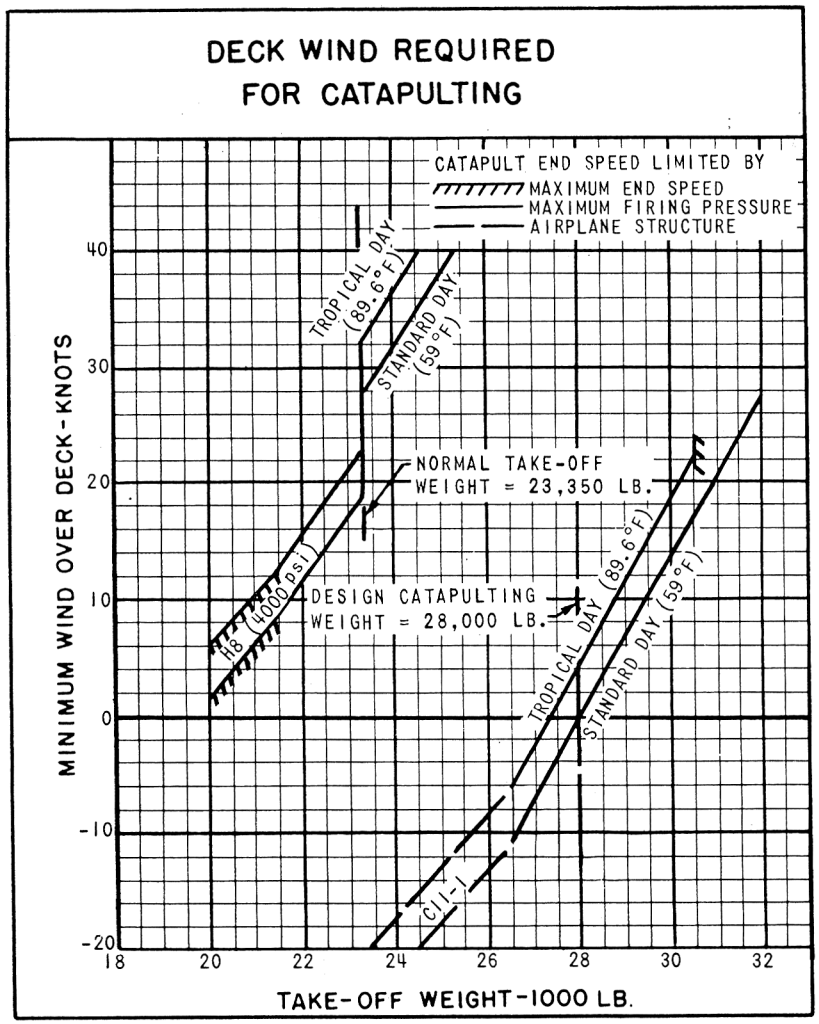


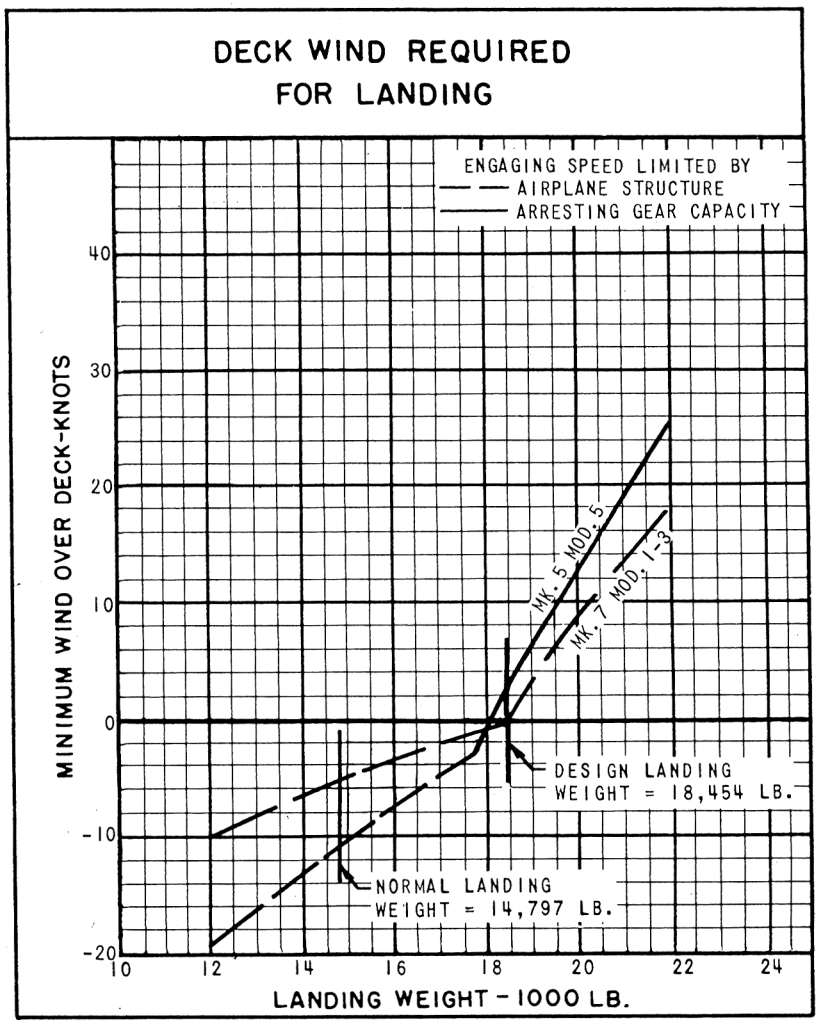




◯LOADING CONDITION COLUMN NUMBER

CARRIER SUITABILITY





1. Take-off speed corresponds to the angle of attack for NATC recommended minimums on the A4D-1 except where launching acceleration of 2.1 ft/sec^2 determines take-off speed. (Partial flap deflection above 23,350 lb.)

2. Airplane structural limits for catapult take-off are: Horizontal hook load = 167,000 lb; maximum acceleration = 6.28 g.

3. Approach speed equals 1.3 times power approach stalling speed. Full flap deflection)

4. Airplane structural limits for arrested landing are: Horizontal hook load = 103,200 lb; maximum acceleration = 5.60 g.

NOTES

COMBAT RADIUS DESCRIPTION
LOW ALTITUDE ATTACK PROBLEM

Start Engine, Take-Off, and Accelerate	Climb-Out	Cruise-Out	Descend	Combat	Climb-Back	Cruise-Back	Reserve
Fuel for 5 min. with normal power at sea level.	At maximum rate of climb with military power on course to optimum cruise altitude.	At max. range airspeeds at optimum cruise altitude. (Drop any external tanks when empty).	To sea level (no fuel consumed-no distance covered). Drop bombs.	At sea level for 5 min. with military power. No distance made good.	At maximum rate of climb with military power on course to optimum cruise altitude.	At max. range airspeeds at optimum cruise altitude.	Fuel allowance: 5 percent of internal fuel plus 20 min. at speed for maximum endurance at sea level.

Combat Radius = Climb-Out + Cruise-Out = Climb Back + Cruise-Back