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NAVAIR 00-110AA3-5

GROUP 4 DOCUMENT
DECLASSIFIED AFTER 12 YEARS
DOD DIR 5200.10

DECLASSIFIED

Standard Aircraft Characteristics

NAVY MODEL
RA-3B
AIRCRAFT

(TITLE UNCLASSIFIED)

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

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INTERVALS
DECLASSIFIED ON DECEMBER 31, 1973

RA-3B

1 JULY 1967

LIST OF CHANGED PAGES ISSUED

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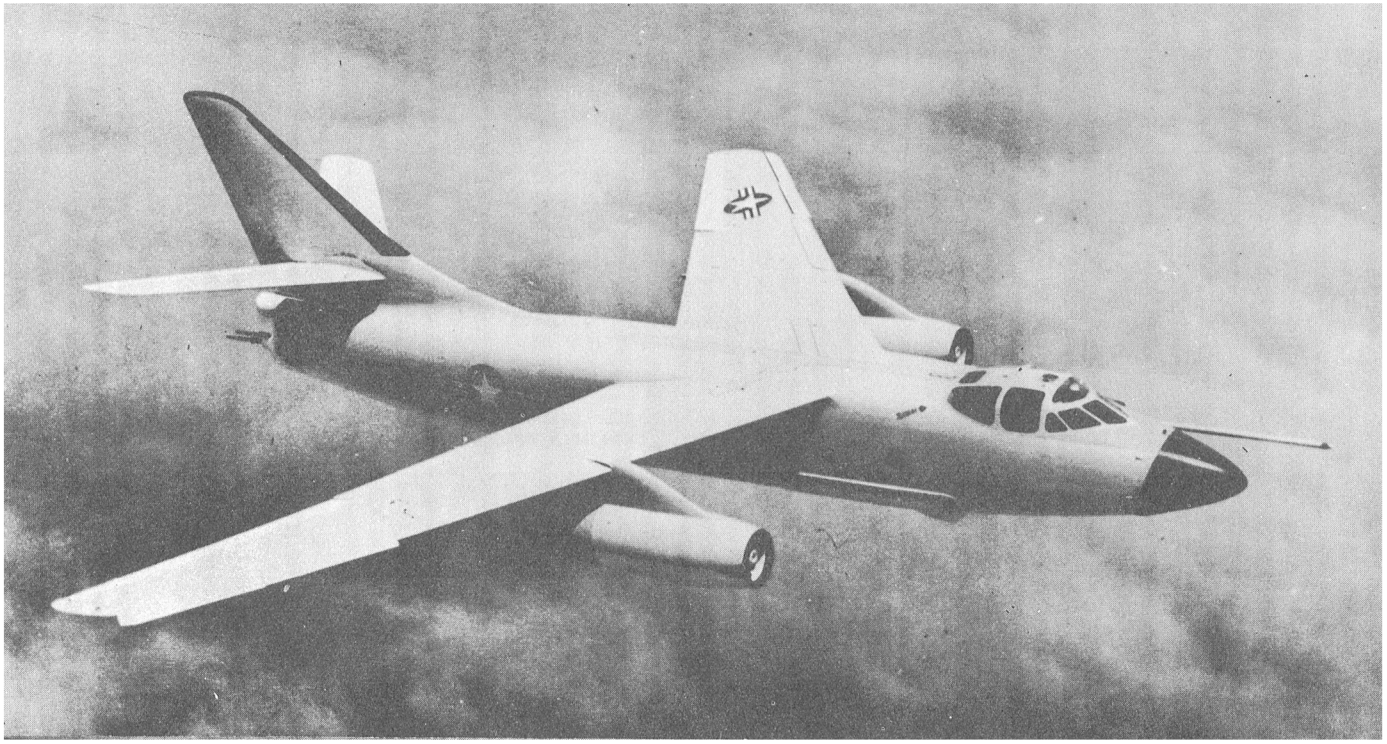
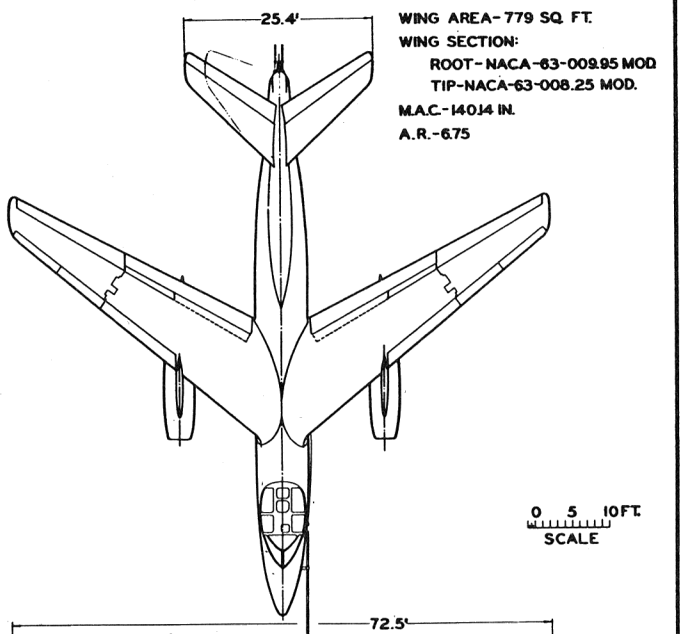


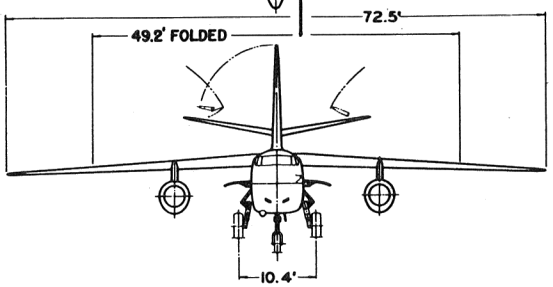
STANDARD AIRCRAFT CHARACTERISTICS

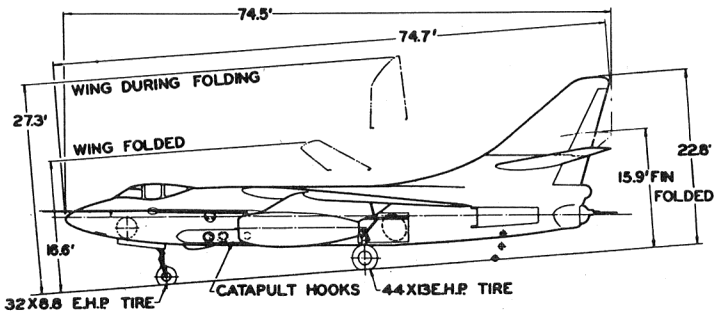
RA-3B SKYWARRIOR

DOUGLAS

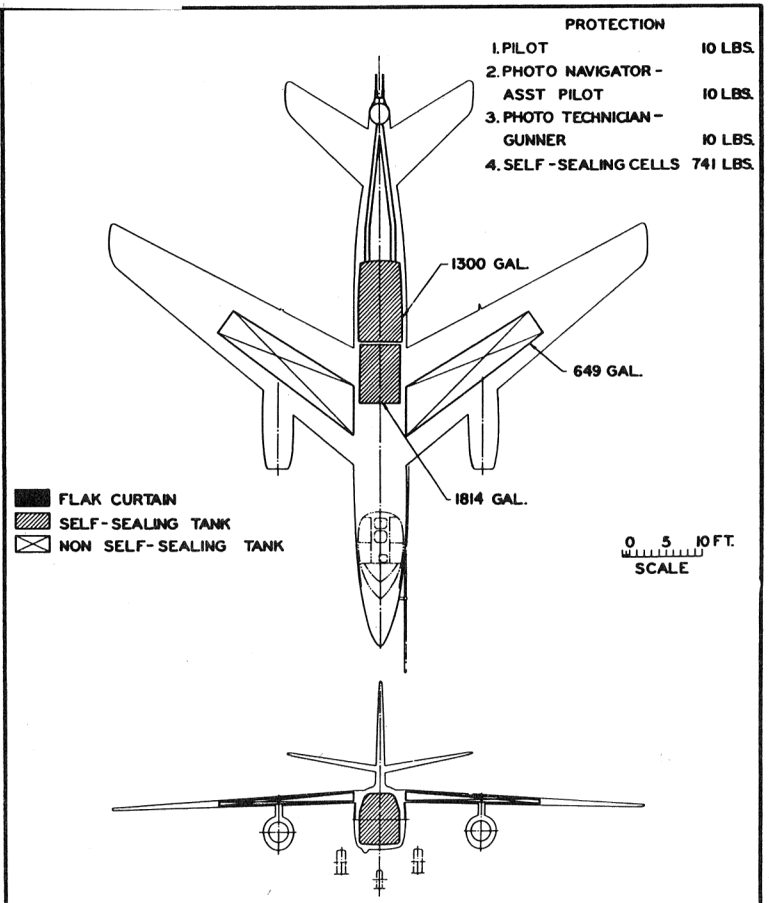
SERVICE

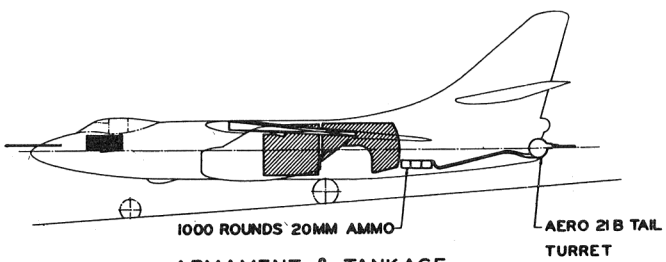






DESCRIPTIVE ARRANGEMENT





ARMAMENT & TANKAGE

POWER PLANT

No. & Model .....(2) J57-P-10
Mfr. .....Pratt & Whitney
Engine Spec. No. N-1700-A
(Rev. 2 February 1955)
Type .....Turbojet
Compressor.....Dual Rotor, Ax. Flow

Length .....158 in.
Diameter .....41 in.
No. & Type Assist 12-5KS4500 JATO
Tail Pipe Nozzle.Const. Exit Area

RATINGS

Sea Level Static

	Thrust Lb.	RPM N_1*	RPM N_2**
Maximum	10500	6150	9900
Military	10500	6150	9900
Normal	9000	5900	9650

* N_1 speed of low-pressure compressor
** N_2 speed of high-pressure compressor

PHOTO EQUIPMENT

K-17C, 6", 12"&24" focal lgth. camera
K-38, 24"& 36" focal lgth. camera
K-47, 12" focal lgth. camera
CAS-2A-100mm, 7", 12", & 20" focal lgth. camera (or AEC lens cones)
T-11, 6" focal lgth. camera
T-12, 6" focal lgth. camera
Forward Oblique Cameras:
KF-8 35mm movie camera,
2", 4", & 6" focal length
K-38 case drive with DAC 24" or 36" bent lens cone
A-8B magazines (for the K-38)
A-9A magazines (for the K-17c)
MA-10A magazines (for the K-17c)
CAS-2A cassettes
16 M-120 or M-122 photo-flash bombs
4 B-4 ejectors with Mk. 123 cartg.
4 A-6 ejectors with Mk. 112 cartg.

MISSION AND DESCRIPTION

The A3D-2P airplane is a long range, high performance photographic-reconnaissance airplane for day and night missions. The airplane operates from land bases and from carriers.

It is a conventional, swept-wing airplane with two turbo-jet engines enclosed in under-wing nacelles. Normal crew consists of three: a pilot, a photo-navigator-assistant pilot and a photo technician-gunner.

The tricycle landing gear, arresting gear, wing-fold and tail-fold mechanisms, single-slotted wing flaps, fuselage speed brakes, and power mechanisms for rudder, elevator and ailerons are operated by hydraulic power. The horizontal stabilizer is adjustable for trim in-flight. Leading-edge slats are actuated automatically by aerodynamic loads. Anti-skid braking is provided. The JATO installation accomodates twelve bottles. The cockpit and camera compartment are pressurized to 7.5 P.S.I. differential.

Photographic provisions consist of the pressurized camera compartment with twelve camera stations. The compartment also houses camera controls, camera door controls and stowage for spare film magazines. The bomb bay accommodates photo-flash bombs and/or cartridges. Sighting equipment and viewfinders are located in the cockpit. Autopilot kits (ASC #268) with skid turn feature and DECM kits (ECP 6140) will be delivered in the future. Cambered wing for improved performance will be delivered on the last two aircraft of Contract 57-181.

DEVELOPMENT

Contract: NOa(s) 55-205. 5 Airplanes
First Flight: July 1958
Contract: NOa(s) 57-181. 25 Airplanes
First Fleet Delivery: August 1959

DIMENSIONS

Wing:
Area.....779 sq. ft.
Span.....72.5 ft.
MAC.....140.14 in.
Sweepback.....36°
Length.....74.7 ft.
Height.....22.8 ft.
Tread.....10.4 ft.

ORDNANCE

GUNS/AMM.

2-20mm (M3) /500 rds. per gun
Tail Turret System Aero 21B

FUEL AND OIL

Gal.	No. Tanks	Location
3114	2	*Fuselage
1298	2	Wing
4412		

Fuel Grade .....JP-4 or JP-5
Fuel Spec. MIL-F- 5624
*Self-sealing

OIL

Gal.	No. Tanks	Location
11	2	Integral with eng.

Oil Spec. MIL-L-7808

ELECTRONICS

UHF Homing.....AN/ARR-25 & AN/ARR-40
VHF Trans-Receiver.... AN/ARC-27 A
IFF Transponder .....AN/APX-6B & APA-89
Radio Altimeter AN/APN-22
TACAN AN/ARN-21
HF Receiver AN/ARC-38
Radio Compass AN/ARN-6
Search Radar AN/ASB-1B
NAV AN/ASN-6
VOR AN/ARN-14E
VHF.....AN/ARC -1
Tape Recorder ....(C.F.E.)

WEIGHTS

Loading	Lbs.	L.F.
Empty	40,852	
Basic	41,617	
Design	55,942	3.40
Combat	61,608	3.09
Max. T.O. (Land)	78,000	2.44
Max. T.O. (Cat)	73,000	2.60
Max. Land (Land)	56,000	
Max. Land (Car)	49,000	

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PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		(1) Limit Carrier T.O. Wt. High Alt. Recon.	(3) Full Fuel High Altitude Reconnaissance	(5) Full Fuel Night Recon.	(7) Full Fuel Photo Mapping	
TAKE-OFF WEIGHT (A)	lb.	73,000	74,522	76,485	73,442	
Fuel (JP-5)	lb.	28,479	30,001	30,001	30,001	
Payload	lb.	1455	1455	3418	375	
Wing loading	lb./sq. ft.	93.7	95.7	98.2	94.3	
Stall speed - power-off (B)	kn.	132	134	135	133	
Take-off run at S.L. - calm (B)	ft.	4460	4700	5080	4530	
Take-off run at S.L. 25 kn. wind (B)	ft.	2940	3150	3400	3000	
Take-off to clear 50 ft. - calm (B)	ft.	6270	6580	7000	6350	
Max. speed/altitude	kn./ft.	555/SL	555/SL	555/SL	555/SL	
Rate of climb at S.L.	fpm	5030	4900	4750	5000	
Time: S.L. to 20,000 ft.	min.	5.2	5.3	5.5	5.2	
Time: S.L. to 30,000 ft.	min.	9.3	9.6	10.0	9.4	
Service ceiling (100 fpm)	ft.	38,900	38,500	37,900	38,800	
Combat range	n.mi.	2240	2350	2280	2390	
Average cruising speed	kn./M	459/.80	459/.80	459/.80	459/.80	
Cruising altitude(s)	ft.	35,400-43,200	35,000-43,200	34,500-42,300	35,300-43,600	
Combat radius/Mission Time	n.mi./hr.	1110/4.8	1160/5.1	780/3.6	1040/4.8	
Average cruising speed	kn./M	459/.80	459/.80	459/.80	459/.80	
IFR-Radius/Mission Time	n mi/hr.	1510/6.9 (C)	1800/7.2 (D)	1230/5.8 (D)	1510/7.1 (D)	
IFR-Fuel Trans/Distance	lb/n mi.	10,560/645	11,160/825	11,360/815	11,050/830	
COMBAT LOADING CONDITION		(2) 60% Fuel	(4) 60% Fuel	(6) 60% Fuel	(8) 60% Fuel	
COMBAT WEIGHT	lb.	61,608	62,522	64,485	61,442	
Engine power		MILITARY	MILITARY	MILITARY	MILITARY	
Fuel	lb.	17,087	18,000	18,000	18,000	
Combat speed/combat altitude	kn./ft.	486/41,000	486/40,800	556/SL	510/35,000	
Rate of climb/combat altitude	fpm/ft.	515/41,000	515/40,800	5850/SL	1720/35,000	
Combat ceiling (500 fpm)	ft.	41,200	40,900	40,200	41,200	
Rate of climb at S.L.	fpm	6150	6000	5850	6150	
Max. speed at S.L.	kn./M	556/.84	556/.84	556/.84	556/.84	
Max. speed at 35,000 ft.	kn./M	510/.88	509/.88	507/.88	510/.88	
LANDING WEIGHT	lb.	47,636	47,730	49,734	46,633	
Fuel	lb.	3133	3209	3250	3192	
Stall speed - power-off/Appr Pwr	kn./kn.	107/105	107/106	109/108	105/104	
Land. Dist. Gr. Run/Over 50 ft (E)	ft./ft.	5315/6030	5325/6040	5495/6200	5245/5950	

NOTES

(A) The limit catapult take-off weight of 73,000 pounds is consistent with current operating bulletins. Under emergency conditions increased take-off weights may be utilized.

(B) Full flaps

(C) One refueling from A3D-2 cambered wing tanker. (Tanker T.O. Wt. = 73,000 lb)

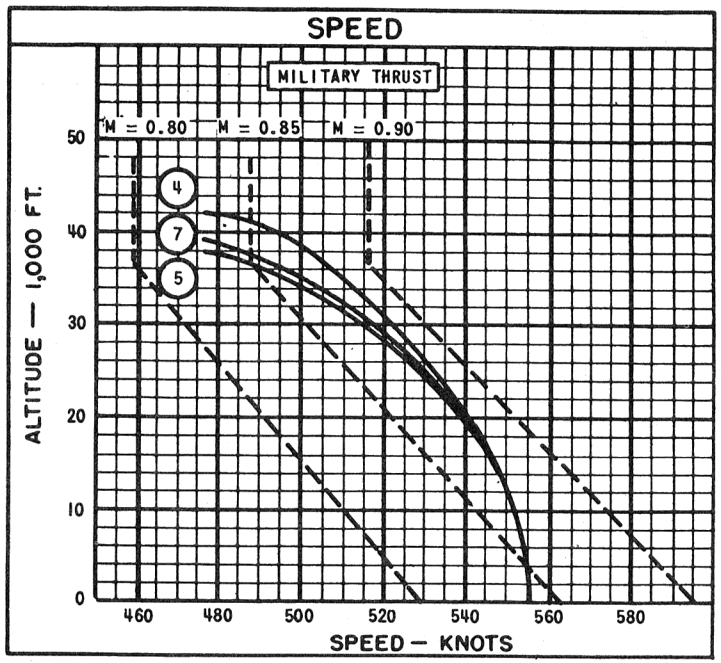
(D) One refueling from A3D-2 cambered wing tanker. (Tanker T.O. Wt. = 78,000 lb)

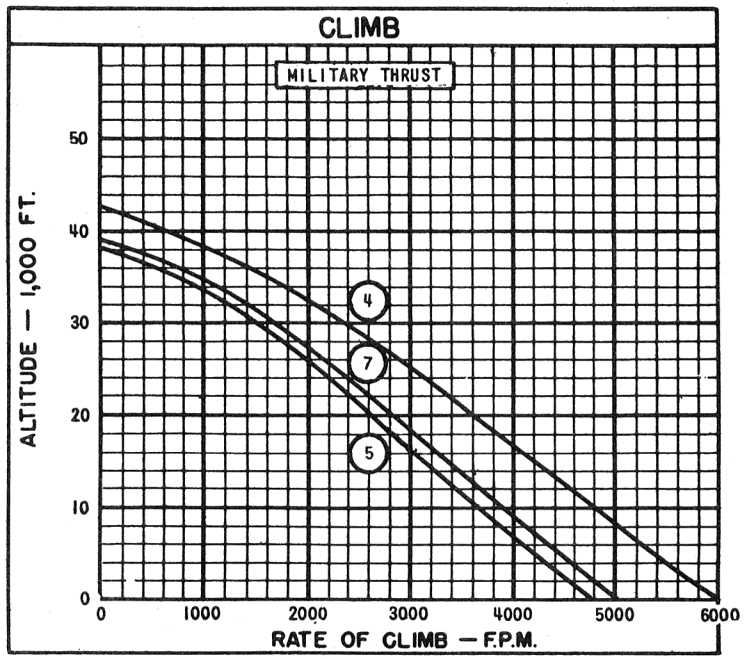
(E) Without chute. With chute, landing distance is decreased approximately 2400 ft.

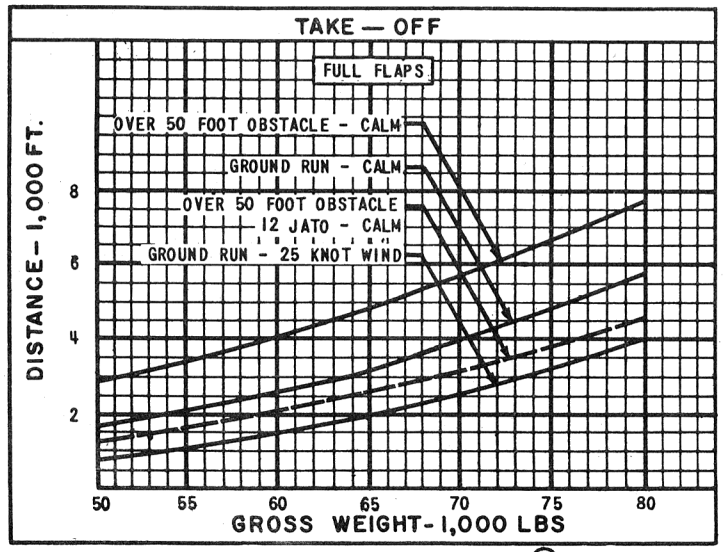
(F) All loadings include IFR probe

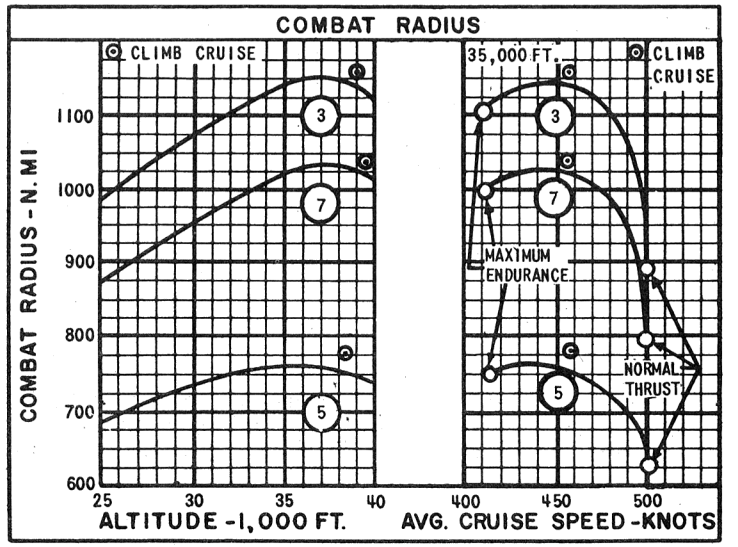
(G) Performance Basis: NATC and Contractor's flight test of A3D-2 and A3D-2P. Range and radii based on flight test fuel consumptions.

(H) Spotting: A total of 27 aircraft can be accommodated in the landing spot of the flight and hangar decks of a CVA-19 class angle-deck carrier.









○ DENOTES LOADING CONDITION COLUMN NUMBER

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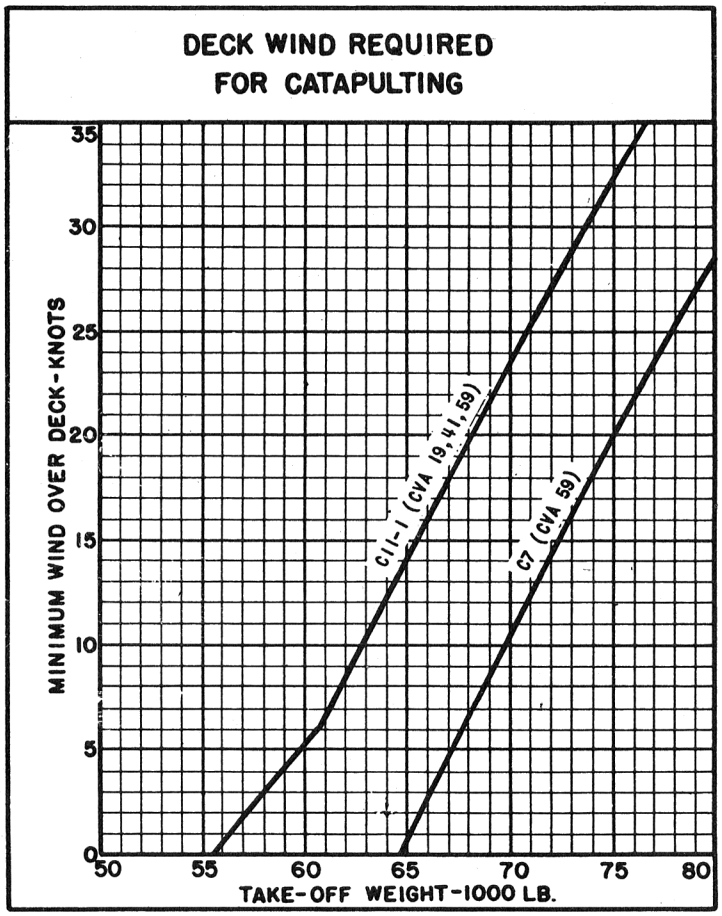
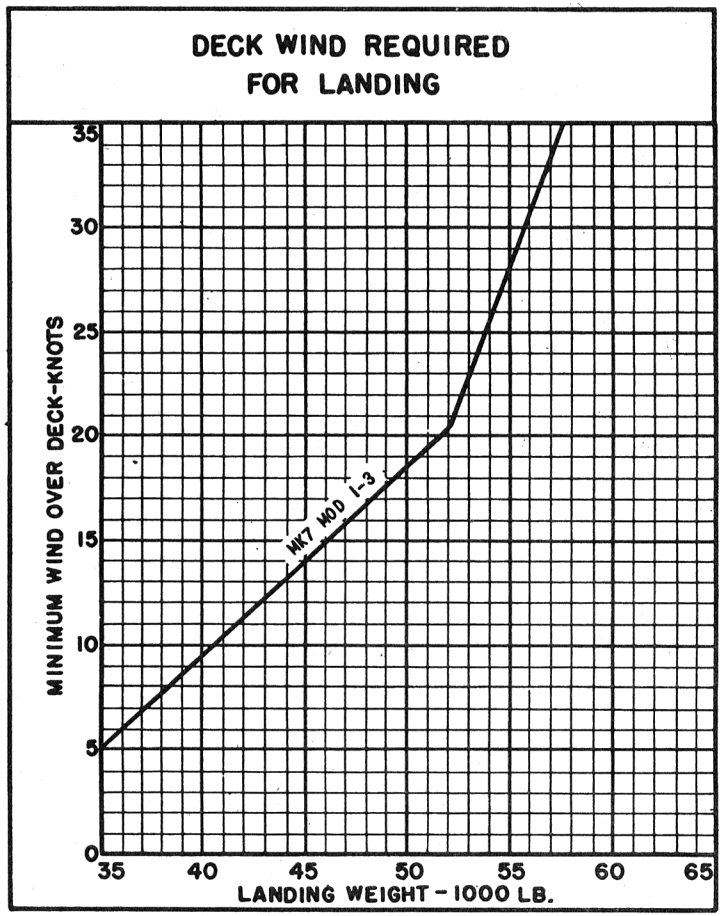
CARRIER SUITABILITY





Catapult take-off speed is based on Launching Bulletin No. 6-49.

Catapult end speed limited by aircraft strength below 60,700 lbs. on C11 Catapult and below 64,200 lbs. on the C7 Catapult. Above these weights catapult end speed is limited by catapult capacity.

Approach speed is based on NATC recommended minimums.

Engaging speed limited by airplane strength limit as determined by maximum rate of sink.

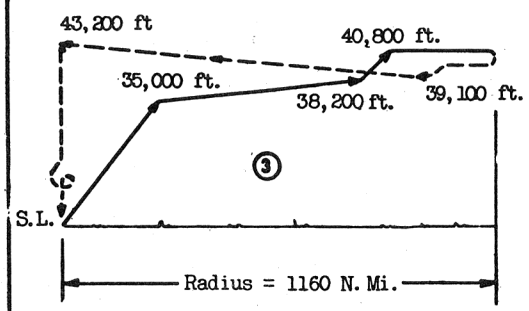
NOTES

HIGH ALTITUDE RECONNAISSANCE

WARM UP, TAKE-OFF, AND ACCELERATE: 5 minutes at normal thrust at sea level.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE OUT: At altitudes and speeds for maximum range.
CLIMB: With maximum thrust on course to cruise ceiling.
RUN IN: 15 minutes at normal thrust at combat altitude.
EVASIVE ACTION: 2 minutes with normal thrust at combat altitude (no distance gained).
ESCAPE: 8 minutes with normal thrust (assume escape ends at optimum cruising altitude).
CRUISE BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5% of the initial fuel load.

Combat Radius = Climb + Cruise Out + Climb + Run in = Escape + Cruise Back.

Mission Time = Time required for climb + cruise out + climb + run in + evasive action + escape + cruise back.



NIGHT RECONNAISSANCE (LOW ALTITUDE PHOTOGRAPHIC)

WARM UP, TAKE-OFF, AND ACCELERATE: 5 minutes at normal thrust at sea level.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE OUT: At altitudes and speeds for maximum range.
DESCEND: To sea level (no fuel used and no distance gained)
RUN IN: For 50 miles with military thrust at sea level
FUEL ALLOWANCE AT TARGET: 8 minutes with normal thrust at sea level (no distance gained).
EVASIVE ACTION: 5 minutes with military thrust at sea level (no distance gained).
RUN OUT: For 50 miles with military thrust at sea level.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5% of initial fuel load.

Combat Radius = climb + cruise out + run in = runout + climb + cruise back.

Mission Time = Time required for climb + cruise out + run in + target time + evasive action + run out + climb + cruise back.

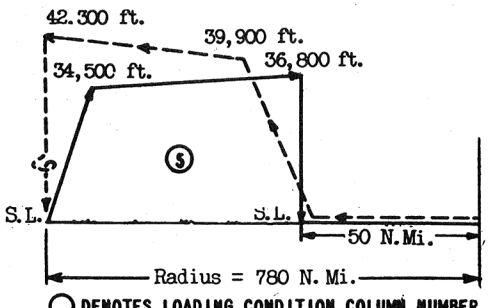
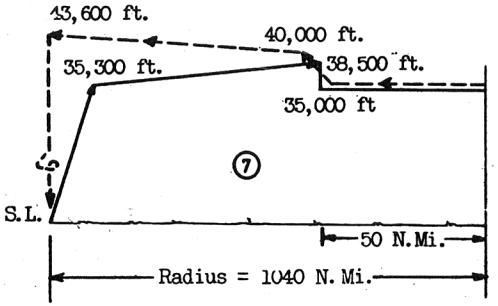


PHOTO MAPPING (HIGH ALTITUDE PHOTOGRAPHIC)

WARM UP, TAKE OFF, AND ACCELERATE: 5 minutes at normal thrust at sea level.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE OUT: At altitudes and speeds for maximum range.
DESCEND: To 35,000 feet (no fuel used, no distance gained).
RUN IN: For 50 miles with military thrust at 35,000 feet.
FUEL ALLOWANCE AT TARGET: 12 minutes with normal thrust at 35,000 feet (no distance gained).
EVASIVE ACTION: 5 minutes with military thrust at 35,000 feet (no distance gained).
RUN OUT: For 50 miles with military thrust at 35,000 feet.
CLIMB: On course to optimum cruise altitude with military thrust
CRUISE BACK: At altitudes and speeds for maximum range.
RESERVE: 20 minutes at speed for maximum endurance at sea level plus 5% of initial fuel load.

Combat Radius = climb + cruise + run in = run out + climb + cruise back.

Mission Time = Time required for climb + cruise out + run in + target time + evasive action + run out + climb + cruise back.



○ DENOTES LOADING CONDITION COLUMN NUMBER

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