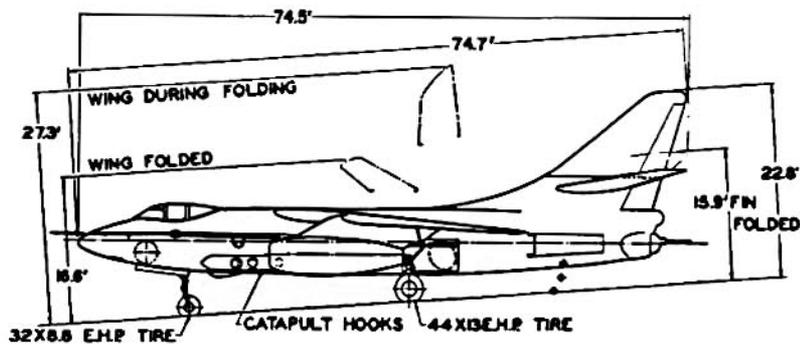
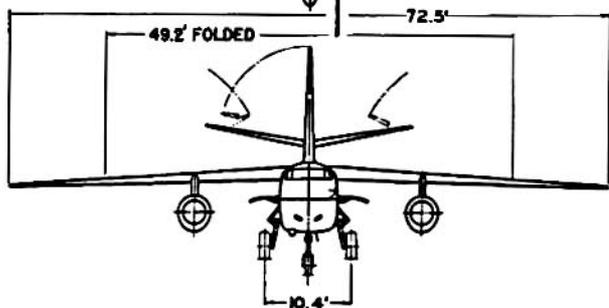
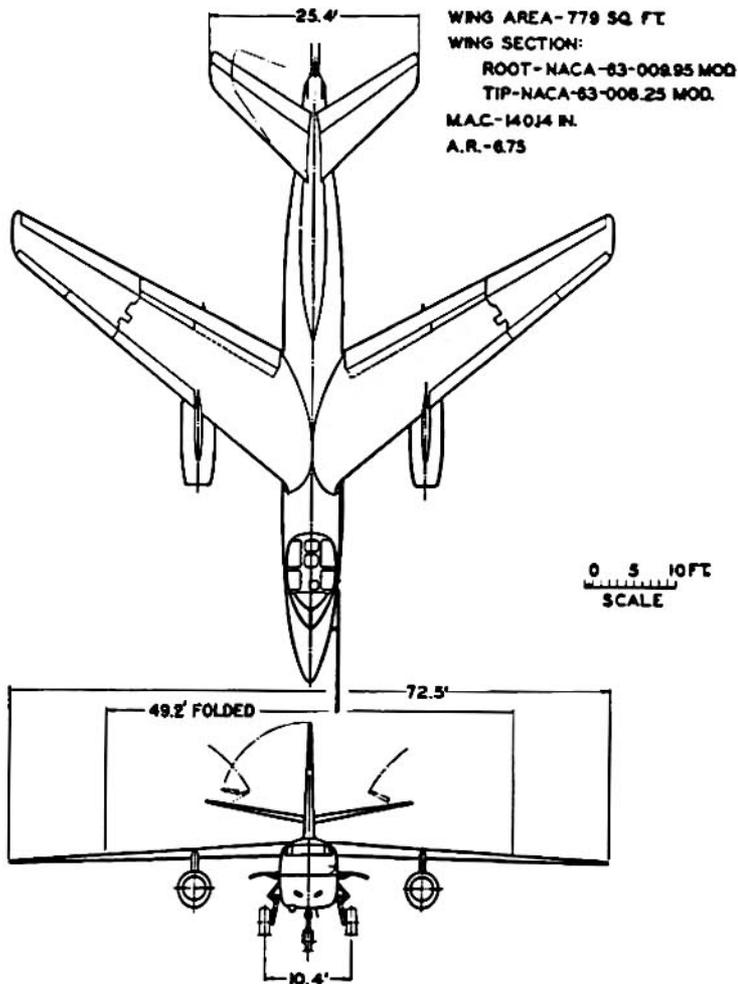
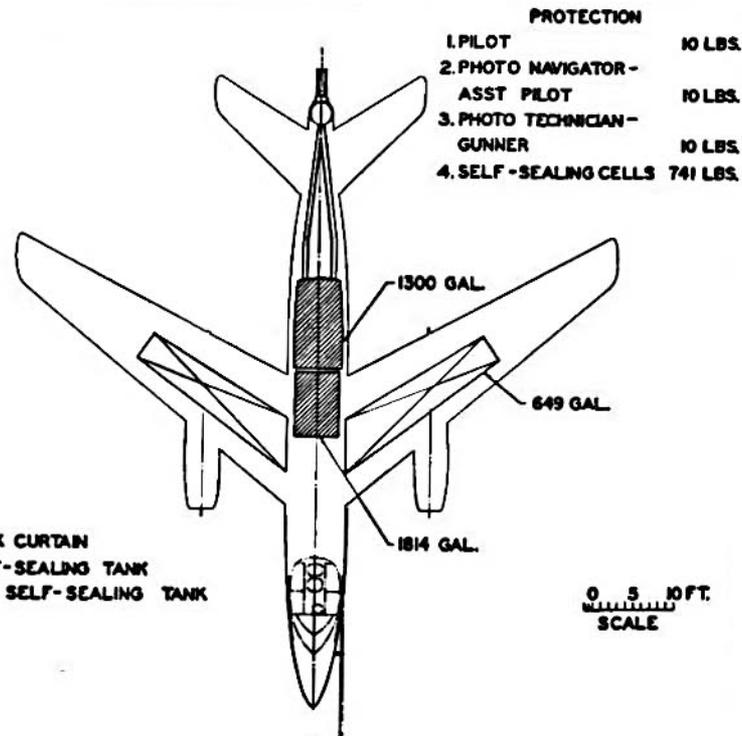


# STANDARD AIRCRAFT CHARACTERISTICS A3D-2P SKYWARRIOR

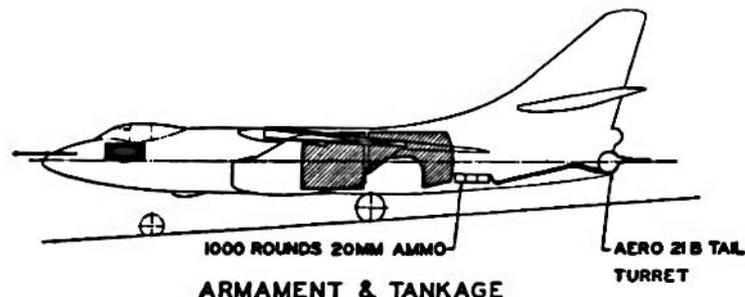
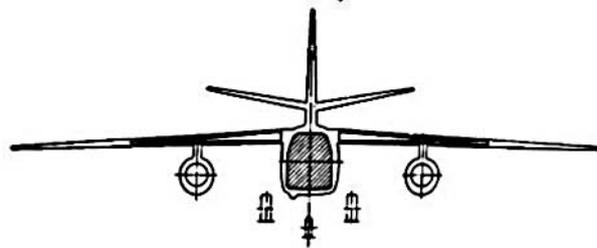
DOUGLAS



**DESCRIPTIVE ARRANGEMENT**



FLAK CURTAIN  
SELF-SEALING TANK  
NON SELF-SEALING TANK



**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-SKS4500 JATO  
 Tail Pipe Nozzle Const. Exit Area

**RATINGS**

Sea Level Static

	Thrust Lb.	RPM **	
		N <sub>1</sub>	N <sub>2</sub>
Maximum	10500	6150	9900
Military	10500	6150	9900
Normal	9000	5900	9650

\* N<sub>1</sub> speed of low-pressure  
 compressor

\*\*N<sub>2</sub> 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", & 5" 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 accommodates 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 #266) 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: NO(a) 55-205. 5 Airplanes  
 First Flight: July 1958

Contract: NO(a) 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	

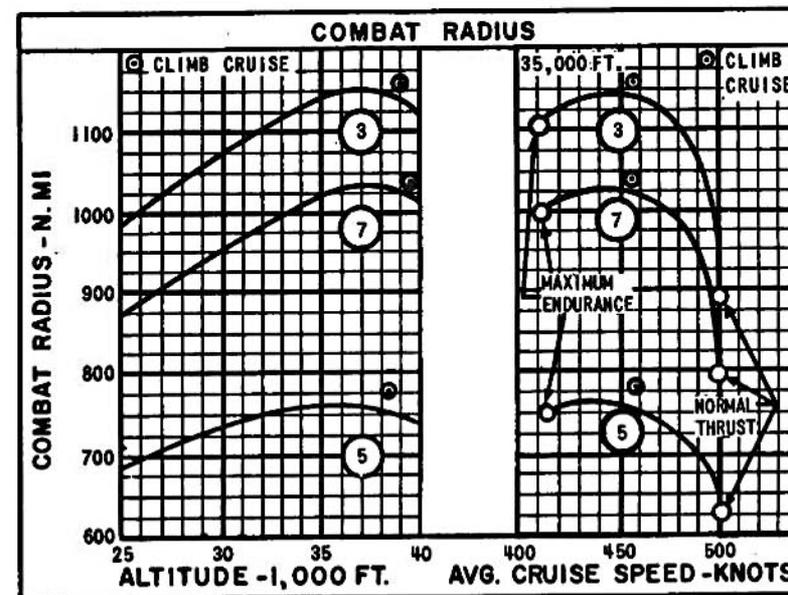
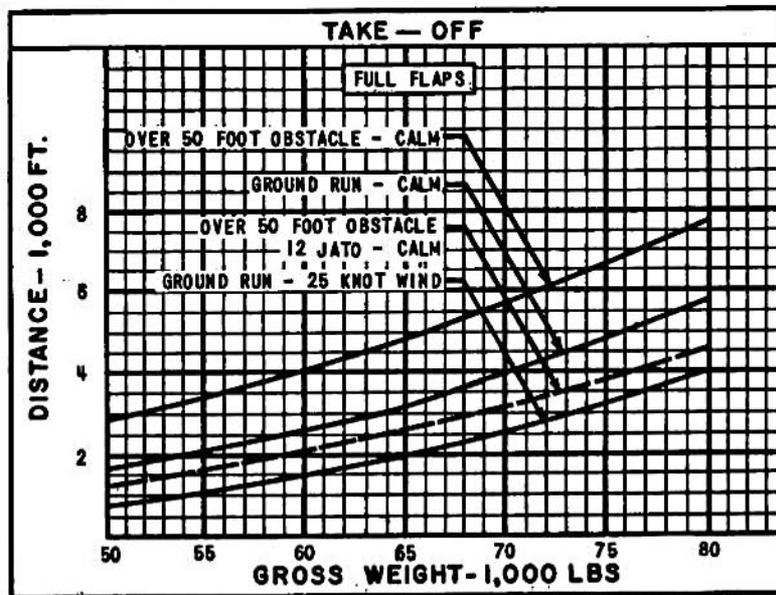
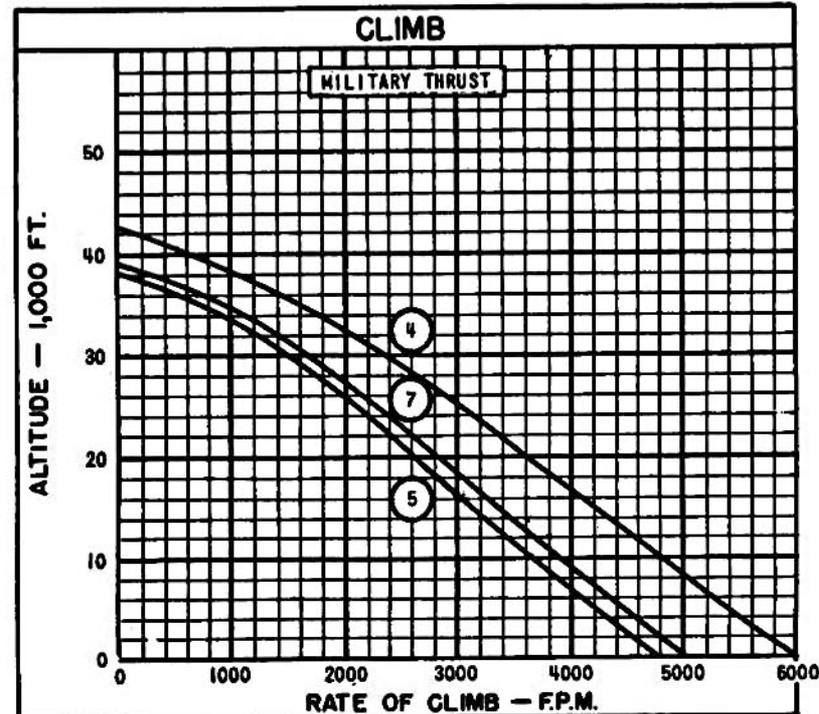
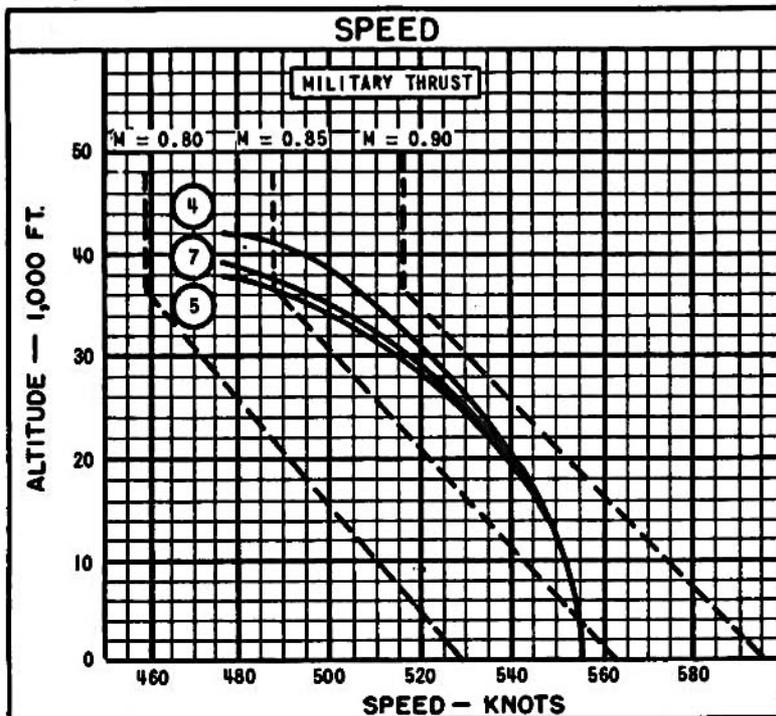
## PERFORMANCE SUMMARY

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)	1600/7.2 (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	720/35,000
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

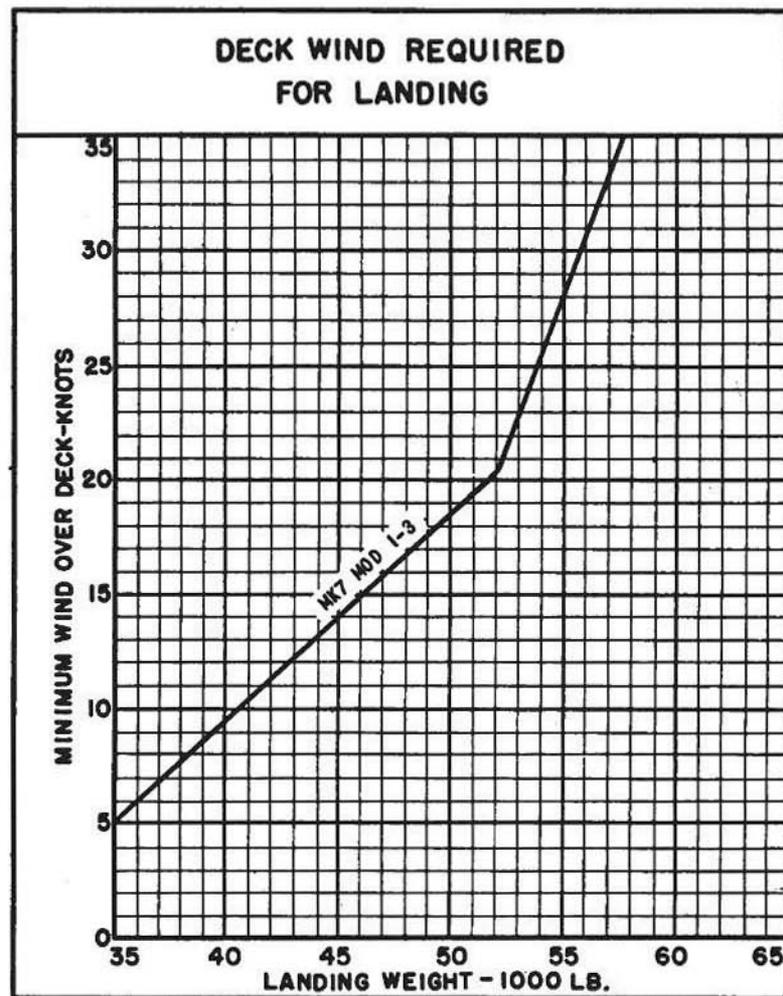
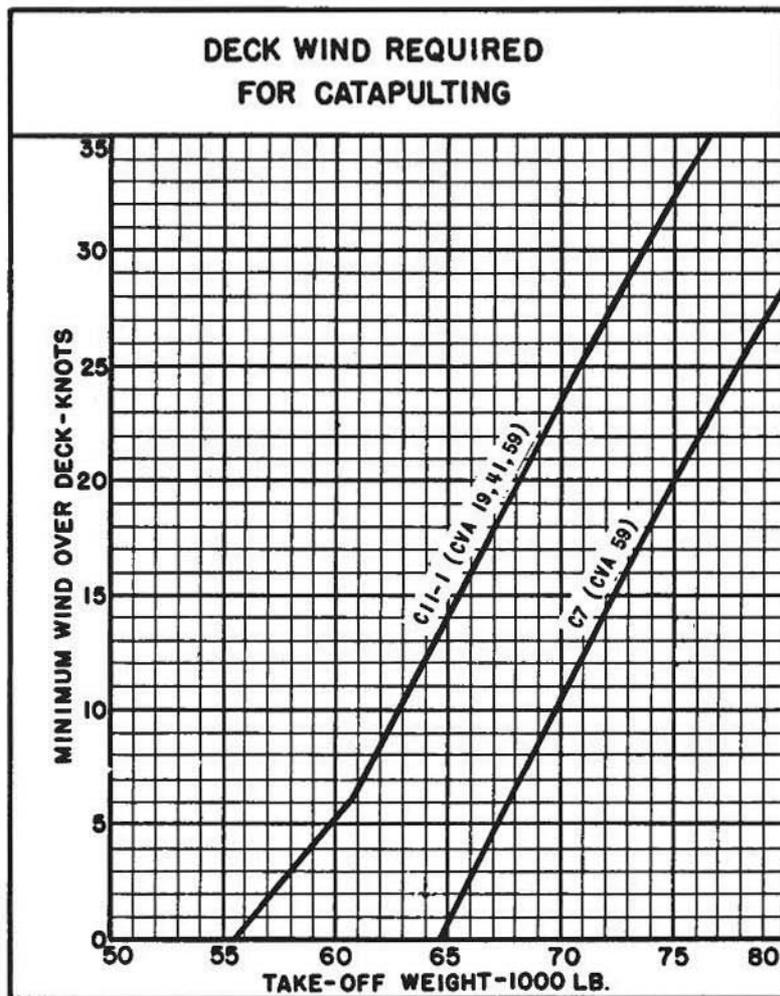
- (A) The limit catapult take-off weight of 73,000 pounds is consistent with current operating bulletins. Under emergency conditions increased take-off weights may be utilized.
- (B) Full flaps
- (C) One refueling from A3D-2 cambered wing tanker. (Tanker T.O. Wt. = 73,000 lb)
- (D) One refueling from A3D-2 cambered wing tanker. (Tanker T.O. Wt. = 73,000 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

## 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).

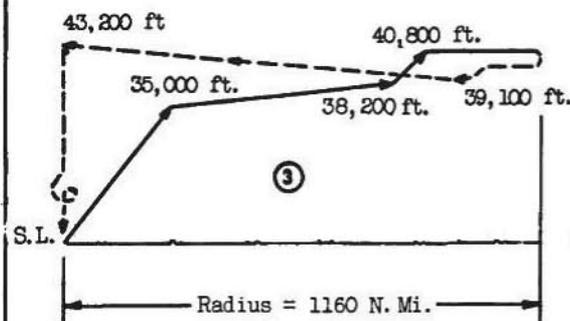
ESCAPE: 8 minutes with normal thrust (assume escape ends at optimum cruising altitude).

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.

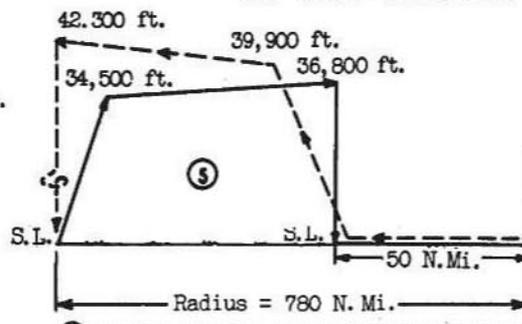
CLIMB: On course to optimum cruise altitude with military thrust.

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.

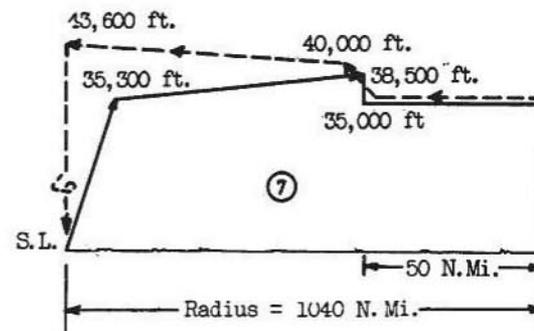
CLIMB: On course to optimum cruise altitude with military thrust

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.

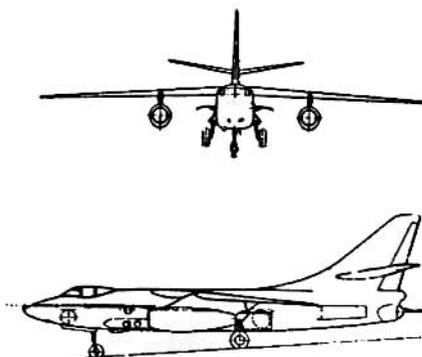
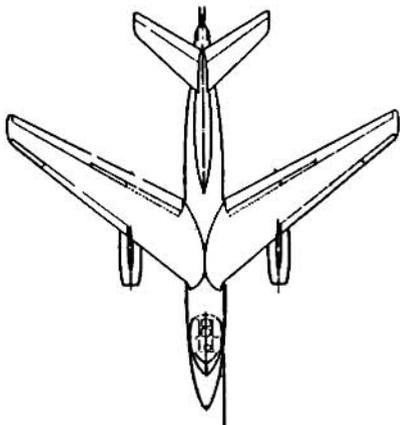
Mission Time = Time required for climb + cruise out + run in + target time + evasive action + run out + climb + cruise back.



○ DENOTES LOADING CONDITION COLUMN NUMBER

# CHARACTERISTICS SUMMARY

PHOTOGRAPHIC AIRPLANE A3D-2P



**WING AREA** 779 Sq. Ft.  
**WING SPAN** 72.5 Sq. Ft.

**LENGTH** 74.7 Ft.  
**HEIGHT** 22.8 Ft.

AVAILABILITY			PROCUREMENT				
NUMBER AVAILABLE			NUMBER DELIVERED IN FISCAL YEARS				
ACTIVE	RESERVE	TOTAL					

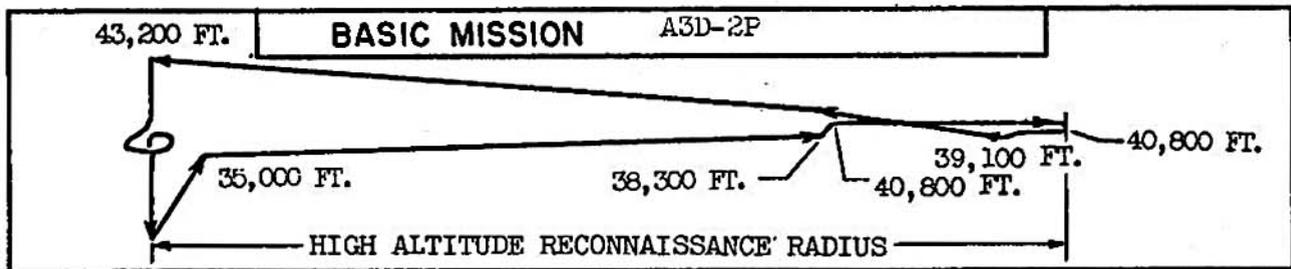
STATUS	
First Flight	July, 1958
First Fleet Delivery	August, 1959

ENGINES	
(2) Pratt & Whitney J57-P-10	
	Thrust Lb.
Maximum	10,500
Military	10,500
Normal	9,000
JATO	12 5KS4500 Units

FEATURES
Carrier Operating Provisions
Photo Reconnaissance (Day and Night)
Pressurized Camera Compartment
Photo Flash Bomb And/Or Cartridge Bay
IFR Provisions

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

## CHARACTERISTICS SUMMARY



### PERFORMANCE

COMBAT RADIUS	COMBAT RANGE	SPEED
1158 nautical miles at 459 knots average speed in 5.1 hours	2353 nautical miles at 459 knots average speed in 4.9 hours	509 knots at 35,000 FT. 490 knots at 40,000 FT. Combat Weight Military Thrust
CLIMB	CEILING	TAKE OFF
4900 fpm at sea level Take off Weight Military Thrust	<b>SERVICE:</b> 38,500 FT. 100 fpm Rate of Climb Take-Off Weight Military Thrust	4700 ft., Full Flaps, No Wind, No JATO
6000 fpm at sea level Take off Weight Military Thrust	<b>COMBAT:</b> 40,900 FT. 500 fpm Rate of Climb Combat Weight Military Thrust	6560 ft., To clear 50 ft. Obstacle, Full Flaps, No Wind, No JATO
LOAD	WEIGHTS	STALLING SPEED
Fuel 4412 gal. (JP-5) Photographic Equipment (1455 Lb.)	Empty      40,852 Lb. Landing:    47,730 Lb. Combat:     62,522 Lb. Take Off:    74,522 Lb.	133.5 knots Take off Weight Power Off
		TIME TO CLIMB
		30,000 ft. in 9.6 min. Take Off Weight Military Thrust

### NOTES

Performance is derived from NATC and contractor's Flight Test of the Model A3D-2 and -2P. Range and Radii based on Flight Test Fuel Consumptions.