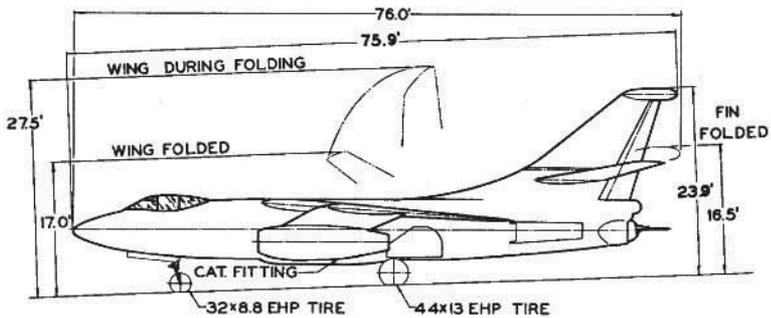
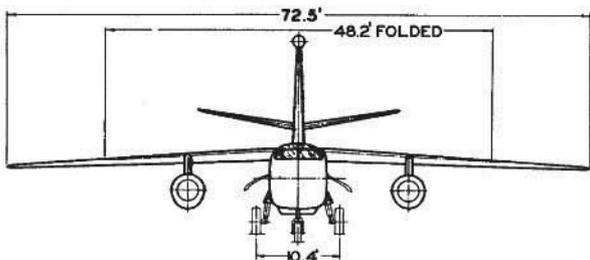
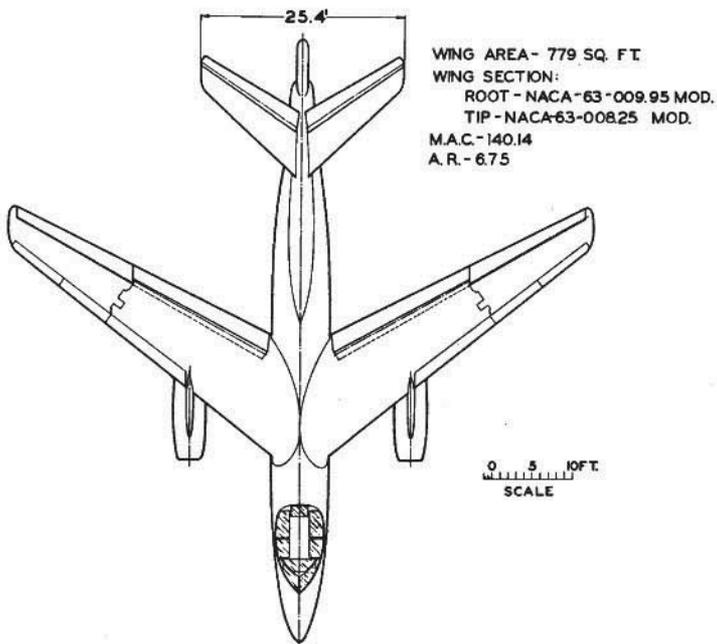


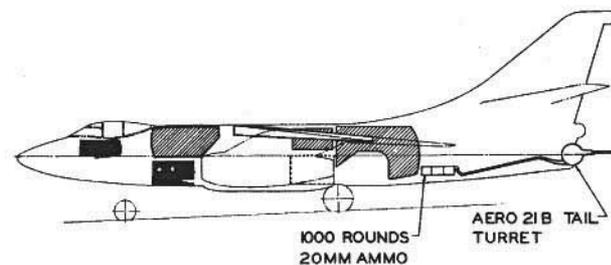
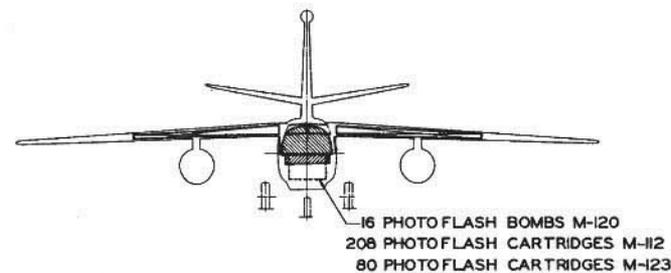
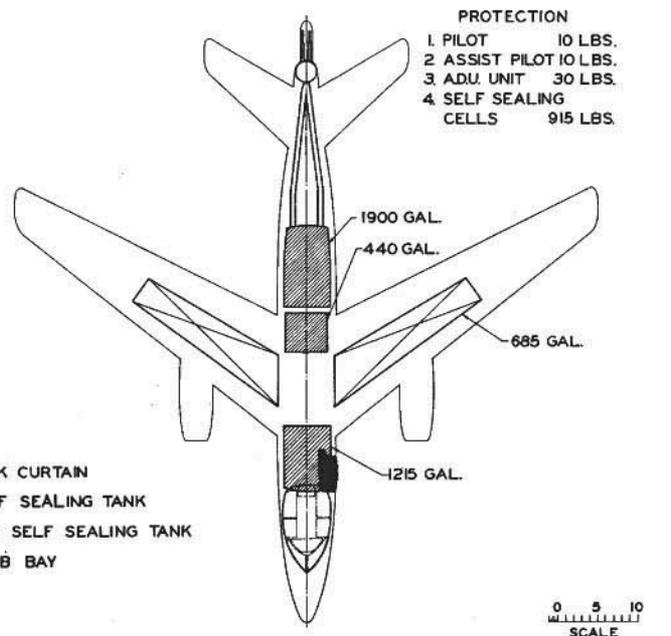
# STANDARD AIRCRAFT CHARACTERISTICS A3D-1P "SKYWARRIOR"

DOUGLAS

Standard Aircraft Characteristics NAVAER 1335A (REV. 1-49)



DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKAGE

**POWER PLANT**

NO. & MODEL.....(2) J57-P-1  
 MFR.....Pratt & Whitney  
 TYPE.....Axial Comp.  
 LENGTH.....164.0"  
 DIAMETER.....41.0"

**RATINGS**

	Lbs.	Rpm		Alt.
		*N <sub>1</sub>	N <sub>2</sub> **	
T.O.	9500	5950	9950	SSL
MIL.	9500	5950	9950	SSL
NORM.	8250	5700	9720	SSL

SPEC. NO. A-1532-A

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

\*\* N<sub>2</sub>: speed of high pressure compressor.

**ORDNANCE****GUNS**

No.	Size	Location	Rds.
2	20mm, M-3	Tail	1000

Tail Turret System... Aero 21B

**PHOTOGRAPHIC**

12-M-120 Photoflash Bombs  
 208-M-112 Photoflash Cartr'dgs  
 or  
 80-M-123 Photoflash Cartr'dgs

**Photographic Equipment**

1/K-38 or A-10 Fwd. Oblique  
 3/K-17, T-11 or CA-8 - Tri-Metrogon  
 1/K-37, 38, 17C, T-11 - Prim. Vert  
 1/K-37, 38, 17C, T-11 - Split Prim Vertical  
 1/A-22 VF - Bomb Bay

**MISSION AND DESCRIPTION**

The primary mission of the A3D-1P airplane is photo reconnaissance on day and night missions. The airplane is designed to operate from aircraft carriers and land bases.

The airplane has a conventional all metal swept wing with a semi-monocoque fuselage. The two turbo-jet engines are enclosed in nacelles under the wing. The three man crew consists of pilot, photo navigator and gunner navigator. The tricycle landing gear, arresting gear, wing and tail fold mechanisms, single-slotted wing flaps, rudder power boost mechanism, elevator and ailerons are operated by hydraulic power.

**DEVELOPMENT**

First flight (A3D-1) - September 1953

**DIMENSIONS****WING**

AREA.....779 sq. ft.  
 SPAN.....72' - 6"  
 MAC.....11' - 8"  
 SWEEPBACK.....36°  
 LENGTH.....75' - 11"  
 HEIGHT.....23' - 10"  
 TREAD.....10' - 6"

**WEIGHTS**

LOADINGS	LBS	L.F.
EMPTY*	37656	
BASIC*	40022	
DESIGN	55942	2.67
COMBAT*	58289	2.67
MAX. T.O. (Field)	70000	2.25
(Cat.)	70000	
MAX. LAND (Field)	55940	
(Arrest)	45900	

All weights are calculated.  
 Day reconnaissance.

**FUEL AND OIL**

NO. TANKS	TOTAL GAL.	LOCATION
2	3115	Fuselage
2	1370	Wing
1	440	Bomb Bay

FUEL GRADE.....JP-4  
 FUEL SPEC.....MIL-F-56244

**OIL**

CAPACITY (GALS.).....11  
 GRADE.....1010  
 SPEC.....MIL-O-6081A

**ELECTRONICS**

VHF COMM.....AN/ARC-27A  
 MHF RECEIVER.....AN/ARR-15A  
 MHF TRANS.....AN/ART-13 or 13A  
 ICS.....AN/AIC-4A  
 ALTIMETER.....AN/APH-22  
 MF RADIO COMPASS.....AN/ARN-6  
 NAV. REC.....AN/ARN-14E  
 IFF.....AN/APX-6E  
 (Video roder not installed  
 AN/APA-89)  
 AUTOMATIC CHAFF.....AN/ALQ-2  
 DISPENSER SET  
 VISUAL HOMING.....AN/ARN-21

## PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION	(1) HIGH ALT. Recon. (Day) 3/K-17C Plus 4/K-38 Cameras	(3) HIGH ALT. Recon. (night) 3/K-37 Cameras 16/M-120 Flash Bombs
TAKE-OFF WEIGHT	lb. 70,000	70,000
Fuel	lb. 29,277	26,719
Payload	lb. 130	2,602
Wing loading	lb./sq.ft. 89.9	89.9
Stall speed - power-off	kn. 129.5	129.5
Take-off run at S.L. - calm	ft. 4,400	4,400
Take-off run at S.L. 25 kn. wind	ft. 2,950	2,950
Take-off to clear 50 ft. - calm	ft. 6,100	6,100
Max. speed/altitude (A)	kn./ft. 524/18,000	524/18,000
Rate of climb at S.L. (B)	fpm 3,720	3,720
Time: S.L. to 20,000 ft. (B)	min. 6.6	6.6
Time: S.L. to 30,000 ft. (B)	min. 11.3	11.3
Service ceiling (100 fpm) (B)	ft. 41,800	41,800
Combat range	n.mi. 3,000	2,630
Average cruising speed	kn. 470	470
Cruising altitude(s)	ft. 41,000-49,200	41,000-49,300
Combat radius	n.mi. 1,500	1,345
Average cruising speed	kn. 470	470
Mission time	hrs. 6.4	4.6
COMBAT LOADING CONDITION	(2) CLEAN	(4) CLEAN
COMBAT WEIGHT	lb. 58,289	56,784
Engine power	Military	Military
Fuel	lb. 17,566	16,031
Combat speed/combat altitude	kn./ft. 485/44,500	491/44,100
Rate of climb/combat altitude	fpm/ft. 410/44,500	600/44,100
Combat ceiling (500 fpm)	ft. 44,100	44,500
Rate of climb at S.L.	fpm 4,650	4,790
Max. speed at S.L.	kn. 532	532
Max. speed/altitude	kn./ft. 542/11,000	543/11,000
LANDING WEIGHT	lb. 43,831	43,709
Fuel	lb. 3,108	2,956
Stall speed - power-off	kn. 102.5	102.3
Stall speed - with approach power	kn. 100.6	100.4

## NOTES

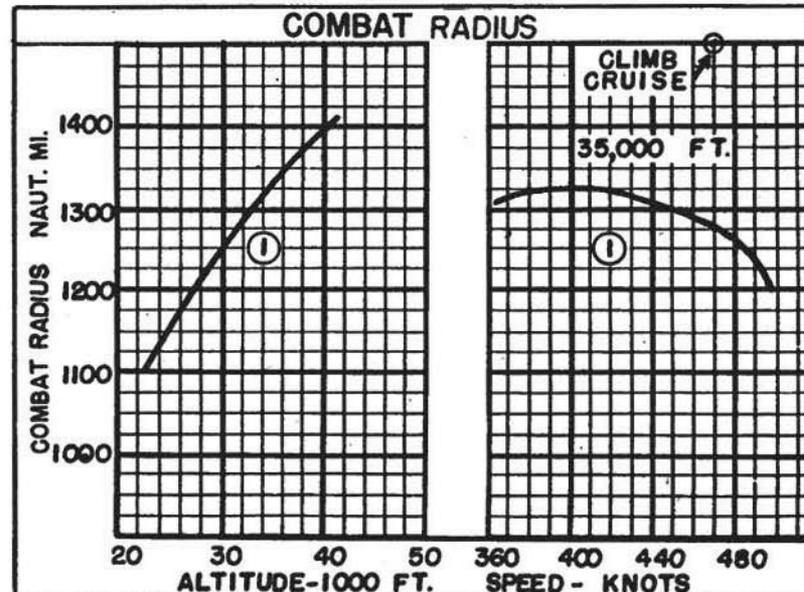
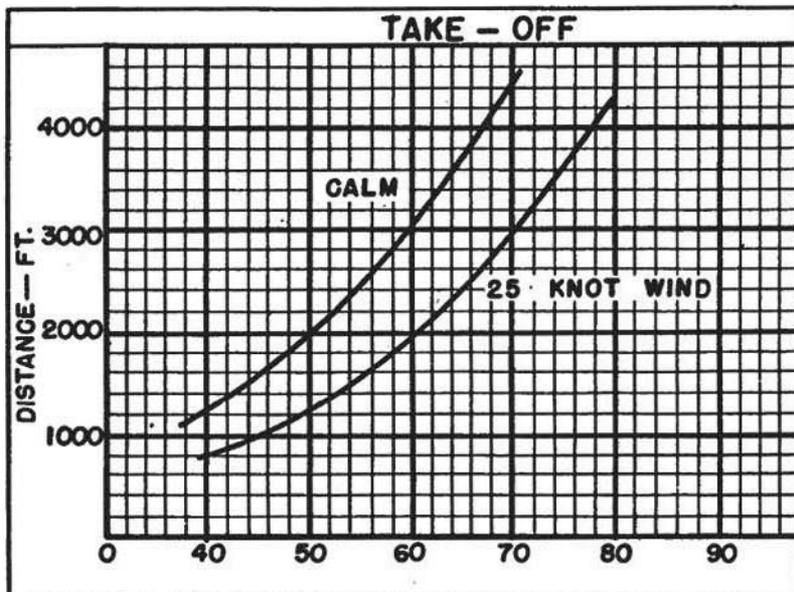
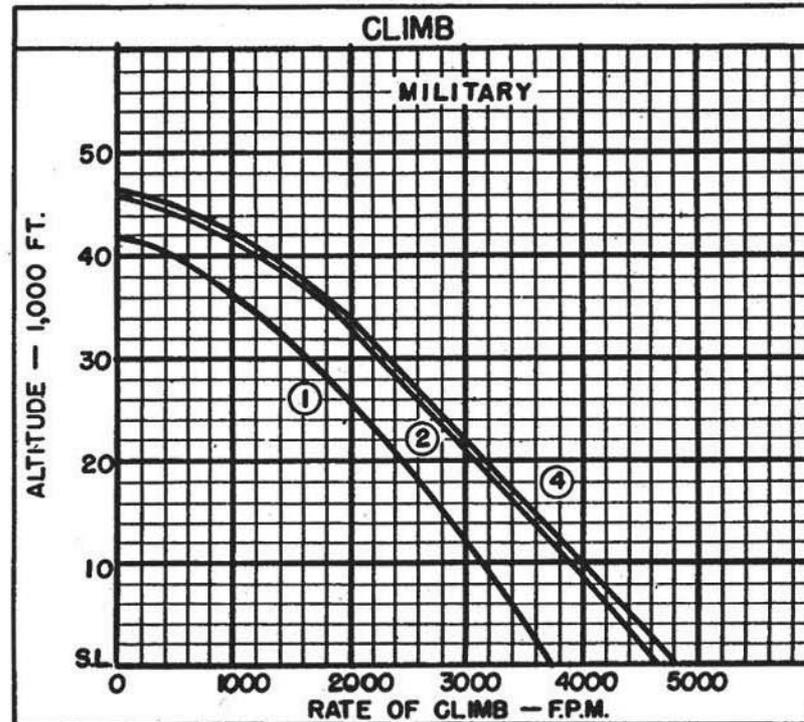
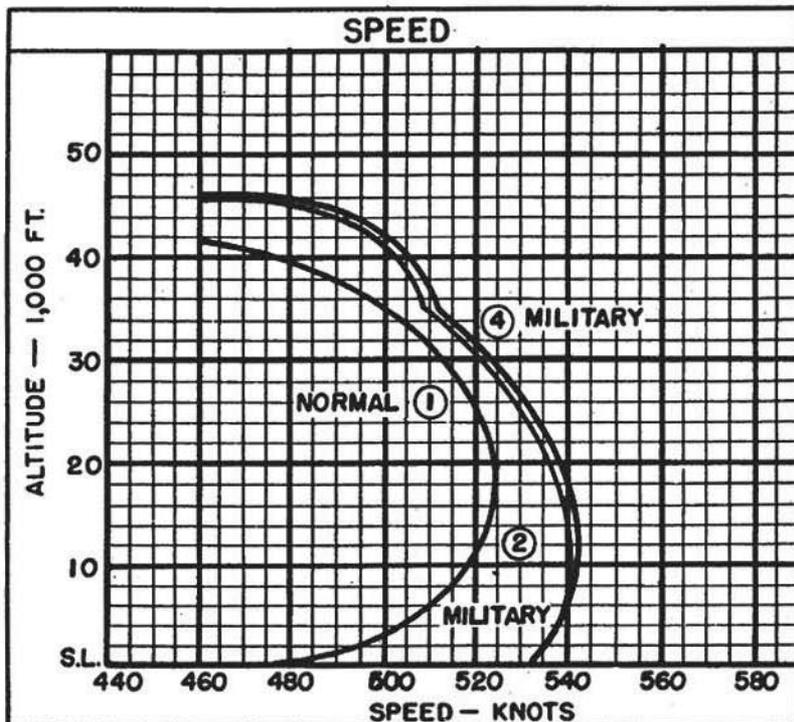
(A) Normal rated thrust

(B) Military rated thrust

Performance Basis: Calculations.

Range and radius are based on engine specification fuel consumption data increased by 5%.

(Cont'd on NOTES page)



○ LOADING CONDITION COLUMN NUMBER

Standard Aircraft Characteristics NAVAER 1335E (REV. 2-50)

# NOTES

(Continued Performance Summary)

**SPOTTING:** A maximum operating spot aboard a CVA-19 (canted deck) class carrier consists of 15 aircraft on the flight deck with elevators and landing area clear and 12 aircraft on the hangar deck with hangar bay fire doors and elevators clear. Total: 27 aircraft.

## HIGH ALTITUDE RECONNAISSANCE

**WARM UP, TAKE-OFF, ACCELERATE:** 5 minutes at normal rated thrust at sea level.

**CLIMB:** On course to cruise altitude at military rated thrust.

**CRUISE OUT:** At speed for long range.

**RUN-IN:** 15 minutes at normal rated thrust in level flight.

**DROP FLARES**

**EVASIVE ACTION:** 2 minutes at normal rated thrust at combat altitude (no distance gained).

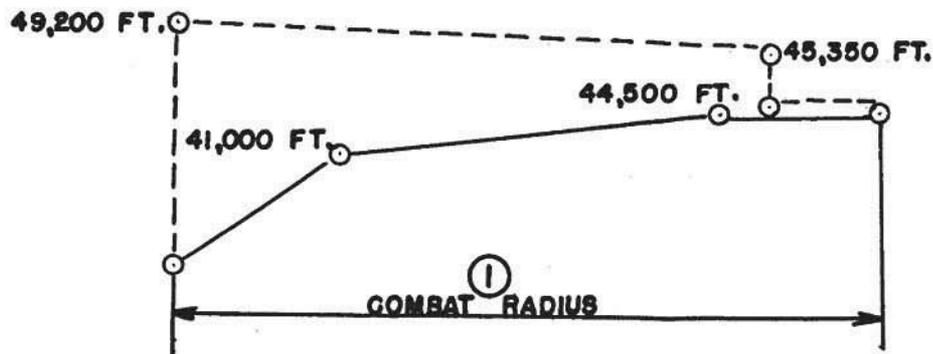
**RUN-OUT:** 8 minutes at normal rated thrust. (Run-out assumed concluded at initial cruise back altitude).

**CRUISE BACK:** At speed for long range at cruise ceiling.

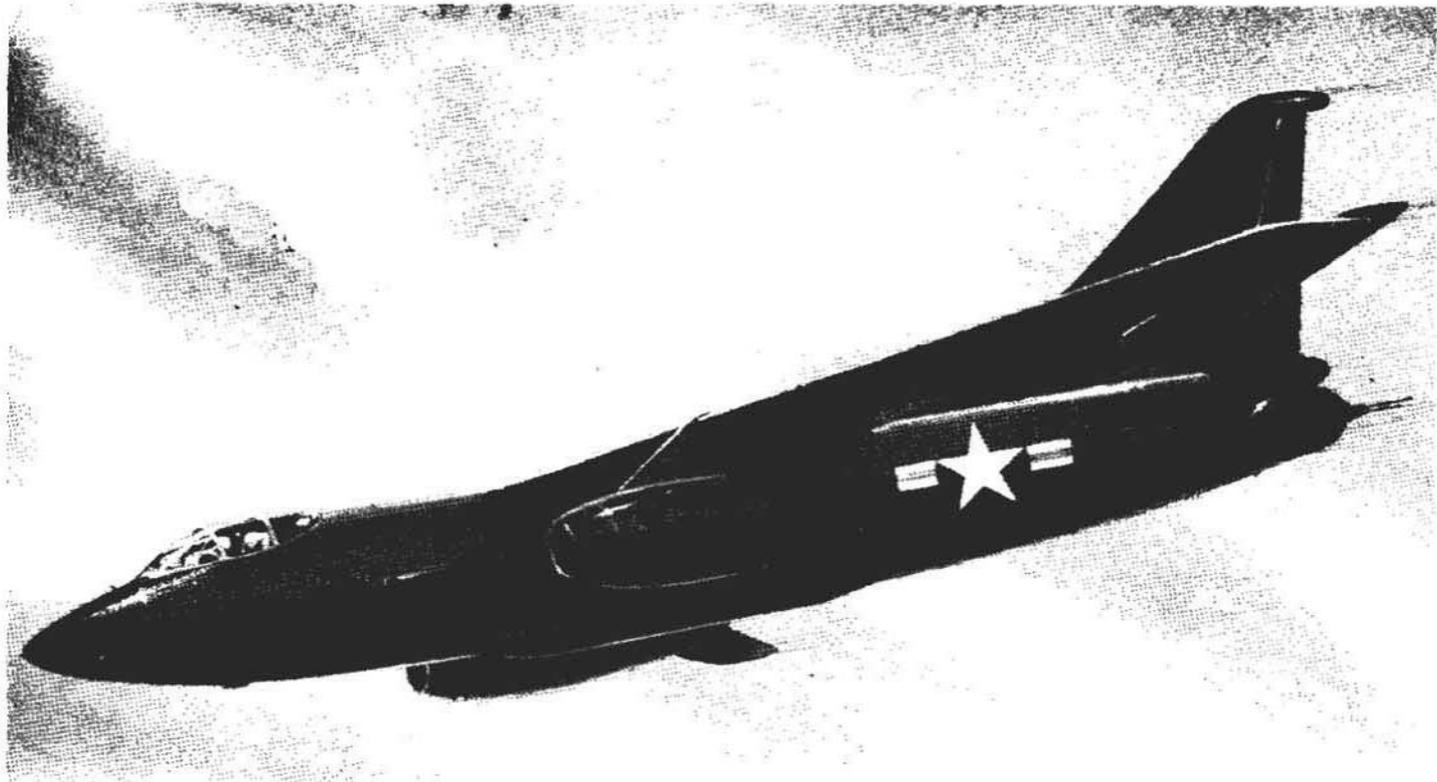
**RESERVE:** 20 minutes at speed for maximum endurance at sea level plus 5% of initial fuel load.

$$\text{COMBAT RADIUS} = \text{CLIMB} + \text{CRUISE OUT} + \text{RUN IN} = \text{RUN OUT} + \text{CRUISE BACK}$$

$$\text{MISSION TIME} = \text{TIME REQUIRED FOR CLIMB} + \text{CRUISE OUT} + \text{RUN IN} + \text{EVASIVE ACTION} + \text{RUN OUT} + \text{CRUISE BACK}$$



① LOADING CONDITION COLUMN NUMBER

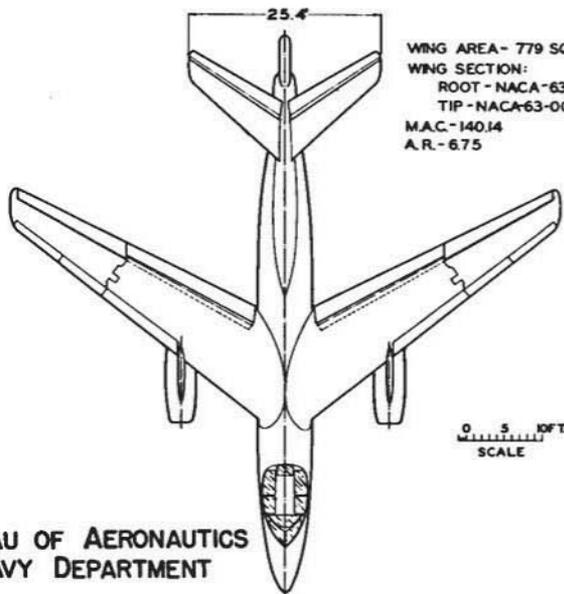


STANDARD AIRCRAFT CHARACTERISTICS  
MODEL A3D-IP

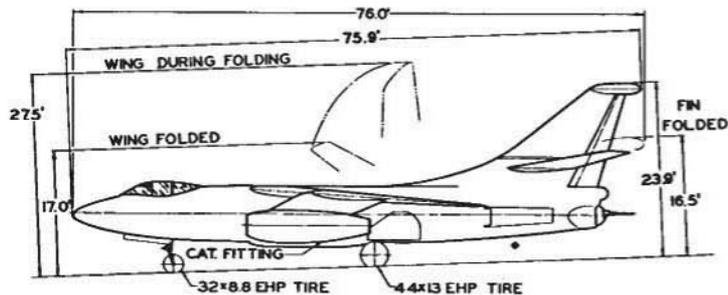
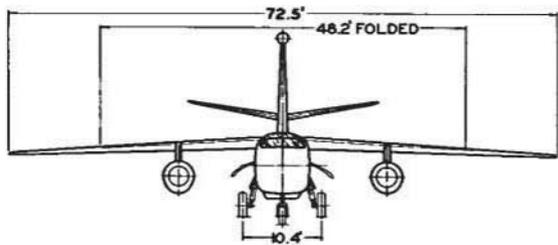
DOUGLAS AIRCRAFT COMPANY INC., EL SEGUNDO DIVISION

11 SEPTEMBER 1953

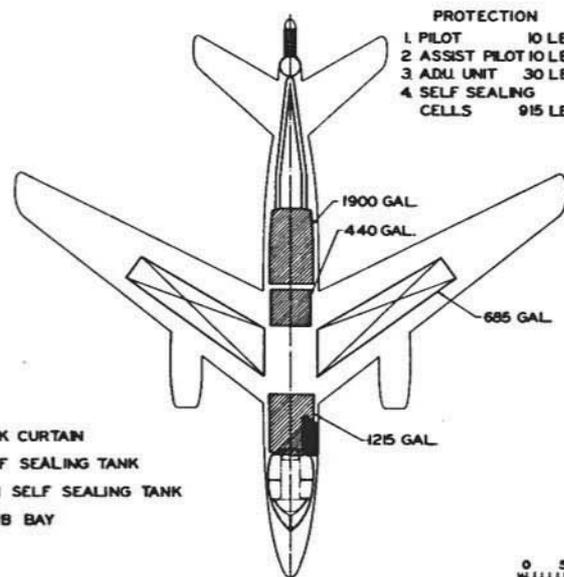
A3D-IP



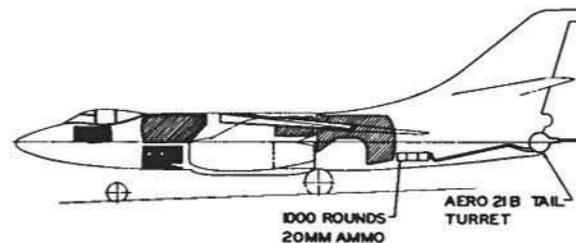
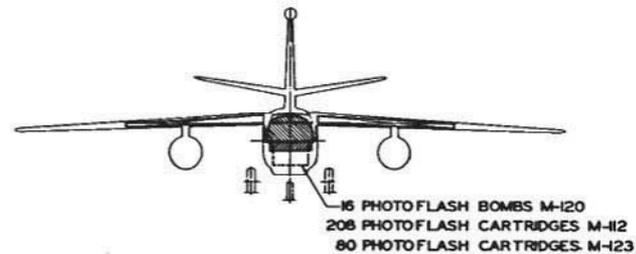
BUREAU OF AERONAUTICS  
NAVY DEPARTMENT



DESCRIPTIVE ARRANGEMENT



- FLAK CURTAIN
- ▨ SELF SEALING TANK
- ▩ NON SELF SEALING TANK
- BOMB BAY



ARMAMENT & TANKAGE

## MISSION AND DESCRIPTION

The standard model ASD-1P airplane is a long-range, high performance photo-reconnaissance airplane used for day and night missions. The airplane is designed to operate from land bases and from large CVA carriers.

The airplane is a conventional swept wing structure. Two turbojet engines are enclosed in under-wing nacelles. Provisions are made for a three man crew; a pilot, a photo-navigator and a gunner-navigator who also is the photo technician. The tricycle landing gear, arresting gear, wing fold and tail fold mechanisms, NACA single-slotted type wing flaps and power boost mechanisms for rudder, elevator and ailerons are operated by hydraulic power. The horizontal stabilizer is adjustable for trim in flight.

Armament provisions consist of the radar controlled tail turret with two 20 mm guns.

Cameras and a viewfinder are enclosed in the forward compartment of the basic bomb bay.

This chart includes M.C.R. #1 to 31.

### DEVELOPMENT

The ASD-1P configuration results from a kit modification of the basic ASD-1 airplane.

Contract approval: Amendment No. 2 to Contract AC(46) 51-652 for one ASD-1P.

First flight: Estimated May 1954.

Production Plans: Unknown.

## DIMENSIONS

SPAN	72'-6"
LENGTH (3 point)	75'-10-3/4"
LENGTH (level)	75'-3-3/4"
HEIGHT	23'-10-3/8"
TREAD	10'-5"
WING AREA	779 Sq. Ft.
TURN RADIUS*	43'-7-7/8"

\*From main wheel to opposite wing tip.

## WEIGHTS

Loading	Weight	L.F.
*EMPTY "C"	37,656	--
*BASIC	40,022	--
DESIGN	55,942	2.67
*COMPAT	58,289	2.67
MAX. T. O.	70,000	2.25
MAX. LANDING		
a. Emergency	55,942	--
b. Basic	45,922	--

\*DAY RECONNAISSANCE

## FUEL AND OIL

Gal. - No. Tanks - Location		
3115*	2	Fuselage
1370*	2	Wing
440	1	Bomb Bay

\*Self-sealing Tanks

Fuel Grade: 80 or higher

Fuel Spec: MIL-F-5572

### OIL

Gal. - No. Tanks - Location		
11	2	Engine

PWA 521A

## ELECTRONICS

*RADAR ALT .....	AN/APN-7
VHF COMM .....	AN/ARC-27A
**RDR BMB DIR. MK5	AN/ASB-1A
MIF XMTR .....	AN/ART-13
MIF REC .....	AN/ARR-15A
NAV REC .....	AN/ARR-2A
IFF .....	AN/APX-6
ICS (3 place) ..	AN/AIC-4A
RADIO COMPASS ..	AN/ARN-6
*To be replaced by AN/APN-22	
**Installed but not used.	

## POWER PLANT

NO. & MODEL	2 J57-P-1
MFR.	P & W
ENG. SPEC. NO.	A-1632-A (12-11-52)
TYPE	Turbojet
COMPRESSOR	Dual rotor, axial flow
LENGTH	164"
DIAMETER	41"
TAIL PIPE	Constant exit area
NOZZLE	
NO. & TYPE	12/JATO units
ASSIST	Aerojet, 5-KS- 4500, X112A1

## RATINGS

J57-P-1 S.L.S. Thrust (lb.)	
TAKE-OFF .....	9500
MILITARY .....	9300
NORMAL .....	8250

## ORDNANCE

1-Aero 21B Tail Turret System including two 20 mm. guns with 500 rounds ammunition per gun and electronic control system  
PHOTOGRAPHIC

12- M-120 Photoflash bombs or  
208- M-112 Photoflash cartridges or  
80- M-123 Photoflash cartridges  
PHOTOGRAPHIC EQUIPMENT

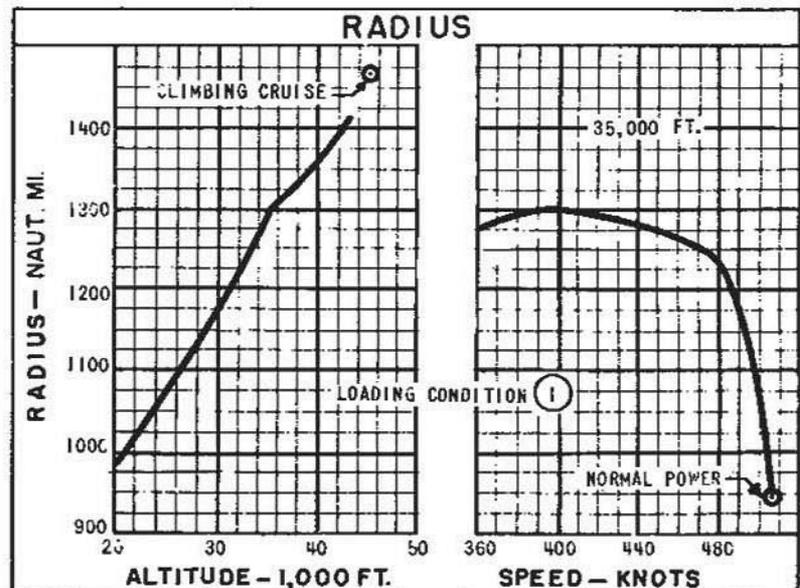
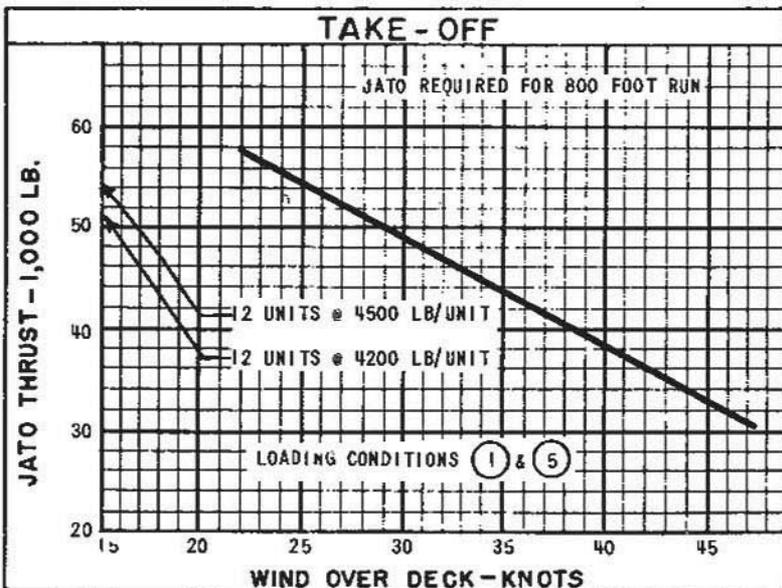
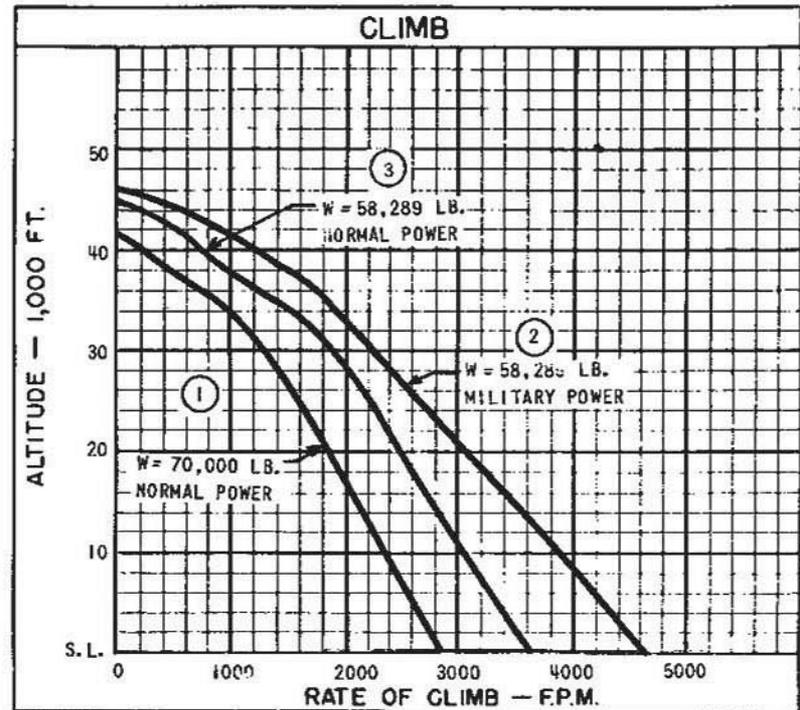
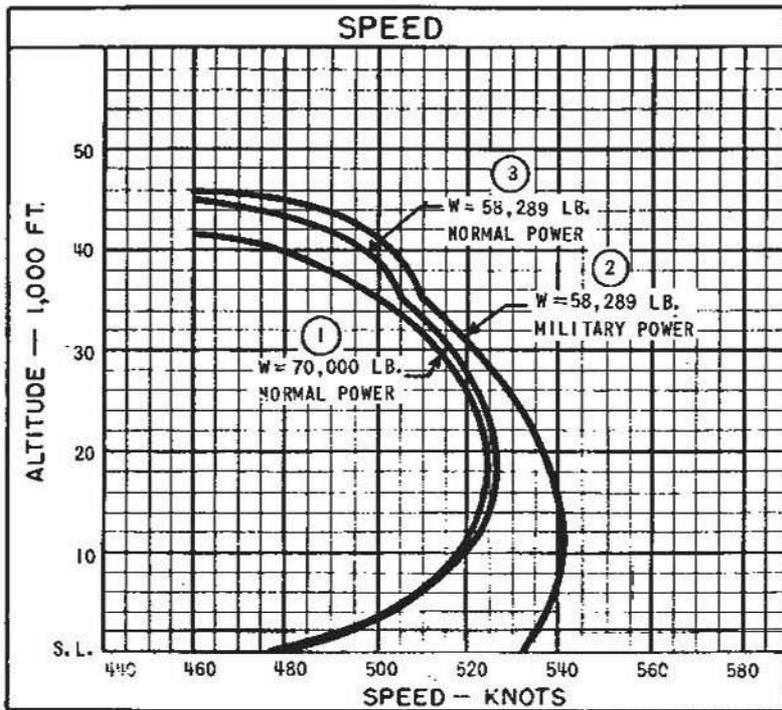
Fwd. Oblique Station-One K-38 (24" or 36") or one A-10.  
Tri-Metrogon Station - Three K-17 (6") or three T-11 (6") or three CA-8 (6")  
Primary Vert. Station-One K-37 (12") or one K-38 (24" or 36") or one K-17C (6", 12" or 24") or one T-11 (6") or one CA-8 (6")  
Split Vert. Station-Same cameras as for Prim. Vert. Sta. Viewfinder One A-22VF type in bomb bay.

## PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		Day Recon- naissance ① (A)		Night Recon- naissance ⑤ (B)	
TAKE-OFF WEIGHT	lb.	70,000		70,000	
Fuel	lb.	29,277		26,719	
Payload	lb.	130 (A)		2602 (B)	
Wing loading	lb./sq.ft.	89.9		89.9	
Stall speed - power-off	kn.	129.5		129.5	
Take-off run at S.L. - calm	ft.	4405		4405	
Take-off run at S.L. 25 kn.wind(C)	ft.	2970		2970	
Take-off to clear 50 ft. - calm	ft.	6100		6100	
Max. speed/altitude (D)	kn./ft.	524/18,000		524/18,000	
Rate of climb at S.L.(E)	fpm	3720		3720	
Time: S.L. to 20,000 ft. (E)	min.	6.6		6.6	
Time: S.L. to 30,000 ft. (E)	min.	11.3		11.3	
Service ceiling (100 fpm) (E)	ft.	41,800		41,800	
Combat range	n.mi.	2933		2561	
Average cruising speed	kn.	471(M=.82)		471(M=.82)	
Cruising altitude(s)	ft.	41,000-49,000		41,000-49,100	
Combat radius	n.mi.	1465(F)		1312(G)	
Average cruising speed	kn.	471(M=.82)		471(M=.82)	
COMBAT LOADING CONDITION		60% Fuel ②	60% Fuel ③	60% Fuel ⑥	60% Fuel ⑦
COMBAT WEIGHT	lb.	58,289(H)	58,289(H)	56,784(I)	No Flashcombs 56,784(I)
Engine power		MILITARY	NORMAL	MILITARY	NORMAL
Fuel	lb.	17,566	17,566	16,031	16,031
Combat speed/combat altitude	kn./ft.	485/44,500	470/44,500	491/44,100	481/44,100
Rate of climb/combat altitude	fpm/ft.	410/44,500	130/44,500	600/44,100	260/44,100
Combat ceiling (500 fpm)	ft.	44,100(H)	42,200	44,600(I)	42,700
Rate of climb at S.L.	fpm	4650	3630	4790	3750
Max. speed at S.L.	kn.	532(J)	479	532(J)	479
Max. speed/altitude	kn./ft.	511/35,000	506/35,000	512/35,000	507/35,000
LANDING WEIGHT	lb.	43,831(K)		43,709(L)	
Fuel	lb.	3108		2956	
Stall speed - power-off	kn.	102.5		102.3	
Stall speed - with approach power	kn.	100.6		100.4	

### NOTES

- (A) Payload consists of three K-17C cameras and four K-38 cameras.  
 (B) Payload consists of three K-37 cameras and 16 M-120 flash bombs.  
 (C) No Jato. Jato required for 800 ft. deck run in 25 knot wind is 54,700 lbs. based on using Jato last five seconds of run only. Jato unit is standard 4200 lb. thrust unit with thrust line canted 30°.  
 (D) Normal Power  
 (E) Military Power  
 (F) High Altitude Reconnaissance radius problem defined in MIL-C-5011A. Radius can be increased to 1478 n.mi. with

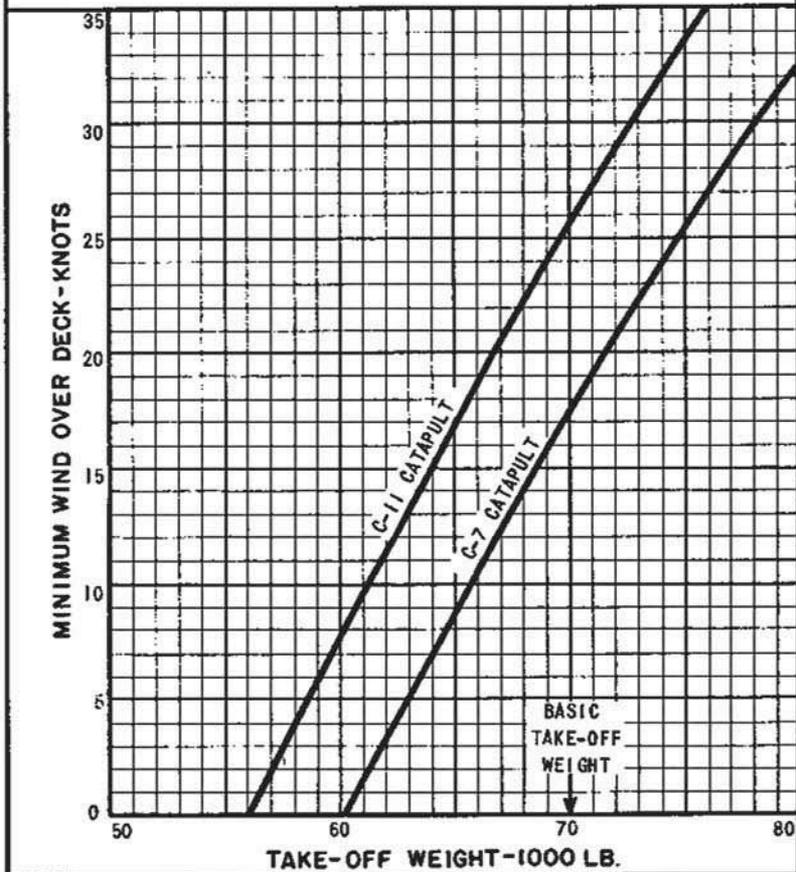


○ LOADING CONDITION COLUMN NUMBER

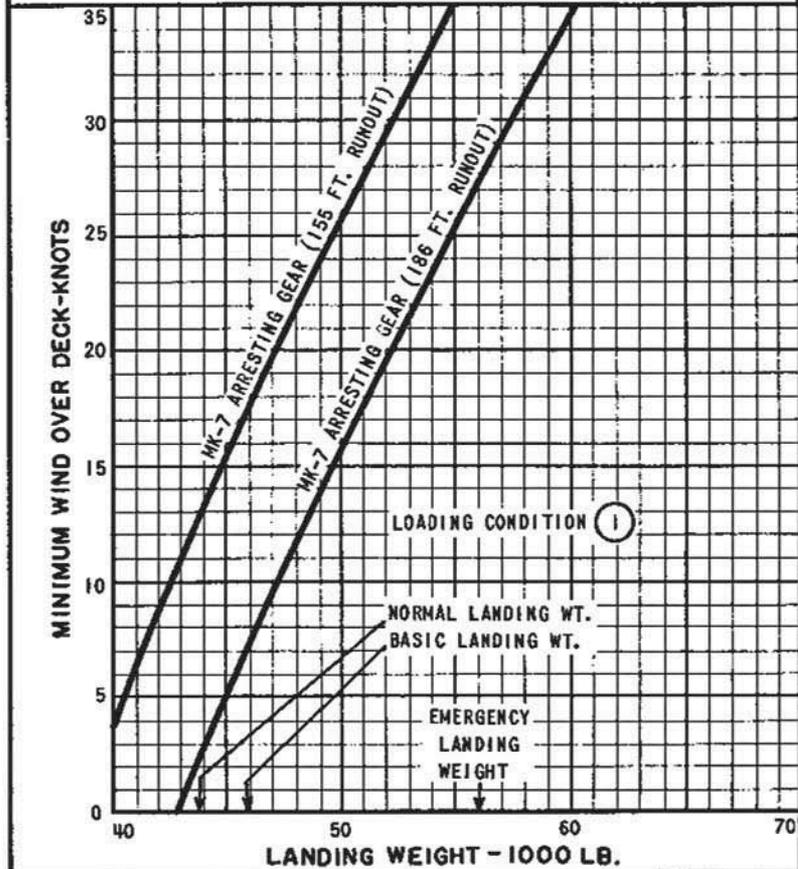
# CARRIER SUITABILITY

## (CVA 59 CLASS CARRIER)

### DECK WIND REQUIRED FOR CATAPULTING



### DECK WIND REQUIRED FOR LANDING

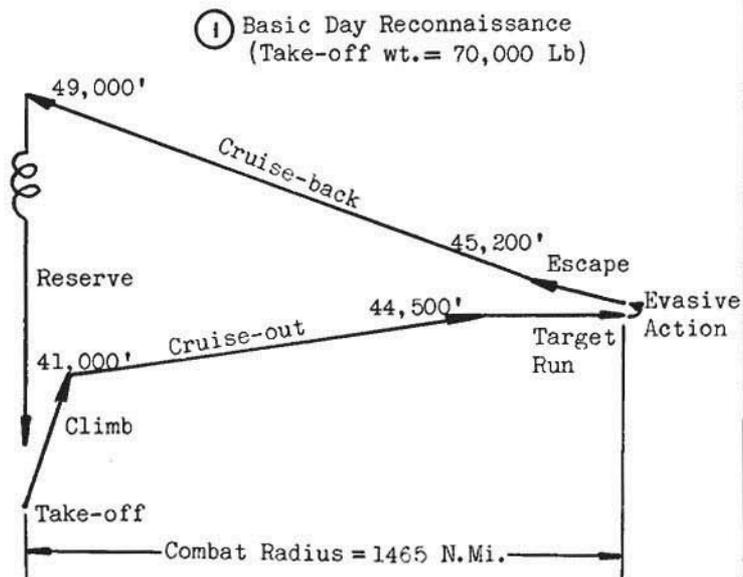


# NOTES

- full internal fuel of 29,550 pounds at an overload gross weight of 70,273 pounds (1588 n. mi. with JP-4 fuel).
- (G) High Altitude Reconnaissance radius problem defined in MIL-C-5011A. Radius can be increased to 1443 n. mi. with full internal fuel of 29,550 pounds at an overload gross weight of 72,831 pounds (1552 n. mi. with JP-4 fuel).
- (H) Actual weight over target just after target run is 54,310 pounds. (Approximately 46% fuel remaining); corresponding combat ceiling is 45,500 feet.
- (I) Actual weight over target just after target run is 53,012 pounds. (Approximately 46% fuel remaining); corresponding combat ceiling is 46,100 feet.
- (J) Limited by engine mechanical limit.
- (K) 200 foot length is required to spot 8 airplanes on the 96 foot wide deck immediately aft of the forward range on CVA-59 class carriers.
- (L) Includes effect of approved and pending MCR's 1-31.
- (M) Performance based on estimated characteristics.
- (N) Combat radius and range are based on Pratt & Whitney Engine Specification No. A-1632-A, dated 12-11-51. Specific fuel consumptions are increased 5%.
- (O) Performance is based on NACA standard conditions, no wind and is for a single airplane.

## HIGH ALTITUDE RECONNAISSANCE COMBAT RADIUS PROBLEM

1. Fuel allowance for starting engines, take-off and accelerate to climb speed is five minutes at sea level static normal power.
2. Climb on course at speed for maximum rate-of-climb with military power to altitude for best range (not to exceed cruise ceiling).
3. Cruise at airspeeds for long range at altitude for best range.
4. If necessary, climb on course so as to reach cruise ceiling 15 minutes before bomb drop.
5. Cruise in level flight to target 15 minutes with normal power.
6. Drop bombs, chaff and/or flares.
7. No credit is taken for distance covered during a two minute period of evasive action with fuel consumption based on normal power at combat altitude.
8. Credit for distance is taken for a period of eight minutes for escape with normal power. (Climb to altitude for best range is accomplished in items 7 and 8).
9. Cruise to home base at airspeeds for long range at altitude for best range.
10. Fuel allowance for reserve and landing is five percent of initial fuel plus fuel for 30 minutes at speed for maximum endurance at sea level.

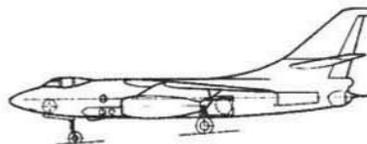
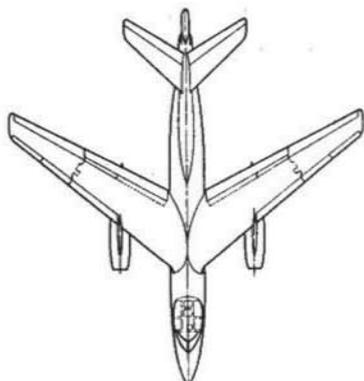


# CHARACTERISTICS SUMMARY

LONG RANGE ATTACK

A3D-1P

DOUGLAS "SKY WARRIOR"



WING AREA 779 sq. ft.

WING SPAN 72' - 6"

LENGTH 75' - 11"

HEIGHT 23' - 10"

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

## STATUS

First Flight (A3D-1P) - - September 1955  
 Service Use- - - - - September 1956

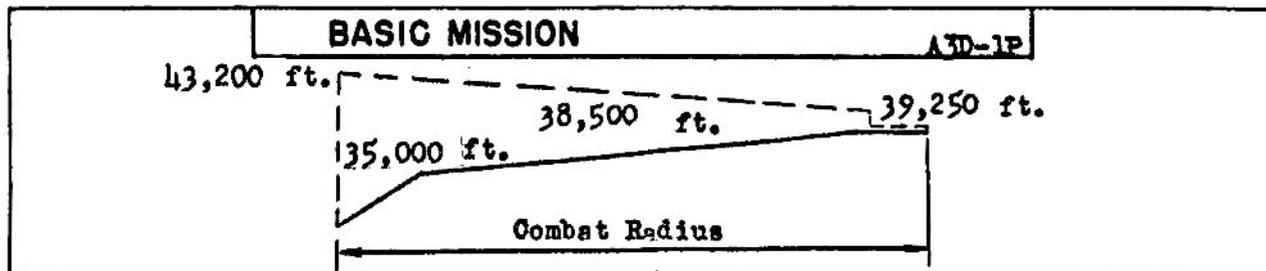
ENGINES		
2 P&W J57-B-6B		
	<u>LBS.</u>	<u>RPM.</u> <u>ALT.</u>
T.O.	10000/9950	S.S.L.
MIL.	9500/9950	S.S.L.
NORM.	8250/9720	S.S.L.

FEATURES
Crew - 3
Tricycle landing gear
Arresting gear
Folding vertical tail
Single slotted wing flaps
Power boost controls
Pressurized cabin
4,925 Gallons Fuel, Maximum Capacity

ARMAMENT
2-20mm (M-3), Tail Turret, 1,000 rds.
- - - - -
<u>PHOTOGRAPHIC</u>
16-M-120 Photo Flash Bombs
- - - - -
208-M-112 Photo flash or 80-M-123 Cartridges

NAVAER 1519 A (REV. 1-49)

## CHARACTERISTICS SUMMARY



PERFORMANCE		
COMBAT RADIUS	COMBAT RANGE	SPEED
1,280 naut. mi. 470 knots avg.  High Altitude Reconnaissance (DAY)	2,750 naut. mi. 470 knots avg.  - - hours	532 knots at S.L. ft. 542 knots at 11,000 ft. 410 knots at 44,500 ft.  Combat Weight Maximum Power
CLIMB	CEILING	TAKE OFF
6,200 ft./min.  Sea Level, Combat Wt. Maximum Power	42,600 ft.  100 ft./min., Combat Wt. Maximum Power	4400 ft. calm  No assist
2,325 ft./min. 35,000 ft. Combat wt. Maximum Power	41,300 ft. 500 ft./min., Combat wt. Maximum Power	6630 ft. Calm Over 50' obst.
LOAD	WEIGHTS	STALLING SPEED
Fuel 4500 gal.  fixed 4500 drop - -	Empty 37,656 lbs.  Combat 58,289 lbs.  Take-off 70,000 lbs.	129.5 knots  Flaps down, T. O. wt.
		TIME TO CLIMB
		- - ft. in - - min.  Combat Wt., Max. Power

## NOTES

Performance basis: Contractor's preliminary flight test data.

Range and radius are based on engine specification fuel consumption data increased by 5%.