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NAVAIR 00-110AA3-2

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Standard Aircraft Characteristics

NAVY MODEL RA-3A AIRCRAFT

(TITLE UNCLASSIFIED)

(A3D-1P)

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

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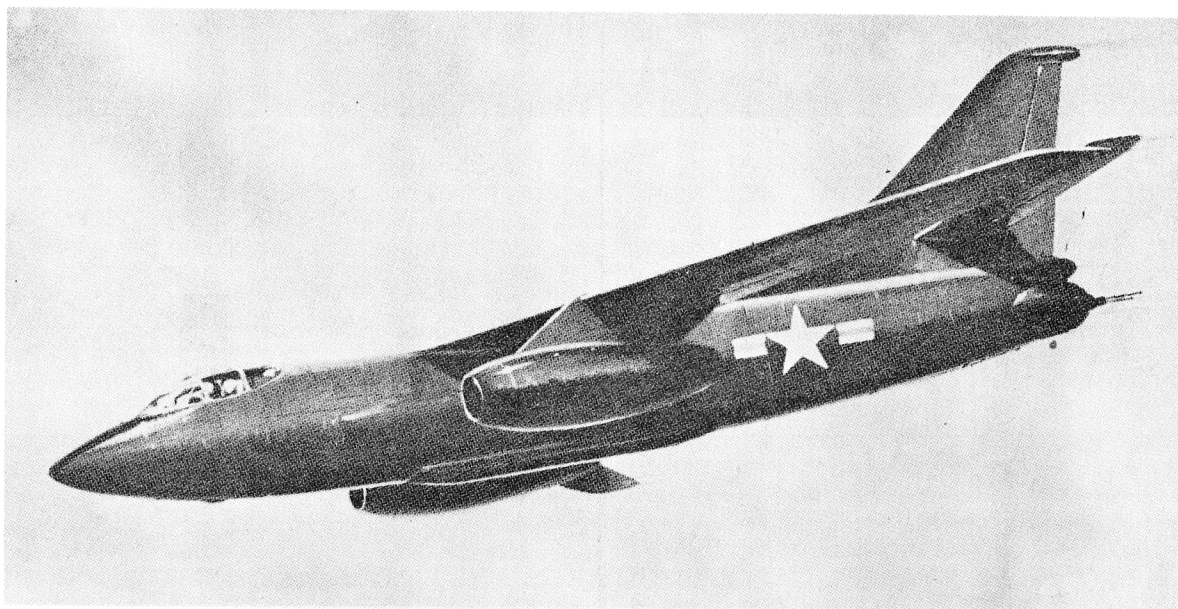
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SERVICE



STANDARD AIRCRAFT CHARACTERISTICS
RA-3A SKYWARRIOR

DOUGLAS

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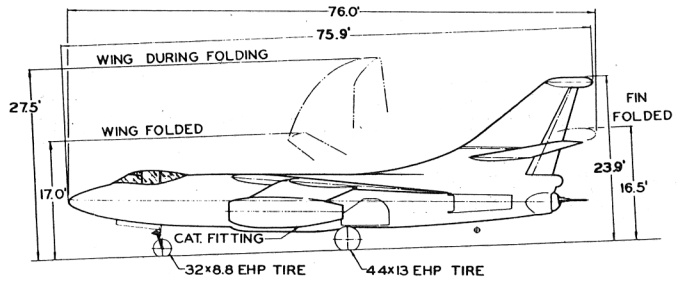
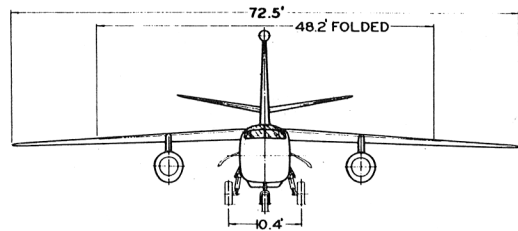
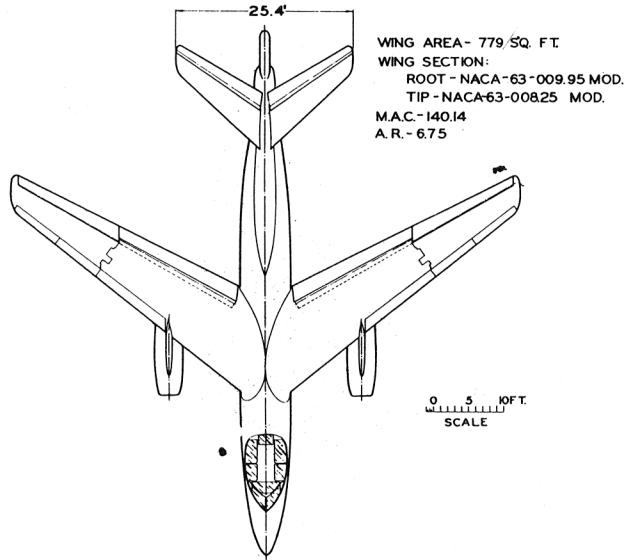
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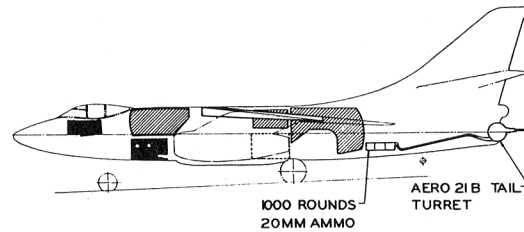
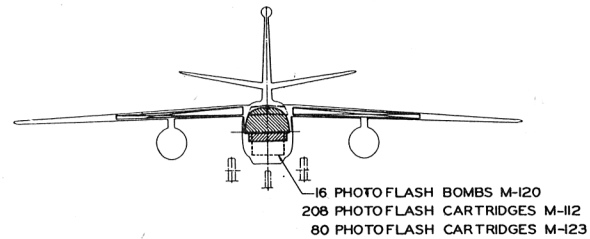
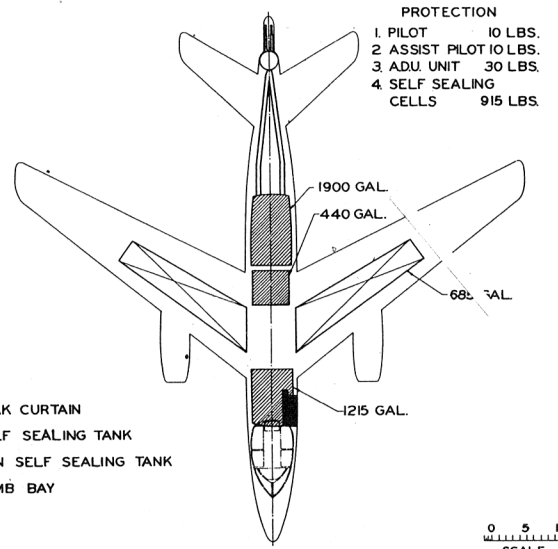
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DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKAGE

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POWER PLANT			
NO. & MODEL.....	(2) J57-P-1		
MFR.....	Pratt & Whitney		
TYPE.....	Axial Comp.		
LENGTH.....	164.0"		
DIAMETER.....	41.0"		
RATINGS			
	<u>Lbs.</u>	<u>Rpm</u>	<u>Alt.</u>
		*N ₁ N ₂ **	
T.O.	9500	5950 9950	SSL
MIL.	9500	5950 9950	SSL
NORM.	8250	5700 9720	SSL
SPEC. NO. A-1532-A			
* N ₁ : speed of low pressure compressor.			
** N ₂ : speed of high pressure compressor.			

ORDNANCE			
GUNS			
No.	Size	Location	Rdg.
2	20mm, M-3	Tail	1000
Tail Turret System... Aero 21B			
PHOTOGRAPHIC			
12-M-120 Photoflash Bombs			
208-M-112 Photoflash Cartr'dgs			
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.T.
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/APC-27A
MHF RECEIVER.....	AN/ARR-15A
MHF TRANS.....	AN/ART-13 or 13A
ICS.....	AN/AIC-4A
ALTIMETER.....	AN/APN-22
M.F. 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 SEE	
VISUAL HOMING.....	AN/ARN-21

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SERVICE

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION	(1) HIGH ALT. Recon. (Day) 3/K-17C Plus 1/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)

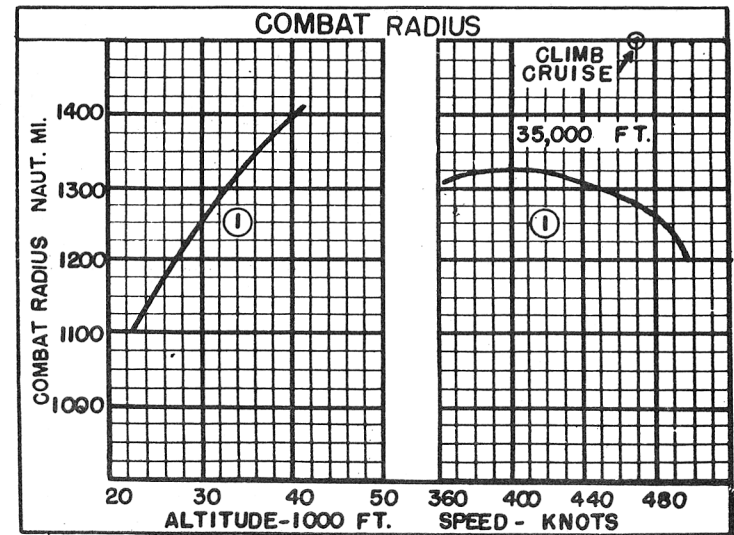
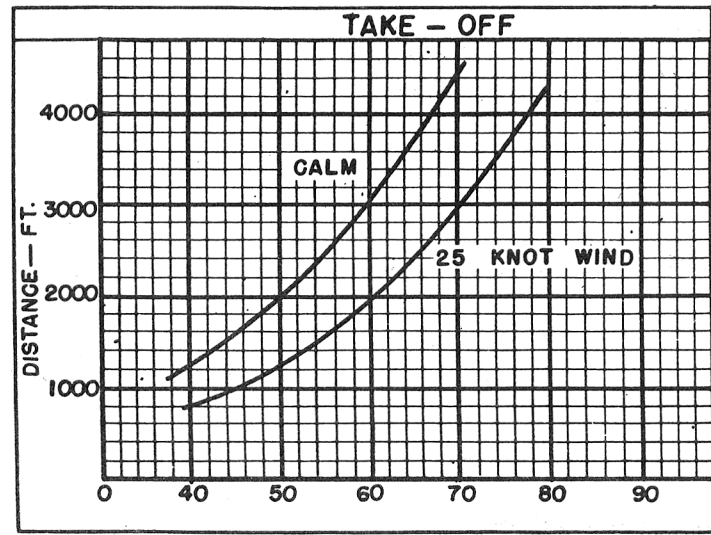
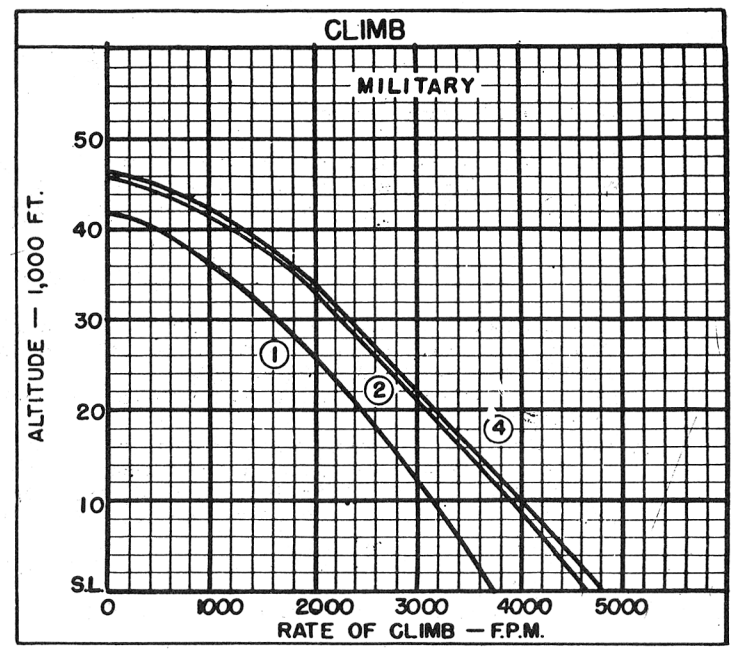
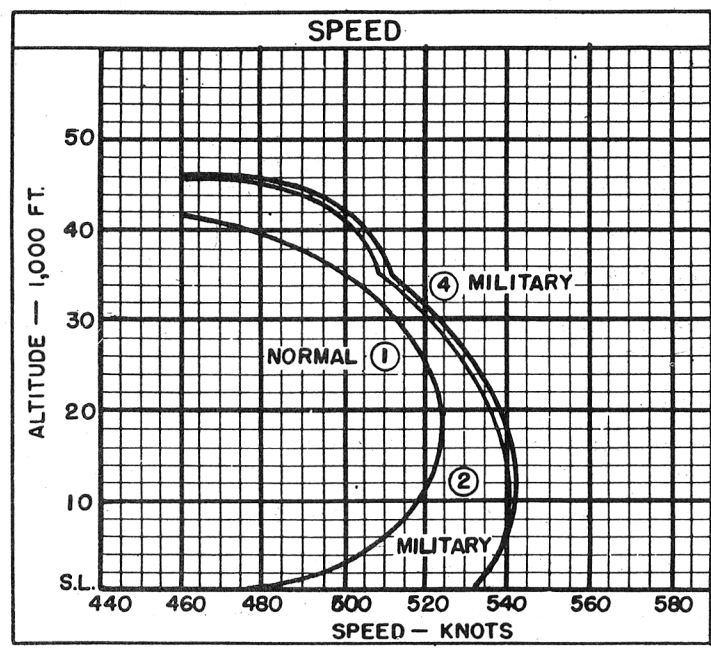
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○ LOADING CONDITION COLUMN NUMBER

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SERVICE

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).

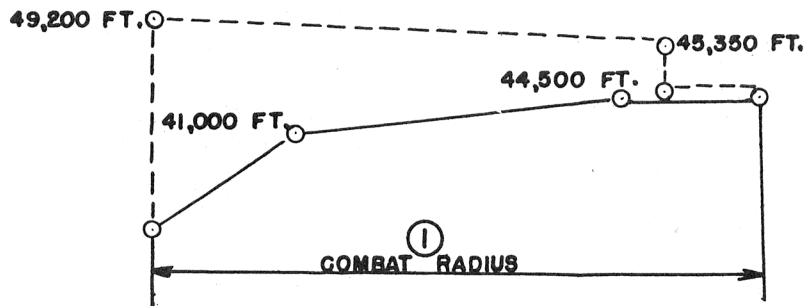
RUN-OUT: 8 minutes at normal rated thrust. (Run-out assumed concluded at initial cruise back altitude).

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.

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

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



⊙ LOADING CONDITION COLUMN NUMBER

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