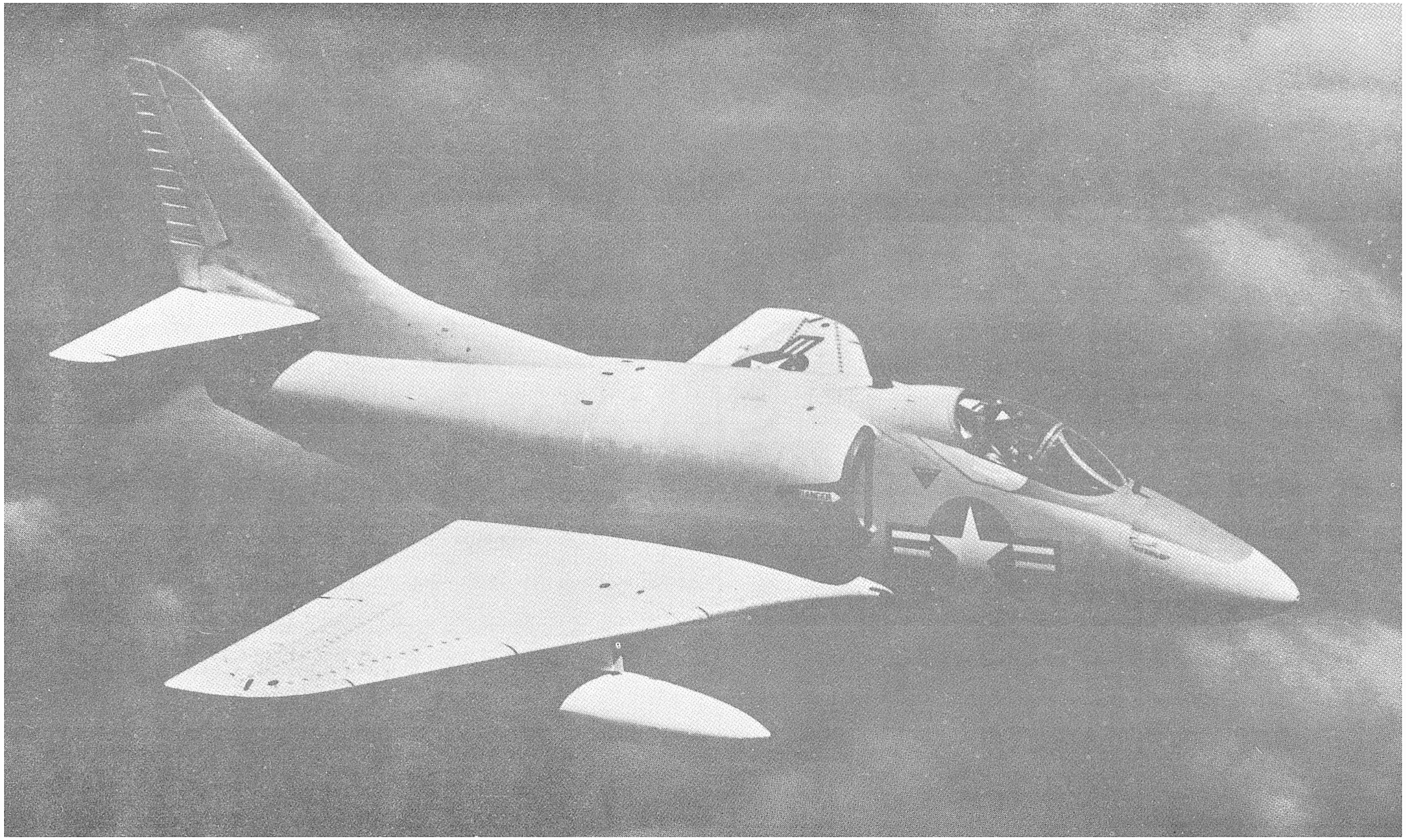
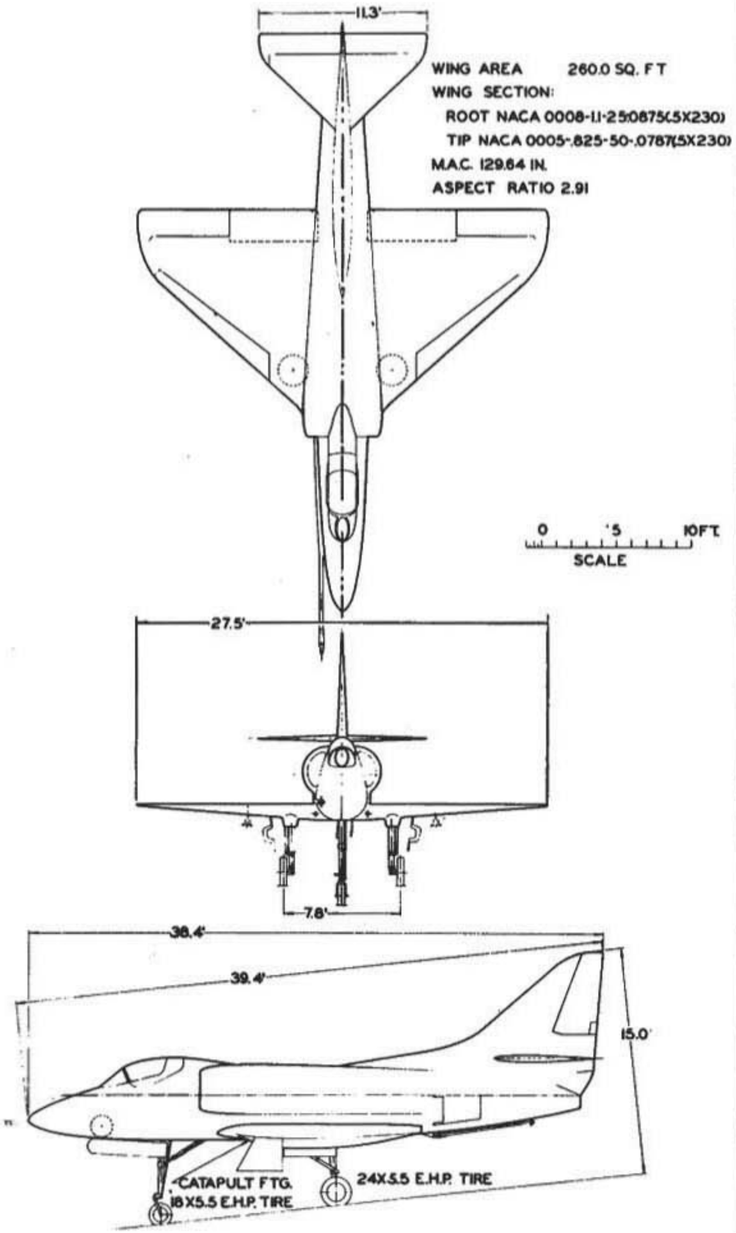


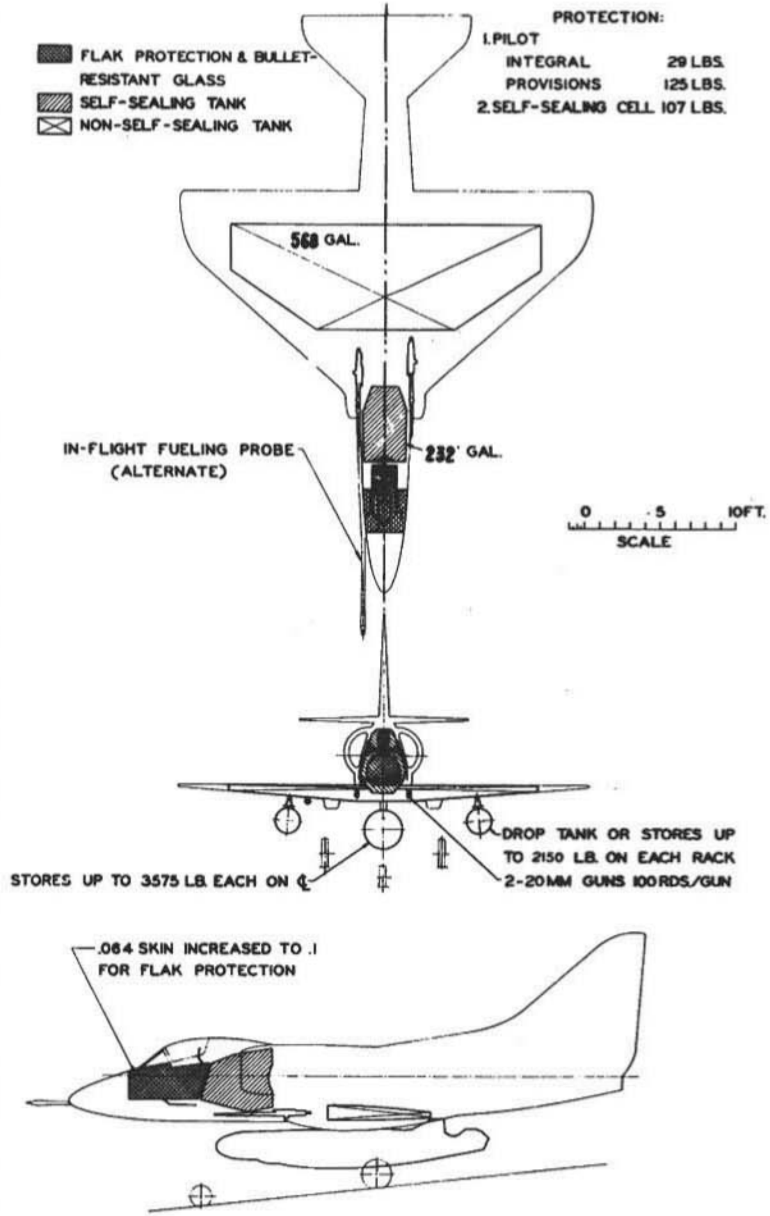
STANDARD AIRCRAFT CHARACTERISTICS

A4D-2 "SKYHAWK"

DOUGLAS



DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKAGE

POWER PLANT

NO. & MODEL......(1) J65-W-16A or -4B
MFR.................WRIGHT AERONAUTICAL
TYPE ....AXIAL FLOW
LENGTH........................113 in.
DIAMETER......................31 in.
AUGMENTATION..................NONE

RATINGS

	LBS	RPM
MILITARY	7000	8300
NORMAL	6780	8030

SEA LEVEL STATIC

SPEC. WAD N890-B

ORDNANCE

FUSELAGE

Bombs	1-Mk.81 Mod.1(250 lb.) 1-Mk.82 Mod.1 (500 lb.) 1-Mk.83 Mod. 2 or 3 (1000 lb) 1-Mk.84 Mod.1 (2000 lb.)
Stores	1-1050 lb. 1-1480 lb. 1-1660 lb. 1-2025 lb. 1-3500 lb. 1-In-flight Refueling Store
Spray Tank	1-Aero 14B
Fire Bomb	1-Mk.79 Mod.0(1000 lbs.) or 1-150 gal.DAC Fuel Tank
Missiles	1-ASM-N-7 Bullpup
Pyrotechnics	1-Aero 5A Flare Dispenser
Rockets	1-pkg (7) 2.75" Aero 3A 1-pkg.(19) 2.75" Aero X7A 1-pkg. (4) 5.00" Aero X10A
Prac. Bombs	1-Aero 5A Prac. bomb cont.
Drop Tanks	1-150 gal. (DAC)(2 fins) 1-300 gal. (DAC)(no fins)

(Continued on NOTE page)

MISSION AND DESCRIPTION

The A4D-2 airplane is a light-weight, carrier based, jet attack airplane whose primary mission is the destruction of enemy ground and surface targets. The airplane is also capable of in-flight refueling as a tanker or a receiver.

The arrangement is conventional with all-metal semi-monocoque structure and three span low aspect ratio wing. Landing gear, flaps and speed-brakes are hydraulically operated. An electrically operated, fully adjustable stabilizer is used to trim throughout the normal flight range. The aileron, elevator, and rudder systems are hydraulic-power operated. Manual control is provided for emergencies.

This airplane does not have folding wings. The A4D-2 differs from the A4D-1 in that A4D-2 has the following:

1. Receiver and tanker in-flight refueling capabilities
2. Basic weight increase of 735 Lbs.
3. Installation of a "tadpole" rudder.

DEVELOPMENT

First Flight..................March 1956
Service Use ....July 1957

DIMENSIONS

WING
AREA....................260 sq. ft.
SPAN ....27' - 6"
MAC.....................10' -9.6"
SWEEPBACK (¼ chord)..........33.2°
LENGTH ....39" -4.8"
HEIGHT ....15' -0"
TREAD.......................7' -9.8"

WEIGHTS

LOADINGS	LBS	L.F.
EMPTY	8965	
BASIC	9570	
DESIGN	12504	7.0
COMBAT	16014	5.5
MAX. T.O. (FIELD)	20,000	4.2
(CAT.)	22,500	3.8
MAX. LAND (FIELD)	16,000	5.5
(ARREST)	12,000	7.0

ALL WEIGHTS ARE ACTUAL

FUEL AND OIL

NO. TANKS	TOL. GALS.	LOCATION
1	568	Wing
1	232	Fuselage
2	300 or 600	Wing Pylons

FUEL GRADE..................JP-4 or -5
FUEL SPEC. (APPLICABLE).....MIL-F-5624

OIL

CAPACITY (GALS)..................3.2
SPEC (APPLICABLE)...........MIL-L-7808

ELECTRONICS

Electronics Control...........AN/ASQ-17
Integrated Package consisting of:
UHF Communication..........AN/ARC-27A
IFF.........................AN/APX-6B
Coder.......................AN/APA-89
Direction Finder...........AN/ARA-25
Automatic Dead
Reckoning Computer..........AN/ASN-19
TACAN AN/ARN-21

External Stores

Marker-Beacon Rec............AN/ARN-12
VOR Rec......................AN/ARN-14E

Standard Aircraft Characteristics NAVAER-1335C (Rev. 1-55)

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		① SEA LEVEL STORE DELIVERY 1-1050 LB. STORE 2-150 GAL. EXT. TANKS	③ SEA LEVEL STORE DELIVERY 1-2025 LB STORE 2-300 GAL. EXT. TANKS	⑤ 15,000 FT. STORE DELIVERY 3-BULLPUP MISSILES	⑦ LOW ALT. ATTACK 3-ZUNI ROCKET PACKAGES	⑨ MODIFIED HIGH ALTITUDE ATTACK 2-CORVUS MISSILES 1-300 GAL. EXT. TANK
TAKE-OFF WEIGHT	lb.	18,324	21,469	17,203	16,947	20,928
Fuel internal/external (JP-5)	lb./lb.	5440/2040	5440/4080	5440/NONE	5440/NONE	5440/2040
Payload	lb.	1050	2025	1650	1284	3500
Wing loading	lb./sq.ft.	70.5	82.6	66.2	65.2	80.5
Stall speed - power-off	kn.	122	132	118	117	130
Take-off run at S.L. - calm (A)	ft.	3160	4750	2660	2570	4500
Take-off run at S.L. 25 kn. wind (A)	ft.	2250	3500	1900	1870	3250
Take-off to clear 50 ft. - calm (A)	ft.	4070	6250	3500	3400	5800
Max. speed/altitude (A)	kn./ft.	542/7000	530/11,000	529/17,000	535/6,000	527/10,000
Rate of climb at S.L. (A)	fpm.	6550	5150	6400	7200	5300
Time: S.L. to 20,000 ft. (A)	min.	3.9	5.0	3.9	3.5	4.9
Time: S.L. to 30,000 ft. (A)	min.	7.0	9.8	7.1	6.3	9.4
Service ceiling (100 fpm) (A)	ft.	38,100	34,100	38,400	39,700	34,700
Combat range	n.mi.	1310	1520	715	800	1030
Average cruising speed	kn.	405	400	395	400	400
Cruising altitude(s)	ft.	33,100-40,600	29,700-38,900	35,100-39,500	34,700-39,500	30,300-36,600
Combat radius/mission time (B)	n.mi/hr.	395/2.1	565/2.8	325/1.8	305/1.7	555/2.8
Average cruising speed	kn.	405	400	400	400	400
IFR-Buddy refuel. -rad./mission time	n.mi./hr.	800/4.0	955/4.8			925/4.8
IFR(30,000') fuel transf./dist. out	lb/n.mi.	3620/525	4050/490			4000/490
COMBAT LOADING CONDITION		② TANKS OFF STORE RETAINED	④ TANKS OFF STORE RELEASED	⑥ MISSILES RETAINED	⑧ ROCKET PACKAGES RETAINED	⑩ TANK OFF MISSILES RETAINED
COMBAT WEIGHT	lb.	16,014	14,964	15,027	14,771	18,705
Engine power		MILITARY	MILITARY	MILITARY	MILITARY	MILITARY
Fuel	lb.	FULL INTERNAL	FULL INTERNAL	60% INTERNAL	60% INTERNAL	FULL INTERNAL
Combat speed/combat altitude	kn./ft.	562/.85/S.L.	574/.87/S.L.	530/.85/15,000	536/.81/S. L.	506/.86/30,000
Rate of climb/combat altitude	fpm/ft.	8200/S.L.	9100/S. L.	5100/15,000	8350/S.L.	2000/30,000
Combat ceiling (500 fpm)	ft.	40,400	42,100	40,200	41,600	36,500
Rate of climb at S.L.	fpm.	8200	9100	7500	8400	6350
Max. speed at S.L.	kn/M	562/.85	574/.87	512/.77	536/.81	538/.81
Max. speed/altitude	kn./M/ft	562/.85/2000	574/.87/S.L.	530/.85/16,000	536/.83/5000	538/.83/4000
Max. speed at 35,000 ft.	kn./M	514/.89	523/.91	500/.87	500/.87	488/.85
LANDING WEIGHT	lb.	10,690	10,794	11,181	11,005	10,939
Fuel	lb.	1166	1270	1068	1073	1174
Stall speed - power-off/appr. pwr.	kn./kn.	91.5/87.3	91.9/87.7	93.6/89.3	92.8/88.6	92.5/88.3
Dist.-grnd.run/over 50 ft. obstacle	ft./ft.	2550/3265	2580/3295	2690/3405	2640/3355	2620/3335

NOTES

PERFORMANCE BASIS: CONTRACTOR AND NATC Flight Test Results

RANGE AND/OR RADIUS are based on NATC Flight test fuel consumption data.

(A) Military Rated Thrust

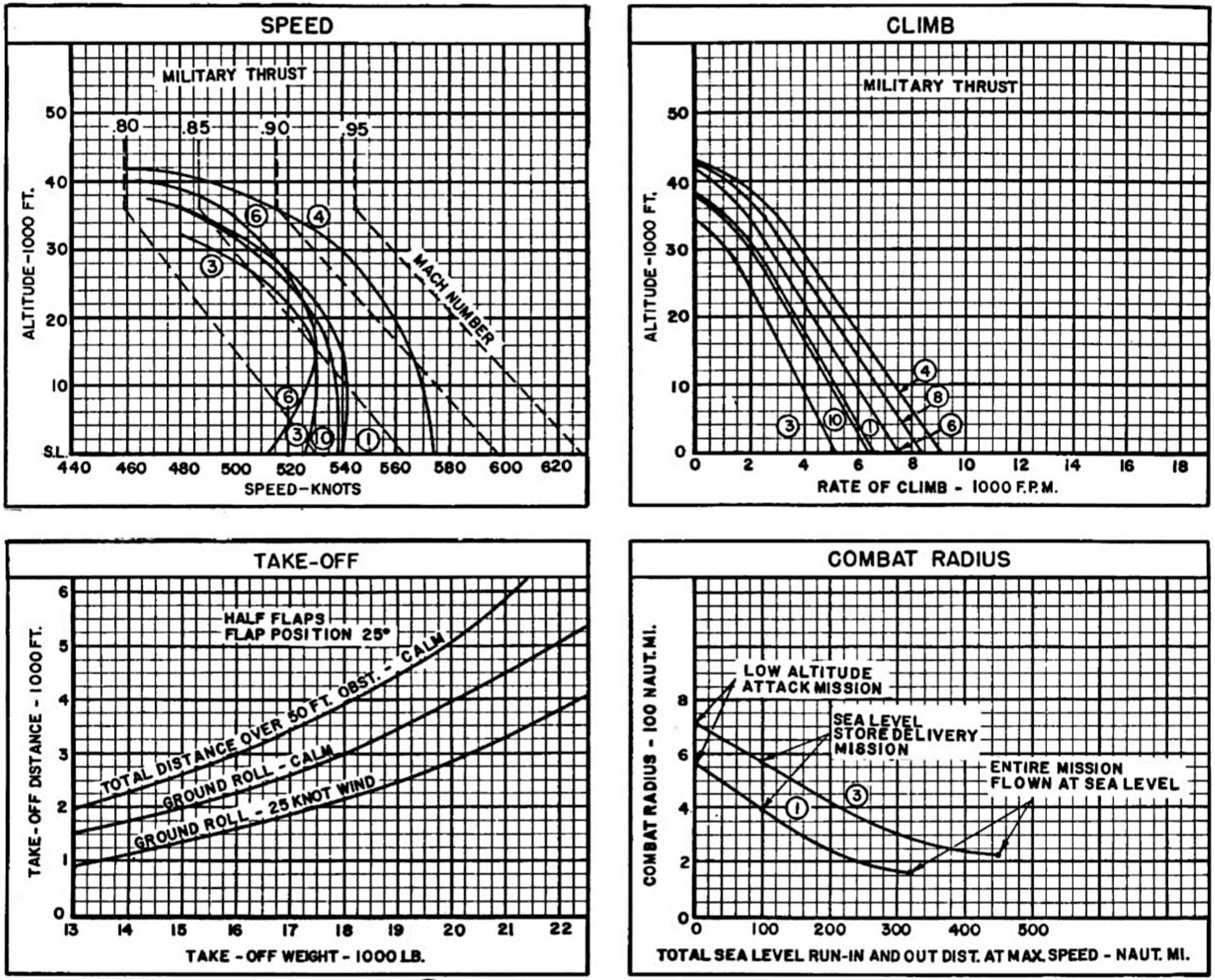
(B) For effect of JP-4 Fuel on Combat Radius and Mission Time. See Notes page.

All configurations include wing pylons and in-flight refueling probe; loadings 5, 6, 7 and 8 include guns and ammunition.

MISSION TIME: Any time where fuel is used and distance gained plus combat and refuel allowance times.

SPOTTING: A total of 106 aircraft can be accommodated in a landing spot on the flight and hangar decks of a CVA-19 class angled-deck carrier.

NAVAER-1335D (Rev. 1-55)



◯ LOADING CONDITION COLUMN NUMBER

Standard Aircraft Characteristics NAVAER 1335E (Rev. 1-55)

NOTES

LOADING (All data based on JP-4 fuel)	TAKE-OFF WEIGHT	15,000 FT. STORE DELIVERY Combat Radius	15,000 FT. STORE DELIVERY Mission Time	SEA LEVEL STORE DELIVERY Combat Radius	SEA LEVEL STORE DELIVERY Mission Time
1-2025 lb. store plus 2-300 gal. ext tanks	21,049 lb.	710 n.mi.	3.7 hr.	525 n.mi.	2.6 hr.
3-Bullpup Missiles	16,963 lb.	305 n.mi.	1.7 hr.	110 n.mi.	0.6 hr.
2-Corvus Missiles plus 1-300 gal.ext.tank	20,598 lb.	490 n.mi.	2.5 hr.	310 n.mi.	1.6 hr.

SEA LEVEL STORE DELIVERY

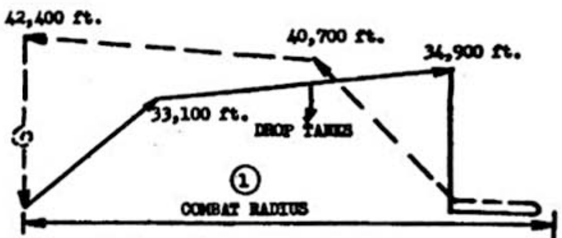
START ENGINE, TAKE-OFF AND ACCELERATE: Fuel for 5 minutes with normal power at sea level.
CLIMB OUT: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE OUT: At maximum range speeds at optimum cruise altitude. (Drop any external tanks when empty.)
DESCEND: To sea level (no fuel consumed - no distance covered.)
RUN-IN: At S.L. for 50 N.Mi. at maximum speed with military power. Drop bombs, fire rockets.
COMBAT: At sea level for 5 minutes with military power. No distance made good.
RUN-OUT: At sea level for 50 nautical miles at maximum speed with military power.
CLIMB BACK: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE BACK: At maximum range airspeeds at optimum cruise altitude.
DESCEND: To sea level (no fuel consumed - no distance covered.)
RESERVE: Fuel allowance; 5% of initial fuel plus 20 minutes at speed for maximum endurance at sea level.

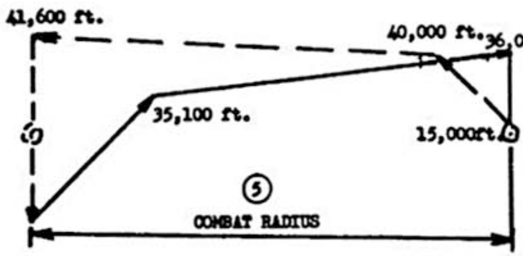
15,000 FT. STORE DELIVERY

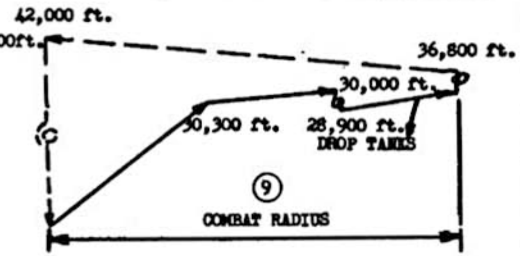
START ENGINE, TAKE-OFF AND ACCELERATE: Fuel for 5 minutes with normal power at sea level.
CLIMB OUT: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE OUT: At maximum range speeds at optimum cruise altitude. (Drop any external tanks when empty)
DESCEND: To 15,000 ft. (no fuel consumed - no distance covered) drop bombs, fire rockets.
COMBAT: At 15,000 ft. for 5 minutes with military power. No distance made good.
CLIMB BACK: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE BACK: At maximum range airspeeds at optimum cruise altitude.
DESCEND: To sea level (no fuel consumed - no distance covered.)
RESERVE: Fuel allowance; 5% of initial fuel plus 20 minutes at speed for maximum endurance at S. L.

MODIFIED HIGH ALTITUDE ATTACK

START ENGINE, TAKE-OFF AND ACCELERATE: Fuel for 5 minutes with normal power at sea level.
CLIMB OUT: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE OUT: At maximum range airspeeds at optimum cruise altitude.
IN-FLIGHT REFUELING: At 30,000 ft. Fuel allowances for hook-up and flight contingencies = 5 minutes at maximum endurance speeds (no distance made good.) Note: Refueling point limited to return of aircraft to base with normal reserve if refueling contact is not made.
CRUISE OUT: Continue to cruise at maximum range airspeeds at optimum cruise altitude. (Drop any external tanks when empty.)
DESCEND: To 30,000 ft. (no fuel consumed - no distance covered.) Launch missiles.
COMBAT: At 30,000 ft. for 5 minutes with military power. No distance made good.
CLIMB BACK: At maximum rate of climb with military power on course to optimum cruise altitude.
CRUISE BACK: At maximum range airspeeds at optimum cruise altitude.
DESCEND: To sea level (no fuel consumed - no distance covered.)
RESERVE: Fuel allow.: 5% of initial fuel plus 20 min. at speed for maximum endurance at S.L.







ORDNANCE (Continued)

Radio	1-NAVPAC unit	Drop Tank	2-150 gal. DAC (2 fins) 2-300 gal. DAC	Rockets	2-pkgs. (7)2.75" Aero 3A 2-pkgs. (19)2.75" Aero X7A 2-Pkgs. (4) 5.00" Aero X10A
Misc.	1-Aero 1A Missile Disp.	Fire Bomb	2-Mk.79 Mod.0 or 2-150 gal. DAC fuel tanks	Misc.	2-Aero 1A Missile Disp.
	WING				
Bombs	2-Mk.81 Mod. 1 (250 lb.) 2-Mk.82 Mod.1 (500 lb.) 2-Mk.83 Mods. 2 or 3 (1000 lb.)	Pyrotechnics	2-Aero 5A Flare Dispensers		FIXED GUNS/RDS. AMM. 2 Mk. 12 Mod. 0 20mm/100 rds. per gun
Missiles	2-ASM-N-7 Bullpup				Maximum Bomb Capacity: 5975 lbs.

◯ LOADING CONDITION COLUMN NUMBER

Standard Aircraft Characteristics NAVAER 1335P (Rev. 1-55)

MISSILE SYSTEM CHARACTERISTICS

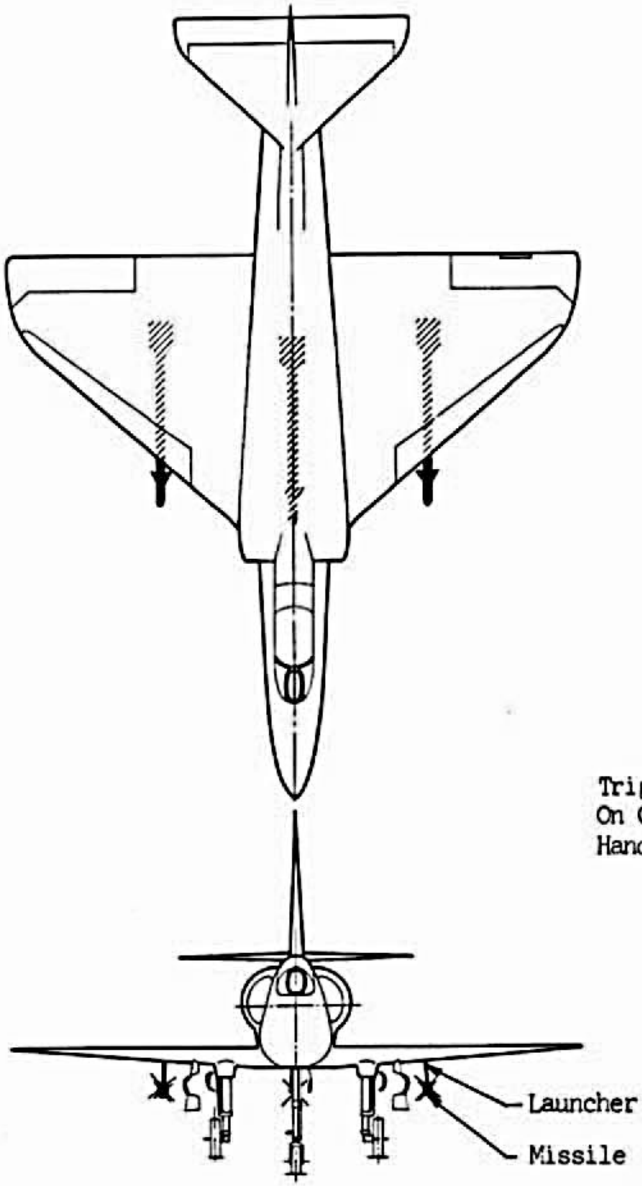
A4D-2 SKYHAWK — AAM-N-7 SIDEWINDER

NOTE:
Although presented as incorporated in actual airplanes, this missile system is a study only.

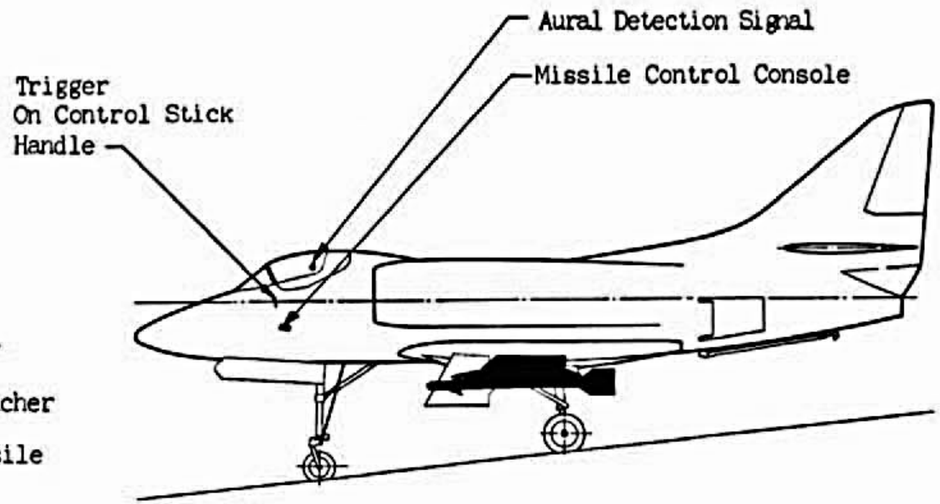
DOUGLAS AIRCRAFT COMPANY, INC.

EL SEGUNDO DIVISION

GENERAL ARRANGEMENT



DIMENSIONS	
Span	27.5 ft.
Length	39.4 ft.
Height	15.0 ft.



DESCRIPTION

The A4D is a carrier-based jet-powered attack airplane designed for dive, glide, and loft bombing as well as interdiction. It operates from CVL and CVA type carriers.

The incorporation of the Sidewinder missile system into the A4D airplane is intended to increase materially the effectiveness of the A4D in the interdiction of such airborne targets as cargo aircraft, helicopters and transports, all of which can be war materiel suppliers. For this type of interception, at low altitude, it is believed that an attack airplane can be more effective than a high performance fighter.

STATUS: Study only

ELECTRONICS

Equipment Carried In Basic A4D-2

Electronics Control........AN/ASQ-17

TACAN AN/ARN-21

Additional Equipment For Missile System

None Required

FUEL

GAL.	NO. TANKS	LOCATION
573	1	Wing
237*	1	Fuselage

* Self-sealing

Total useable fuel: 800 Gallons

Fuel spec..............MIL-F-5624 or MIL-F-5572

LAUNCHING EQUIPMENT

Aero X3A Pylon Launcher.

WEIGHTS

***LOADINGS	THREE SIDEWINDER MISSILES
Empty	8822
Basic	9129
*Combat	12990
**Flight Design	12504
**Landing Design	11556
**Catapulting Design	19910

Useful Load	
Pilot	200
Internal Fuel (800 Gal.)	5200
Oil	30
Trapped Fuel & Oil	29
Sidewinders (3 @ 160# ea.)	480
Sidewinder Instal.	251
Oxygen Equipment	27
Parakit & Seat Pan	31
Total Useful Load	6248
Gross Weight - Take-off	15070

*Less 40% Useable Fuel (320 Gal. JP-4 Fuel)
**See Spec. SD-495-2
***All Loadings Based On JP-4 Fuel

SIDEWINDER MISSILE SYSTEM

INSTALLATION

The A4D airplane is configured to carry 3 Sidewinder air-to-air missiles. One missile is carried on each of the three bomb rack stations. The ejector racks are removed and the Aero X3A missile launchers on special adapters are installed in their place.

The Sidewinder control console is installed in the cockpit on the left armament console. The airplane contains the necessary wiring throughout to accommodate the missiles.

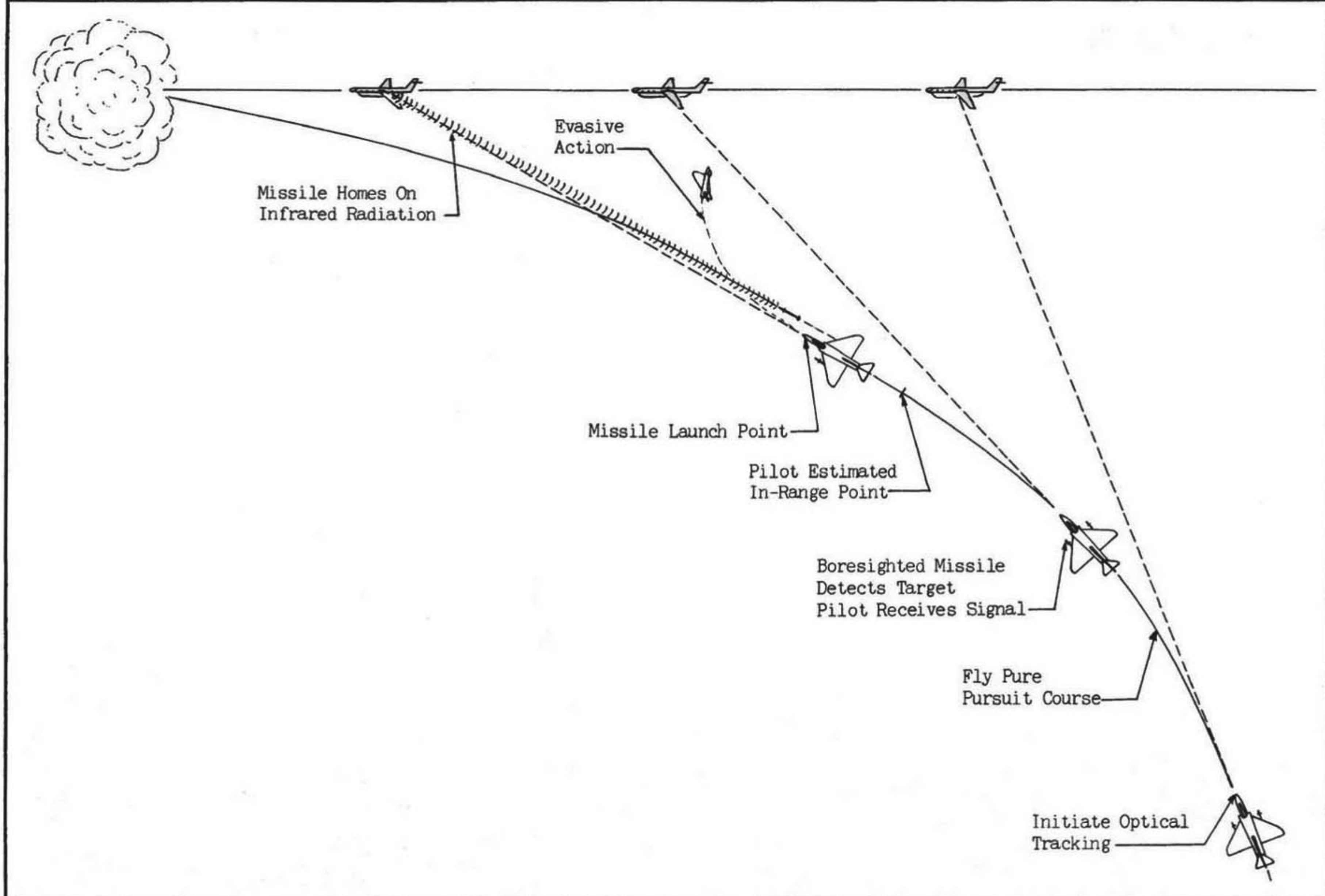
Consequently the Sidewinder provisions and installation are easily made due to the simplicity of the Sidewinder weapons system.

OPERATION

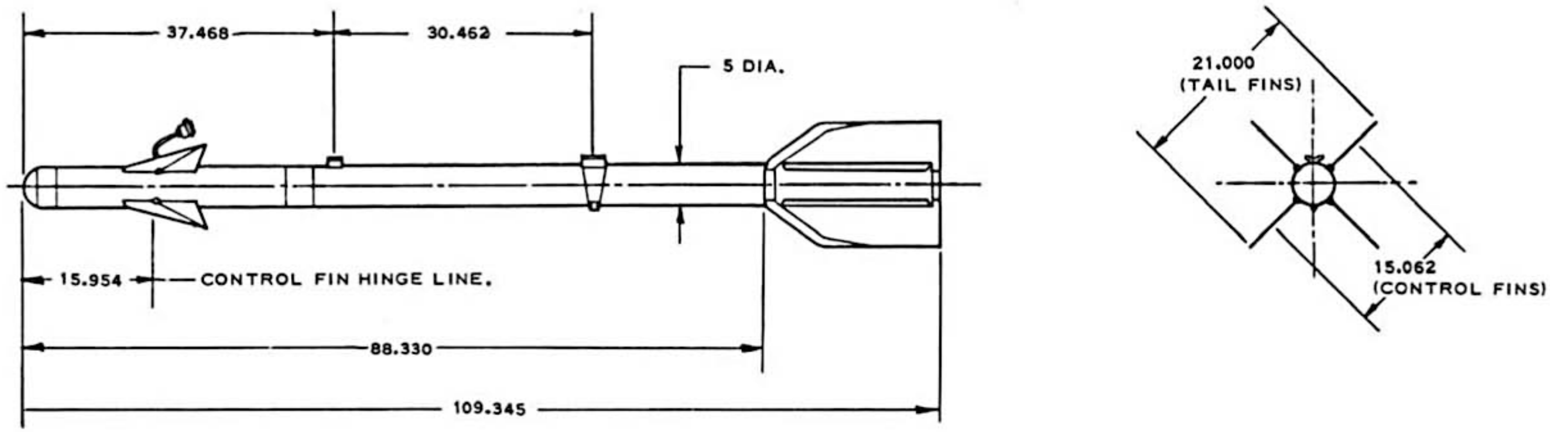
The pilot acquires the target optically and initiates a pure pursuit type of attack. The Sidewinder axis is aligned parallel with the optical sight, therefore, the pilot can easily aim the missile at the desired target. When the attacking airplane has closed within detection range, the missile senses the infrared radiation of the target and provides an aural tone to the pilot. The launch point is determined at the pilot's discretion.

No fire control system is necessary to launch Sidewinder missiles. Optimum attacks are made in the pursuit mode only.

TYPICAL AIR-TO-AIR ATTACK



GENERAL ARRANGEMENT AAM-N-7 SIDEWINDER MISSILE



TYPE - Air-to-Air Missile

LENGTH - 109.345 inches

WEIGHT - 160 lbs.

BODY DIAMETER - 5.0 inches

WING SPAN - 21.0 inches

FIN SPAN - 15.062 inches

WARHEAD - 25 lbs.

HBX-1 - 10.5 lbs.

Frag Case - 14.5 lbs.

MOTOR - Solid propellant

Total Impulse - 8,400 lb-sec.

MANEUVER ACCELERATION -
10g - S.L. to 30,000 ft.

3g - 60,000 ft.

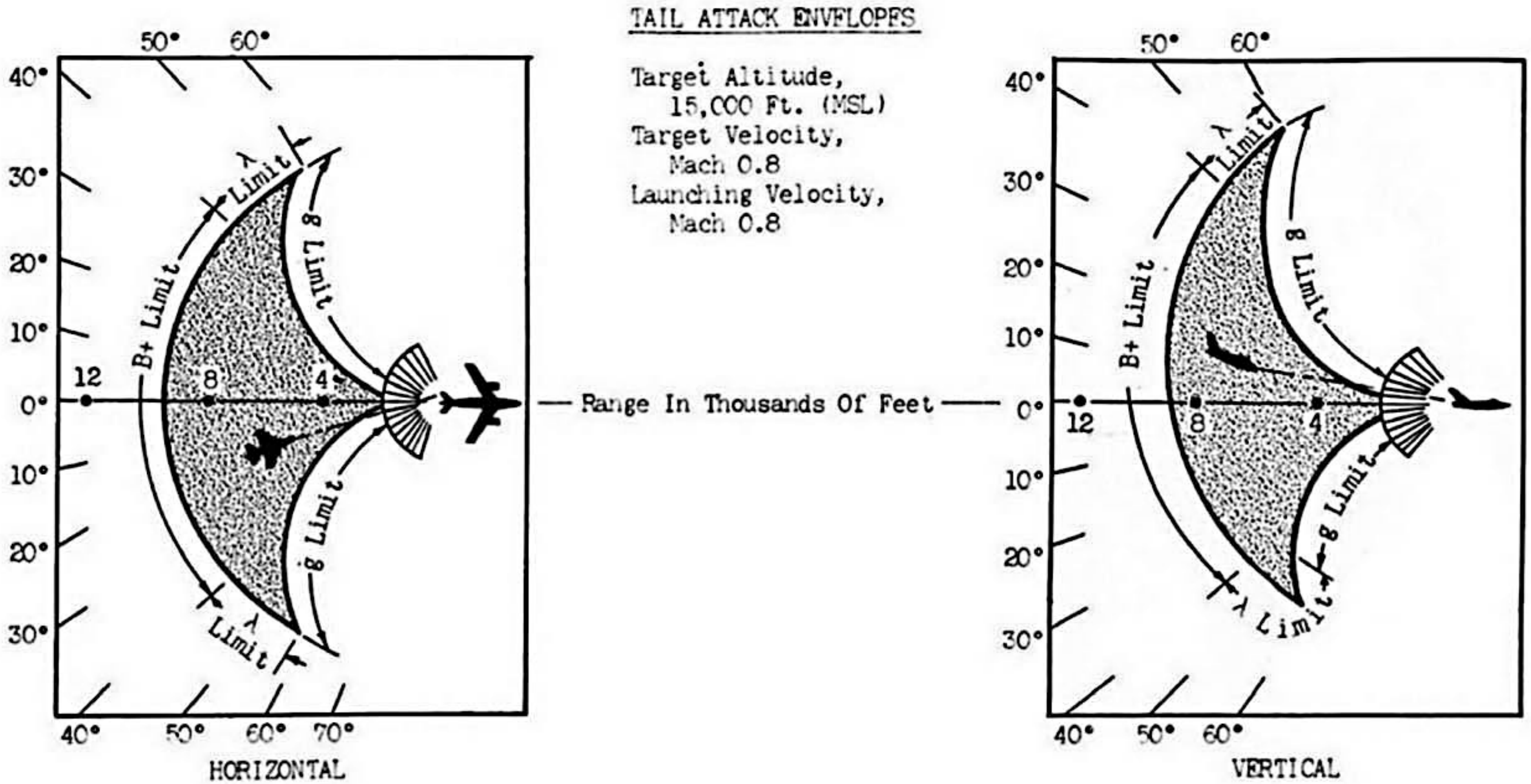
ALTITUDE RANGE - 0-60,000 ft.

TARGET DETECTION - Infrared (passive)

GUIDANCE TYPE - Proportional navigation

LAUNCHING MANEUVER - Pursuit tracking

SIDEWINDER MISSION OPERATIONAL ENVELOPES



1. The B+ limit indicates that internal (guidance and control) power terminates far enough from the target to cause a miss in excess of 10 feet. The internal power of the present missile lasts about 10 1/2 seconds after launching.
2. The λ limit indicates maximum seeker lead angle available of 20 degrees.
3. The g limit indicates that the maneuver necessary to correct heading for intercept exceeds ability of control system to accelerate the missile laterally.

REFERENCE: NAVORD REPORT 4896

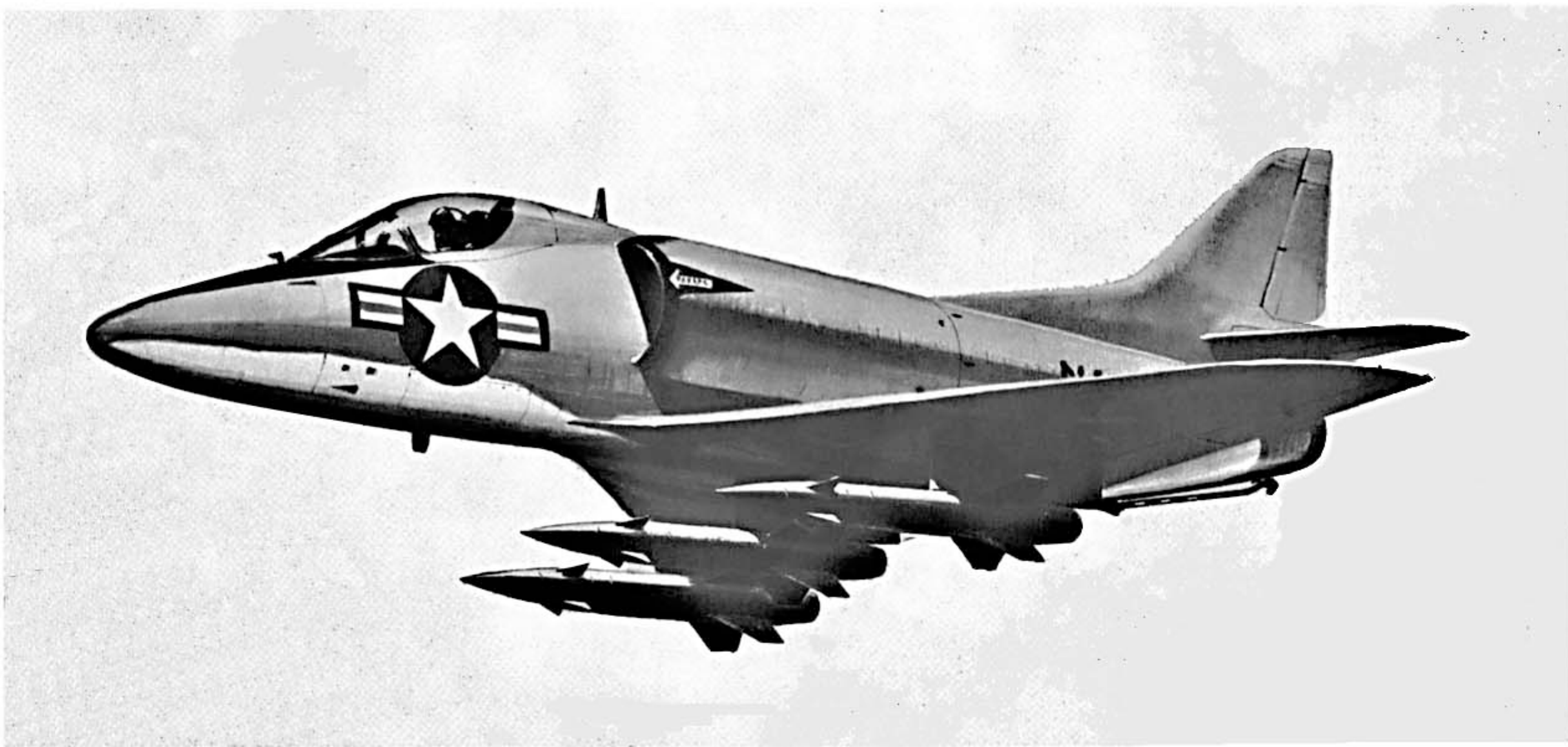
PERFORMANCE

CONDITION / CONFIGURATION		(1) 1-1050 Lb. Store	(2) 3 Sidewinder Missiles	(3) 2-Sidewinder Missiles One 300 Gallon Tank On Centerline
TAKE-OFF WEIGHT	lb.	15,492	15,070	17,035
Fuel (JP-4)	lb.	5200	5200	7150
Stall Speed - Power-off	kn.	110	109	115
Wind Req'd For Catapult (H-8) Take-off	kn.	2	0	9
Combat Radius	n.mi.	372	334	571
Mission Time/Cycle Time	hr./hr.	1.8/2.1	1.7/2.0	2.8/3.1
COMBAT WEIGHT (60% Initial Fuel + Armament)	lb.	13,412	12,990	
Fuel (JP-4)	lb.	3120	3120	
Rate of Climb At S.L. (A)	ft./min.	10,100	9550	
Combat Ceiling (A)	ft.	44,000	43,500	
Maximum Speed At S.L. (A)	kn./M	575/.87	551/.83	
Maximum Speed At 35,000 Ft. (A)	kn./M	518/.90	511/.89	
LANDING WEIGHT	lb.	10,153	10,344	
Fuel (JP-4)	lb.	911	954	
Stalling Speed - Power-off S.L.	kn.	89	90	
Wind Req'd For Arrested Landing With MK 5 Mod. 1 (155 ft.) Arresting Gear.	kn.	6	7	

NOTES

(A) Military thrust

(B) Performance is based on preliminary A4D-1 flight test results. Combat radii are based on fuel consumption data from Wright Aeronautical Division Specification No. N-890-A for the J65-W-16 engine dated 5 December 1952, revised 1 March 1955, increased 5%.

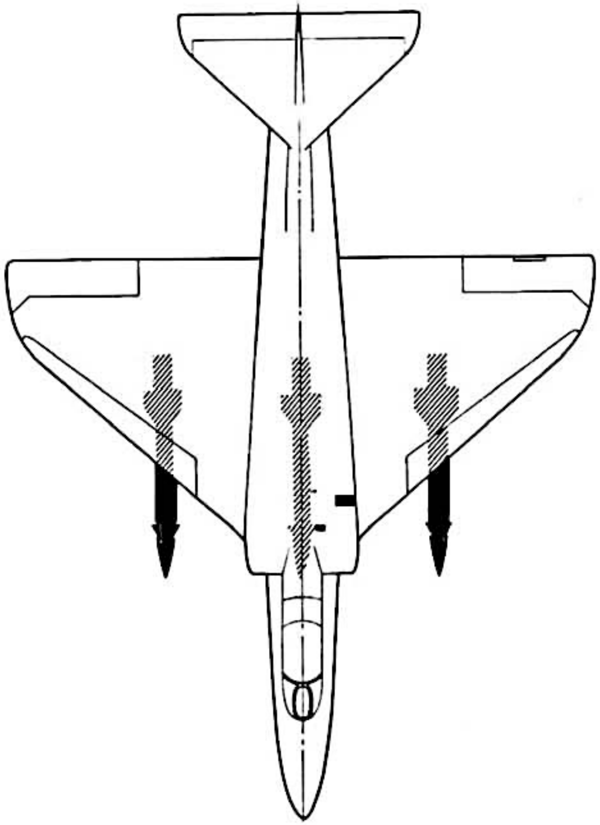


MISSILE SYSTEM CHARACTERISTICS

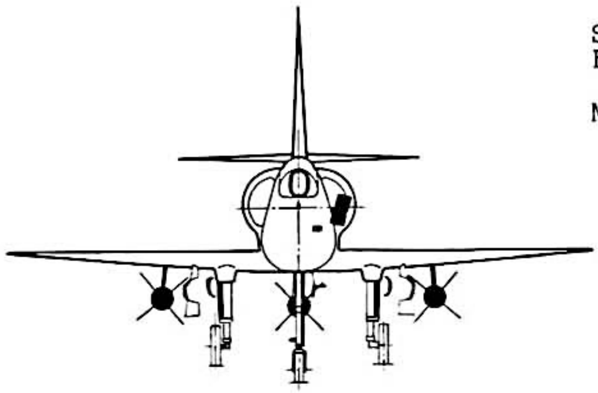
A4D-2 SKYHAWK — XASM-N-7 BULLPUP

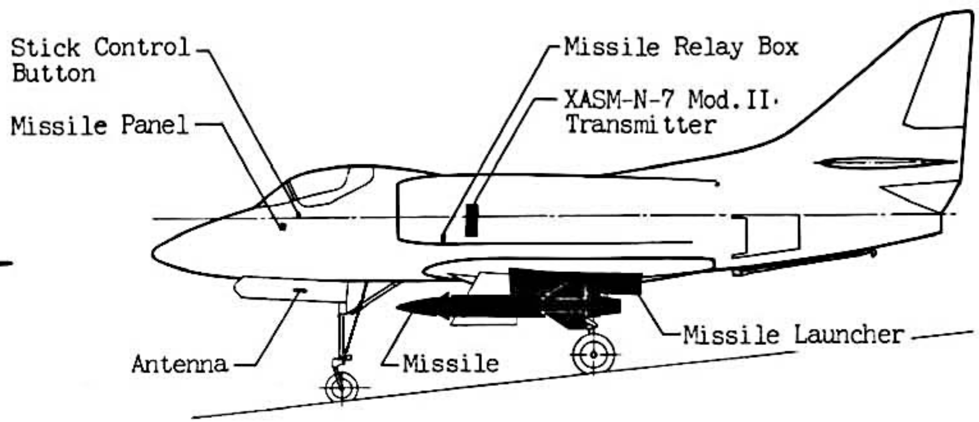
DOUGLAS AIRCRAFT COMPANY, INC.
EL SEGUNDO DIVISION

GENERAL ARRANGEMENT



DIMENSIONS	
Span	27.5 ft.
Length	39.4 ft.
Height	15.0 ft.





DESCRIPTION

The A4D-2 is a lightweight, high-performance, carrier-based, jet-powered airplane designed for dive, glide, and loft bombing as well as missile attacks against ground targets.

The Bullpup weapons system is intended to increase materially the effectiveness of the A4D-2 airplane in the destruction of such ground targets as surfaced submarines, coastal shipping, bridges, trains, grounded aircraft and similar targets mobile cr immobile.

The Bullpup system is designed for considerably higher kill probability than conventional bombing systems.

STATUS: Provisions on five A4D-2 airplanes only. BuNos 142085, 142417, 142675, 142680, 142685. Proposal pending for incorporation on subsequent aircraft.

ELECTRONICS

Equipment Carried In Basic A4D-2

Electronics Control......AN/ASQ-17
TACAN AN/ARN-21

Additional Equipment For Missile System

Missile Guidance System consisting of:
- Antenna
- Control Box
- Transmitter
- Control Box

FUEL

GAL.	NO. TANKS	LOCATION
573	1	Wing
237*	1	Fuselage

* Self-sealing

Total useable fuel: 800 Gallons

Fuel spec. .... MIL-F-5624 or MIL-F-5572

LAUNCHING EQUIPMENT

LAUNCHER - Martin Bullpup
PYLON - Special Douglas

WEIGHTS

***LOADINGS	(2) 3-XASM-N-7 MISSILES	(3) 2-XASM-N-7 MISSILES 1-300 GAL. TANK
Empty	8823	8823
Basic	9219	9186
* Combat	14250	15020
** Flight Design	12504	12504
** Landing Design	11556	11556
** Catapult Design	19910	19910
Useful Load		
Pilot	200	200
Internal Fuel (800 Gal)	5200	5200
External Fuel (300 Gal)	---	1950
Oil	30	30
Trapped Fuel and Oil	29	29
Bullpups @ 550# ea.	1650	1100
Bullpup Instl.	340	240
300 Gal. Drop Tank	---	183
Oxygen Equipment	27	27
Parakit and Seat Pan	31	31
Drop Tank Rack	---	67
Total Useful Load	7507	9057
Gross Weight - Take Off	16330	17880

* Less 40% useable fuel; 320 gal. JP-4 fuel for (2)
40% useable fuel; 440 gal. JP-4 fuel for (3)
** See Spec. SD-495-2
*** All loadings based on JP-4 fuel

BULLPUP MISSILE SYSTEM

INSTALLATION

The A4D-2 airplane is capable of carrying three Bullpup missiles, one on each wing and one on the centerline. Special pylons, which contain a launcher and a wing adapter are installed in place of the ejector rack installation and are readily interchangeable on the wing attachment points.

The aircraft contains the required wiring so that the electronic component installation is accomplished by connecting the appropriate electrical harnesses. The electronic equipment that must be installed in a basic airplane for the Bullpup system consists of: (1) XASM-N-7 Mod.II transmitter in the equipment compartment; (2) the missile control panel in the cockpit; (3) a transmitting antenna on the nose gear door and (4) the missile relay control box in the equipment compartment.

The pilot's control stick grip contains the switch button whereby the pilot maneuvers the missile in flight.

OPERATION

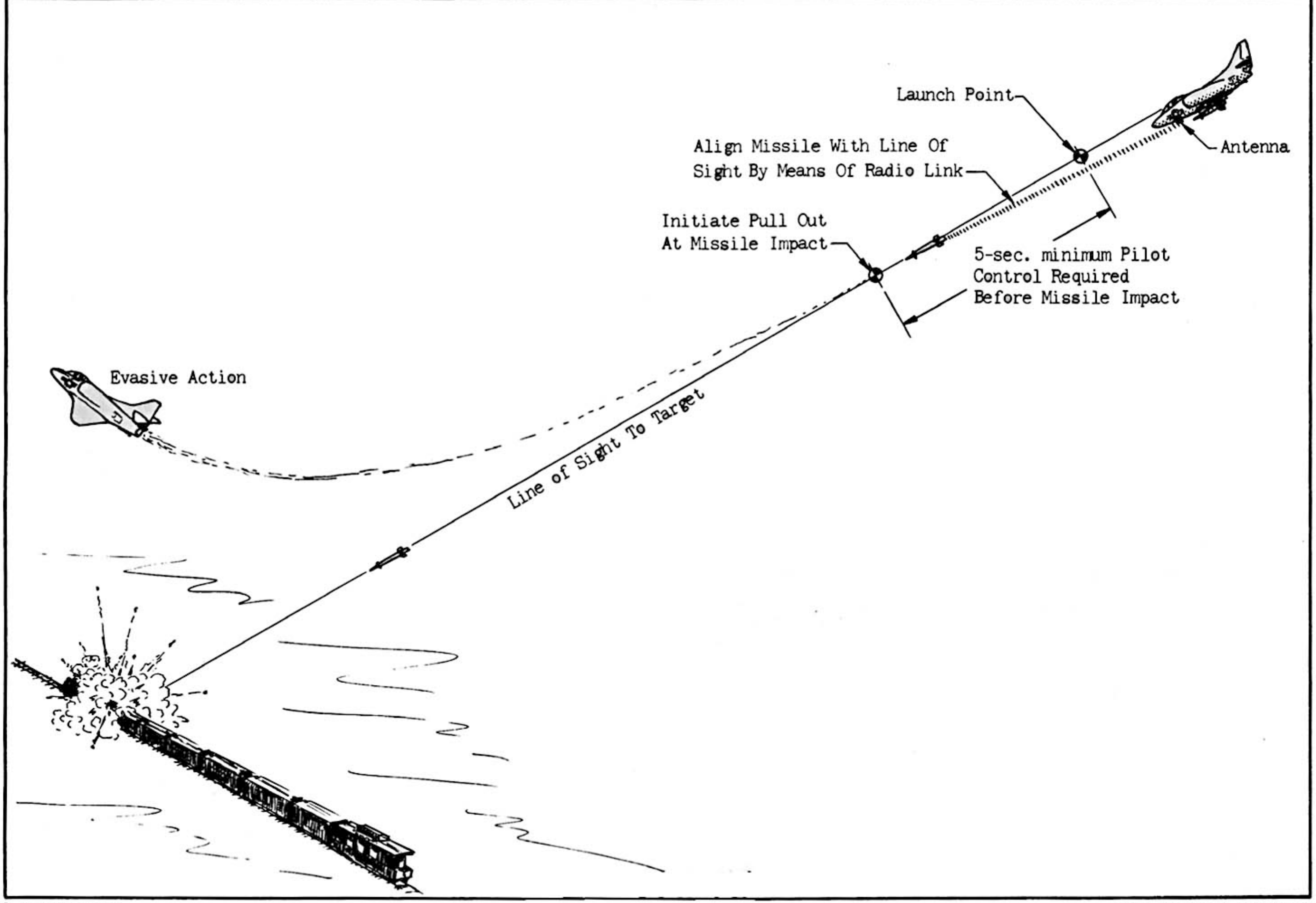
The pilot visually identifies his target and if within the ranges shown on the operational envelope diagram, he initiates a dive

The missile is launched while the airplane is in a dive on the target and the dive must be maintained until missile impact. The airplane must remain "on target" for a minimum of 5 seconds prior to impact to stabilize the missile path.

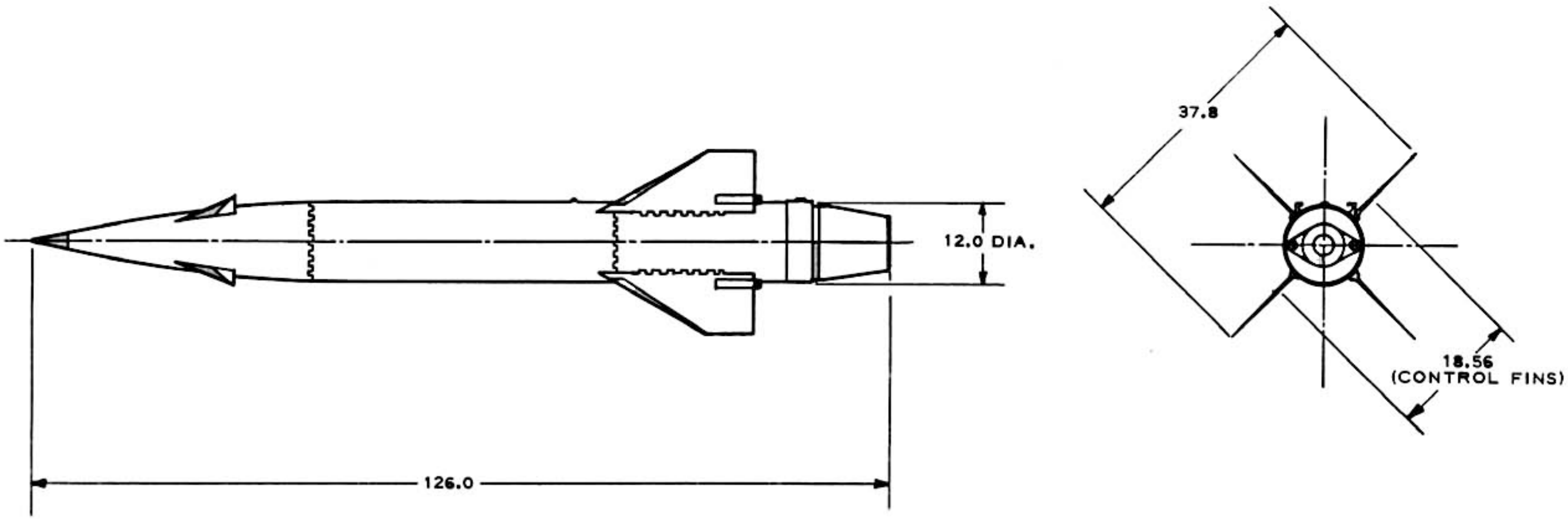
After launching, the missile is aligned with the pilot's line of sight to the target by means of a correlation radio link, whereby the pilot sends directional commands to the missile. It is possible to send up, right, down and left signals or any two adjacent commands simultaneously. The missile control system is an "on-off" or "bang-bang" type and pilot control of command magnitude is not provided.

No fire control system or optical sights are needed for launching or guidance of the missile. Bullpup missile attacks on ground targets are possible in any weather condition permitting visual identification of the target.

TYPICAL ATTACK



GENERAL ARRANGEMENT-XASM-N-7 BULLPUP MISSILE



TYPE - Air-to-Surface

TAKE-OFF WEIGHT - 550 lbs.

PROPULSION - Solid propellant rocket

THRUST - 12,550 lbs.

BURNING TIME - 1.5 sec.

WARHEADS - 250 lb. Fragmentation Bomb

250 lb. General purpose bomb

250 lb. Low drag bomb

GUIDANCE - Pilot control by radio link

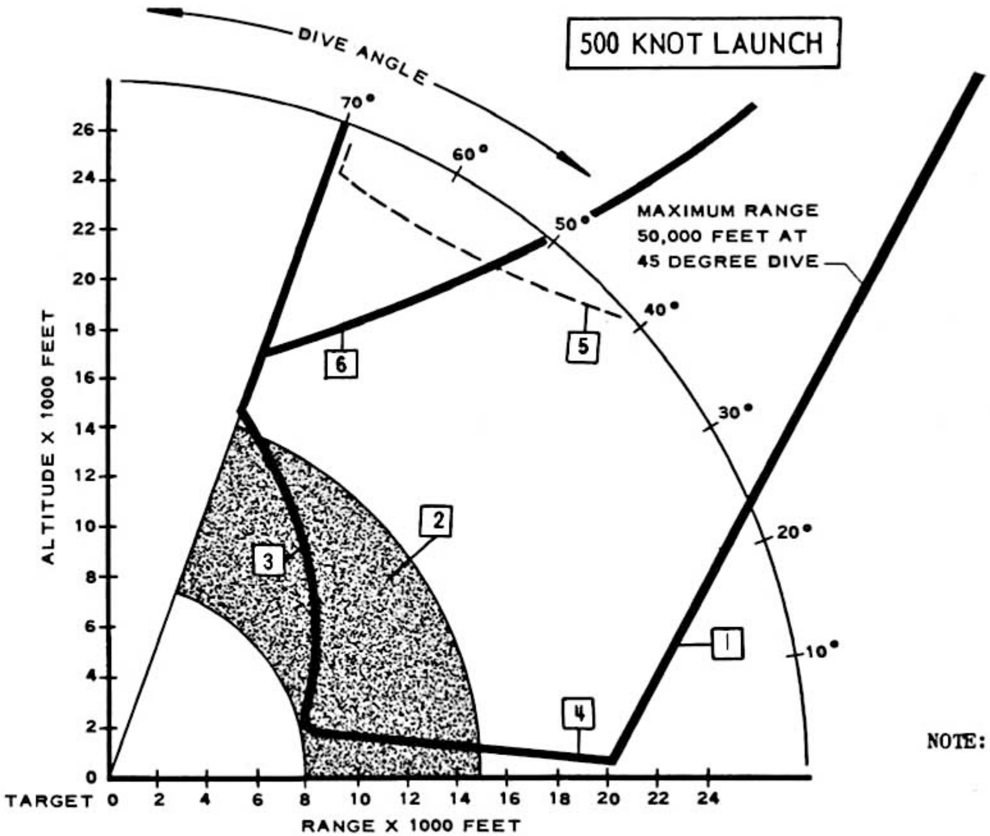
LAUNCH RANGE - 8,000 ft. to 15,000 ft.

LAUNCH VELOCITY - 250 kn. to 500 kn.

DIVE ANGLE - 0° to 70°

ACCURACY - 50% within 40 ft. of target

BULLPUP MISSION OPERATIONAL ENVELOPE



EXPLANATION OF OPERATIONAL ZONES

1. Maximum launch range determined by limiting minimum missile velocity at impact to Mach 1.
2. Range of pilot's ability to acquire and recognize such targets as bridges, tanks, or surface ships - 8,000 to 15,000 ft.
3. Minimum missile flight time of five seconds required for pilot to optimize aim point.
4. Minimum terrain clearance of 500 feet
5. Minimum launch range required to give 6000 feet terrain clearance at 3G pull-up to avoid small arms anti-aircraft fire.
6. Max. dive entry altitude to keep speed to 500 knots (true). Dive brakes open, idle thrust, entry M = .75

NOTE: The carriage of three XASM-N-7 Bullpup missiles on the airplane does not impose any additional flight or strength restrictions above those which may exist on the basic airplane.

REFERENCE: MARTIN ENGINEERING REPORT NO. 6427

PERFORMANCE

CONDITION \ CONFIGURATION		(1) 1-1050 lb. Store on Centerline	(2) 3-XASM-N-7 Missiles	(3) 2-XASM-N-7 Missiles Plus 1-300 Gal.Ext. Fuel Tank On C. L.
TAKE-OFF WEIGHT	lb.	15,492	16,330	17,880
Fuel (JP-4)	lb.	5200	5200	7150
Stall speed - power-off	kn.	110	113	118
Wind required for catapult from H-8	kn.	2	5	12
Combat radius	n.mi.	372	306	549
Mission time/cycle time	hr./hr.	1.8/2.1	1.6/1.9	2.7/3.0
COMBAT WEIGHT (60% initial fuel + stores)	lb.	13,412	14,250	
Fuel (JP-4)	lb.	3120	3120	
Rate of climb at S. L. (A)	ft./min.	10,100	8050	
Combat ceiling (A)	ft.	44,000	41,200	
Max. speed at S. L. (A)	kn./M	575/.87	533/.81	
Max. speed at 35,000 ft. (A)	kn./M	518/.90	501/.87	
LANDING WEIGHT	lb.	10,153	10,419	
Fuel (JP-4)	lb.	911	939	
Stalling speed - power-off at S. L.	kn.	89.1	90.3	
Wind required for arrested landing with MK. 5 Mod 1 (155 ft.) arresting gear	kn.	6	7	

NOTES

(A) Military thrust

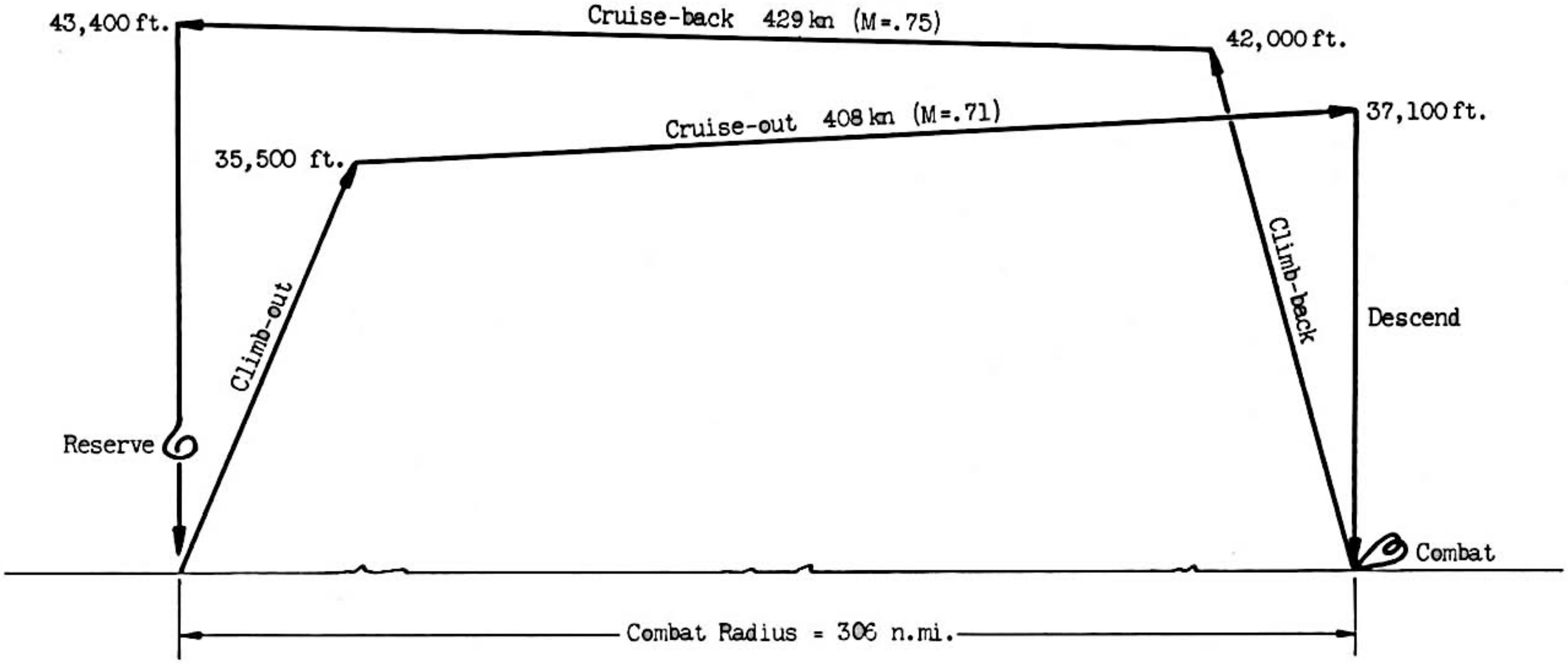
(B) Performance is based on preliminary A4D-1 flight test results. Combat radii are based on fuel consumption data from Wright Aeronautical Division Specification No. N-890-A for the J65-W-16 engine dated 5 December 1952, revised 1 March 1955, increased 5%.

COMBAT RADIUS DESCRIPTION

LOW ALTITUDE ATTACK PROBLEM

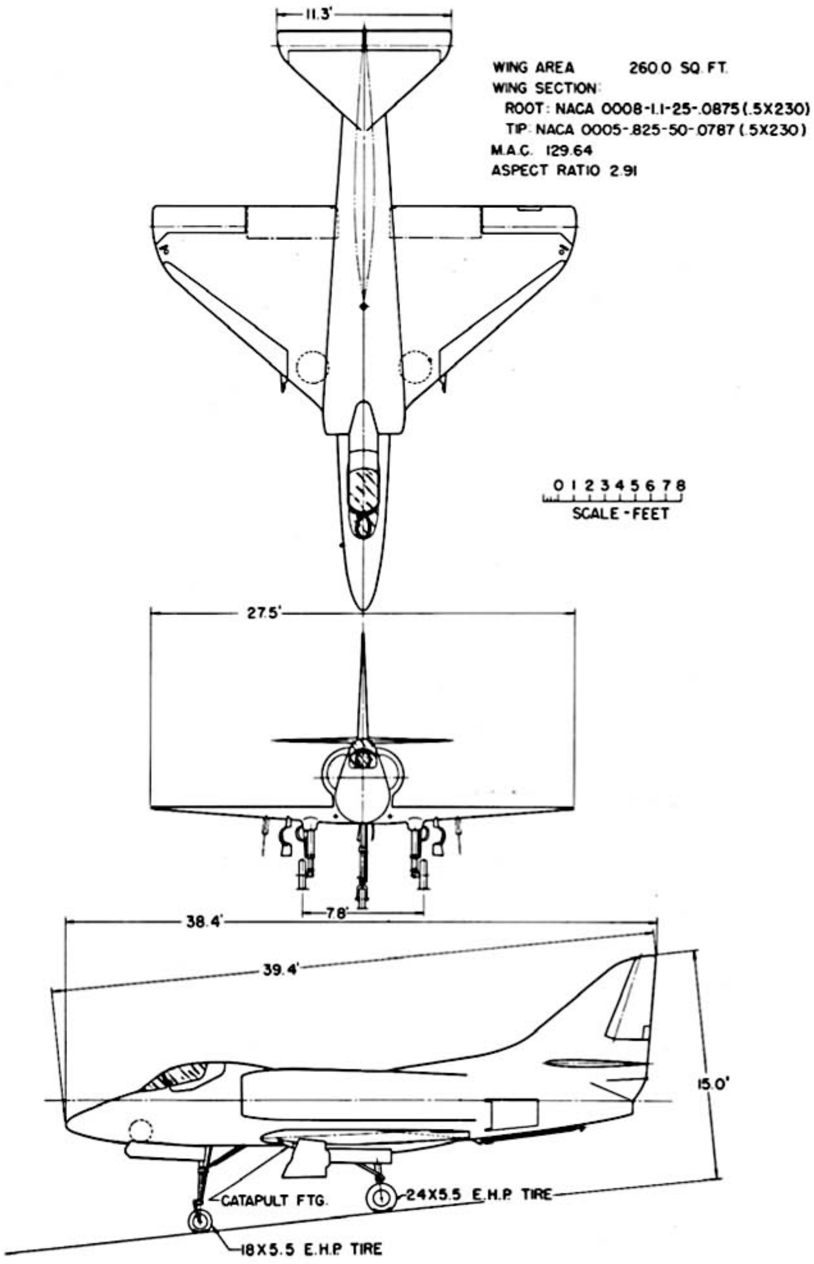
Start Engine, Take-Off, and Accelerate	Climb-Out	Cruise-Out	Descend	Combat	Climb-Back	Cruise-Back	Reserve
Fuel for 5 min. with normal power at sea level.	At maximum rate of climb with military power on course to optimum cruise altitude.	At speed for maximum range at optimum cruise altitude. (Drop any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

LOADING CONDITION (2)

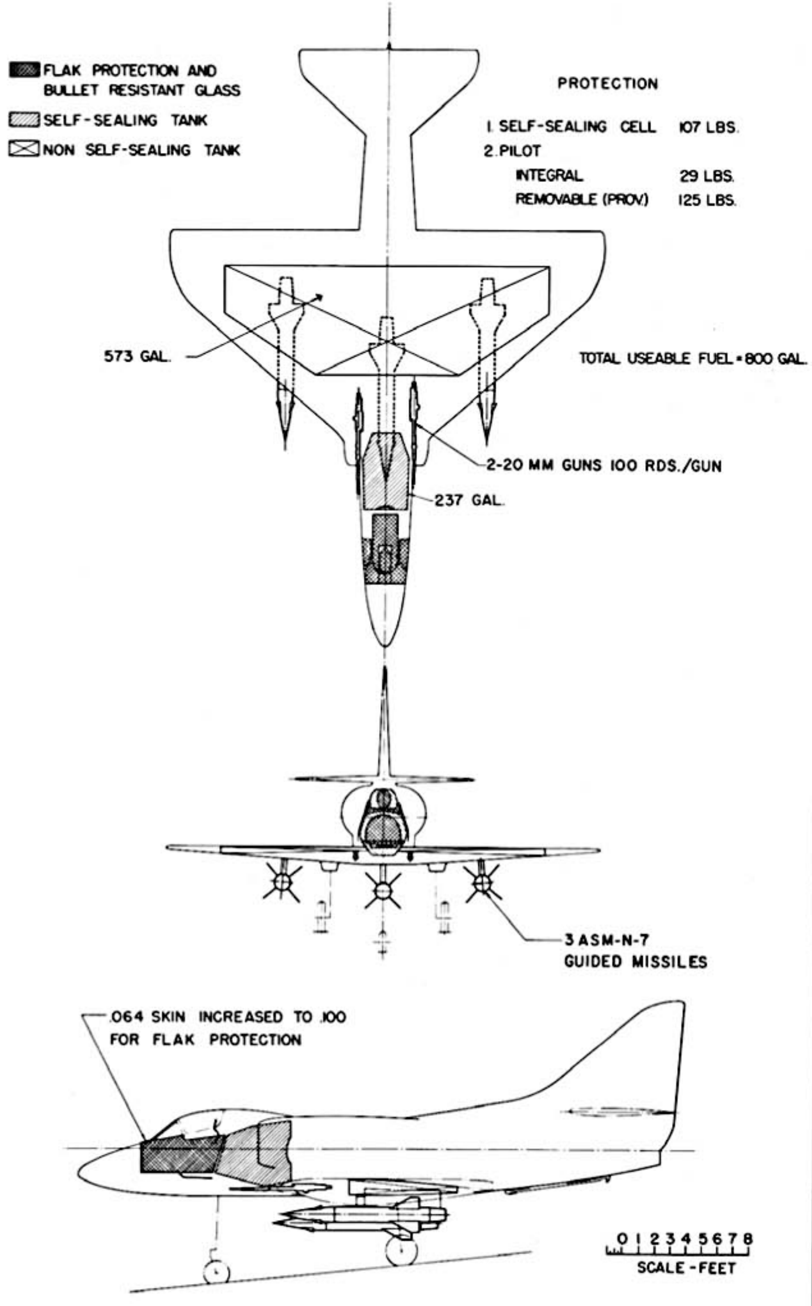


STANDARD AIRCRAFT CHARACTERISTICS
A4D-2 SKYHAWK (ASM-N-7 MISSILES)

DOUGLAS AIRCRAFT COMPANY, INC., EL SEGUNDO DIVISION



DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKAGE

A4D-2 (ASM-N-7 MISSILES)

24 MARCH 1958

POWER PLANT

No. & Model... (1) J65-W-16A Axial Flow Turbojet Without Afterburner

Manufacturer .... Wright Aero
Spec. No. .... W.A.C. N-890-B
Length .... 113 In.
Diameter .... 31 In.

RATINGS

Mil.	8300 RPM	7700 lbs.
Norm.	8030 RPM	6780 lbs.

MISSION AND DESCRIPTION

The A4D-2 is a lightweight, high-performance, carrier-based, jet-powered airplane designed for dive, glide, and loft bombing as well as missile attacks against ground targets.

The Bullpup weapons system is intended to increase materially the effectiveness of the A4D-2 airplane in the destruction of such ground targets as surfaced submarines, coastal shipping, bridges, trains, grounded aircraft and similar targets, moving or stationary.

The Bullpup system is designed for considerably higher kill probability than conventional bombing systems.

DEVELOPMENT

Contracts: NOa(s) 55-189 and NOa(s) 56-119
First Flight: 29 October 1957 (Scheduled)
Service Use: January 1958 (Scheduled)
Status: Five airplanes are being fitted with provisions for Bullpup installation. Proposal pending for incorporation on subsequent aircraft.

WEIGHTS

Loading	Lbs.	L.F.
Empty	8823	
Basic	9219	
Design	12504	7.0
Combat	14250	6.1
Max. T.O. (Field)	17880*	
Max. T.O. (Cat.)	17880*	
Max. Land. (Des.)		
Basic	11556	
Emergency	17880*	

All weights are calculated.
*Includes 2 missiles plus 300 gallons external fuel.

FUEL AND OIL

Gal.	No. Tanks	Location
573	1	Wing
237*	1	Fuselage

*Self-sealing
Total useable fuel: 800 gallons

OIL

Fuel Spec. .... MIL-F-5624 or MIL-F-5572
2.8 gal. mounted on engine
Oil Spec. MIL-L-7808

ORDNANCE

MISSILES: (3) ASM-N-7 on Special Pylons

FIXED GUNS/RDS. AMM.

2 Mk.12 Mod.0 20mm/100 rds. per gun

DIMENSIONS

Span .... 27.5 ft.
Length .... 39.4 ft.
Height .... 15.0 ft.
Max. Tread .... 7.8 ft.
Turn.Rad. (nose) .... 20.5 ft.
Wing Area .... 260 sq. ft.

ELECTRONICS

Equipment Carried In Basic A4D-2

Electronics Control AN/ASQ-17
TACAN AN/ARN-21

Additional Equipment For Missile System

Missile Guidance System consisting of:
- Antenna
- Control Box
- Transmitter
- Control Box

PERFORMANCE SUMMARY

TAKE-OFF LOADING CONDITION		1 ATTACK 3 ASM-N-7 MISSILES		5 ATTACK 2 ASM-N-7 MISSILES 1-300 GAL. EXT. FUEL TANK		
TAKE-OFF WEIGHT	lb.	16,330		17,880		
Fuel	lb.	5200		7150		
Payload	lb.	1650		1100		
Wing loading	lb./sq.ft.	62.9		68.8		
Stall speed - power-off	kn.	113		118		
Take-off run at S.L. 25 kn. wind	(A) ft.	1360		1620		
Take-off run at S.L. - calm	(B) ft.	1990		2440		
Take-off to clear 50 ft. - calm	(B) ft.	2820		3350		
Max. speed/altitude	(C) kn./ft.	533/10,000		531/9700		
Rate of climb at S.L.	(C) fpm	7000		6100		
Time: S.L. to 20,000 ft.	(C) min.	3.8		4.3		
Time: S.L. to 30,000 ft.	(C) min.	6.9		8.0		
Service ceiling (100 fpm)	(C) ft.	38,900		36,800		
Combat range	n.mi.	746		1157		
Average cruising speed	kn/M	414/.72		414/.72		
Cruising altitude(s)	ft.	35,700 - 40,700		33,500-41,500		
Combat radius	n.mi.	300		541		
Average cruising speed	kn/M	422/.73		422/.73		
Mission time/cycle time	hr./hr.	1.9/2.2		4.9/5.2		
COMBAT LOADING CONDITION		2 60% FUEL 3 ASM-N-7 MISSILES	3 60% FUEL NO STORES			
COMBAT WEIGHT	lb.	14,250	12,600			
Engine power		MILITARY	MILITARY			
Fuel	lb.	3120	3120			
Combat speed/combat altitude	kn./ft.	528/S.L.	572/S.L.			
Rate of climb/combat altitude	fpm/ft.	8200/S.L.	10,600/S.L.			
Combat ceiling (500 fpm)	ft.	40,600	44,700			
Rate of climb at S.L.	fpm	8200	10,600			
Max. speed at S.L.	kn/M	528/.80	572/.87			
Max. speed/altitude	kn/M/ft.	500/.87/35,000	524/.91/35,000			
LANDING WEIGHT	lb.	4 10,405				
Fuel	lb.	925				
Stall speed - power-off	kn.	90.2				
Stall speed - with approach power	kn.	86.9				

NOTES

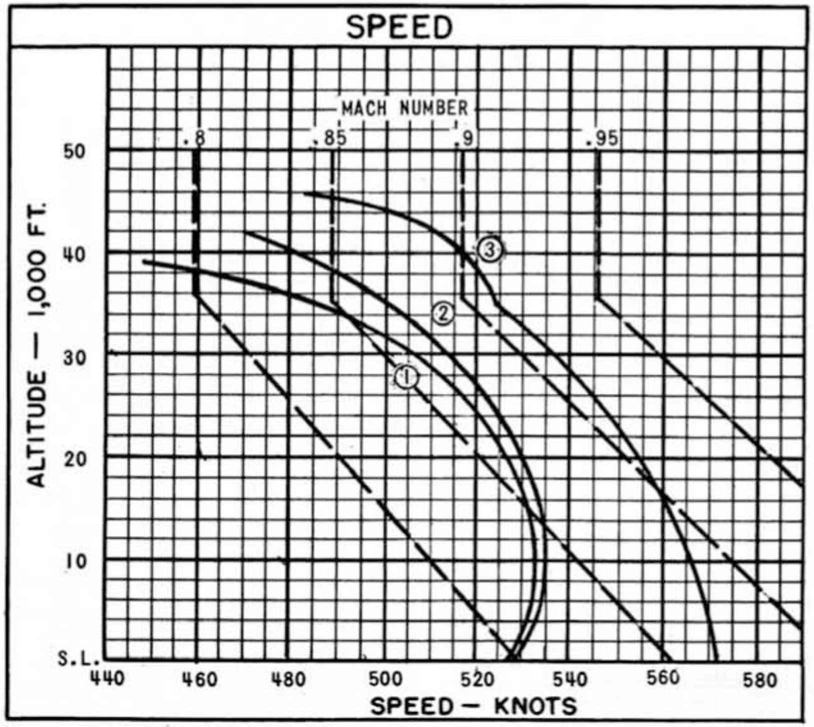
(A) Full Flaps

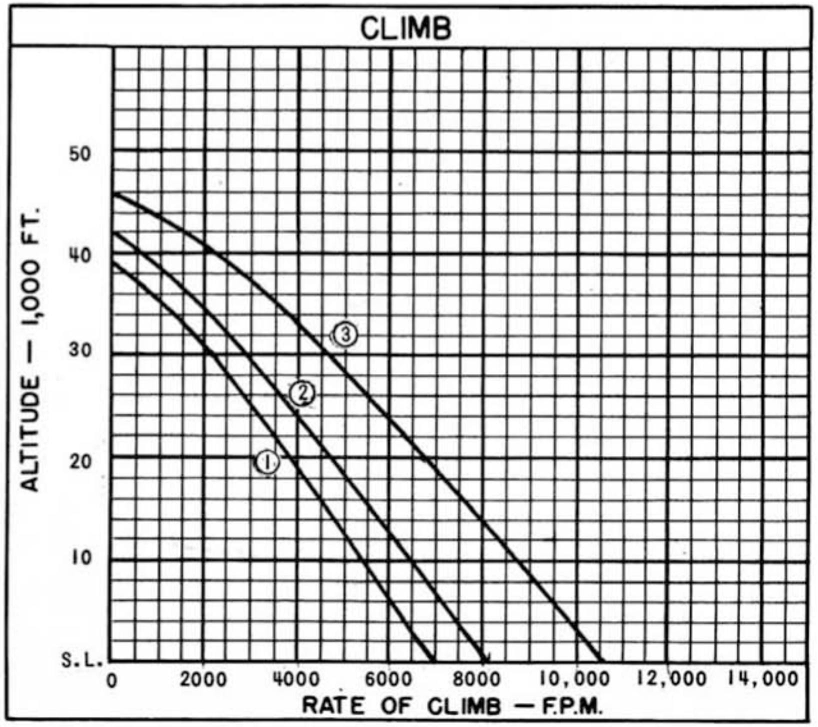
(B) Half Flaps

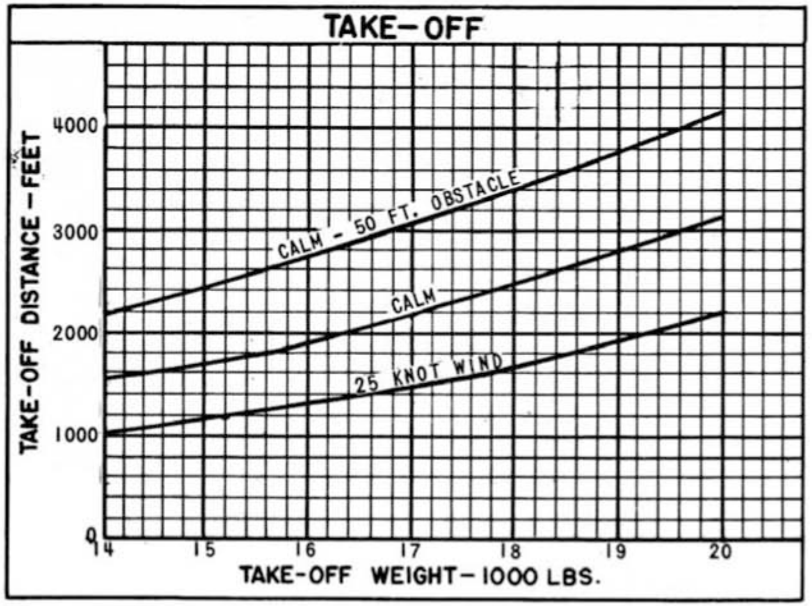
(C) Military thrust

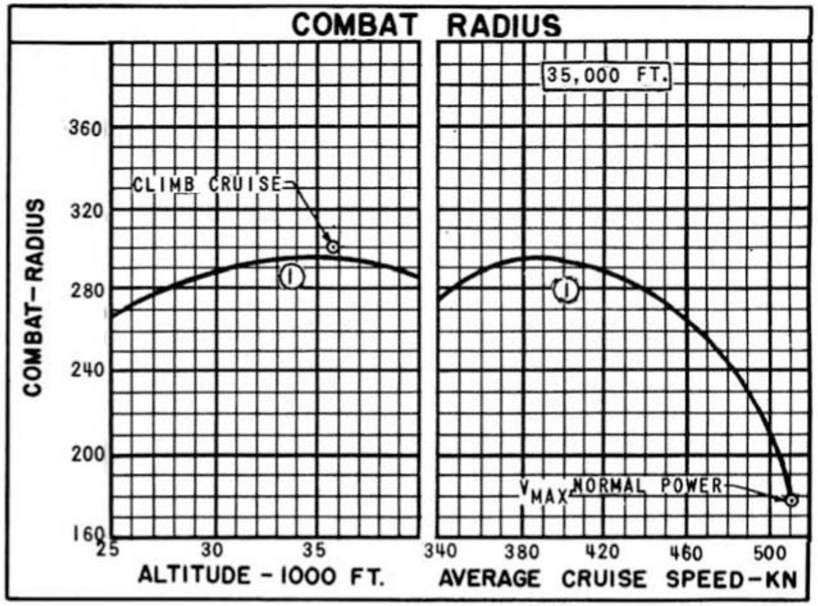
(D) Performance is based on Contractor's preliminary flight tests of the A4D-1. Combat range and radius are based on fuel consumption from Wright Aeronautical Division Specification No. N-890-B for the J65-W-16A engine, (coordination copy) received 24 January 1957, increased 5%.

(E) A maximum operating spot aboard a CVA-19 (angle deck) class carrier consists of 46 aircraft on the flight deck with elevators and landing area clear and 60 aircraft on the hangar deck with hangar bay fire doors and elevators clear. Total 106 aircraft.


SPEED
MACH NUMBER
.8
.85
.9
.95
ALTITUDE — 1,000 FT.
50
40
30
20
10
S.L.
440
460
480
500
520
540
560
580
SPEED — KNOTS

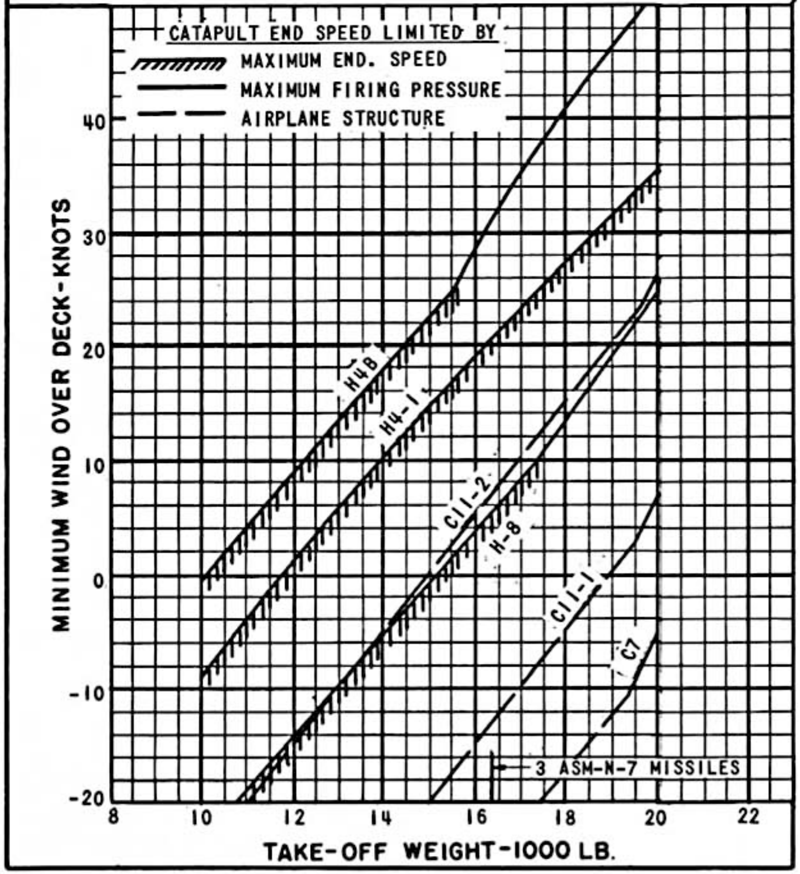

CLIMB
ALTITUDE — 1,000 FT.
50
40
30
20
10
S.L.
0
2000
4000
6000
8000
10,000
12,000
14,000
RATE OF CLIMB — F.P.M.


TAKE-OFF
CALM - 50 FT. OBSTACLE
CALM
25 KNOT WIND
TAKE-OFF DISTANCE - FEET
4000
3000
2000
1000
0
14
15
16
17
18
19
20
TAKE-OFF WEIGHT - 1000 LBS.

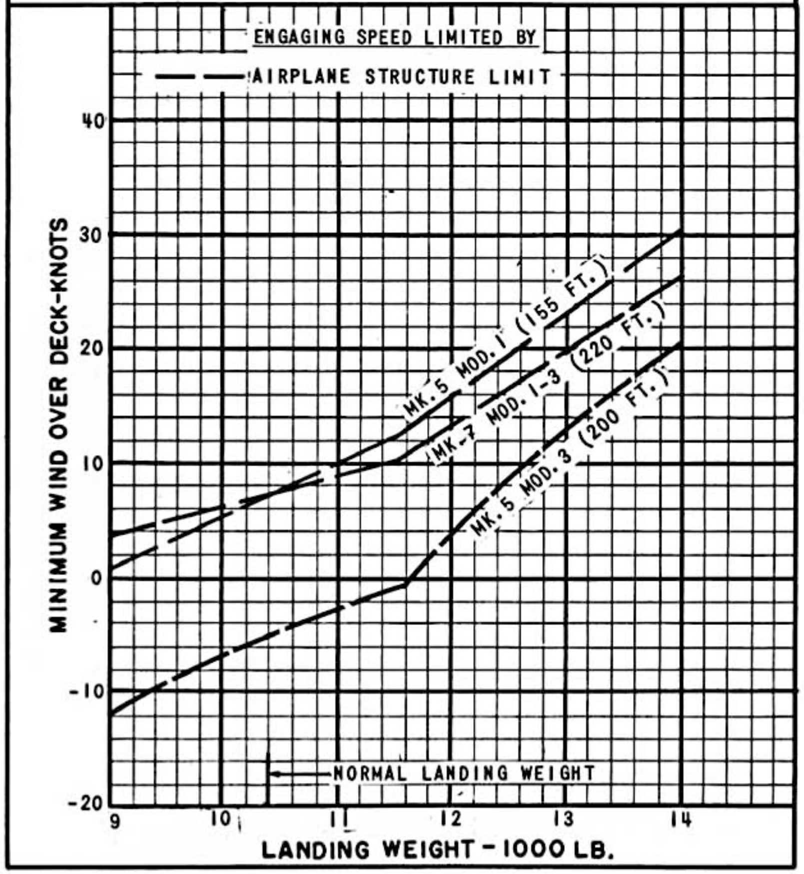

COMBAT RADIUS
35,000 FT.
CLIMB CRUISE
V MAX NORMAL POWER
COMBAT-RADIUS
360
320
280
240
200
160
25
30
35
ALTITUDE - 1000 FT.
340
380
420
460
500
AVERAGE CRUISE SPEED-KN

CARRIER SUITABILITY

DECK WIND REQUIRED FOR CATAPULTING



DECK WIND REQUIRED FOR LANDING



NOTES:

(1) Catapult take-off speed corresponds to .84 $C_{L_{max}}$ for hydraulic catapults and to NATC recommended minimins for steam catapults.

(2) Airplane structural limits for catapult take-off are: horizontal hook load = 94,400 lbs., maximum acceleration = 5.08g, and firing pressure limit of 3600 psi on H8 catapult due to gear limit.

(3) Approach speed equals 1.2 times power-off stalling speed.

(4) Engaging speed is limited by airplane deceleration of 5.14g below 11,556 lbs and by horizontal hook load of 59,400 lbs. at weights above 11,556 lbs.

NOTES

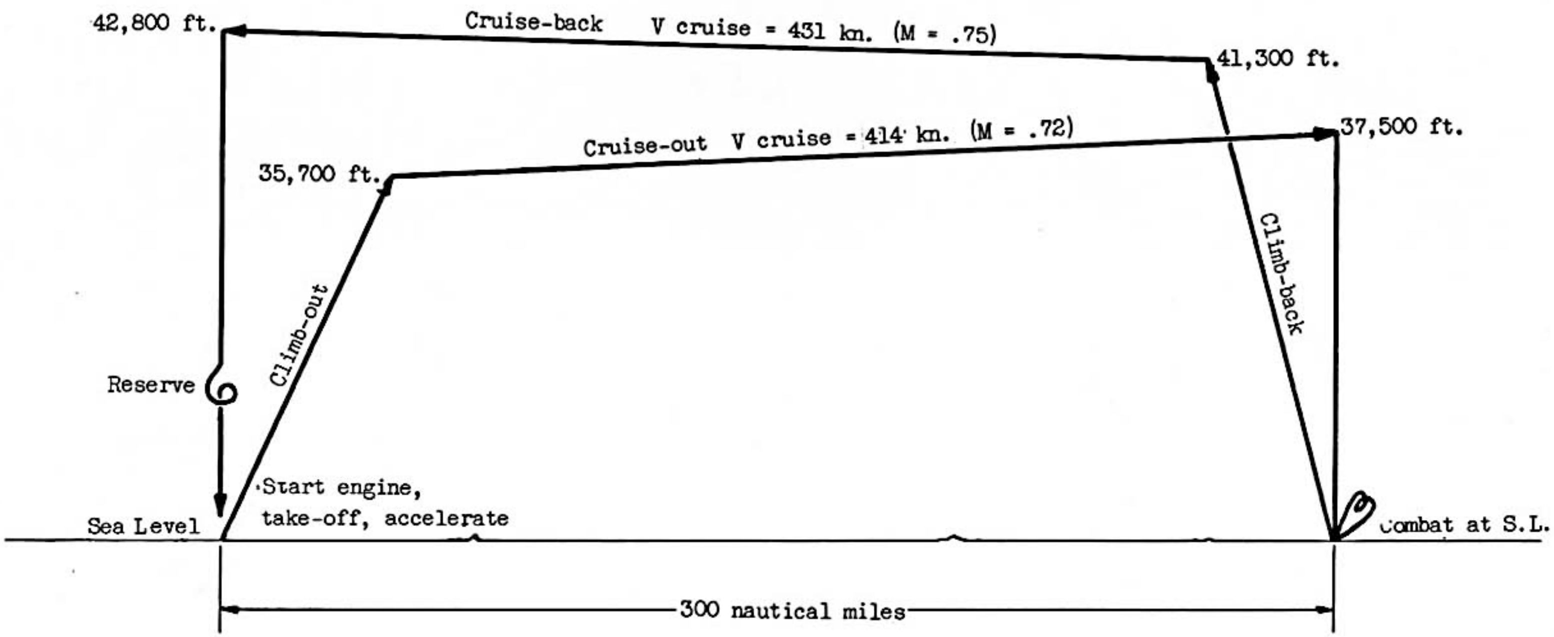
COMBAT RADIUS DESCRIPTION

LOW ALTITUDE ATTACK MISSION

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 speed for maximum range at optimum cruise altitude. (Drop any external tanks when empty).	To sea level (no fuel consumed-no distance covered) fire missiles.	At sea level for 5 minutes with military power. No distance made good.	At maximum rate of climb with military power on course to optimum cruise altitude.	At speed for maximum range at optimum cruise altitude.	Fuel allowances 5 percent of initial fuel plus 20 minutes at speed for maximum endurance at sea level.

Combat radius = Climb-out + Cruise-out = Climb-back + Cruise-back

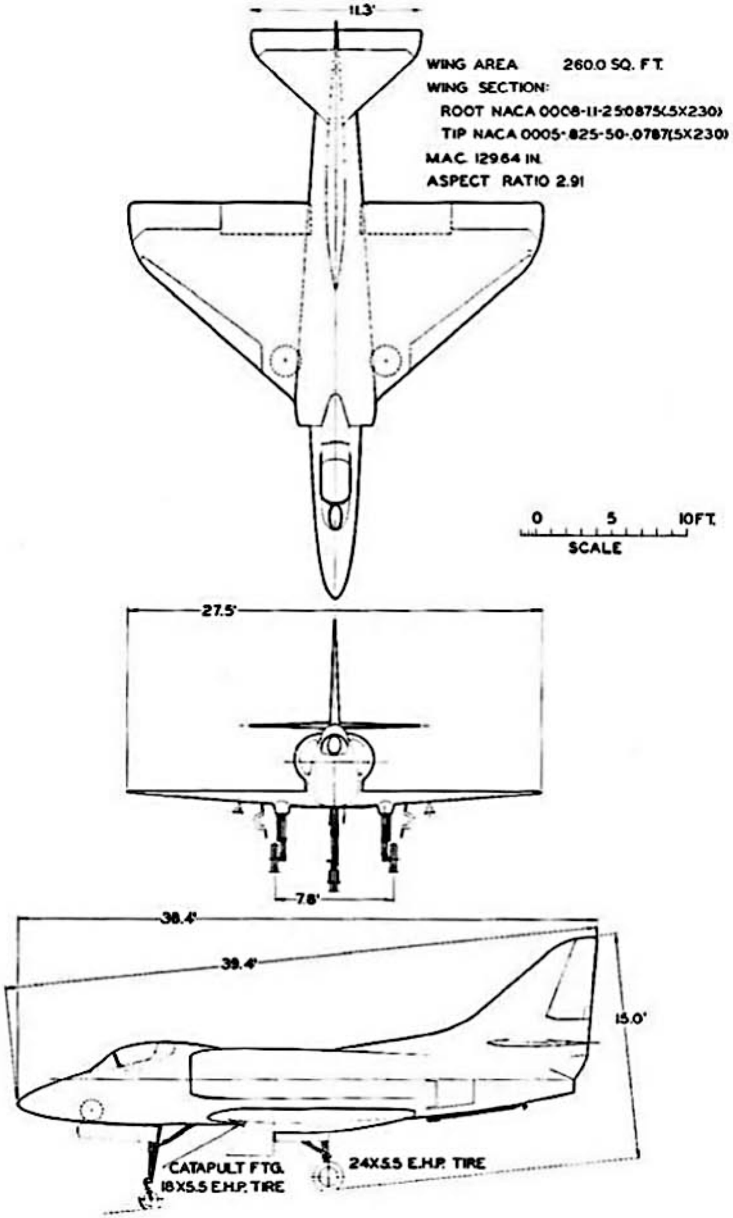
LOADING CONDITION (1)



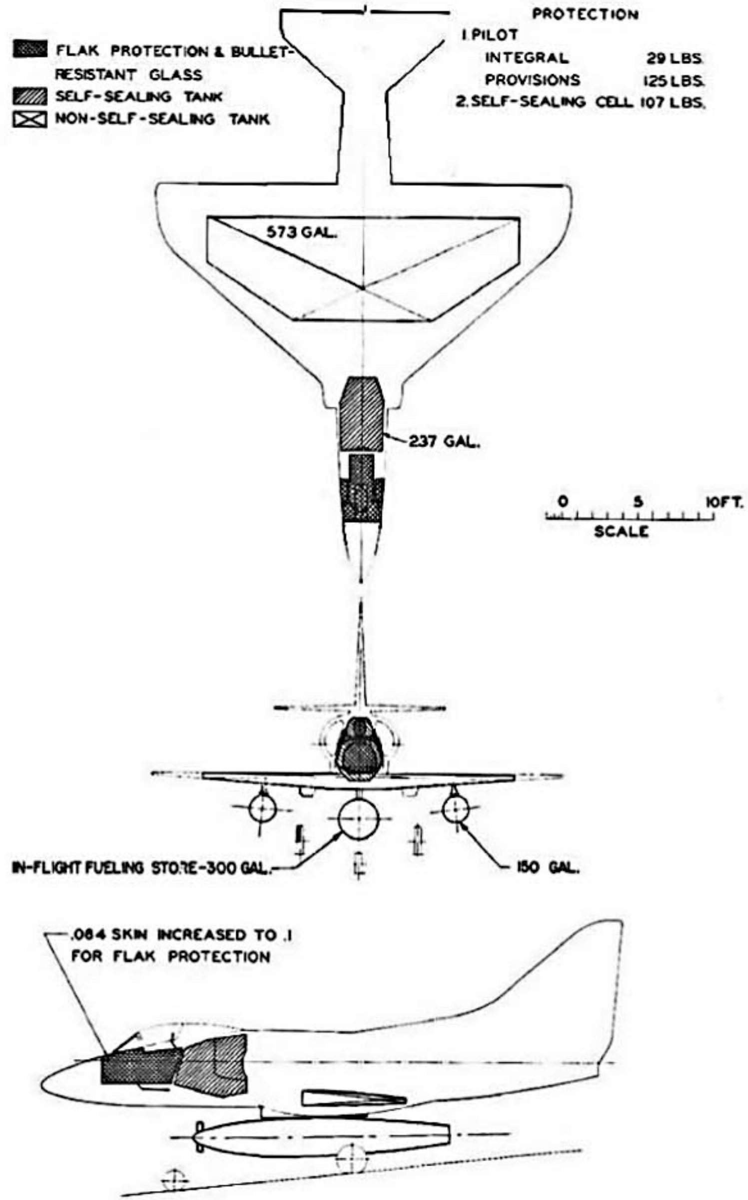
STANDARD AIRCRAFT CHARACTERISTICS

A4D-2 SKYHAWK (TANKER)

DOUGLAS AIRCRAFT COMPANY, INC., EL SEGUNDO DIVISION



DESCRIPTIVE ARRANGEMENT



ARMAMENT & TANKAGE

POWER PLANT

No. & Model (1) J65-W-16A
Axial Flow Turbojet
Without Afterburner

MFR.-Wright Aeronautical

Spec. No. - W.A.C. N-890-B
(Coordination Copy)

Length .... 113 in.
Diameter .... 31 in.

RATINGS

Mil.	8300 RPM	7700 lbs.
Norm.	8030 RPM	6780 lbs.

ORDNANCE

None

MISSION AND DESCRIPTION

The basic A4D-2 airplane can be converted into a refueling tanker by installation of a Douglas In-Flight Fueling Store, a pilot's console and a provisions kit.

The loading consists of the fueling store (containing 300 gallons of fuel) on the centerline bomb rack and 150-gallon fuel tanks on the two wing stations. Additional fuel may be transferred from the tanker's internal fuel tanks.

Two A4D-2 attack airplanes form a team of tanker and receiver with complete compatibility in altitude, cruise speed and range.

The combat radius of the receiver airplane is increased approximately 50% with one refueling. Additional range can be achieved with multiple refuelings.

DIMENSIONS

Span .... 27.5 ft.
Length .... 39.4 ft.
Height .... 15.0 ft.
Max. Tread .... 7.8 ft.
Turn. Rad. (nose) .... 20.5 ft.
Wing Area .... 260 sq. ft.

WEIGHTS

Loadings	Lbs.	L.F.
Empty	8763	
Basic	9050	
Flight Design	12,504	7.0
Refueling	17,728	4.9
Max. Take-off		
Field	20,000	4.4
Catapult	20,000	4.4
Max. Landing		
Field	16,000	5.5
Arrested	12,000	7.0

FUEL AND OIL

Gal.	No. Tanks	Location
573	1	Wing
237	1	Fuselage
300	1	C_L Fueling Store
300	2	Wing Stores

1400 gal. total useable fuel.

Fuel Grade JP-5
Fuel Spec. MIL-F-7917

OIL

3.25 gal. mounted on engine
Oil Spec. MIL-L-7808

ELECTRONICS

Electronics Control AN/ASQ-17
consisting of:
UHF Communication
IFF
Coder
Direction Finder

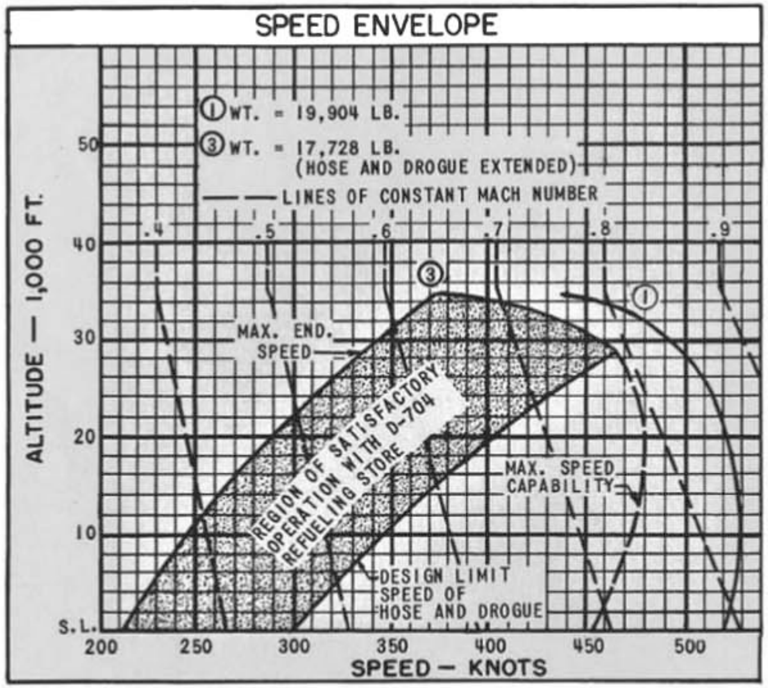
TACAN AN/ARN-21
"Tapeline" Dead reckon. computer

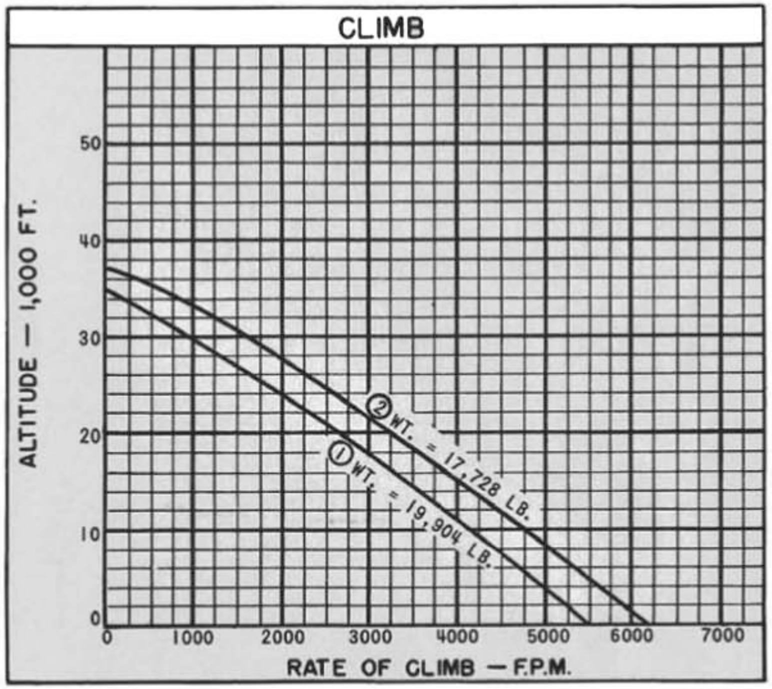
PERFORMANCE SUMMARY

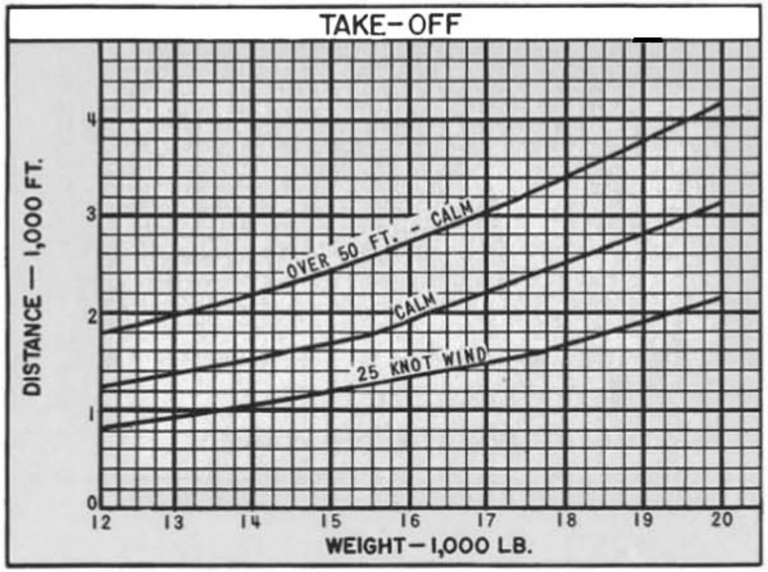
TAKE-OFF LOADING CONDITION		(1) 2-150 GAL EXT. TANKS PLUS 300 GAL. REFUELING STORE ON CENTERLINE				
TAKE-OFF WEIGHT	lb.	19,904				
Fuel (JP-5)	lb.	9520				
Payload (max. fuel for transfer) (A)	lb.	6825				
Wing loading	lb./sq.ft.	76.6				
Stall speed - power-off	kn.	125				
Take-off run at S.L. 25 kn. wind (B)	ft.	2130				
Take-off run at S.L. - calm (C)	ft.	3100				
Take-off to clear 50 ft. - calm (C)	ft.	4125				
Max. speed/altitude (D)	kn./ft.	530/10,000				
Rate of climb at S.L. (D)	fpm	5400				
Time: S.L. to 20,000 ft. (D)	min.	5.0				
Time: S.L. to 30,000 ft. (D)	min.	10.1				
Service ceiling (100 fpm) (D)	ft.	34,200				
Range (E)	n.mi.	1542				
Average cruising speed	kn./M	415/.72				
Cruising altitude(s)	ft.	30,800/42,500				
REFUELING LOADING CONDITION - 60% int. fuel plus full refueling store and ext. tanks.		(2) HOSE AND DROGUE RETRACTED	(3) HOSE AND DROGUE EXTENDED			
REFUELING WEIGHT	lb.	17,728	17,728			
Engine power		MILITARY	MILITARY			
Fuel (JP-5)	lb.	7344	7344			
Max. speed/refueling altitude	kn./ft.	503/30,000	458/30,000			
Max. endurance speed/refueling alt.	kn./ft.	355/30,000	343/30,000			
Max. rate of climb/refueling alt.	fpm/ft.	1600/30,000	900/30,000			
Combat ceiling (500 fpm)	ft.	35,400	31,800			
Rate of climb at S.L.	fpm	6200	5200			
Max. speed at S.L.	kn./M	522/.79	300/.45 (G) (Maximum Design Limit Speed of Hose and Drogue)			
LANDING WEIGHT	lb.	(4) 11,332				
Fuel (F)	lb.	948				
Stall speed - power-off	kn.	94.1				
Stall speed - with approach power	kn.	91.4				

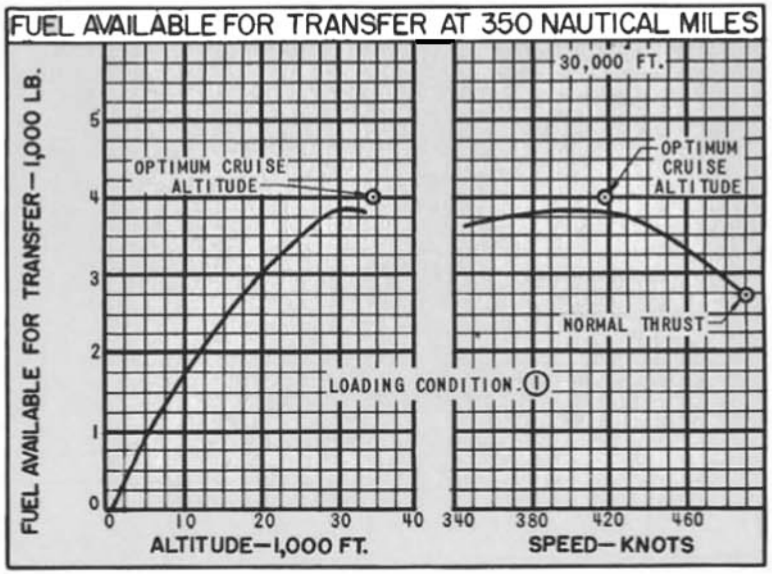
NOTES

(A) See fuel available for transfer vs. distance (see chart)
(B) Full Flaps
(C) Half Flaps
(D) Military thrust
(E) Maximum range available. Normal take-off, cruise at optimum conditions and reserve allowance. No fuel transferred.
(F) 5% of fuel not transferred plus 20-minute loiter at maximum endurance at sea level.
(G) Performance is based on Contractor's preliminary flight tests on the A4D-1. Range is based on fuel consumption from Wright Aeronautical Division Specification N-890-B for the J65-W-16A engine, (coordination copy) received 24 January 1957, increased 5%.


SPEED ENVELOPE
① WT. = 19,904 LB.
③ WT. = 17,728 LB. (HOSE AND DROGUE EXTENDED)
LINES OF CONSTANT MACH NUMBER
MAX. END. SPEED
REGION OF SATISFACTORY OPERATION WITH D-704 REFUELING STORE
MAX. SPEED CAPABILITY
DESIGN LIMIT SPEED OF HOSE AND DROGUE
ALTITUDE — 1,000 FT.
SPEED — KNOTS

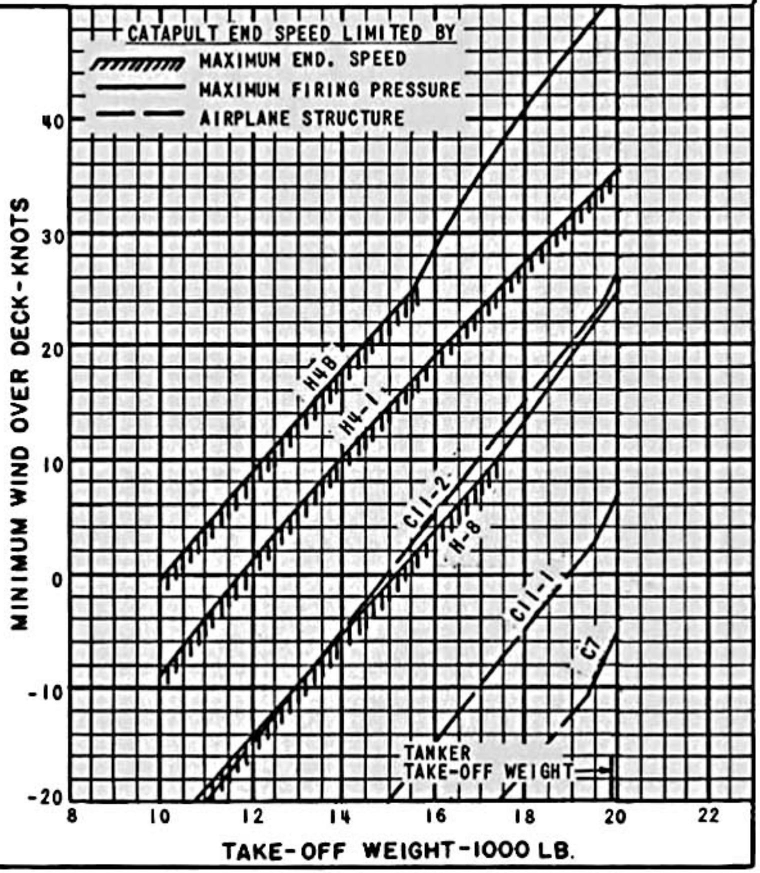

CLIMB
② WT. = 17,728 LB.
① WT. = 19,904 LB.
ALTITUDE — 1,000 FT.
RATE OF CLIMB — F.P.M.


TAKE-OFF
OVER 50 FT. - CALM
CALM
25 KNOT WIND
DISTANCE — 1,000 FT.
WEIGHT — 1,000 LB.

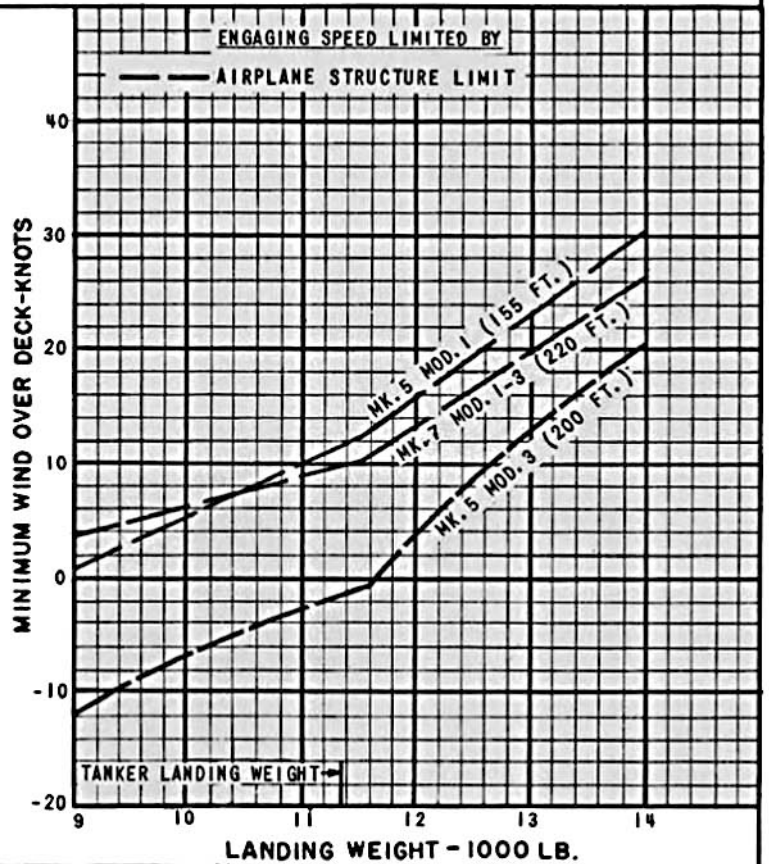

FUEL AVAILABLE FOR TRANSFER AT 350 NAUTICAL MILES
30,000 FT.
OPTIMUM CRUISE ALTITUDE
OPTIMUM CRUISE ALTITUDE
NORMAL THRUST
LOADING CONDITION ①
FUEL AVAILABLE FOR TRANSFER — 1,000 LB.
ALTITUDE — 1,000 FT.
SPEED — KNOTS

CARRIER SUITABILITY

DECK WIND REQUIRED FOR CATAPULTING



DECK WIND REQUIRED FOR LANDING



NOTES:

(1) Catapult take-off speed corresponds to .84 $C_{L_{max}}$ for hydraulic catapults and to NATC recommended minimins for steam catapults.

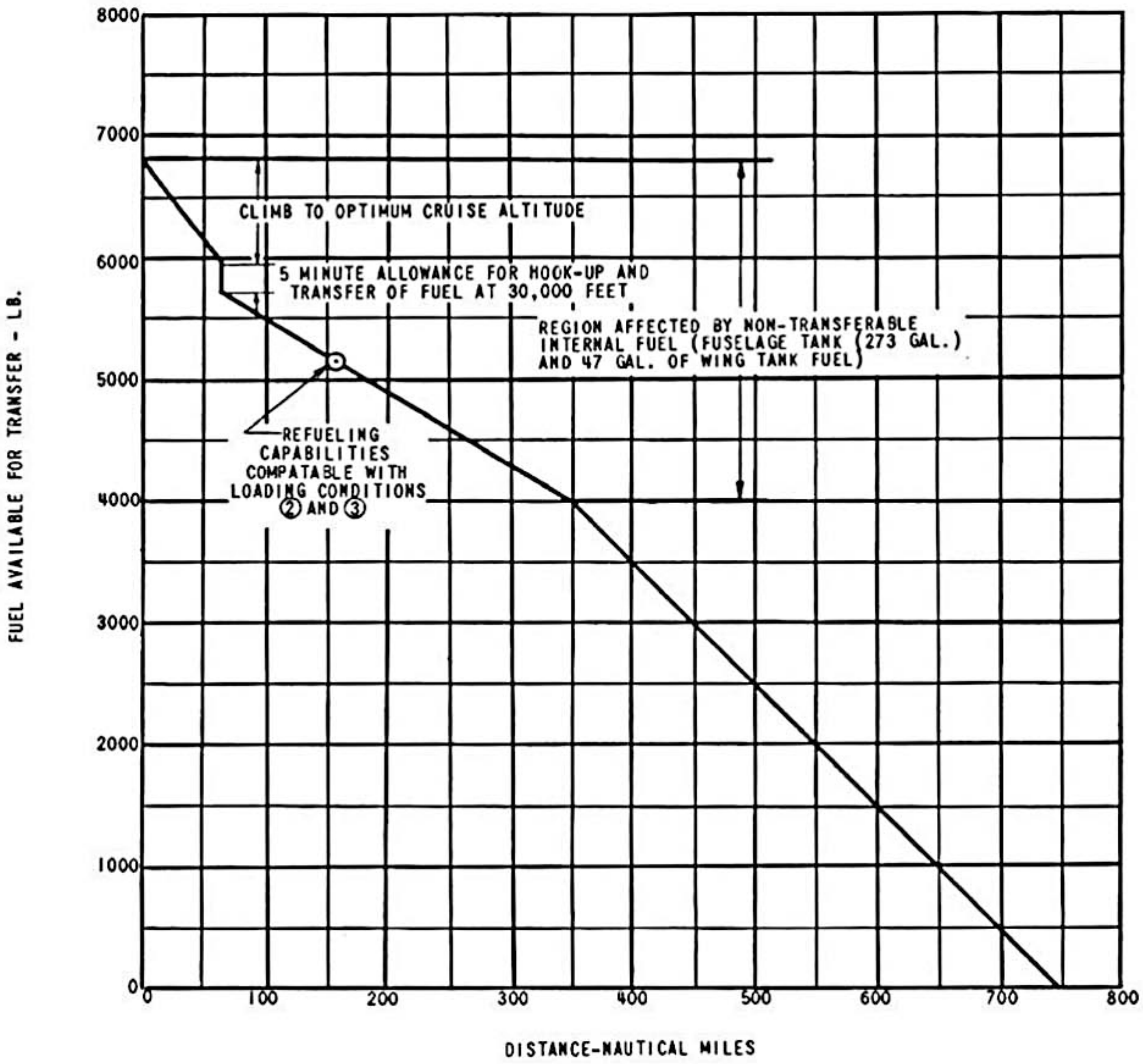
(2) Airplane structural limits for catapult take-off are: horizontal hook load = 94,400 lbs., maximum acceleration = 5.08g, and firing pressure limit of 3600 psi on H8 catapult due to gear limit.

(3) Approach speed equals 1.2 times power-off stalling speed.

(4) Engaging speed is limited by airplane deceleration of 5.14g below 11,556 lbs and by horizontal hook load of 59,400 lbs. at weights above 11,556 lbs.

TANKER FUEL AVAILABLE FOR TRANSFER AT OPTIMUM CRUISE ALTITUDE VS. DISTANCE

LOADING CONDITION 1



NOTES

COMBAT RADIUS MISSION WITH ONE IN-FLIGHT REFUELING

TANKER LOADING CONDITION (1)

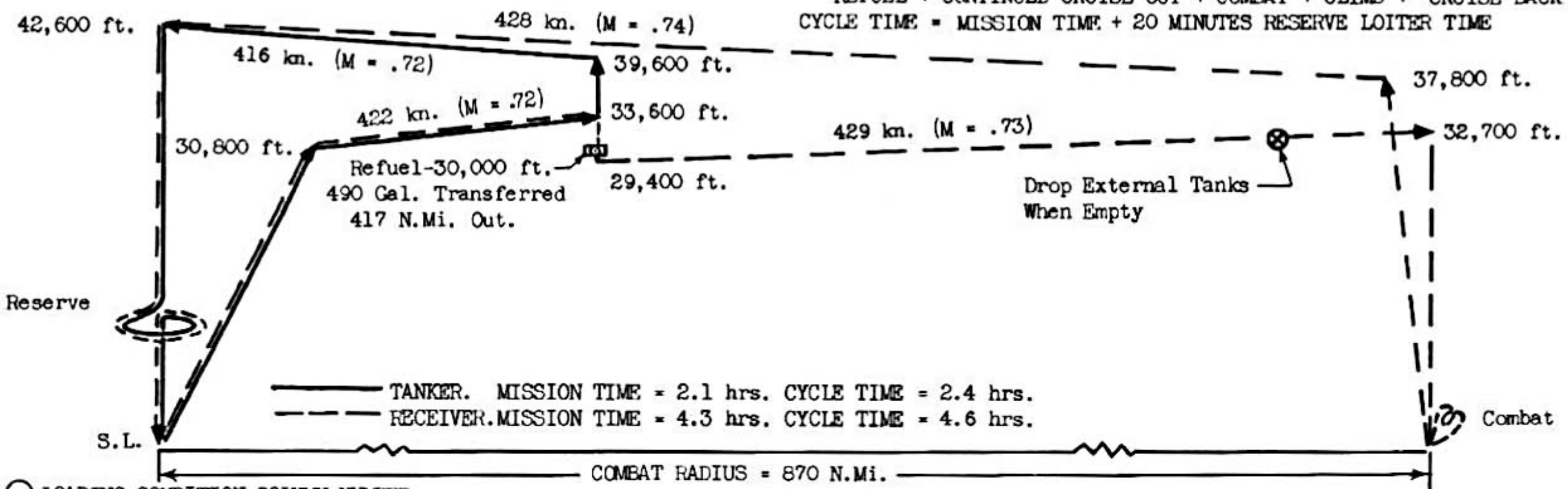
WARM-UP, TAKE-OFF AND ACCELERATE: 5 minutes at normal rated sea level static thrust.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE OUT: At altitudes and speeds for maximum range.
CONDUCT REFUELING: Refuel receiver 5 minutes at speeds for maximum endurance at 30,000 feet with hose and drogue extended. No credit for distance covered. Includes climb back to optimum cruise altitude.
CRUISE BACK: At altitudes and speeds for maximum range.
DESCEND TO SEA LEVEL: No fuel used, no credit for distance covered.
RESERVE: 5% of total fuel not transferred plus fuel for 20 minutes at speed for maximum endurance at sea level.

COMBAT RADIUS = CLIMB + CRUISE-OUT = CRUISE-BACK
MISSION TIME = TIME REQUIRED FOR CLIMB + CRUISE-OUT + CONDUCT REFUELING + CRUISE-BACK
CYCLE TIME = MISSION TIME + 20 MINUTES RESERVE LOITER TIME

MODEL A4D-2 RECEIVER CONFIGURATION
INCLUDES: ONE 2025 LB. STORE, 2-150 GAL. EXTERNAL FUEL TANKS, AND IN-FLIGHT REFUELING PROBE.

WARM-UP, TAKE-OFF AND ACCELERATE: 5 minutes at normal rated sea level static thrust.
CLIMB: On course with tanker to tanker's optimum cruise altitude with military thrust.
CRUISE OUT: At tanker's optimum cruise altitude and speed.
HOOK-UP AND REFUEL: Refuel for 5 minutes at speeds for maximum endurance at 30,000 feet.
CRUISE OUT (Cont.): At altitudes and speeds for maximum range. Drop external tanks when empty.
DESCEND TO SEA LEVEL: No fuel used, no credit for distance covered.
DROP STORE
COMBAT: At sea level for 5 minutes at military thrust.
CLIMB: On course to optimum cruise altitude with military thrust.
CRUISE BACK: At altitude and speeds for maximum range.
RESERVE: 5% of initial fuel plus fuel for 20 minutes at speed for maximum endurance at sea level.

COMBAT RADIUS = CLIMB + CRUISE-OUT + CONTINUED CRUISE-OUT = CLIMB + CRUISE-BACK
MISSION TIME = TIME REQUIRED FOR CLIMB + CRUISE-OUT + HOOK-UP AND REFUEL + CONTINUED CRUISE-OUT + COMBAT + CLIMB + CRUISE-BACK
CYCLE TIME = MISSION TIME + 20 MINUTES RESERVE LOITER TIME



○ LOADING CONDITION COLUMN NUMBER

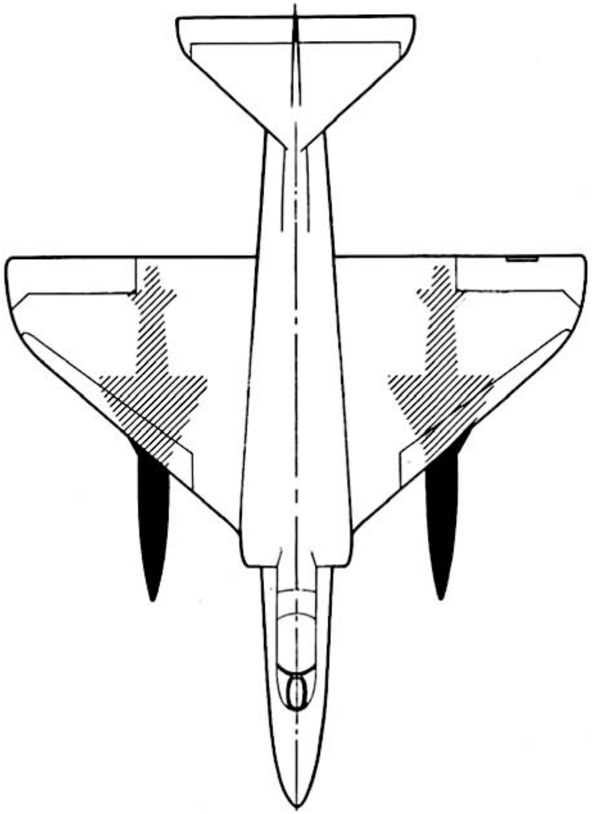
MISSILE SYSTEM CHARACTERISTICS
A4D-2 SKYHAWK — XASM-N-8 CORVUS

DOUGLAS AIRCRAFT COMPANY, INC.

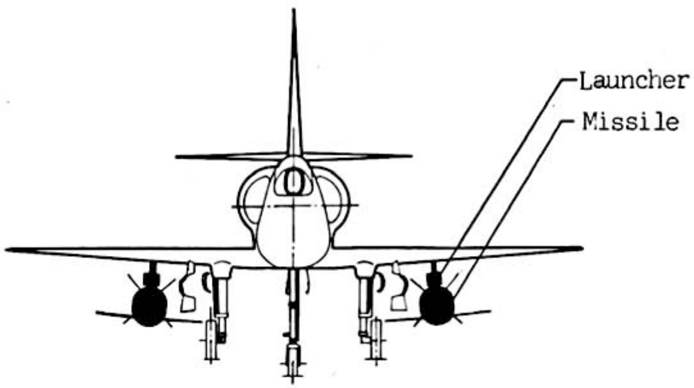
EL SEGUNDO DIVISION

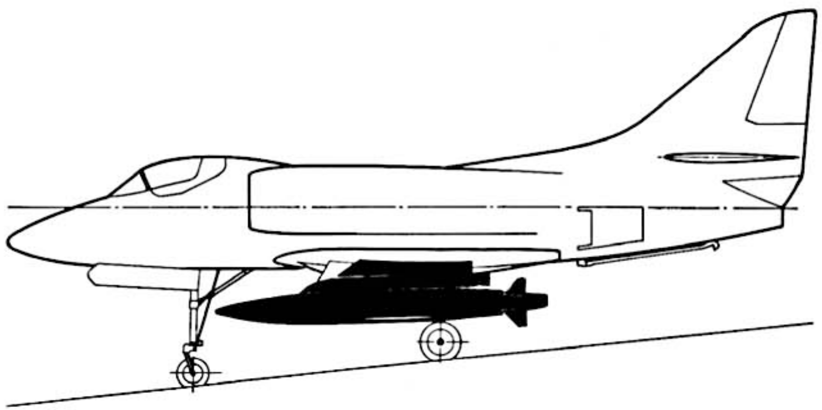
NOTE:
Although presented as incorporated in actual airplanes, this missile system is a study only.

GENERAL ARRANGEMENT



DIMENSIONS	
Span	27.5 ft.
Length	39.4 ft.
Height	15.0 ft.





DESCRIPTION

The A4D-2 is a light weight, carrier-based attack airplane which can effectively carry and launch XASM-N-8 Corvus air-to-surface missiles.

One Corvus missile is carried on each wing on a special displacement-type launcher installed in place of the ejector racks.

Since the Corvus missile is still in the early design stages, the complete system compatibility cannot be determined at this time.

STATUS: Study only.

ELECTRONICS

Equipment Carried In Basic A4D-2

Electronics Control........AN/ASQ-17
consisting of:
UHF Communication
IFF
Coder
Direction Finder

TACAN..................................AN/ARN-21
"Tapeline" Dead reckon. computer

External Stores

Marker-Beacon Rec..........AN/ARN-12
VOR Rec.............................AN/ARN-14

Additional Equipment For Missile System - Information Not Available

FUEL

Gal.	No. Tanks	Location
573	1	Wing
237*	1	Fuselage

*Self-sealing

Total useable fuel: 800 Gallons

Fuel spec...............MIL-F-5624 or MIL-F-5572

LAUNCHING EQUIPMENT

Corvus XASM-N-8 Launcher

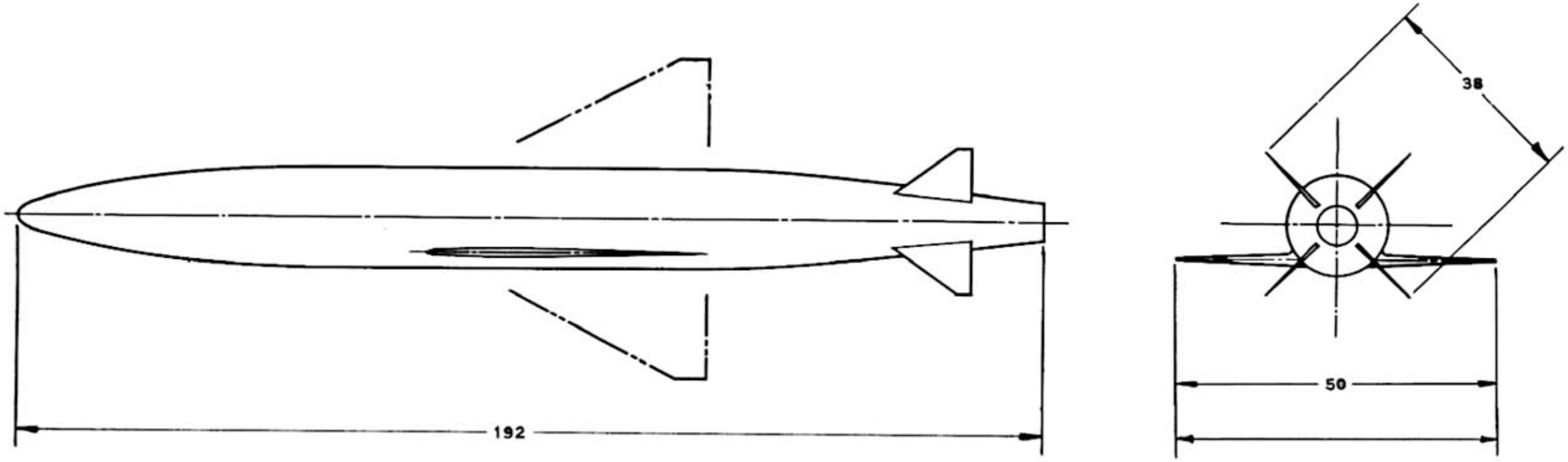
WEIGHTS

***LOADINGS	TWO CORVUS MISSILES
Empty	8840
Basic	9183
*Combat	17417
**Flight Design	12504
**Landing Design	11556
**Catapulting Design	19910

Useful Load	
Pilot	200
Internal Fuel (800 Gal.)	5200
Oil	30
Trapped Fuel & Oil	29
Corvus Missiles (2 @ 1750#)	3500
Corvus Launchers - Adapters	220
300 Gallon Drop Tank	183
Centerline Rack Installation	67
300 Gallon External Fuel	1950
Oxygen Equipment	27
Parakit & Seat Pan	31
Total Useful Load	11437
Gross Weight - Take Off	20277

*Less 40% Useable Fuel (440 Gallon)
**See Spec. SD-495-2
***All Loading Conditions Based On JP-4 Fuel

GENERAL ARRANGEMENT XASM-N-8 CORVUS MISSILE



WEIGHT - 1750 lbs.

PROPULSION - Liquid Rocket

IMPULSE - 183,000 lb.-sec.

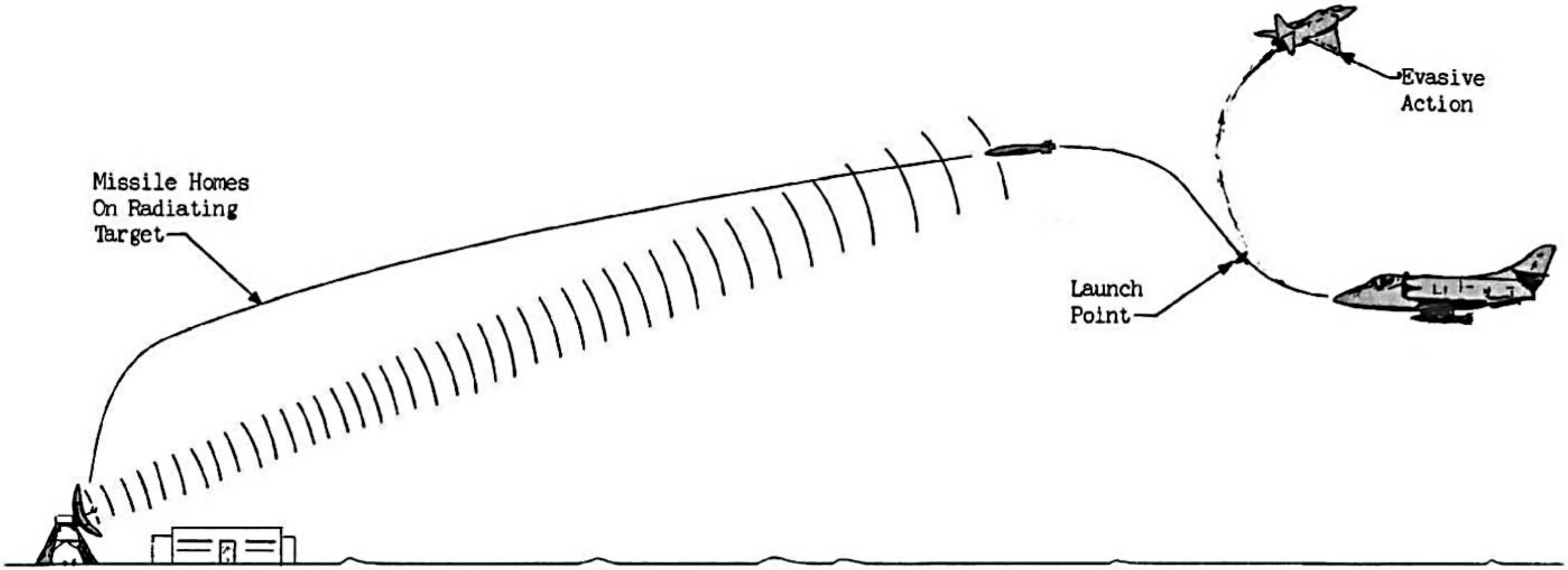
WARHEAD - Nuclear XW-40

LAUNCH VELOCITY - 150 kn. to M=1.0

LAUNCH ALTITUDE - 400 ft. to 50,000 Ft.

RANGE - 170 n.mi.- Against Radiating Target

TYPICAL AIR-TO-SURF·CE ATTACK



PERFORMANCE

CONDITION / CONFIGURATION		(1) One 1050-Lb. Store	(2) Two Corvus Missiles One 300 Gal. Tank
TAKE-OFF WEIGHT	lb.	15,492	20,277
Fuel (JP-4)	lb.	5200	7150
Stall-Speed-Power-Off	kn.	110	126
Wind Req'd For Catapult From H-8	kn.	2	25
Combat Radius	n.mi.	372 (B)	517 (C)
Mission Time/Cycle Time	hr./hr.	1.8/2.1	2.5/2.8
COMBAT WEIGHT (60% Initial Fuel + Stores)	lb.	13,412	17,417
Fuel (JP-4)	lb.	3120	4290
Rate Of Climb At S.L. (A)	ft./min.	10,100	6300
Combat Ceiling (A)	ft.	44,000	35,800
Maximum Speed At S.L. (A)	kn./M	575/.87	526/.80
Maximum Speed At 35,000 Ft. (A)	kn./M	518/.90	465/.81
LANDING WEIGHT	lb.	10,153	10,463
Fuel (JP-4)	lb.	911	1019
Stall-Speed-Power-Off	kn.	89.1	90.4
Wind Req'd For Arrested Landing With MK. 5 Mod. 1 (155 Ft.) Arresting Gear	kn.	6	8

NOTES

(A) Military thrust
(B) Low altitude attack mission defined in MIL-C-5011A.
(C) Modified high altitude attack mission. See next page for mission definition.
(D) Performance is based on preliminary A4D-1 flight test results. Combat radii are based on fuel consumption data from Wright Aeronautical Division Specification No. N-890-A for the J65-W-16 engine dated 5 December 1952, revised 1 March 1955, increased 5%.

COMBAT RADIUS DESCRIPTION

MODIFIED HIGH ALTITUDE ATTACK PROBLEM

Start Engine Take-off and Accelerate	Climb-out	Cruise-out	Attack	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 speed for long range at optimum cruise altitude (drop any external fuel tanks when empty).	At final cruise out altitude. Fire missiles.	At 35,000 ft. for 5 minutes with military power. No distance made good.	To initial cruise back altitude is accomplished during combat. No distance made good.	At speed for long range at optimum cruise altitude.	Fuel allowances 5% of initial fuel plus 20 minutes loiter at speed for maximum endurance at sea level.