

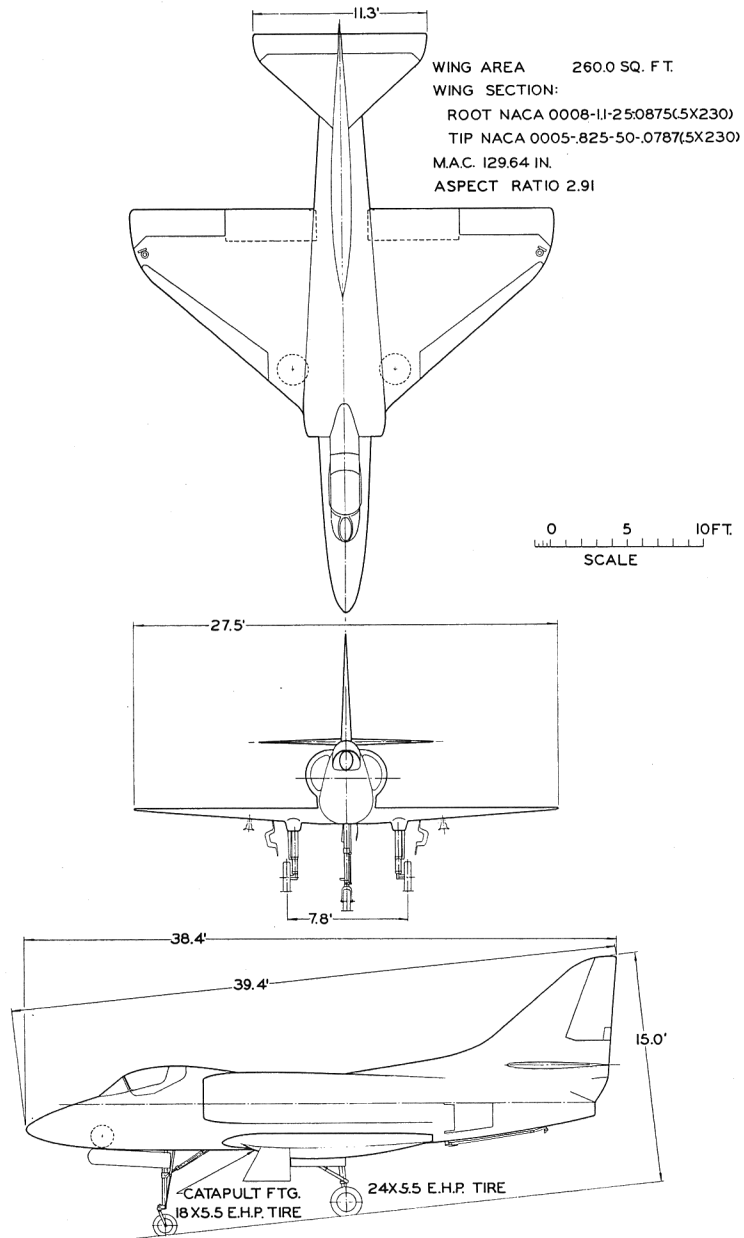
STANDARD AIRCRAFT CHARACTERISTICS

A4D-2 SKYHAWK (TANKER)

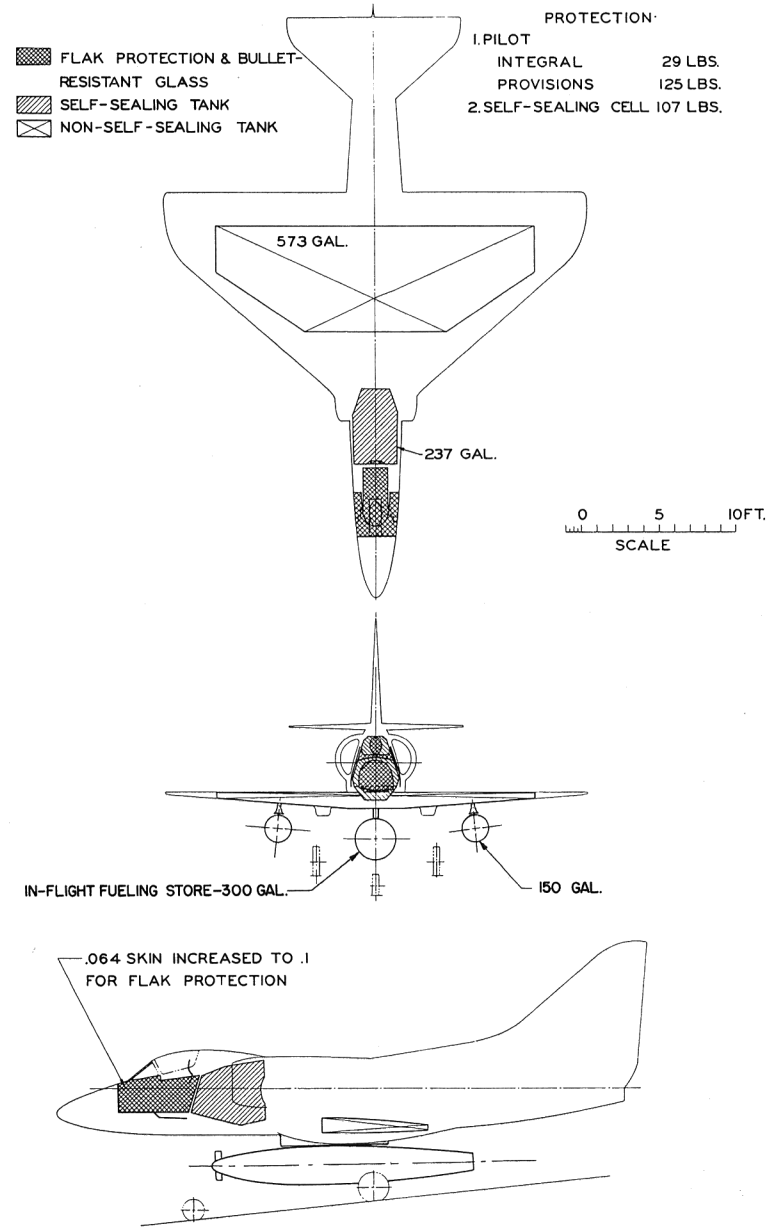
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 AUTHORITY *DD-254 1-12-64*

DOUGLAS AIRCRAFT COMPANY, INC., EL SEGUNDO DIVISION

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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.

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.

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

ORDNANCE

None

DIMENSIONS

Span..... 27.5 ft.
 Length.....39.4 ft.
 Height.....15.0 ft.
 Max. Tread7.8 ft.
 Turn.Rad. (nose).....20.5 ft.
 Wing Area.....260 sq. ft.

ELECTRONICS

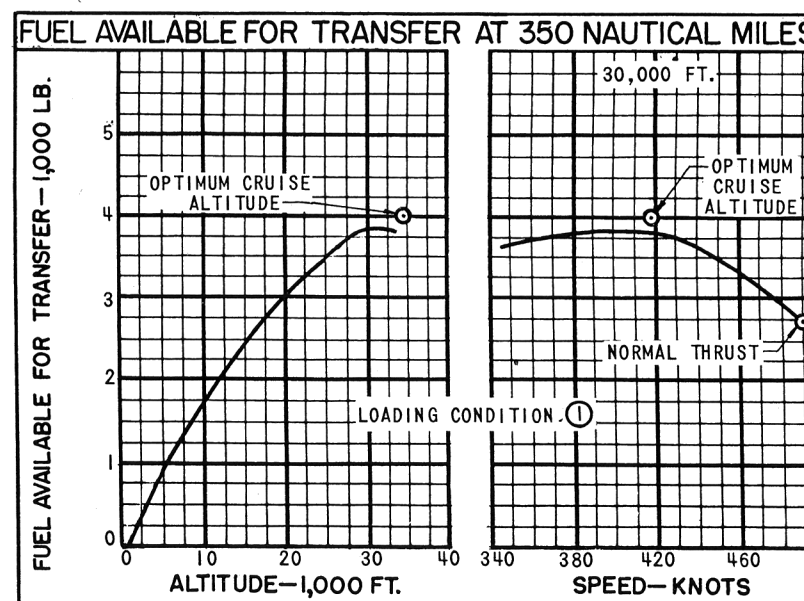
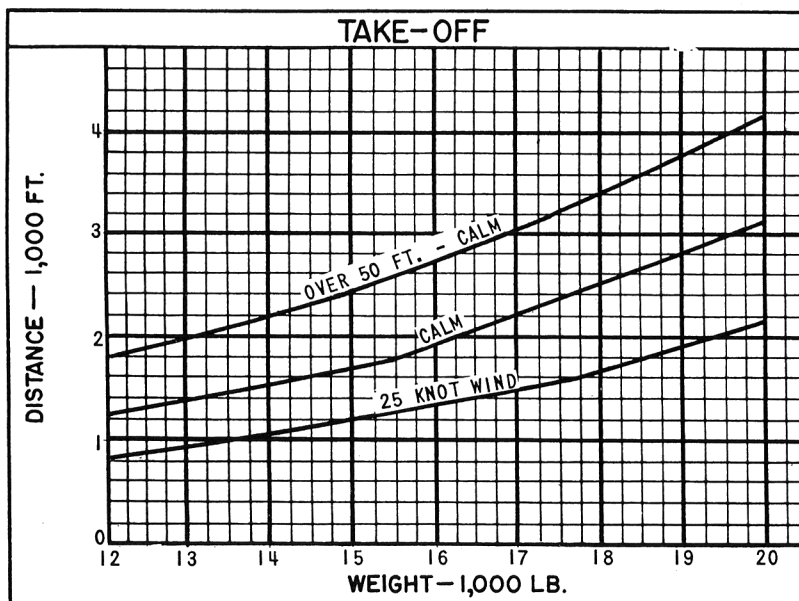
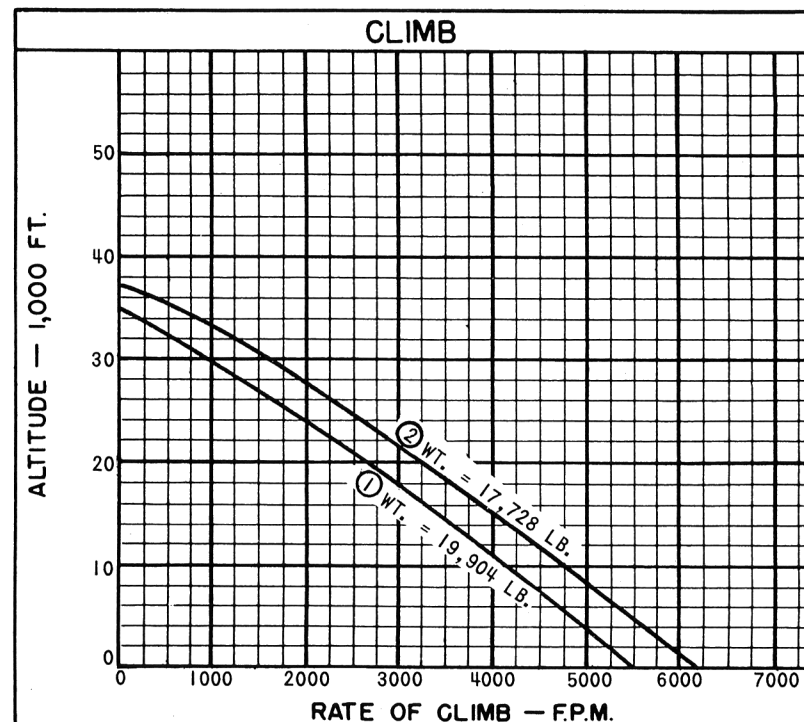
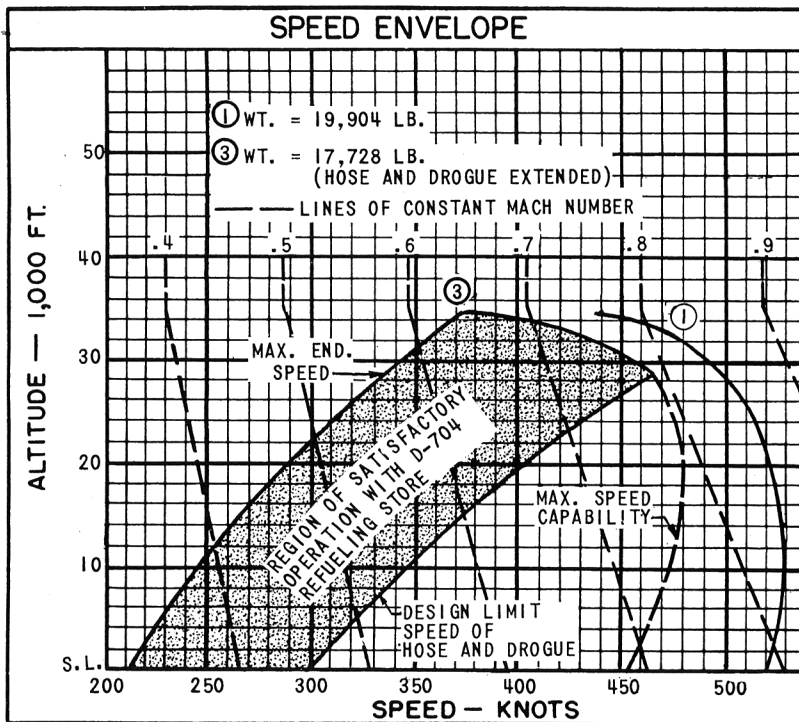
Electronics Control.....AN/ASQ-17
 consisting of:
 UHF Communication
 IFF
 Coder
 Direction Finder

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 (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			

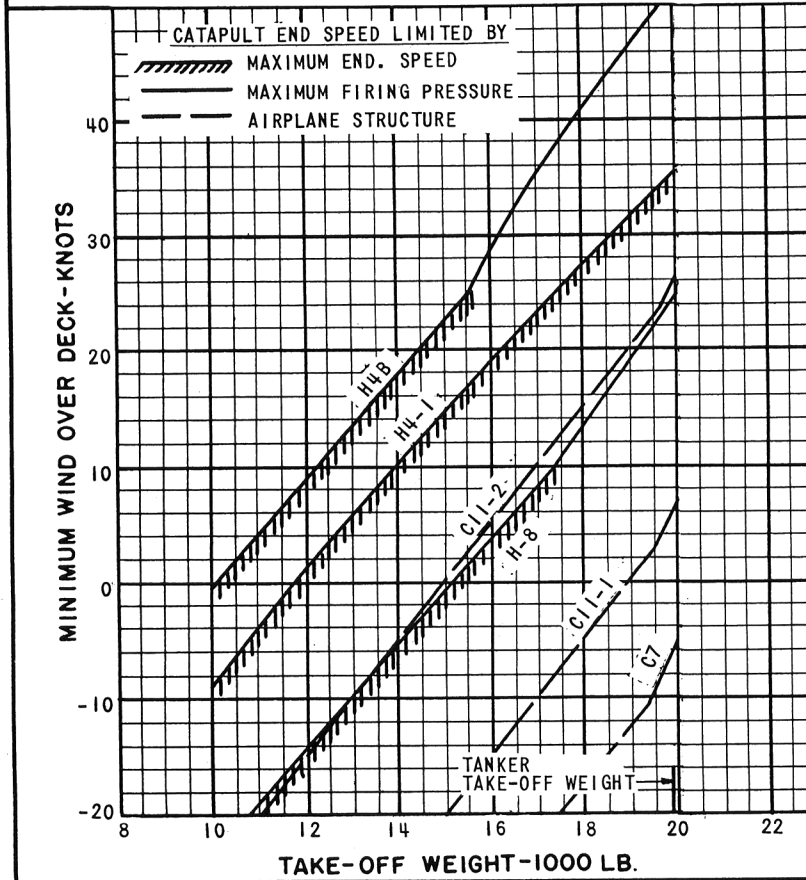
NOTES

- (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%.

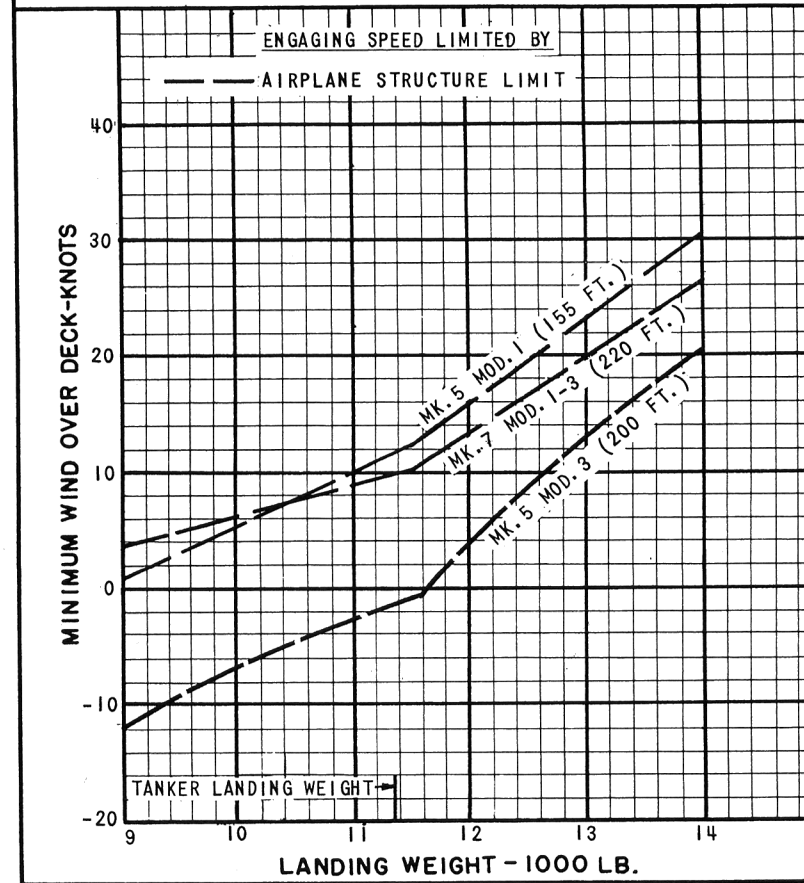


CARRIER SUITABILITY

DECK WIND REQUIRED FOR CATAPULTING



DECK WIND REQUIRED FOR LANDING



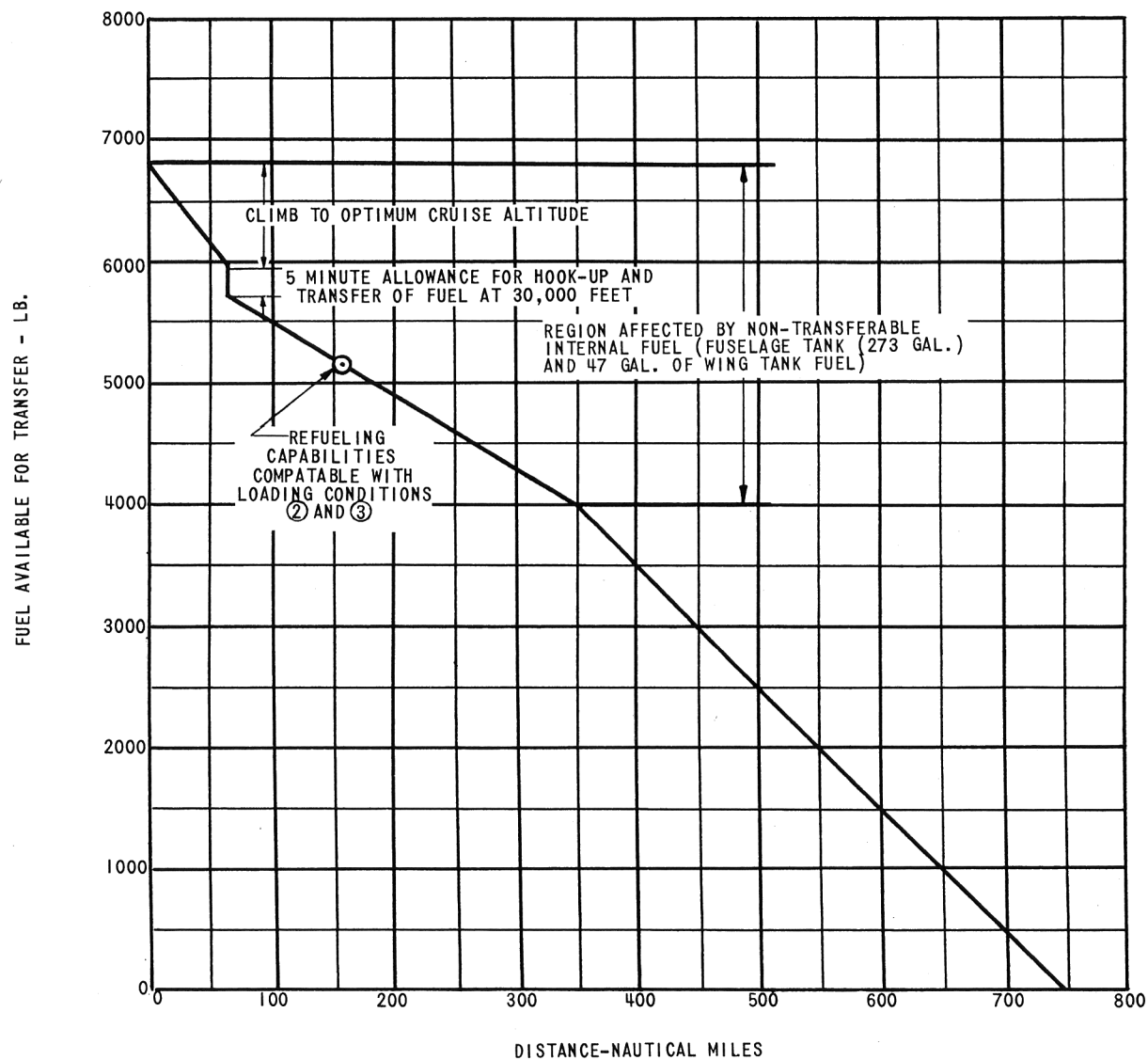
NOTES:

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

