

UNCLASSIFIED  
RESTRICTED

SERVICE



15

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

# STANDARD AIRCRAFT CHARACTERISTICS

## AD-1 "SKYRAIDER"

DOUGLAS

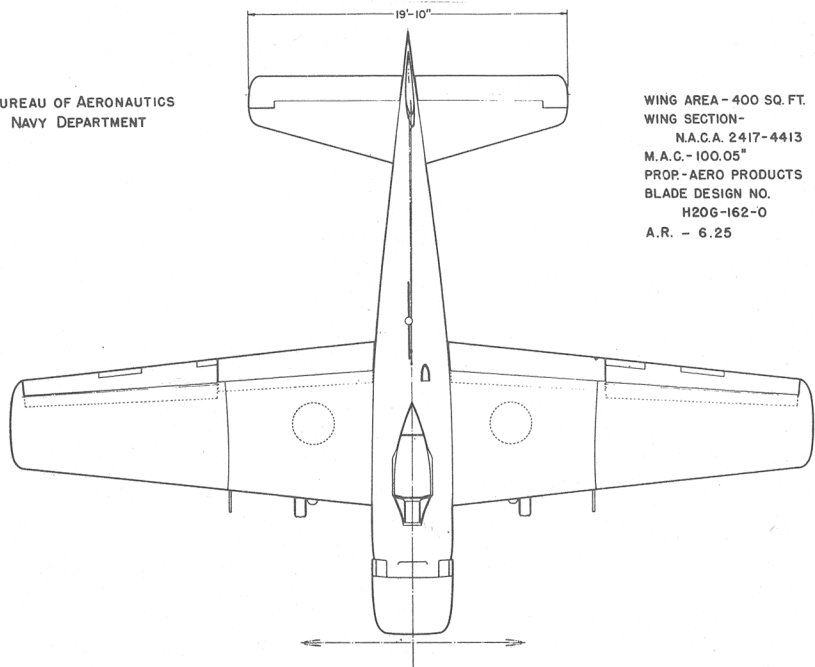
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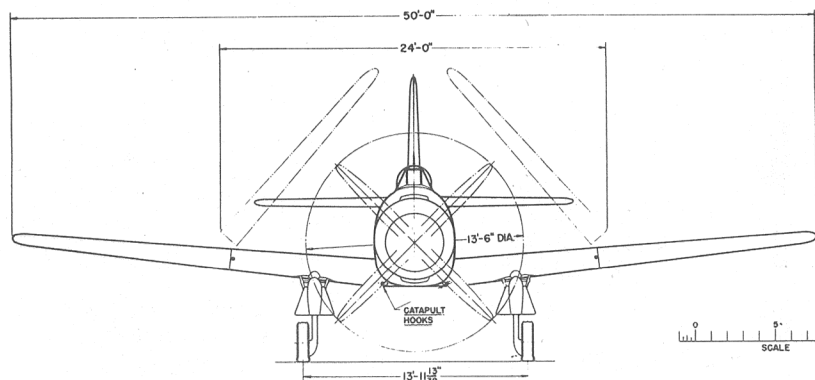
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AD-1

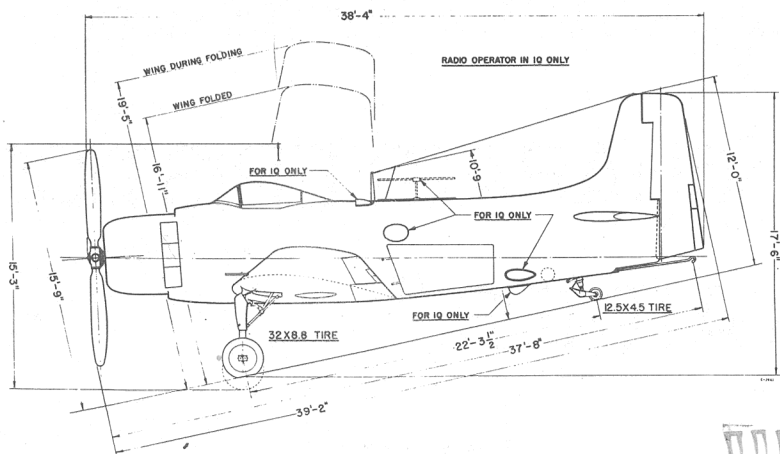
BUREAU OF AERONAUTICS  
NAVY DEPARTMENT



WING AREA - 400 SQ. FT.  
WING SECTION -  
N.A.C.A. 2417-4413  
M.A.C. - 100.05"  
PROP-AERO PRODUCTS  
BLADE DESIGN NO.  
H20G-162-0  
A.R. - 6.25



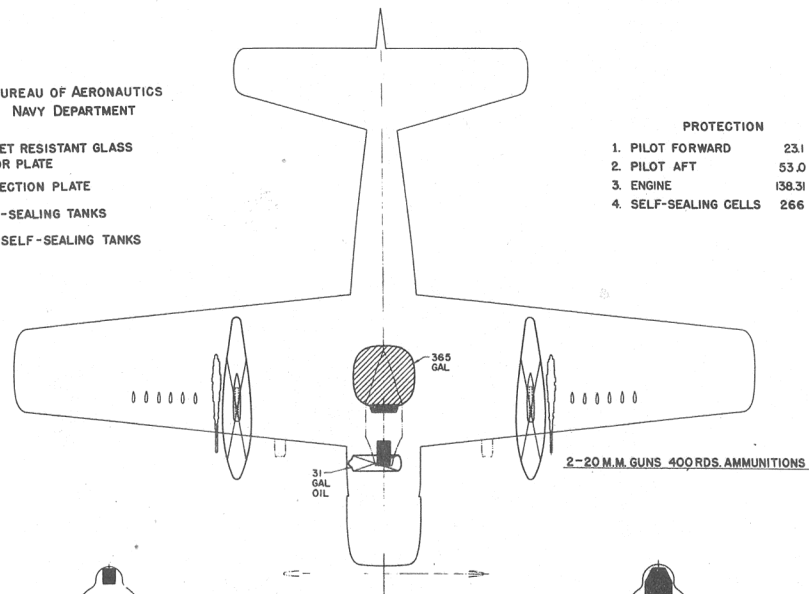
0 5' 10 FT.  
SCALE



DESCRIPTIVE ARRANGEMENT

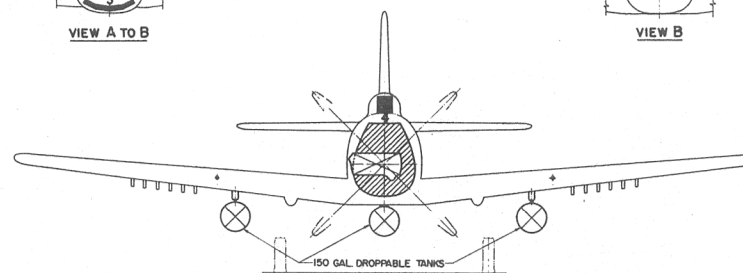
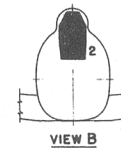
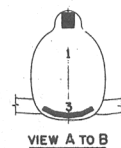
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- BULLET RESISTANT GLASS ARMOR PLATE
- DEFLECTION PLATE
- SELF-SEALING TANKS
- NON-SELF-SEALING TANKS

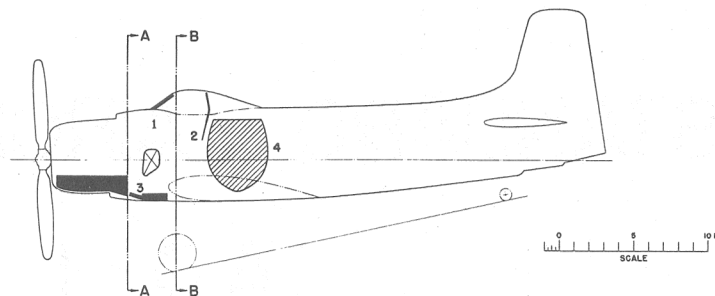


PROTECTION

- |                       |             |
|-----------------------|-------------|
| 1. PILOT FORWARD      | 231 LBS.    |
| 2. PILOT AFT          | 53.0 LBS.   |
| 3. ENGINE             | 138.31 LBS. |
| 4. SELF-SEALING CELLS | 266 LBS.    |



0 5' 10 FT.  
SCALE



ARMAMENT AND TANKS

**MISSION AND DESCRIPTION**

The primary mission of the AD-1 is the destruction of sea and ground targets by dive bombing attacks. The airplane is also capable of torpedo, glide bombing and rocket attacks. The AD-1 is designed to operate from all classes of naval aircraft carriers or from land bases.

The airplane is conventional in design and structure with all-metal two-spar wing, semi-monocoque fuselage. Landing gear, canopy, slotted flaps, wing folding and three fuselage dive brakes are hydraulically operated. Sealed-gap ailerons and rudders with spring tabs and trim tabs are used. Longitudinal trim is achieved by an electrically adjustable stabilizer. Elevators and interchangeable power plant installation are conventional with a monocoque engine mount. Oxygen for five hours is supplied. Bomb displacing gear at the centerline station is power operated by a standard engine starter cartridge. Twenty gallons of water are supplied for injection.

Variations of this model have been built for use as night attack, countermeasures, photographic, airborne early warning and utility airplanes.

**DIMENSIONS**

WING AREA.....400 sq. ft.  
SPAN.....50'- 0"  
LENGTH.....38'- 4"  
HEIGHT.....15'- 9"  
TREAD.....13'-11"  
M.A.C.....8'- 4"  
PROP. CLEAR.....7"

**WEIGHTS**

Loadings	Lbs.	L.F.
EMPTY.....	10,519.....	
BASIC.....	11,009.....	
DESIGN.....	15,600..	7.0
COMBAT.....	13,923..	7.0
MAX.T.O.(Cat.)...17,800..	6.1	
(Field)...	22,923*..	4.7
MAX.LD.(Smooth)..18,000.....		
(Rough)...	15,800.....	
(Arrest.)...	16,000.....	
(Qualif.)...	14,600.....	

\*Tentative

All weights are actual.

**FUEL AND OIL**

Gal.	No. Tanks	Location
365	1	Fuse, S.S.
150	1	Ctr., Drop
300	2	Wing, Drop

FUEL GRADE.....100/130

FUEL SPEC.....AN-F-48

**OIL**

CAPACITY (Gals.).....31  
GRADE.....1120  
SPEC.....AN-O-8

**ELECTRONICS**

MHF.....AN/ARC-2  
RANGE REC.....AN/ARC-5  
VHF.....AN/ARC-1  
HOMING.....AN/ARR-2A  
RADIO ALT.....AN/APN-1  
IFF.....AN/APX-2  
RADAR REC.....AN/APS-4A

**POWER PLANT**

NO. & MODEL....(1) R-3350-24W  
MFR.....Wright  
SUPERCH.....1 Stage, 2 Speed  
PROP. GEAR RATIO.....0.4375  
PROP. MFR.....Aero Prod  
PROP. DES. NO.....H20G-162-0  
NO. BL./DIA.....4/13'-6"

**RATINGS**

Bhp @ Rpm @ Alt.

T. O.	2,500	2,900	S. L.
COMBAT	2,950	2,800	S. L.
	2,570	2,600	6,200
MIL.	2,500	2,800	3,500
	1,900	2,600	14,800
NORMAL	2,100	2,400	5,500
	1,800	2,400	15,000
SPEC. NO.	N-825		

**ORDNANCE****GUNS**

No.	Size	Location	Rds.
2	20mm	Wing	400

**BOMBS & ROCKETS**

Type	Size	Location	No.
D.B.	325#	External	3
Bomb	500#	External	3
Bomb	2000#	External	3
Mine	1000#	External	3
Mine	2000#	External	3
Torp.	Mk-13	External	3
A.R.	11.75"	Wing	2
HVAR	5"	Wing	12

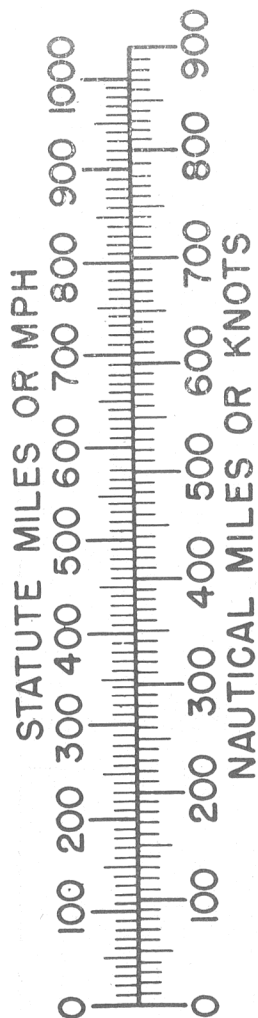
**FIRE CONTROLS**

Sighting Sys.....Mk. 1 Mod. 2  
Bomb Director.....AN/ASG-10A

MAX. BOMB CAPACITY....9,000 #

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PERFORMANCE SUMMARY				
LOADING CONDITION		(1) ATTACK 1-2000# Bomb 2-150 Gal. Ext. Tanks		(5) ATTACK 1-2000# Bomb AN/APS-4 Radar
TAKE-OFF WEIGHT	lbs.	18,029		16,065
Fuel (Fixed/Drop)	lbs.	2,190/1,800		2,190
Bombs	lbs.	2,000		2,000
Wing/Power Loading (A) lbs/sq.ft; lbs/bhp.		45.1/10.0		40.2/8.9
Stall Speed--Power off	kn.	81.0		76.5
Stall Speed--Power off - No Fuel	kn.	71.5		71.1
Stall Speed--Power on	kn.	76.0		71.8
Maximum Speed/Alt (B)	kn/ft.	256/16,000		265/16,000
Take-off Distance, deck -- calm	ft.	958		717
Take-off Distance, deck 25 kn.	ft.	455		324
Take-off Distance, Airport	ft.			
Rate of climb -- sea level (B)	ft/min.	2,050		2,490
Service Ceiling (B)	ft.	28,000		30,400
Time-to-climb 10,000 ft. (B)	min.	6.0		4.7
Time-to-climb 20,000 ft. (B)	min.	14.4		11.0
Combat Range/V av 15,000	ft. n.mi/kn.	1,390/174		705/169
Combat Radius/V av B-1	ft. n.mi/kn.	675/175		260/175
LOADING CONDITION		(2) COMBAT	(3) COMBAT	(4) COMBAT
GROSS WEIGHT	lbs.	13,923	13,923	13,923
Engine power		Combat	Military	Normal
Fuel	lbs.	2,190	2,190	2,190
Bombs/Tanks				
Max. speed at sea level	kn.	311	285	267
Max. speed/Alt	kn/ft.	311/S.L.	301/15,800	299/16,400
Combat speed/Alt	kn/ft.	310/1,500	289/1,500	271/1,500
Rate of climb SL	ft/min.	4,630	3,840	3,230
Ceiling for 500 fpm R/C	ft.	33,200	33,200	32,600
Time-to-climb/Alt.	min/ft.			

## NOTES

- (A) BHP at Maximum Critical Altitude  
(B) Normal BHP

Performance is based on NATC flight test of AD-1 and AD-1Q.

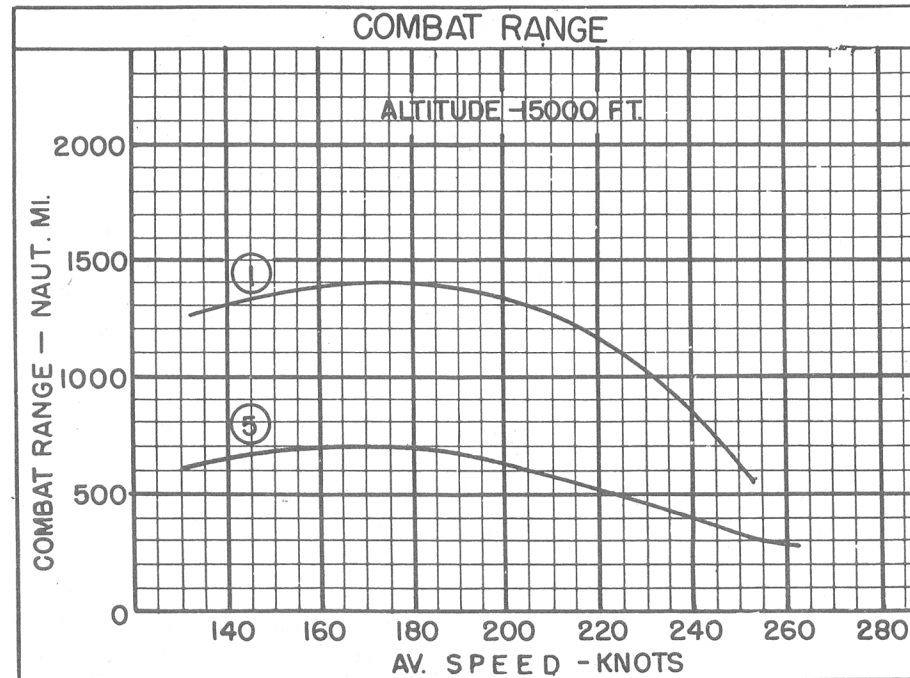
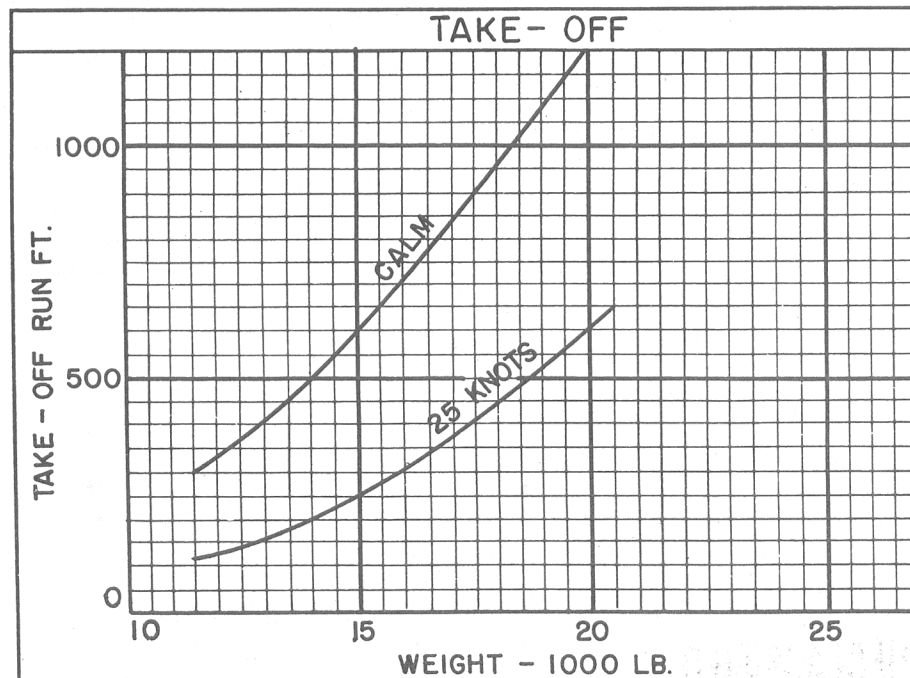
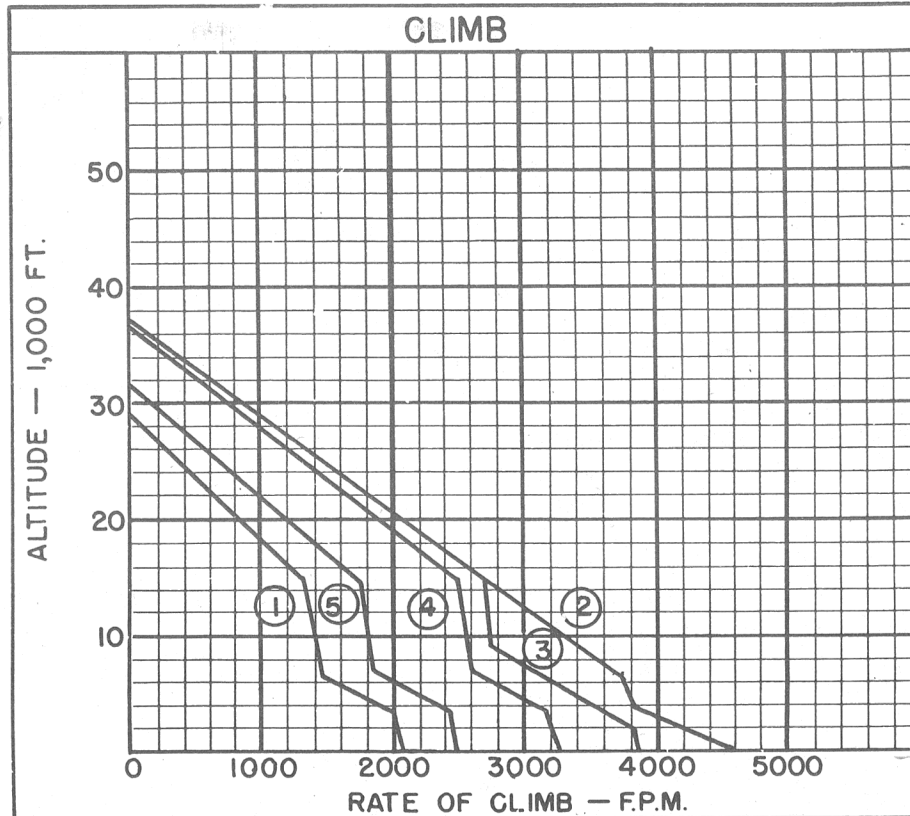
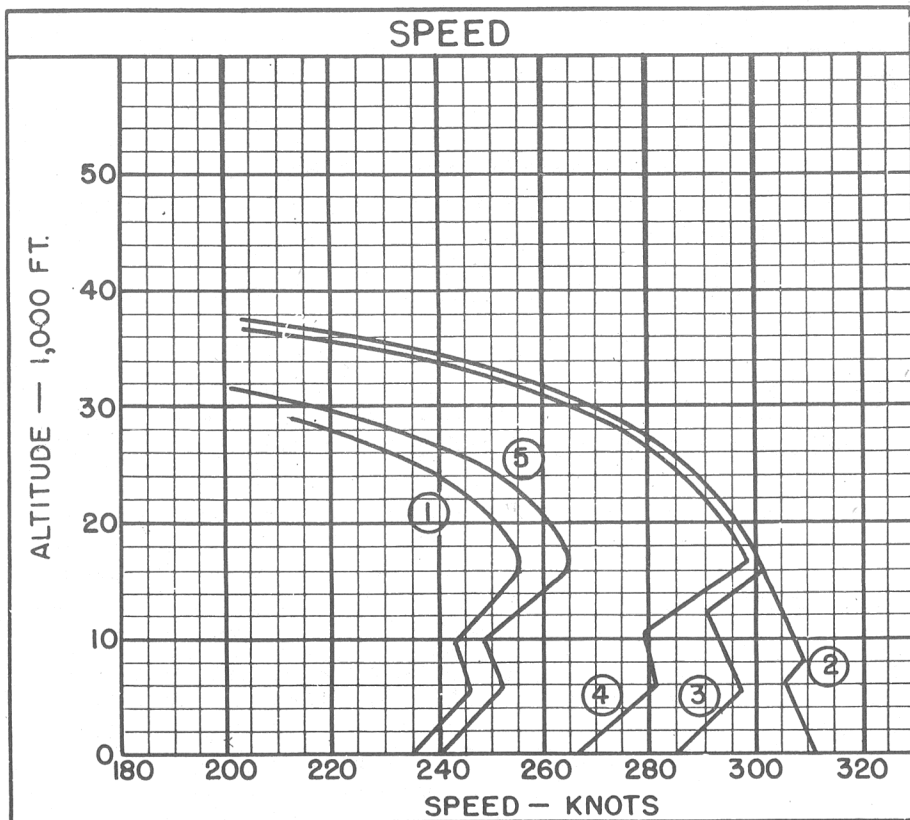
Combat range and radius are based on contractor's flight test fuel consumption data increased 5%.

Rocket launchers not aboard. Addition of 12 launchers to Cond. (2) reduces  $V_{max}$ . S. L. to 304 kn. and  $V_{max.}/ACA$  to 302 kn./8,000 ft. Addition of 12 launchers and 12-5" HVAR increases gross weight of Cond. (2) to 15,652 lbs. and decreases  $V_{max}$ . S. L. to 285 kn. and  $V_{max.}/ACA$  to 282 kn./8,000 ft.

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○ LOADING CONDITION COLUMN NUMBER

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## NOTES

All loadings include 2 Mk-51 wing bomb racks with sway bracing and fuselage bomb ejector with sway bracing.

AN/APS-4 radar is carried on port side wing bomb rack for Condition (5) only.

Twelve 100 lb. bombs or twelve 250 lb. bombs can be carried at Mk-9 rocket launcher positions by replacing launchers with Mk-55 bomb racks.

Twenty gallons of ADI fluid are available for 12 minutes at combat power.

200 ft. length is required to spot 20 planes on the 96 ft. wide deck immediately aft of the forward ramp on the CV-9 class carriers.

## ATTACK COMBAT RADIUS FORMULA NO. B-1

<u>WARM-UP</u>	<u>RENDEZVOUS</u>	<u>CLIMB</u>	<u>CRUISE-OUT</u>	<u>DROP TANKS</u>	<u>COMBAT</u>	<u>CRUISE-BACK</u>	<u>RESERVE</u>
20 min. $\frac{1}{2}$ Normal RPM	20 min. at Sea Level	to 15000 ft.	at 15,000 ft.	<u>DESCEND</u> to 1,500 ft.	15 min. at 1,500 ft.	at 1500 ft. 170 kts.	60 min. at V for Max.
<u>TAKE-OFF</u>	at 60%	at Normal	180 kts.	<u>DROP BOMBS</u>	5 min. combat	TAS Normal	Range at 1500 ft.
1 min. at T. O. Pr.	N. Pr. Normal Mixture	Power Normal Mixture	TAS Normal Mixture	<u>FIRE</u> ROCKETS	and 10 min. N. Pr.	Mixture	Normal Mixture

20

$$\text{RADIUS} = \text{CLIMB} / \text{CRUISE-OUT} = \text{CRUISE-BACK}$$

Following engine ratings from flight test were used in preparation of performance data:

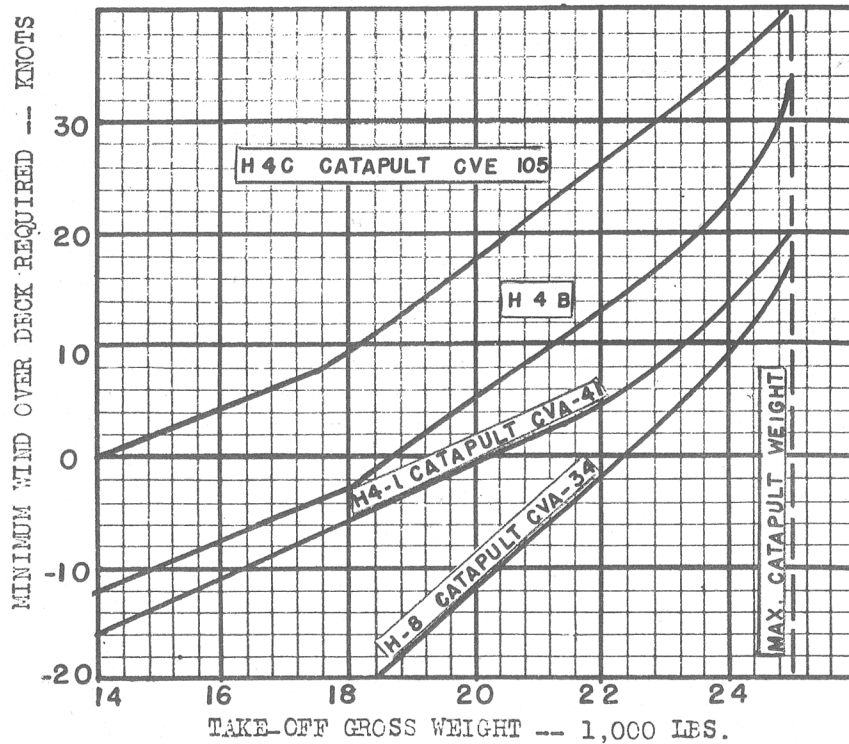
	<u>Bhp.</u>	<u>Rpm.</u>	<u>Alt.</u>
T.O.	2500	2900	S. L.
Mil.	2500	2800	2000'
	1900	2600	14300'
Norm.	2100	2400	3300'
	1800	2400	14800'

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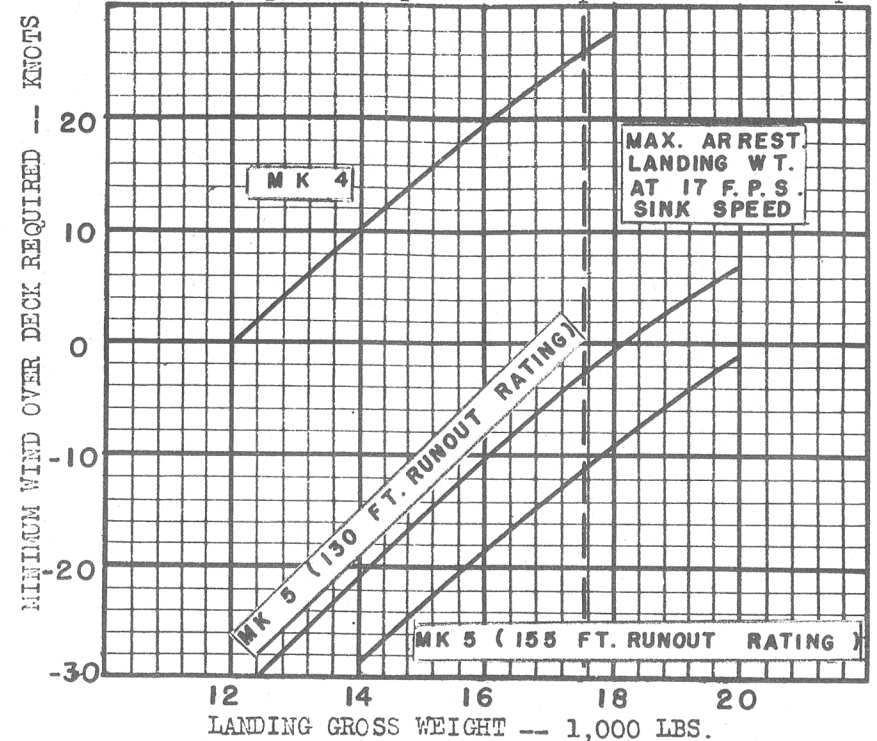
# CARRIER SUITABILITY

MINIMUM WIND OVER DECK REQUIRED FOR CATAPULTING  
VS. GROSS WEIGHT



MINIMUM WIND OVER DECK REQUIRED FOR LANDING  
VS. GROSS WEIGHT

Based on approach speed of 1.2 power-off stall speed



## NOTES

- (A) These curves should be used for planning purposes only. Actual catapult and arresting gear operation should be in accordance with applicable Aircraft Technical Orders, and Catapult and Arresting Gear Bulletins.
- (B) Based on NATC flight test.

