

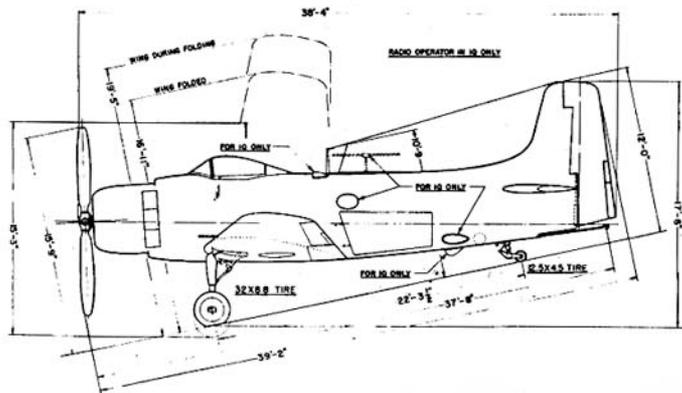
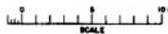
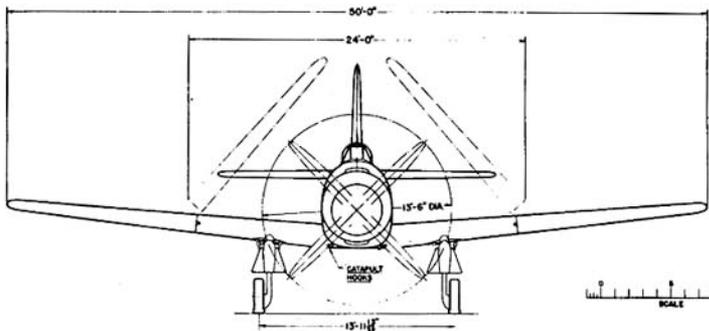
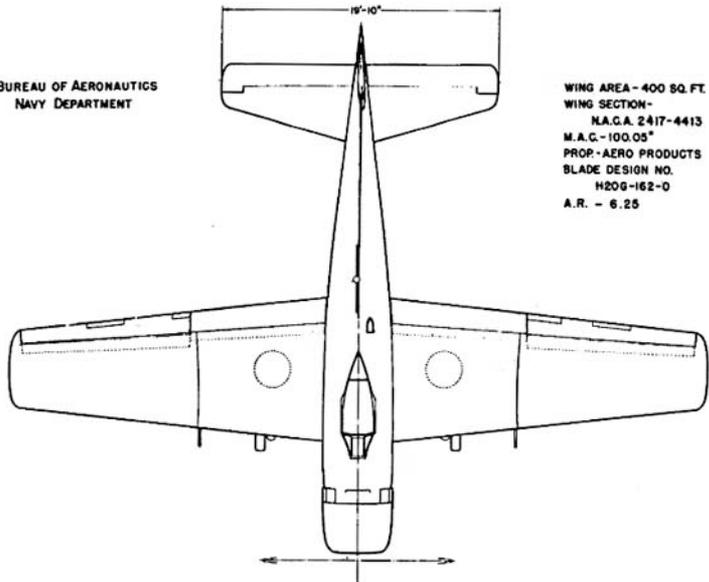
STANDARD AIRCRAFT CHARACTERISTICS

AD-1Q "SKYRAIDER"

DOUGLAS

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



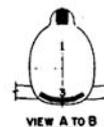
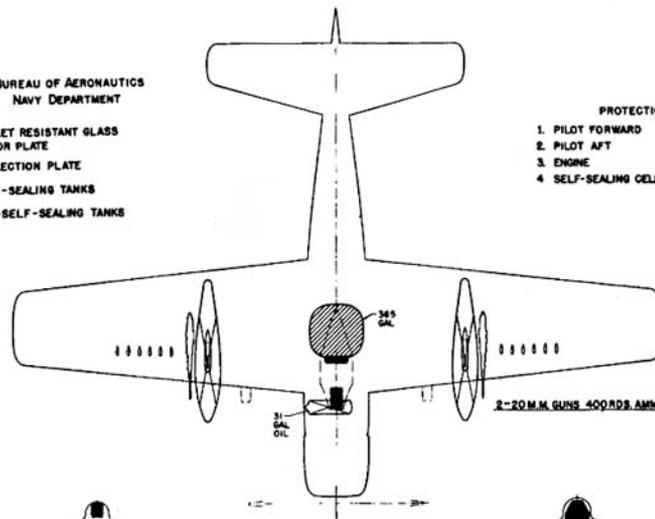
DESCRIPTIVE ARRANGEMENT

BUREAU OF AERONAUTICS
NAVY DEPARTMENT

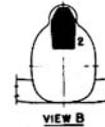
- BULLET RESISTANT GLASS ARMOR PLATE
- DEFLECTION PLATE
- ▨ SELF-SEALING TANKS
- ⊗ NON-SELF-SEALING TANKS

PROTECTION

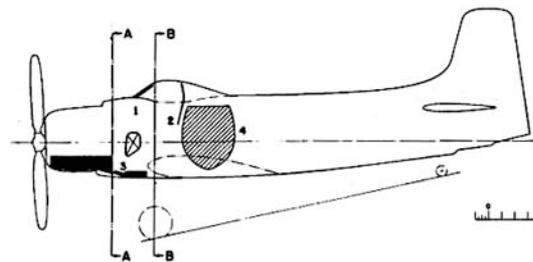
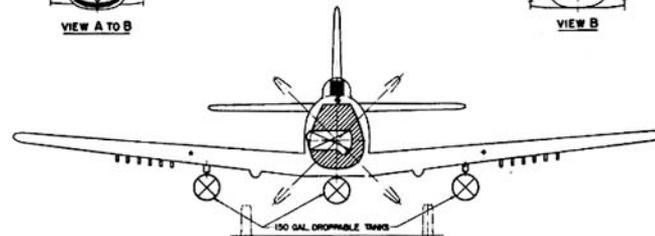
- | | |
|-----------------------|------------|
| 1. PILOT FORWARD | 231 LBS. |
| 2. PILOT AFT | 53.0 LBS. |
| 3. ENGINE | 156.3 LBS. |
| 4. SELF-SEALING CELLS | 266 LBS. |



VIEW A TO B



VIEW B



ARMAMENT AND TANKS

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

MISSION AND DESCRIPTION

The AD-1Q model is primarily designed for use as a radar countermeasures airplane. As such it can be used for search and jamming of enemy radar. This airplane has accommodation for an RCM operator in the rear.

This modification of the AD-1 airplane can also be used for dive and glide bombing and torpedo and rocket attacks. Use of the standard Mark 51-9 Racks permits alternate installations of mines, incendiary clusters, fuel tanks, and other standard external stores up to a maximum of 2,000 pounds weight. The structure and basic equipment are identical to the AD-1 except that the RCM operator's compartment is provided aft of the fuel tank with partial controls for the radio and complete controls for radar and radar countermeasures equipment. An entrance door (incorporating a window) for this compartment is provided on the right side of the fuselage.

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.....	11,142.....	
BASIC.....	11,638.....	
DESIGN.....	15,600...7.0	
COMBAT.....	14,802...7.0	
MAX.T.O. (Cat.)...17,800..6.1		
(Field)...	23,802*..4.6	
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

CM REC.....AN/APR-1
PAN.ADAPT.....AN/APA-38
PULSE ANALYZER.....AN/APA-11
RCM.....AN/APQ-2
and AN/APT-1
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

<u>GUNS</u>			
No.	Size	Location	Rds.
2	20mm	Wing	400

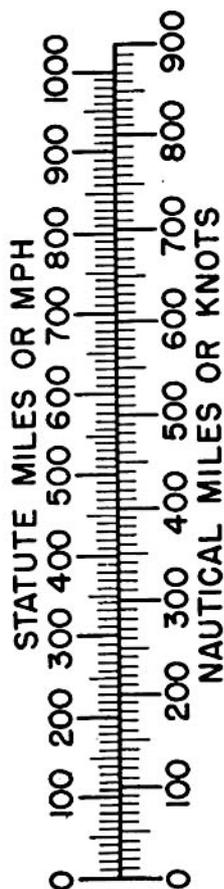
BOMBS & ROCKETS

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 #



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.	18,906		16,994
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.		47.3/10.5		42.5/9.4
Stall Speed--Power off	kn.	83.0		78.6
Stall Speed--Power off - No Fuel	kn.	73.8		73.3
Stall Speed--Power on	kn.	77.8		73.7
Maximum Speed/Alt (B)	kn/ft.	253/16,000		261/16,000
Take-off Distance, deck -- calm	ft.	1,079		821
Take-off Distance, deck 25 kn.	ft.	527		379
Take-off Distance, Airport	ft.			
Rate of climb -- sea level (B)	ft/min.	1,880		2,280
Service Ceiling (B)	ft.	26,500		29,000
Time-to-climb 10,000 ft. (B)	min.	6.7		5.2
Time-to-climb 20,000 ft. (B)	min.	16.7		12.4
Combat Range/V av 15,000	ft. n.mi/kn.	1,290/178		650/174
Combat Radius/V av B-1	ft. n.mi/kn.	630/175		240/175
LOADING CONDITION		(2) COMBAT	(3) COMBAT	(4) COMBAT
GROSS WEIGHT	lbs.	14,802	14,802	14,802
Engine power		Combat	Military	Normal
Fuel	lbs.	2,190	2,190	2,190
Bombs/Tanks				
Max. speed at sea level	kn.	307	280	263
Max. speed/Alt	kn/ft.	307/S.L.	295/15,800	292/16,400
Combat speed/Alt	kn/ft.	306/1,500	284/1,500	267/1,500
Rate of climb SL	ft/min.	4,280	3,560	2,970
Ceiling for 500 fpm R/C	ft.	31,700	31,700	30,900
Time-to-climb/Alt.	min/ft.			

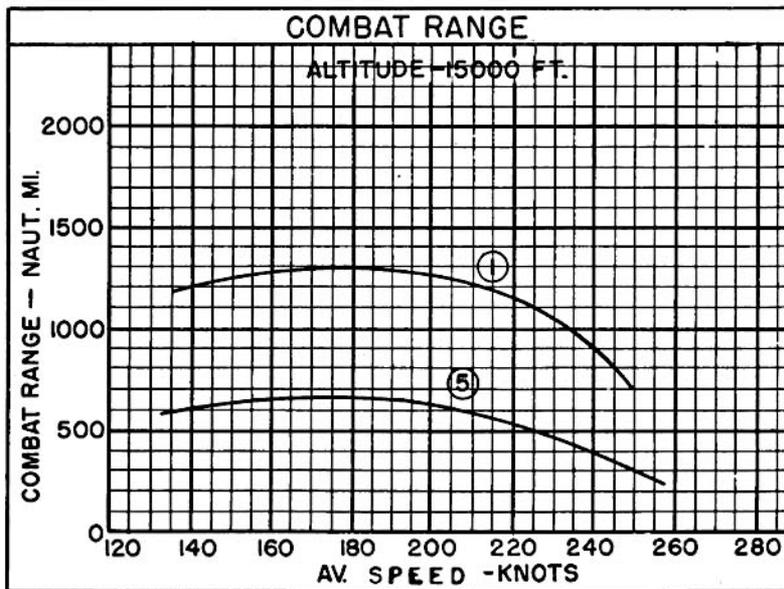
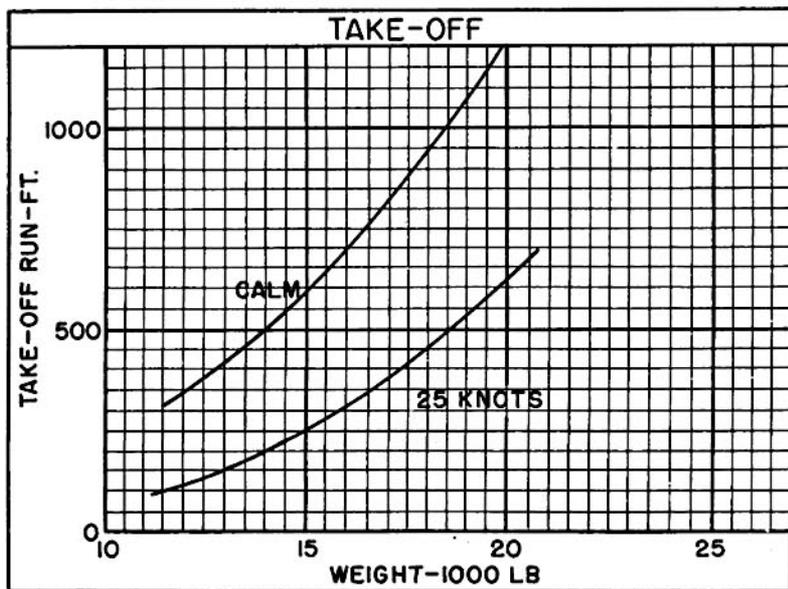
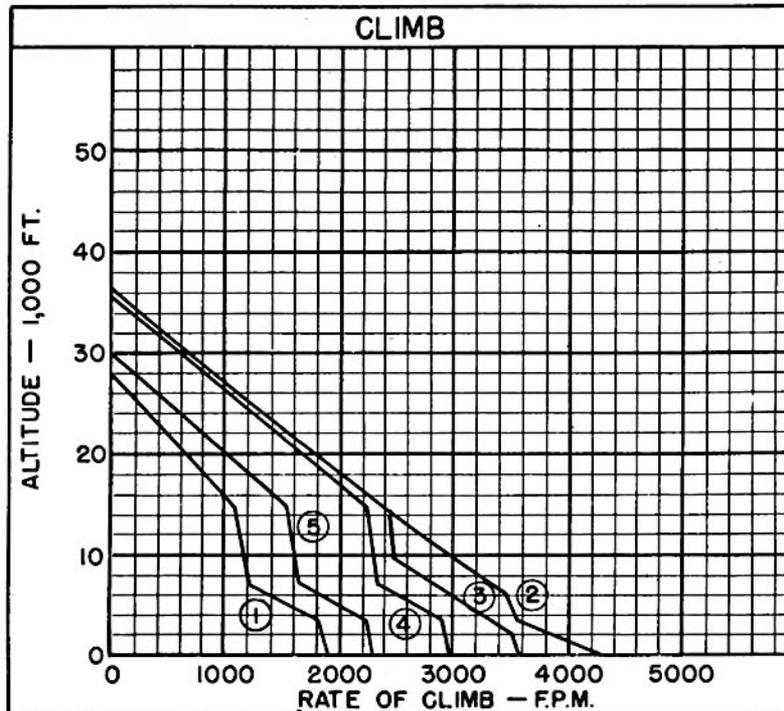
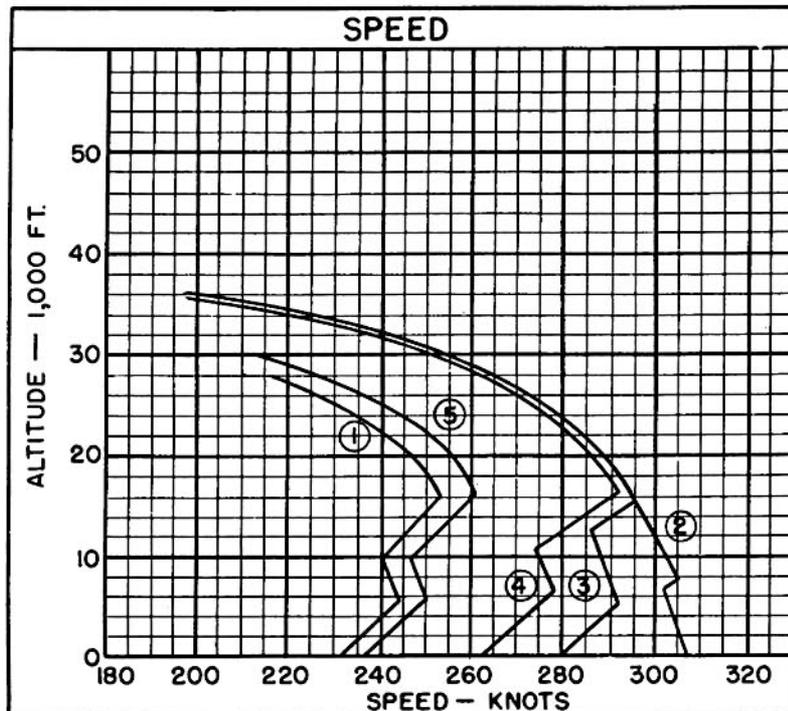
NOTES

- (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 300 kn. and $V_{max.}/ACA$ to 298 kn./8,000 ft. Addition of 12 launchers and 12-5" HVAR increases gross weight of Cond. (2) to 16,531 lbs. and decreases V_{max} , S. L. to 281 kn. and $V_{max.}/ACA$ to 278 kn./8,000 ft.



○ LOADING CONDITION COLUMN NUMBER

Standard Aircraft Characteristics, NAVAR 1335E (REV. 1-59)

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. ½ 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 and 10 min.	TAS Normal	Range at 1500 ft.
1 min. at T. O. Pr.	N. Pr. Normal Mixture	Power Normal Mixture	TAS Normal Mixture	FIRE ROCKETS	N. Pr.	Mixture	Normal Mixture

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

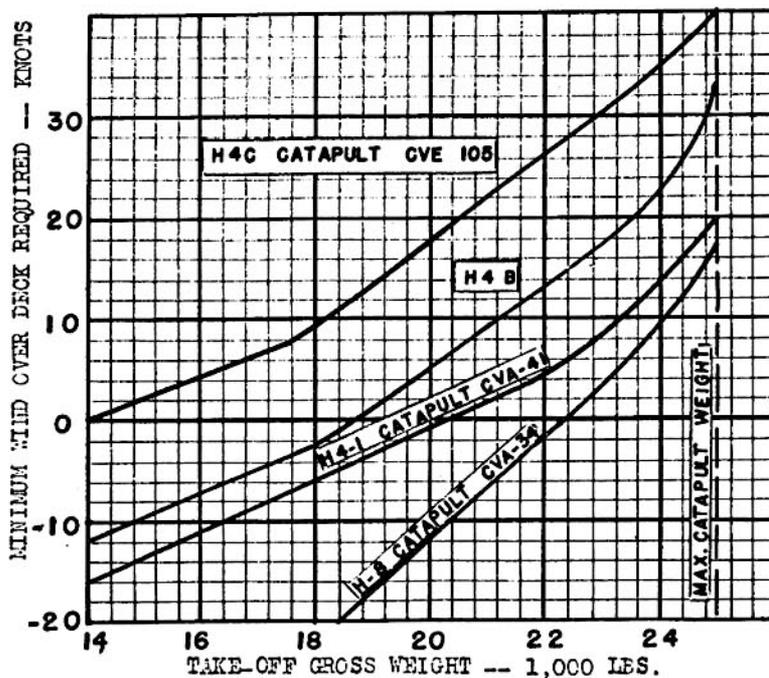
NOTE: Addition of window dispenser to Cond. (5) increases gross weight to 17,145 lbs., decreases V_{\max} S.L. 9 kn., decreases combat range 53 n.mi. and increases T.O. distance (25 kn.) 21 ft.

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

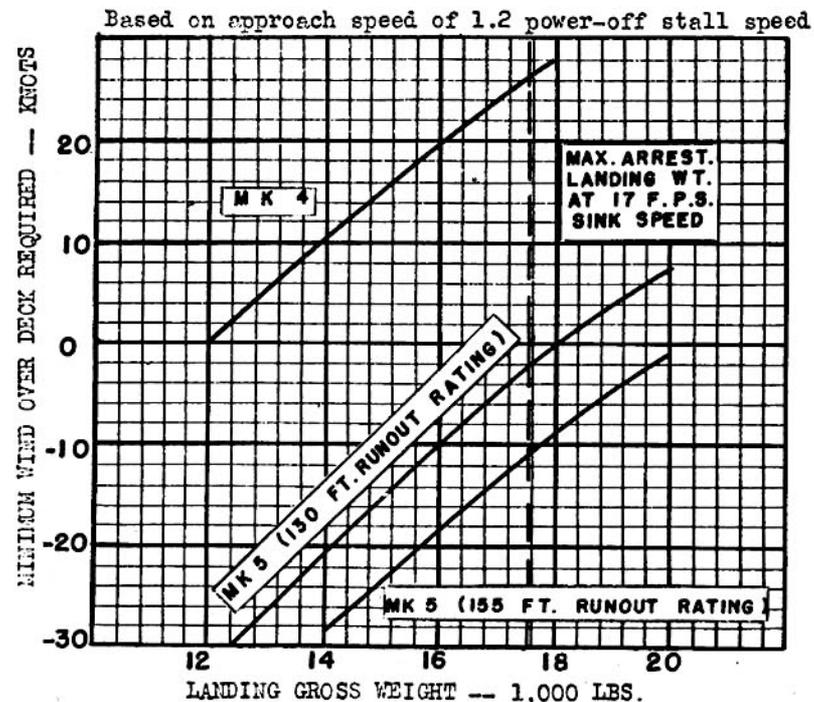
	<u>Bhp.</u>	<u>Rpm.</u>	<u>Alt.</u>
T.O.	2500	2900	S.L.
Mil.	2500	2800	2000'
	1900	2600	14300'
Norm.	2100	2400	3300'
	1800	2400	14800'

CARRIER SUITABILITY

MINIMUM WIND OVER DECK REQUIRED FOR CATAPULTING
VS. GROSS WEIGHT



MINIMUM WIND OVER DECK REQUIRED FOR LANDING
VS. GROSS WEIGHT



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.

NAVAER-13351 (New 5-52)

ISSUE OF 6 PAGES
AIRPLANE CHARACTERISTICS & PERFORMANCE

BUREAU OF AERONAUTICS, NAVY DEPT.

COLUMN NUMBER		1	2	3	4
LOADING CONDITION		Scout No Explosives	Scout No Explosives	Window Dispenser AN/APS-4	1-2000# Bomb AN/APS-4
GROSS WEIGHT	LBS.	14718	14718	15071	16861
EMPTY WEIGHT	Calculated LBS.	10946			
FUEL / OIL	GALS.	365/20	365/20	365/20	365/20
FIXED GUNS/AMMUNITION		2-20 MM/400 Rds. Mk.I Sight System			
FLEXIBLE GUNS/AMMUNITION		NONE			
ENGINE POWER USED FOR PERFORMANCE		COMBAT	NORMAL	NORMAL	NORMAL
WING LOADING	LBS./SQ.FT.	36.8	36.8	37.7	42.2
POWER LOADING ①	LBS./BHP.	6.7	8.2	8.4	9.4
V-MAX. SEA LEVEL.	KN	296	266	243	241
V-MAX. / CRITICAL ALT.	KN/FT.	309/13300	298/17000	269/16600	265/16600
V-STALL GROSS WEIGHT ②	KN	75.0	75.0	75.8	80.2
V-STALL WITHOUT FUEL ②	KN	69.1	69.1	70.1	74.7
TIME-TO-CLIMB -10000FT-	MIN.	4.1	4.5	4.7	5.6
TIME-TO-CLIMB -20000FT-	MIN.	9.0	10.5	11.2	13.7
SERVICE CEILING	FT.	31900	31300	30200	28400
TAKE-OFF DISTANCE -CALM-	FT.	564	564	615	821
TAKE-OFF DISTANCE -15 KN-	FT.	355	355	391	537
TAKE-OFF DISTANCE -25 KN-	FT.	243	243	269	377
TAKE-OFF DISTANCE -50 FT. OBST.	FT.				
TAKE-OFF TIME	SECONDS				
RATE OF CLIMB -SL-	FT./MIN.	3350	2300	2280	1940
MAX. RANGE / V-AV. ③	NMI./KN		1170/153	1030/135	930/142
RANGE / V-AV. -60%NSP-③	NMI./KN				
SEARCH RADIUS / V-AV. -20%R-	NMI./KN.				
A.S.W. RADIUS / V-AV. -20%R-	NMI./KN.				
SCOUT RADIUS	N MI.		(S-1) 320	(S-1) 280	
COMBAT RADIUS -B-1	N MI.				(B-1) 195

ENGINE / PROP GEAR RATIO W.A.C. R-3350 - 24W/.4375:1

ENGINE RATING
 BHP/RPM/ALT

COMBAT	MILITARY	NORMAL	TAKE-OFF
2800/2800/SL-1000	2500/2800/SL-3500	2100/2400/SL-5300	2500/2900
2200/2600/8000-11000	1900/2600/11000-14800	1800/2400/9700-14800	

AUX. FIXED	TANKAGE IN GALLONS		OIL	FUEL	OFFENSIVE ARMAMENT	
	PROTECTED	UNPROTECTED			FUSELAGE (EXPLOSIVE DISPLACING GEAR)	
				365		Bombs: 1-2000#, 1-1600#, 1-1000# or 1-500#
			31			Depth Bomb: 1-325#
			31			Mines: 1-2000# or 1-1000#
				300		Torpedo: 1-MK13-3
						Incendiary Cluster: 1-500#
			31	665		

NOTE

- ① BHP AT MAX CRIT. ALT.
- ② STALL - WITHOUT POWER
- ③ AT 1500' ALTITUDE

WINGS: (PAIRED MK51-9 BOMB RACKS)
 Bombs: 2-1000#, 2-500#, or 2-250#
 Depth Bombs: 2-325#
 Mines: 2-1000#
 Rockets: 2 11.75" A.R. (Tiny Tim)
 Torpedo: 2-MK 13-3

AIRPLANE CHARACTERISTICS & PERFORMANCE

BUREAU OF AERONAUTICS, NAVY DEPT.

Performance is based on flight tests of XBT2D-1 airplane. Range and radius are based on engine specification fuel consumption data increased by 15% to conform with past experience.

Scout Condition: Two wing bomb racks (MK51-12) with sway bracing and bomb ejector (fuselage) aboard. Sway bracing for bomb ejector aboard only in bomber condition. AN/APS-4 radar and rocket launcher not aboard. Addition of 12 MK-9 rocket launchers reduces Vmax S.L. to 289 Kn. and Vmax/ACA to 302 Kn/13300 Ft. at combat power. Addition of 12-5" HVAR increases gross weight of condition (1) to 16438# and decreases Vmax S.L. to 271 Kn. and Vmax/ACA to 281 KN/13000 Ft.

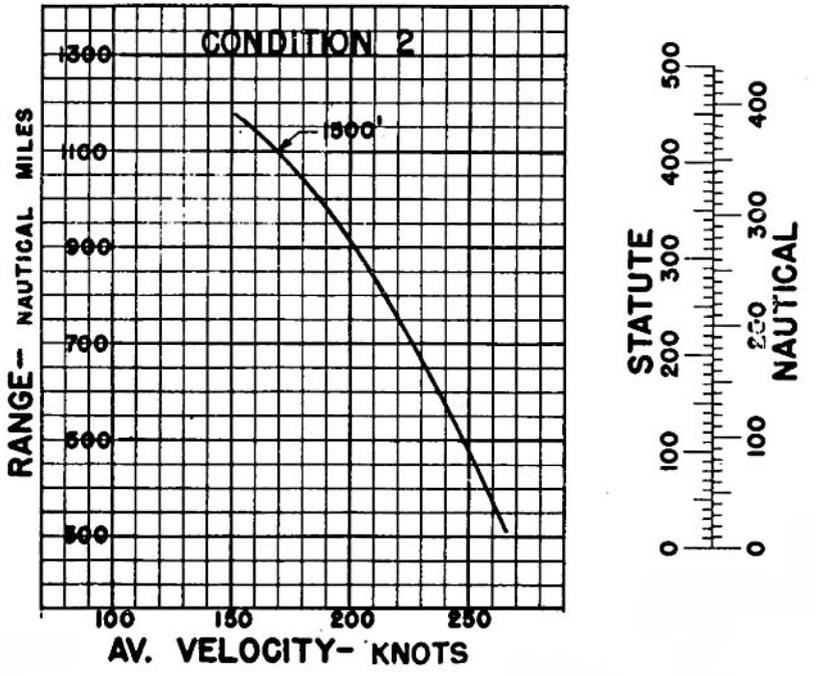
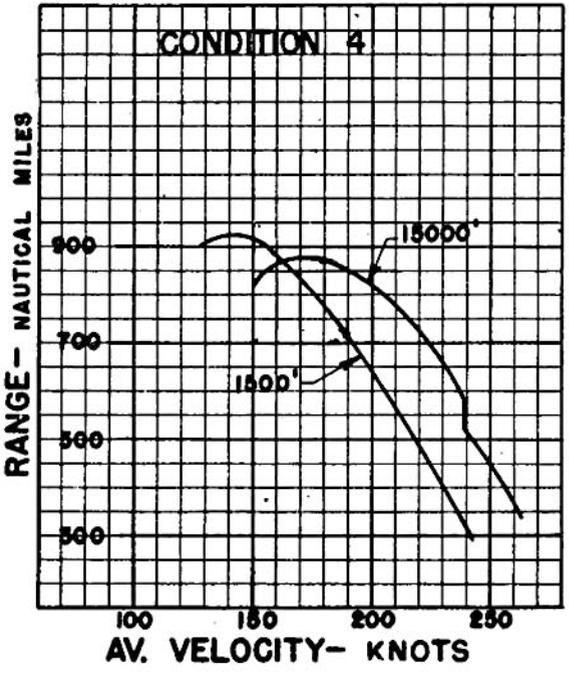
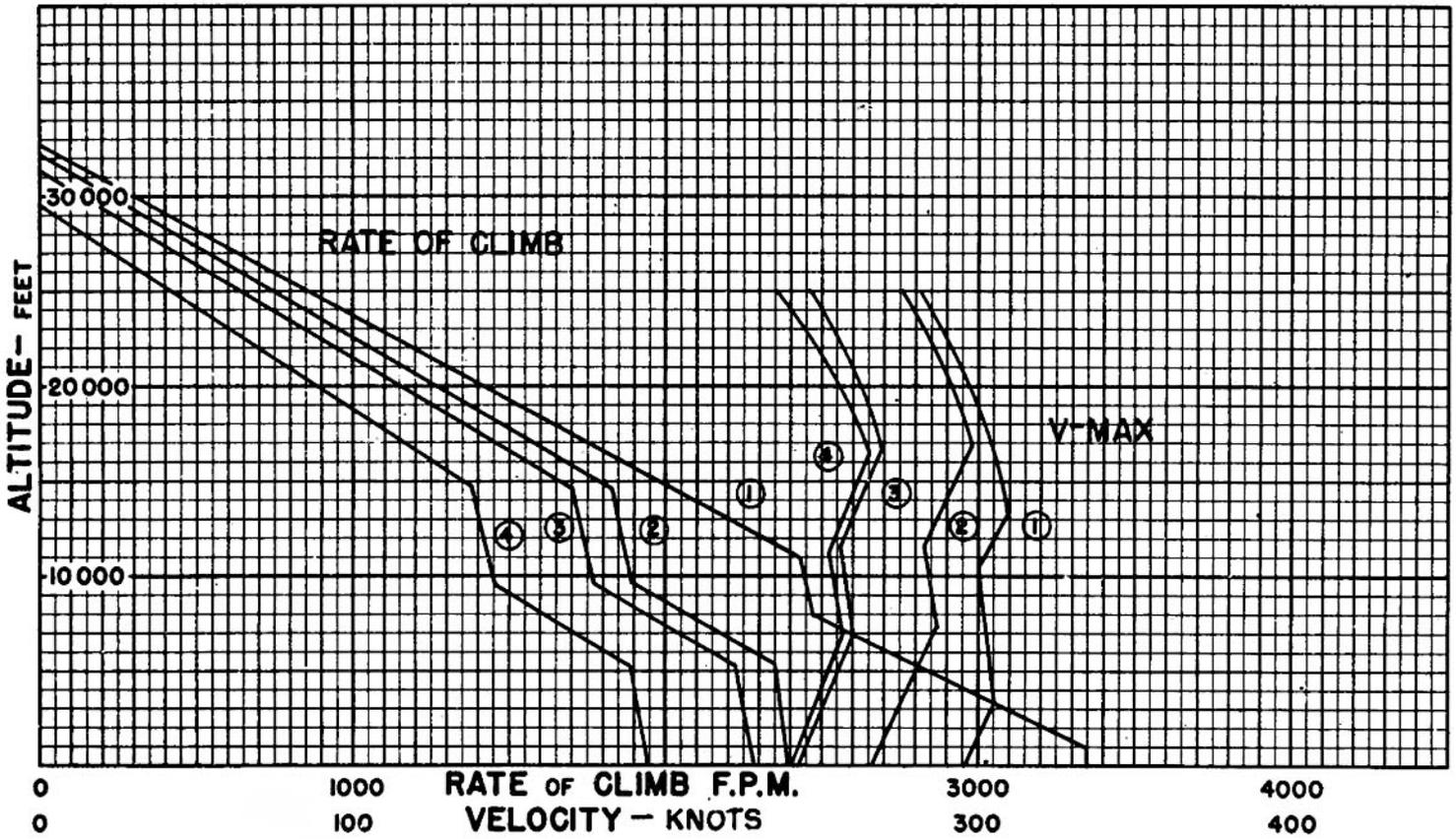
NOTES:

1. AN/APS-4 radar is carried on port side wing bomb-rack.
2. 12-100# bombs or 12-250# bombs can be carried at MK-9 rocket launcher positions by replacing launchers with MK-55 bomb-racks.
3. Minimum engine power and speed of 568 BHP and 1200 RPM, respectively, limits max. range and scouting radius of conditions (2) and (3) and also the bomber radius of condition (4) by requiring more fuel for reserve.
4. 20 gallons of ADI fluid are available for 12 minutes at combat power.
5. 200 ft. length is required to spot 20 planes on the 96' wide deck immediately aft of the forward ramp on the CV-9 class carriers.

BOMBER COMBAT RADIUS FORMULA NO. B-1-CONDITIONS NOS. - 4				RADIUS = CLIMB + CRUISE-OUT + CRUISE BACK			
WARM-UP 20 min.	RENDEZVOUS 20 min. at sea level	CLIMB to 15000 ft.	CRUISE OUT at 15000 ft.	DROP TANKS <u>DESCEND</u> to 1500 ft.	COMBAT 15 min. at 1500 ft.	CRUISE BACK at 1500 ft.	RESERVE 60 min. at
TAKE-OFF 1 min.	at 60% N.S.P.	NORMAL POWER Auto Lean. Auto Rich.	180 kts.TAS Auto Lean.	DROP BOMBS FIRE ROCKETS	5 min. WEP. 10 min. Hor. Pr.	170 kts.TAS Auto Lean.	Vel. for Max. Range Auto Lean.

SCOUTING RADIUS FORMULA NO. S-1 - CONDITIONS (2) & (3).

Radius is 1/3 range at velocity for max. range at 1500 Ft. fuel for 20 min. warm-up, 1 min. T.O., used at start of flight. Allowance for 60 min. at velocity for max. range for rendezvous, landing and reserve carried entire distance. Practical scout radius is reduced 9 nautical miles for each minute of combat power operation at 1500 ft.



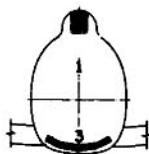
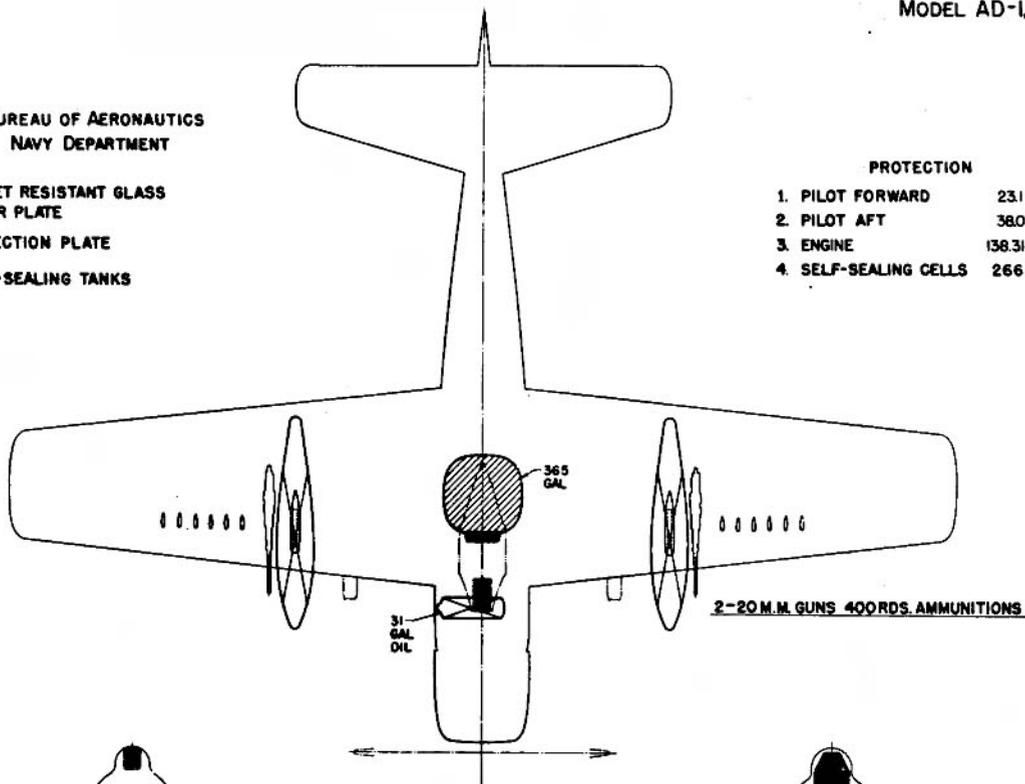
○ LOADING CONDITION COLUMN NUMBER

BUREAU OF AERONAUTICS
NAVY DEPARTMENT

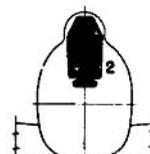
-  BULLET RESISTANT GLASS ARMOR PLATE
-  DEFLECTION PLATE
-  SELF-SEALING TANKS
- 

PROTECTION

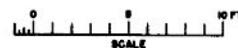
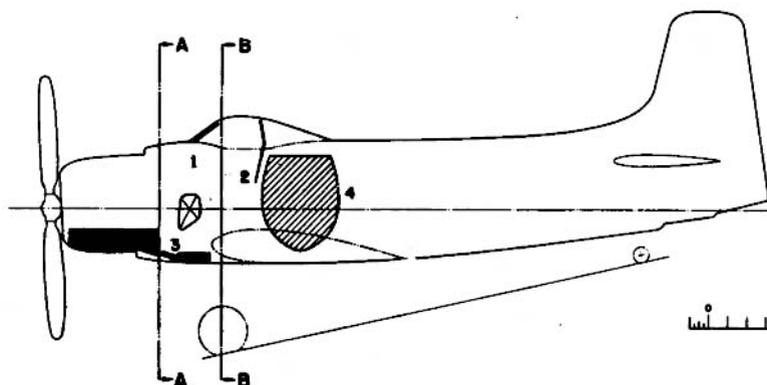
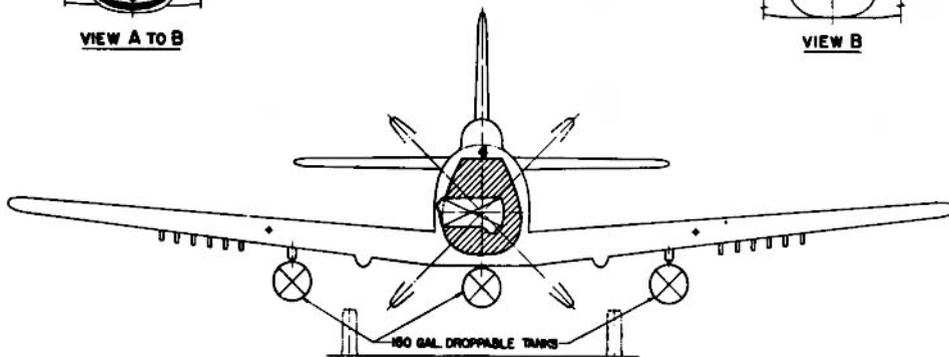
- | | |
|-----------------------|-------------|
| 1. PILOT FORWARD | 231 LBS. |
| 2. PILOT AFT | 380 LBS. |
| 3. ENGINE | 138.31 LBS. |
| 4. SELF-SEALING CELLS | 266 LBS. |



VIEW A TO B

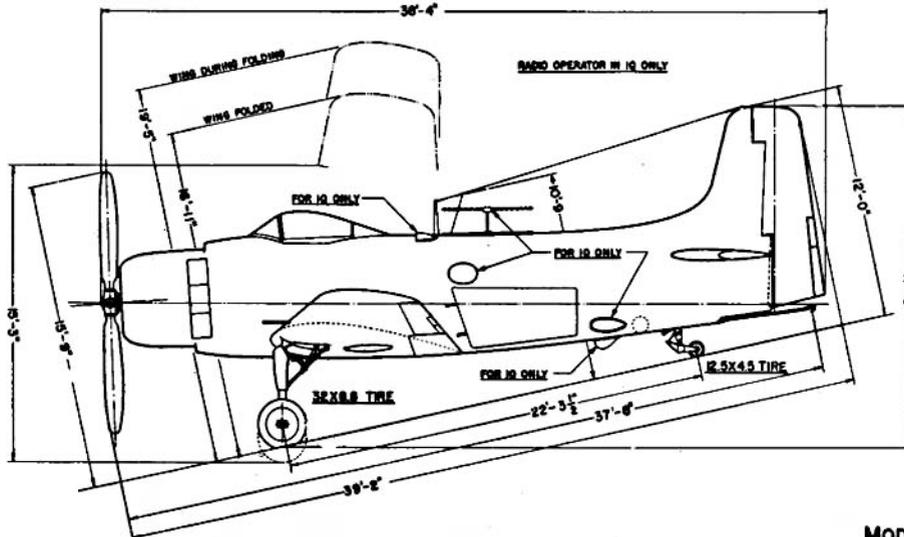
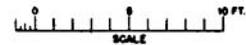
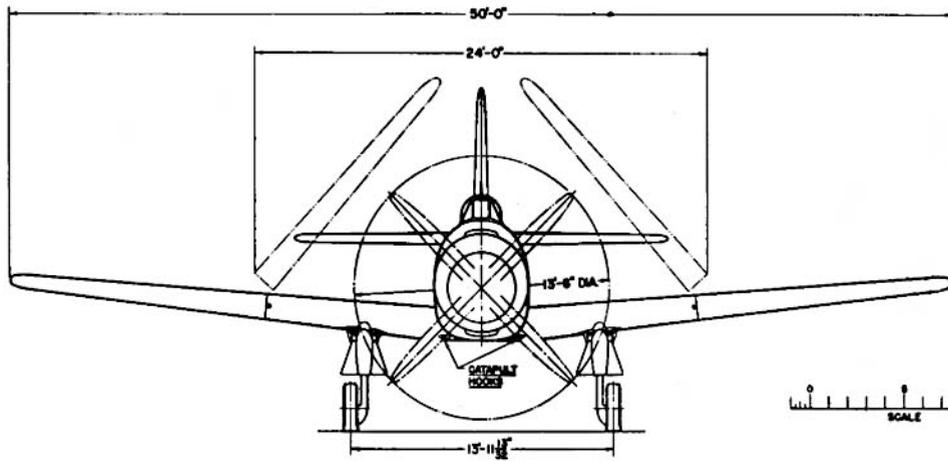
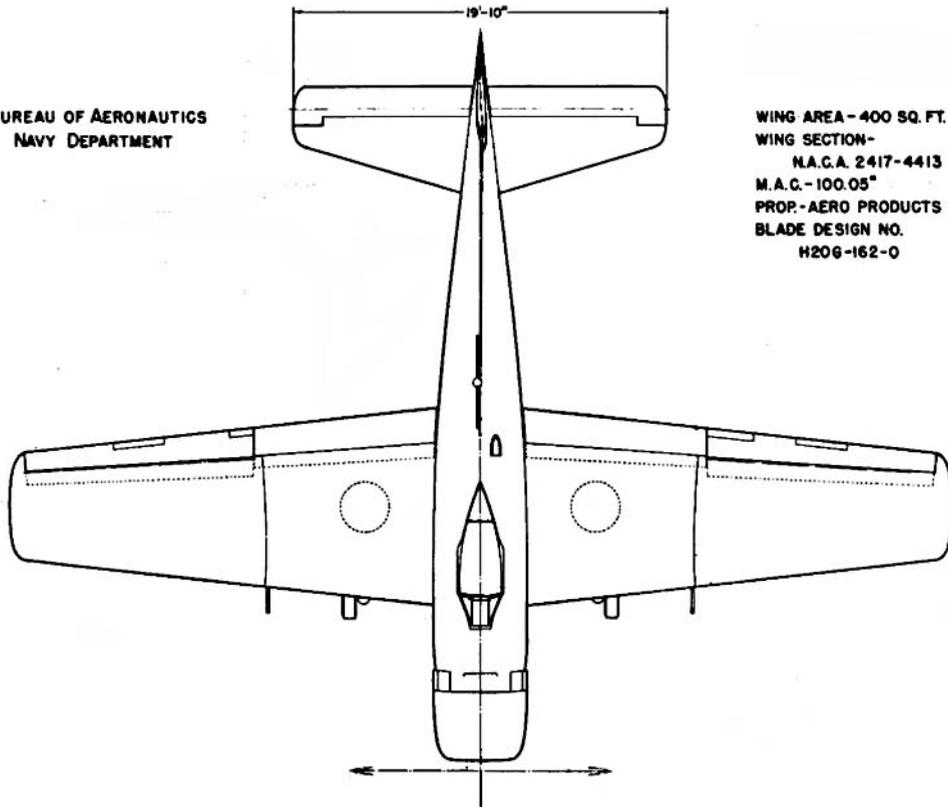


VIEW B



BUREAU OF AERONAUTICS
NAVY DEPARTMENT

WING AREA - 400 SQ. FT.
WING SECTION -
M.A.C.A. 2417-4413
M.A.C. - 100.05"
PROP. - AERO PRODUCTS
BLADE DESIGN NO.
H206-162-0



MODEL AD-1, IQ