

FAA APPROVED AIRPLANE FLIGHT MANUAL
FOR THE
GRUMMAN G-44, G-44A
WITH
CONTINENTAL ENGINES
IO470-D

J. RAY McDERMOTT & CO., INC.
P. O. DRAWER 38
HARVEY, LA.

FAA APPROVED AIRPLANE FLIGHT MANUAL
FOR THE
GRUMMAN G-44, G-44A
WITH
CONTINENTAL ENGINES
IO470-D

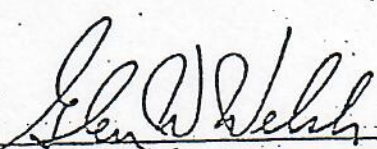
REG. NO. N86609

SER. NO. 1435

This airplane must be operated in compliance with the operating limitations specified herein.

A copy of this manual shall be carried in each certificated airplane at all times and be readily available to the flight crew.

FAA APPROVED


Glen W. Welsh
Chief, Engineering and
Manufacturing Branch
Southwest Region
Fort Worth, Texas

DATE

March 19, 1968

TABLE OF CONTENTS

FAA APPROVED DATA

LOG OF REVISIONS

I. OPERATING LIMITATIONS

II. OPERATING PROCEDURES

NON-FAA APPROVED OPERATING DATA

III. PERFORMANCE CHART

IV. WEIGHT AND BALANCE AND LOADING SCHEDULE

V. EQUIPMENT LIST

OTHER DATA

LOG OF SUPPLEMENTS

VI. AFM SUPPLEMENTS

F.A.A. APPROVED AIRPLANE FLIGHT MANUAL
FOR THE GRUMMAN G-44, G-44A AIRPLANES

Aircraft Specification A 734 and modified
as per STC SA2-13 and STC SA61SW, STC-SA2-284

By: J Ray McDermott & Co., Inc.
P.O. Drawer 38
Harvey, La. 70058

Page

FAA APPROVED
Date:

LOG OF REVISIONS

Rev. No.

Page No.

Date

FAA Approved

SECTION I

OPERATING LIMITATIONS

The observance of the limitations
contained by this section is required
by law.

SECTION 1

OPERATING LIMITATIONS

Compliance with the operating limitations given in this section is required by law.

A. WEIGHT LIMITS

1. Land Plane Operation
 - a. Maximum take-off weight - 5400 lbs.
 - b. Maximum landing weight - 5400 lbs.
2. Sea Plane Operation
 - a. Maximum take-off weight - 4700 lbs.
 - b. Maximum landing weight - 4700 lbs.

B. CENTER OF GRAVITY LIMITS

(Inches aft of datum, which is the wing center section leading edge.)

1. For all weights
 - a. Most forward C.G. limit 14.8"
 - b. Most rearward C.G. limit 22.5"

C. POWER PLANT AND PROPELLER LIMITATIONS

The airplane is equipped with two Continental IO470-D engines and two Hartzell HCA2XF2/A propellers.

1. Temperature Limitations
 - a. Maximum permissible cylinder head temperature
Bayonet Thermocouple 238°C (460°F)
 - b. Maximum permissible oil-in temperature 107°C (225°F)
2. Engine Ratings
 - a. Take-off (5 min.) (S.L.) 2625 RPM 260 BHP (Full throttle)
 - b. Maximum continuous (S.L.) 2625 260
3. Propeller Limits
 - a. Pitch settings: Low 13°
High auto-stop pin 22.10°
Feather 81.6°
 - b. Diameter: 84 in. max. 82" min.
4. Fuel minimum octane: 100/130 aviation grade fuel
5. Oil Pressure: Idling 10 PSI
Normal 30 to 60 PSI
Grade SAE 50 for temperature above 40°F, SAE 30 below 40°F
6. Fuel Pressure: 26 PSI

D. AIR SPEED LIMITS

V _{SI}	65 knots	75 mph	Stall Speed (Gear and Flaps Up)
V _{SO}	52 knots	60 mph	Stall Speed (Gear and Flaps Down)
V _{MC}	82 knots	94 mph	Minimum Control Speed with Critical Engine Inoperative (Red Line)
V _Y	87 knots	100 mph	Best Rate of Climb Speed (Two Engine)
V _{YSE}	95 knots	109 mph	Best Single Rate of Climb Speed (Blue Line)
V _{FE}	90 knots	104 mph	Max Flaps Extended Speed
V _A	152 knots	175 mph	Design Maneuvering Speed
V _{NE}	182 knots	209 mph	Never Exceed Speed (Red Line)

E. PLACARDS REQUIRED

1. This airplane must be operated as a normal category airplane in compliance with the operating limitations stated in the form of Placards, Markings, and Manuals.

F. PROCEDURES

1. Normal Operating Procedures
 - a. No unusual or unconventional operating procedures exist.
2. This airplane is equipped with one engine driven hydraulic pump installed as per STC SA2-13 on left engine.
3. One Engine Inoperative.
 - a. To feather engine.
 1. Pull propeller control lever on propeller to be feathered in aft direction through detent. Apply side pressure to clear detent stop.
 - b. To unfeather engine with engine starter.
 1. Push propeller control to high RPM position. (Full forward travel). Follow normal procedure for starting engine with starter.
 - c. Emergency procedures.
 1. With the left engine feathered, the landinggear and wing flaps must be operated by the emergency hand hydraulic pump, located on the left side of the pilots seat.
 2. Move landing gear or wing flap selector to emergency position and operate hand pump.

G. CONTROL SURFACE MOVEMENTS

Flaps	0° to 30°	
Elevator trim	10° up	33° down
Elevator	31° up	21° down
Rudder	30° Rt	27° left
Rudder trim	2 1/8" Rt	3 1/4" left
Aileron	20° up	21° down
Elevator Aux Tab		30° down

SECTION II

OPERATING PROCEDURES

SECTION II
OPERATING PROCEDURES

FAA APPROVED

DATE 3/19/68

F. PROCEDURES

1. Normal Operating Procedures

a. No unusual or unconventional operating procedures exist.

2. This airplane is equipped with one engine driven hydraulic pump installed as per STC SA2-13 on left engine.

3. One engine inoperative.

a. To feather engine.

1. Pull propeller control lever on propeller to be feathered in aft direction through detent. Apply side pressure to clear detent stop.

b. To unfeather engine with engine starter.

1. Push propeller control to high RPM position. (Full forward travel). Follow normal procedure for starting engine with starter.

c. Emergency procedures.

1. With the left engine feathered, the landing gear and wing flaps must be operated by the emergency hand hydraulic pump located on the left side of the pilots seat.

2. Move landing gear or wing flap selector to emergency position and operate hand pump.

G. CONTROL SURFACE MOVEMENTS

Flaps	0° to 30°	
Elevator trim	10° up	33° down
Elevator	31° up	21° down
Rudder	30° rt.	27° left
Rudder trim	2 1/8" rt	3 1/4" left
Aileron	20° up	21° down
Elevator Aux Tab		30° down

FAA APPROVED AIRPLANE FLIGHT MANUAL

GRUMMAN WIDGEON G-44, G-44A

FAA APPROVED

DATE _____

OPERATING INFORMATION

1. The accompanying rate of climb curve for single engine flight is based on a maximum gross weight of 4700 lbs. and the following:
 - (a) Standard Air
 - (b) One Engine Inoperative
 - (c) Inoperative Engine Feathered
 - (d) Operative Engine at Maximum Continuous Power
 - (e) Mixture Setting "Full Rich"
 - (f) Carburetor Air Intake "Cold Air"
 - (g) Wings Level
 - (h) No de-icers Installed

Departure from any of the above conditions in the adverse direction or from the airspeed specified will normally result in lower rate of climb. Also turbulent air will result in lower rate of climb by an undetermined amount.

2. Best rate of climb speed with two engines operating at 225 BHP is 100 MPH CAS.

Procedure for Single Engine Flight

- (a) Mixtures Rich
- (b) Propeller Controls Forward
- (c) Throttle Controls Forward
- (d) Feather Propeller of Inoperative Engine
- (e) Mixture at Idle Cut-off on Inoperative Engine
- (f) Ignition Switch Off on Inoperative Engine
- (g) Fuel Selector Off on Inoperative Engine
- (h) Generator Switch Off on Inoperative Engine

Note: Use Auxiliary Hand Hydraulic Pump for gear and flap operation in event of failure of left engine. This aircraft equipped with parallel vacuum system which requires no action in event of failure of either engine.

SECTION III

PERFORMANCE CHARTS

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION

Second Region

P. O. Box 1689
Bartlett, Illinois

March 1, 1957

J. Ray McDermott Co.
P. O. Drawer 384
Harvey, Louisiana

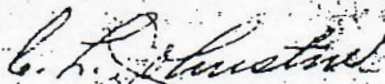
Attention: Mr. W. J. Boedee, Superintendent
of Aviation

Gentlemen:

Enclosed for your use and guidance is the single-engine climb performance for the Grumman G44 airplane equipped with Continental O-470B engines. These data are based exclusively on the recent flight tests conducted by our Mr. Ford and show somewhat better performance than the original data. The Airplane Flight Manual for your airplane should be corrected to reflect the data shown.

Following the correction to the Flight Manual, a Log of Revisions page and the revised page as it will appear in the Manual should be prepared and submitted to this office for signature.

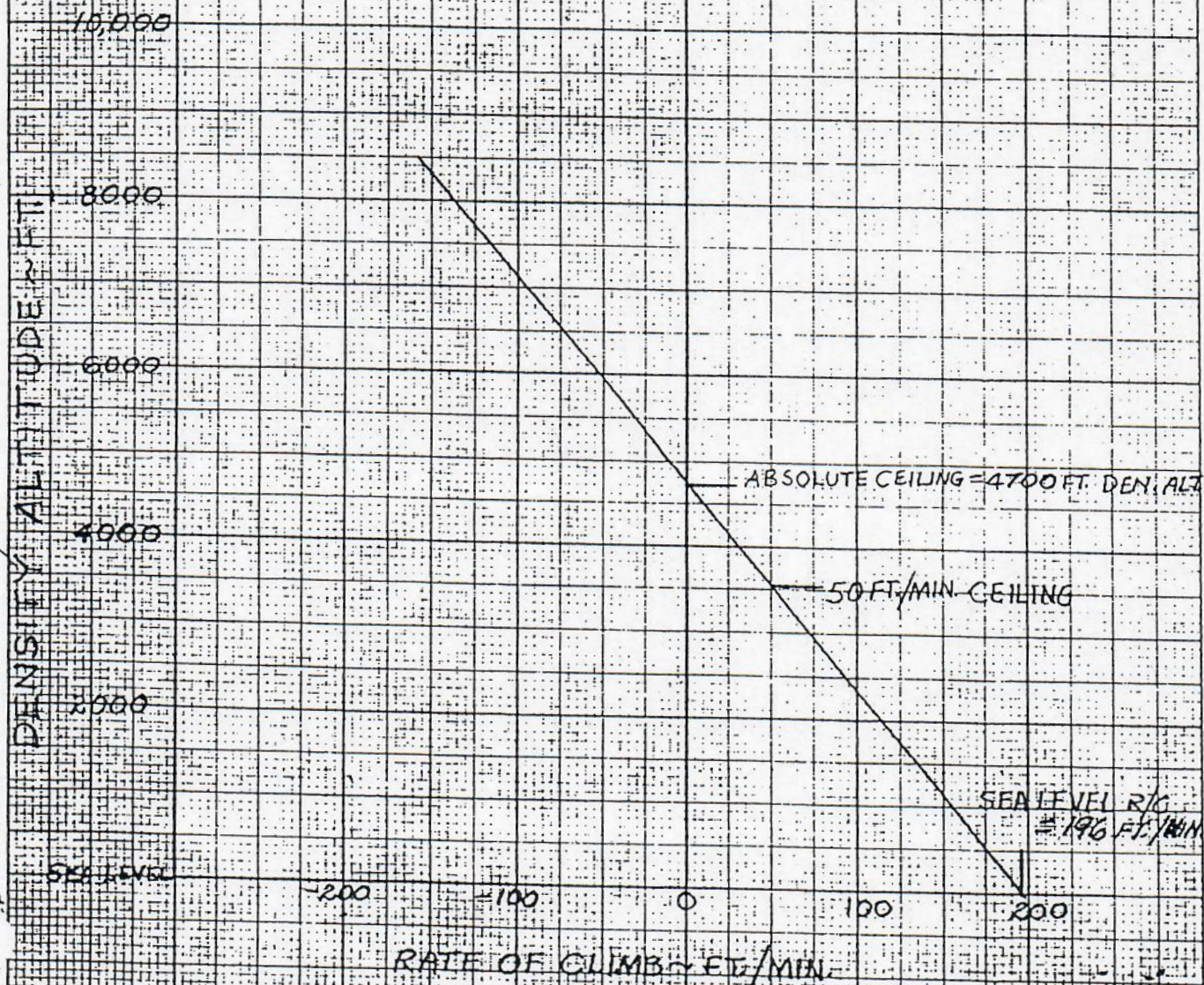
Sincerely yours,

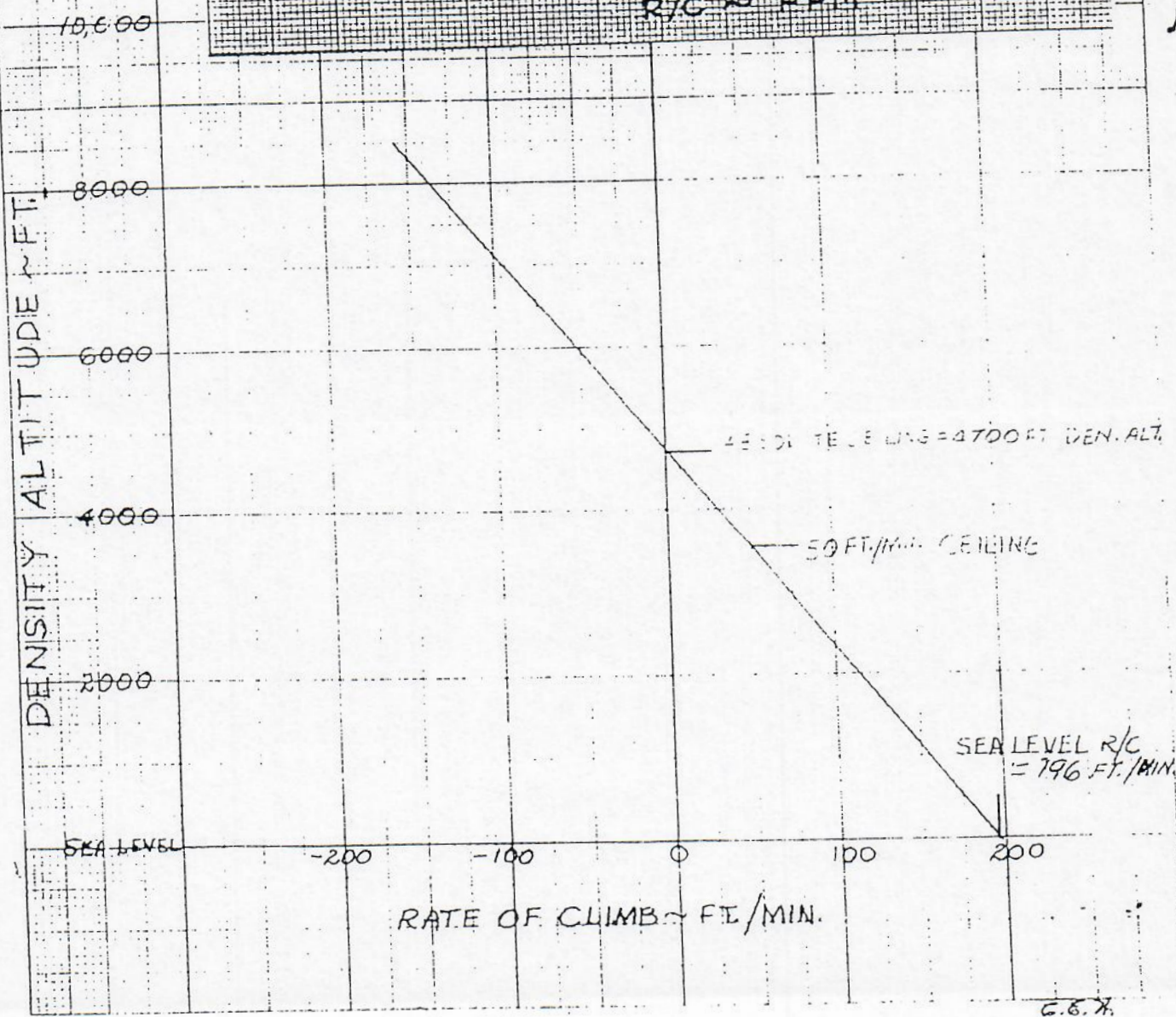
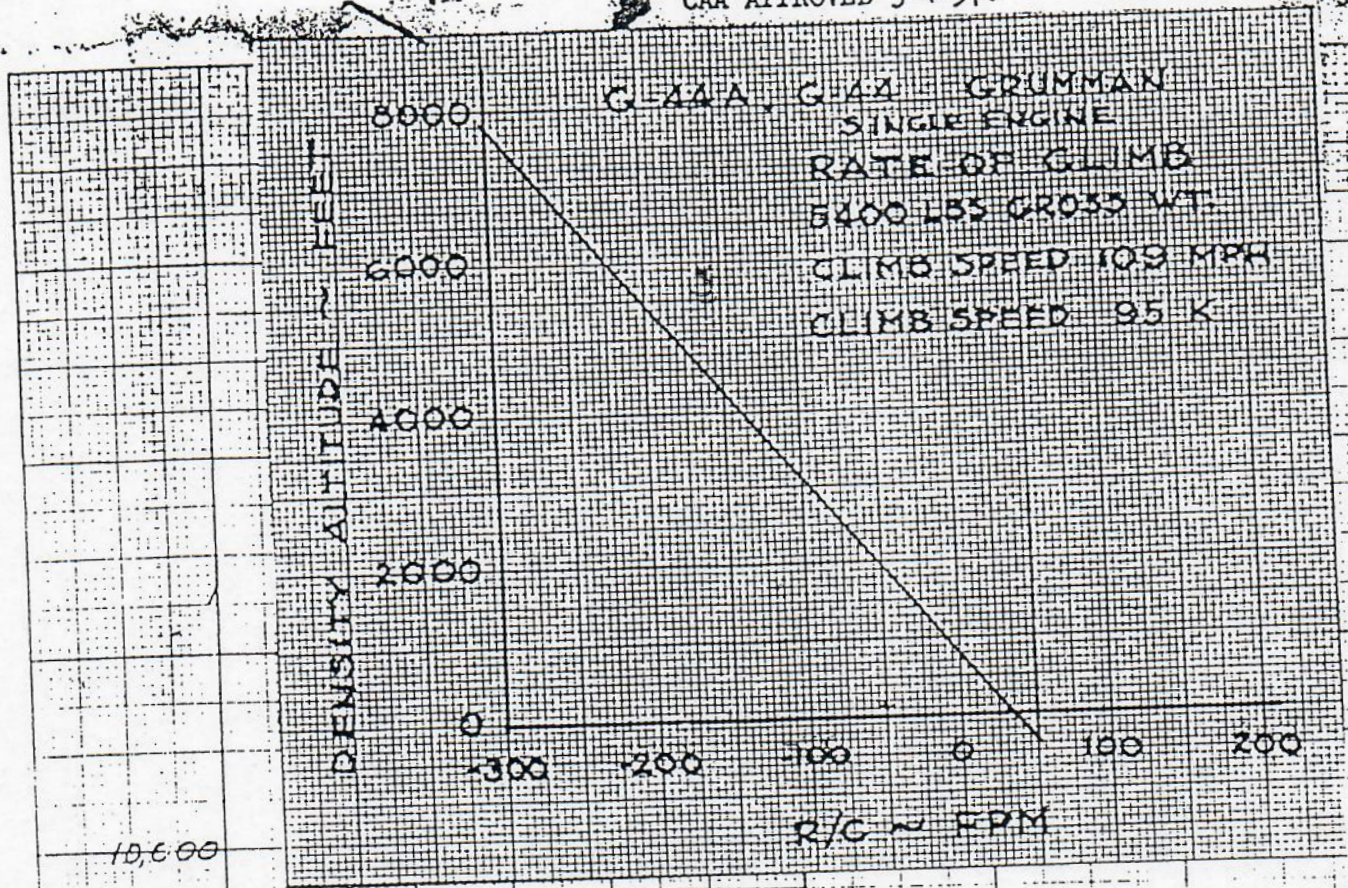


C. L. Johnston
Chief, Aircraft Engineering Division

Enclosure (2)

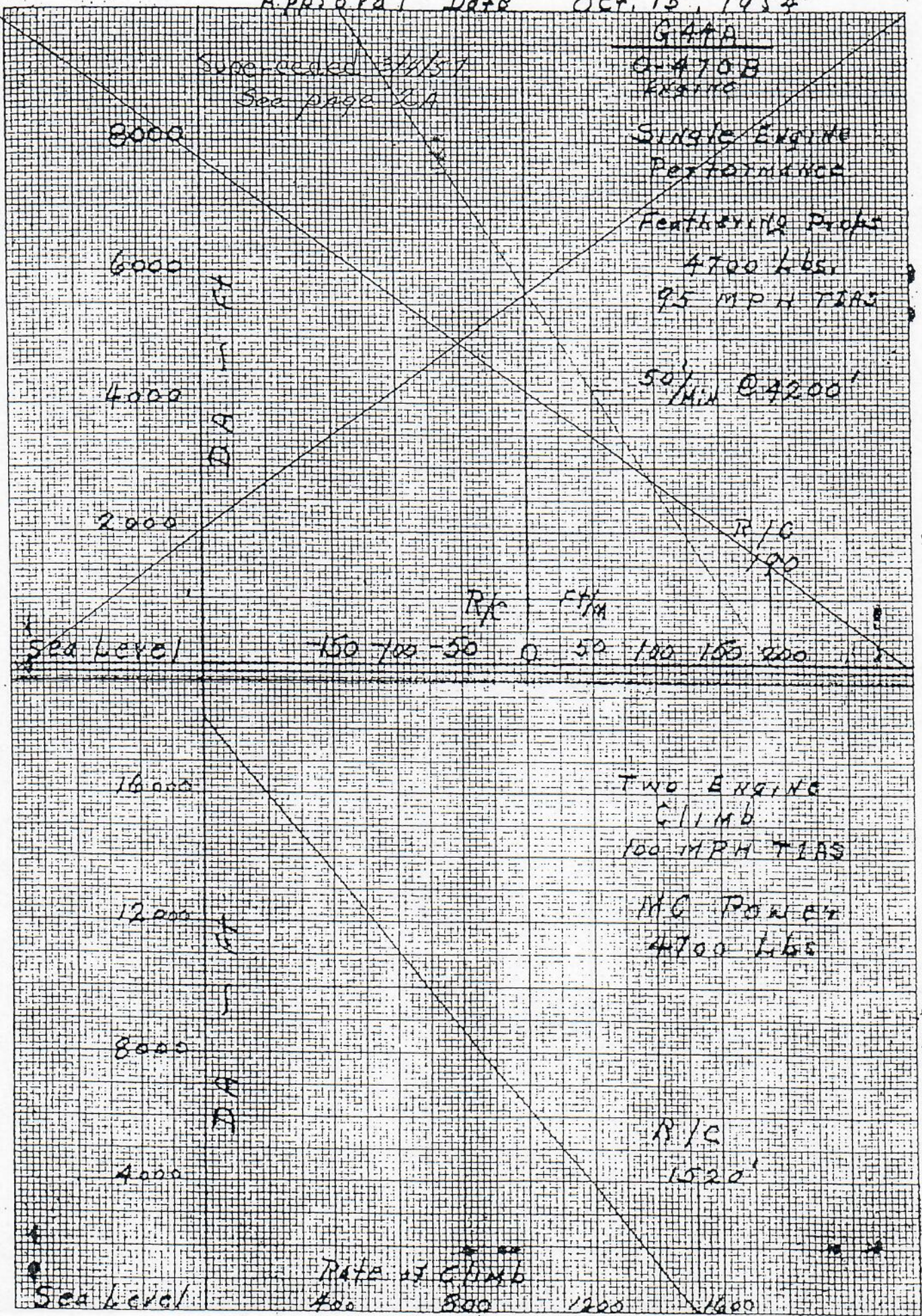
GRUMMAN G44-A
O-470B ENGINE
SINGLE ENGINE
CLIMB PERFORMANCE
L.E. - FEATHERED
R.E. - MAX. CONT.
GROSS WEIGHT
4700 LBS.



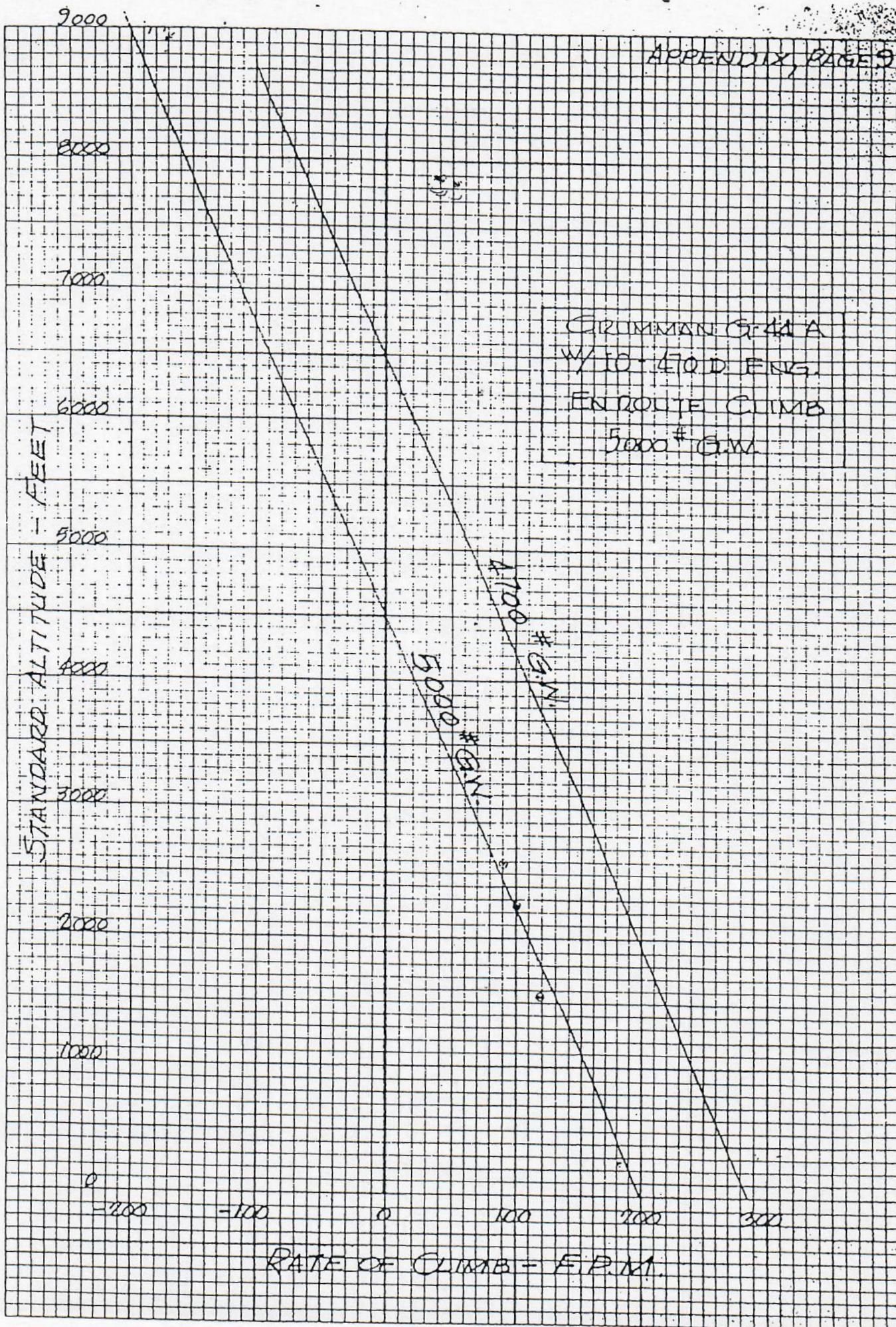


G.B.H.
plotted

Approval Date Oct. 15, 1954



APPENDIX, PAGE 9



FMA APPROVED

JAN. 18, 1960

PAGE 2

GROSS WT 4700 #

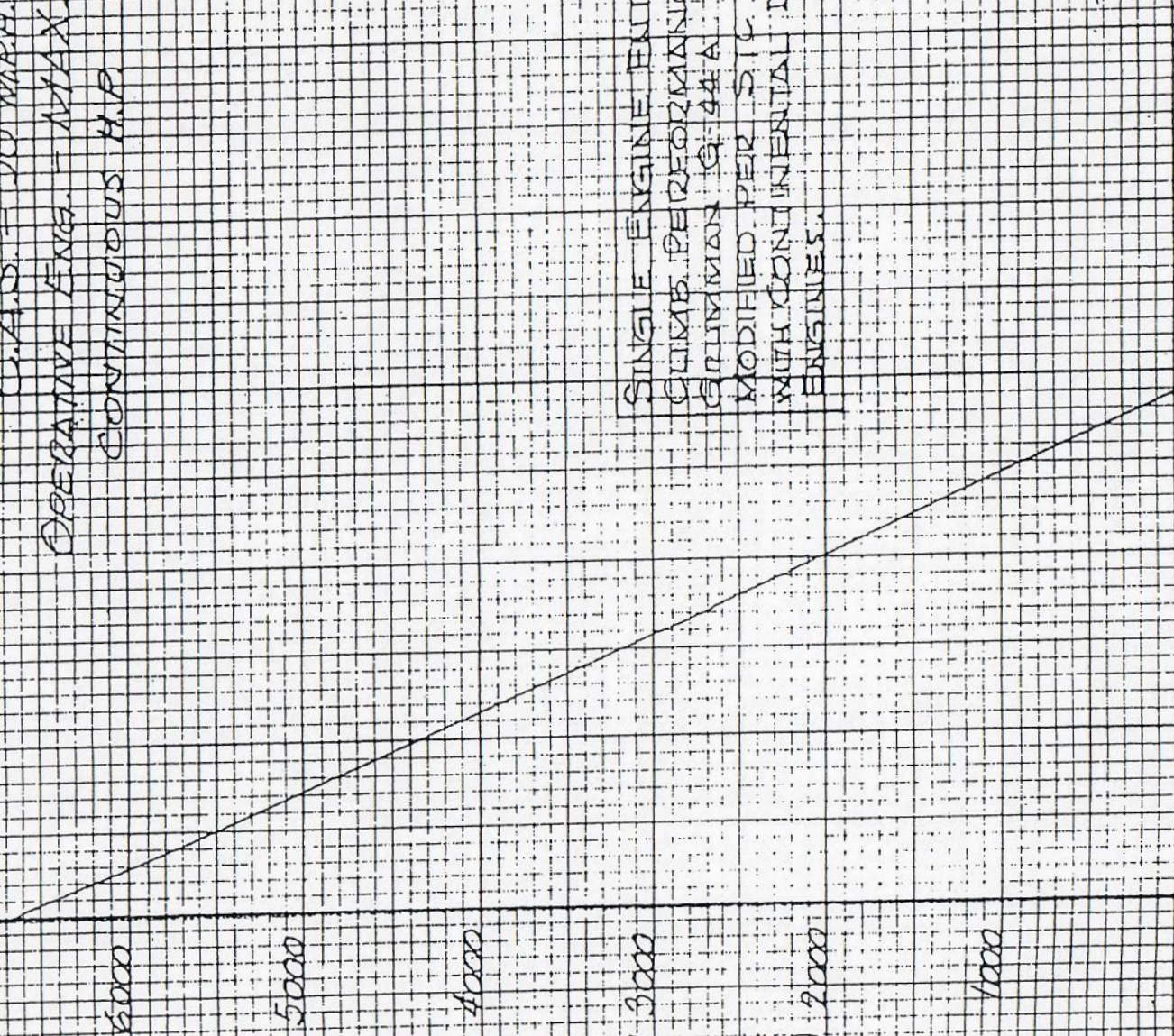
CRITICAL ENGINE FEATHERED

C.A.S. = 90 MPH.

OPERATIVE ENGS. = MAX.

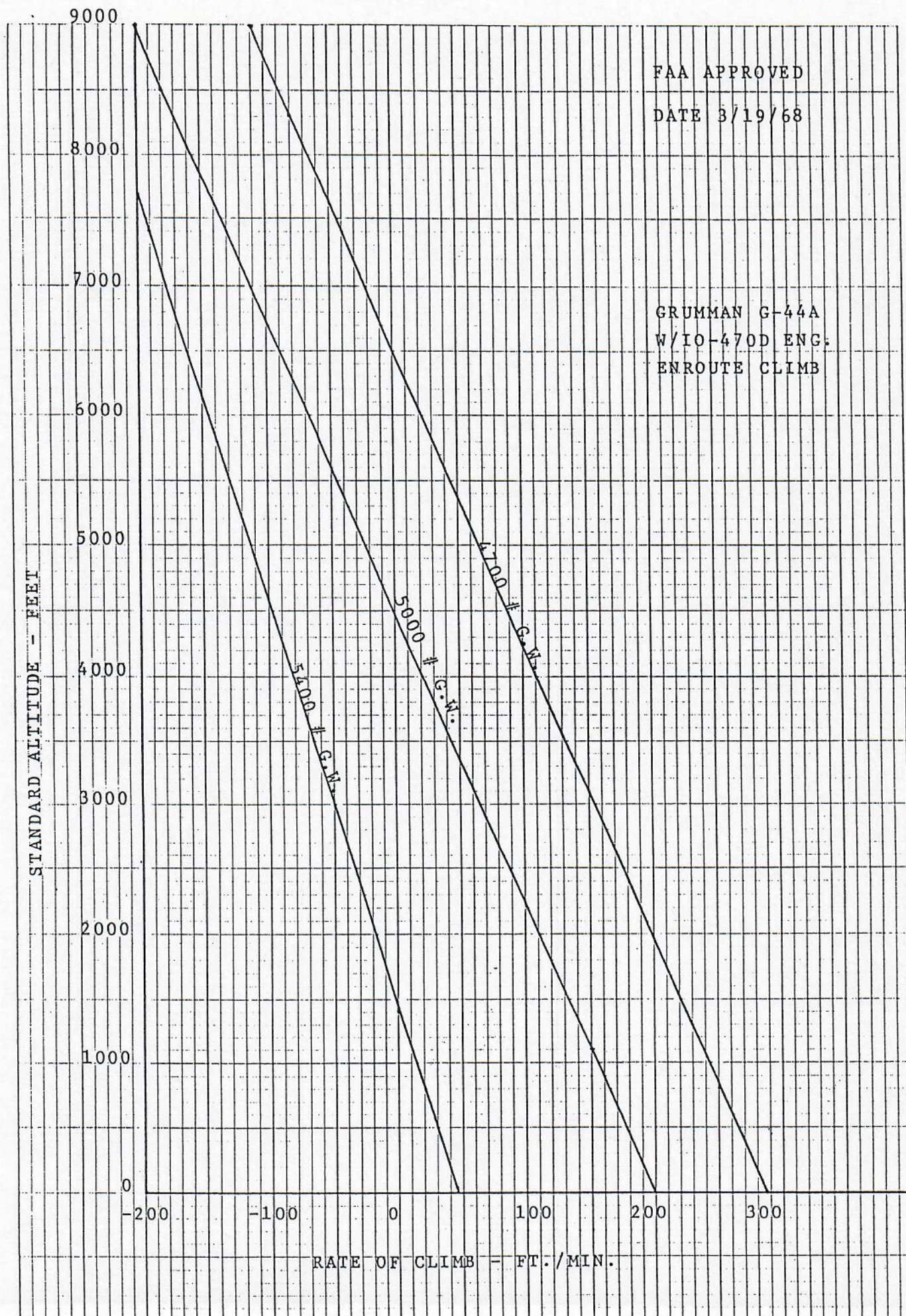
CONTINUOUS H.P.

STANDARD ALTITUDE = FEET



SINGLE ENGINE ENROUTE
CLIMB PERFORMANCE
COMMON Q-44A
MODIFIED PER STC SA 2-13
WITH CONTINENTAL IO 410-D
ENGINES.

RATE OF CLIMB = FPM.



FAA APPROVED

JAN. 18, 1960

GROSS WT. 4700#

CRITICAL ENGINE FEATHERED

C.A.S. 90 M.P.H.

OPERATIVE ENG. MAX

CONTINUOUS H.P.

STANDARD ALTITUDE - FEET

6000

5000

4000

3000

2000

1000

SINGLE ENGINE ENROUTE
CLIMB PERFORMANCE

GRUMMAN G-44A

MODIFIED PER STC SA2-13

WITH CONTINENTAL IO-470D
ENGINES

0

100

200

300

400

500

RATE OF CLIMB = FT./MIN.

PERFORMANCE CHART

CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 2500 FT.

RPM	MP	% BHP	FUEL PRESSURE	GAL./ HR.	ENDURANCE 100 GAL.
2450	24	74	8.7	28.1	3.6
	23	70	8.1	26.3	3.8
	22	66	7.6	24.9	4.0
	21	62	7.1	23.3	4.3
2300	24	68	7.8	25.5	3.9
	23	64	7.3	24.0	4.2
	22	60	6.9	22.8	4.4
	21	57	6.5	21.4	4.7
2200	23	59	6.7	22.3	4.5
	22	56	6.4	21.2	4.7
	21	53	6.1	20.1	5.0
	20	49	5.8	19.0	5.2
2100	22	52	6.0	19.7	5.1
	21	49	5.7	18.7	5.4
	20	45	5.4	17.7	5.6
	19	42	5.2	16.7	6.0
	18	39	4.9	15.8	6.3
	17	36	4.7	14.8	6.8

CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 7500 FT.

RPM	MP	% BHP	FUEL PRESSURE	GAL./ HR.	ENDURANCE 100 GAL.
2450	22	70	8.2	26.6	3.8
	21	66	7.6	24.9	4.0
	20	62	7.1	23.5	4.3
	19	58	6.7	22.1	4.5
2300	22	64	7.4	24.2	4.1
	21	60	6.9	22.6	4.4
	20	57	6.5	21.5	4.6
	19	54	6.1	20.3	4.9
2200	22	59	6.8	22.4	4.5
	21	56	6.4	21.1	4.7
	20	53	6.0	20.0	5.0
	19	50	5.8	19.0	5.3
2100	21	52	6.0	19.7	5.1
	20	49	5.7	18.7	5.4
	19	45	5.4	17.7	5.7
	18	42	5.2	16.8	5.9
	17	39	4.9	15.8	6.3
	16	36	4.7	14.9	6.7

CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 5000 FT.

RPM	MP	% BHP	FUEL PRESSURE	GAL./ HR.	ENDURANCE 100 GAL.
2450	24	77	9.1	29.0	3.4
	23	72	8.4	27.2	3.7
	22	68	7.9	25.7	3.9
	21	64	7.3	24.1	4.2
2300	24	70	8.1	26.1	3.8
	23	66	7.5	24.7	4.0
	22	62	7.1	23.5	4.2
	21	58	6.7	22.1	4.5
2200	23	61	7.0	23.0	4.4
	22	58	6.6	21.8	4.6
	21	54	6.2	20.6	4.9
	20	51	5.9	19.5	5.1
2100	22	53	6.1	20.3	4.9
	21	50	5.8	19.2	5.2
	20	47	5.6	18.3	5.5
	19	44	5.3	17.2	5.8
	18	41	5.1	16.3	6.1

CRUISE PERFORMANCE WITH NORMAL LEAN MIXTURE AT 10,000 FT.

RPM	MP	% BHP	FUEL PRESSURE	GAL./ HR.	ENDURANCE 100 GAL.
2450	20	64	7.4	24.2	4.1
	19	60	6.9	22.8	4.4
	18	56	6.4	21.2	4.7
	17	52	6.0	19.7	5.1
2300	20	59	6.7	22.1	4.5
	19	55	6.3	20.9	4.8
	18	51	6.0	19.7	5.1
	17	47	5.6	18.3	5.5
2200	20	54	6.2	20.6	4.8
	19	51	5.9	19.5	5.1
	18	48	5.6	18.4	5.4
	17	44	5.3	17.3	5.8
2100	20	50	5.8	19.2	5.2
	19	47	5.6	18.2	5.5
	18	44	5.3	17.2	5.8
	17	40	5.1	16.2	6.2
	16	37	4.8	15.3	6.5

SECTION IV

WEIGHT & BALANCE
&
LOADING SCHEDULE

WIDGEON

AMPHIBIAN

WEIGHT AND BALANCE REPORT

AND

LOADING CHART

MODEL G 44A

SERIAL NO. 1435

CERTIFICATE NO. N86609

Date: _____

Prepared by: _____

Checked by: _____

Approved by: _____

JOE SPEIDEL
P.O. BOX 392
SOUTH MIAMI, FLORIDA

CAA APPROVED
DATE: July 24, 1958

CAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
GRUMMAN G-44

This aircraft Flight Manual Supplement is applicable to all Grumman G-44 aircraft approved under STC No. SA2-13 when modified in accordance with the provisions of STC No. SA2-284.

The information contained herein supplements the information contained in the Procedure Section of the basic CAA Approved Airplane Flight Manual. For Limitations, Procedures and Performance Data not contained in this supplement, consult the Manual proper.

I. LIMITATIONS SECTION

Maximum Gross Weight: 5400 lbs.

C.G. Range: 4700 lbs ($\frac{1}{14.8}$) to ($\frac{1}{22.5}$)
5400 lbs ($\frac{1}{17.0}$) to ($\frac{1}{21.9}$)

(Straight line variation between points).

II. PROCEDURES SECTION

No Change.

III. PERFORMANCE

Best rate of climb single-engine 95 Knots I/S.

CAA APPROVED H.H. Slaughter
Chief, Aircraft Engineering Division

WIDGEON

LOADING CHART

TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
Introduction	3
Sample Loading	4
Airplane Weighing Data	5
Passenger & Cargo Loading Diagram	6
Fuel, Oil, and Compartment Loading Chart	7
Center of Gravity Limit Chart	8-8(a)
Equipment Installed When Weighed	V-1, V-2, V-3, V-4

WIDGEON

LOADING CHART

INTRODUCTION

The Federal Aviation Agency requires that a loading chart or device be prepared and made a part of the Weight and Balance Report for each individual airplane. This is done by Grumman for every new airplane and also for any airplanes altered at the factory. When the airplane is altered in the field the Loading Chart must be altered accordingly. A method for keeping a running log of the airplane "Basic Weight and Index" is provided on page 5 where all changes may be entered.

In an attempt to provide a more usable Loading Chart, a tabular type chart has been prepared rather than a graph type. Although this method is not quite as accurate as the coordinate graph, it is satisfactory. With this type of chart the operator is able to determine take-off and landing weight, center of gravity location to the nearest inch aft of the L.E.W., and ascertain if these c.g. locations fall within the airplane operational limits. These limits are the absolute c.g. limits (14.80" to 22.5") aft of the L.E.W.

For simplicity, and in order to agree with the current Federal Aviation Agency airplane specifications, the L.E.W. has been selected as zero datum point for preparing the loading chart.

To simplify the method of depicting moments of the airplane, the term "Index Unit" is used. The "Index Unit" for an item is computed by substituting in the following expression:

$$\text{Index Unit} = \frac{A \times W}{1000}$$

where: A-arm to c.g. of item in inches from the datum.
(Forward = minus Aft - plus)

W = weight of item in pounds

WIDGEON

LOADING CHART

To clarify the use of the loading chart, the following sample loading will be discussed in detail:

SAMPLE LOADING

<u>Item</u>	<u>Weight</u>	<u>Index Unit</u>
Basic Weight (Sample Only)*	3522	66.63
Plus Items of Useful Load:		
Fuel (80 Gals)	480	10.08
Passengers:		
Position FWD (1)	170	-1.02
AUX (1)	170	+3.23
Baggage:		
Compt. A	20	-1.40
Compt. E	100	+9.00
Take-Off Gross Weight	4462	86.52

The basic weight and index unit is obtained from the Log on page 6. For loading 80 gals. of fuel in the wing tanks, refer to fuel chart on page 7, and follow down the gallon column until 80 is reached, then read across to the right for the weight in the next column and the index unit in the third column. The weight and index unit for the cargo is determined in a similar manner by referring to the appropriate chart on the same page.

The take-off gross weight and index unit is totaled, (The Gross Weight must not exceed the maximum allowable), and by referring to the Center of Gravity Limit Chart (page 8), it is possible to determine the airplane C.G. to the nearest inch aft of the L.E.W. The index unit will appear on line with the gross weight used only if C.G. is within allowable limits. Since the take-off gross weight for the sample above is 4462 lbs., it is well within the gross weight limitations. The index unit for this weight is 86.52. Now run your pencil down the "Gross Weight" side of the chart to 4650# which is closest to 4462#. Then follow across to the right until you reach 70.95 which is the nearest index unit and read vertically upward to find the C.G. In this case the take-off C.G. is at approximately 17" aft of the L.E.W. Since the loading condition falls within the loading limits, the loading is satisfactory. If the C.G. should fall outside the maximum indicated loading limits, the loading must be revised by shifting either passengers or cargo, or both, so that these maximum limits are not exceeded.

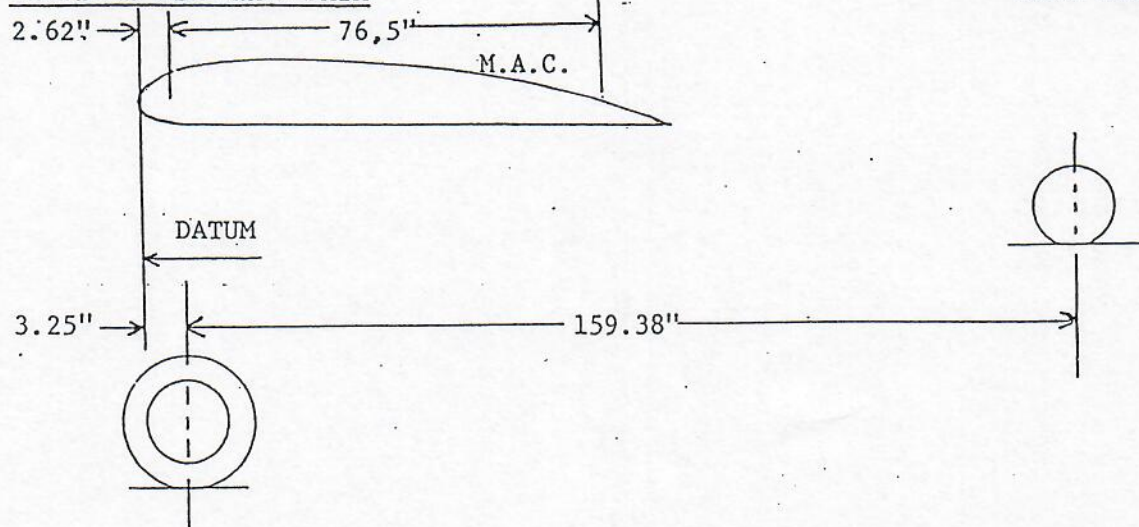
It should be noted that cargo or baggage can be substituted for a passenger at the passenger position at any time.

*Includes full oil (20 qt.)

WIDGEON N86609
LOADING CHART

DATE WEIGHED 22 Jul.'89

AIRPLANE WEIGHING DATA



	<u>SCALE READING</u>	<u>TARE</u>	<u>NET</u>
RIGHT WHEEL	1723	0	1723
LEFT WHEEL	1736	0	1736
TAIL WHEEL	321	0	321
TOTAL	3779	0	3779

C.G. LOCATION-AIRCRAFT AS WEIGHED

AIRCRAFT WEIGHED - Fuel Empty
Oil Full (20 qt.)

$$\text{MAIN WHEEL C.G.} = \frac{(1723 + 1736) \times 3.25}{3779} = 2.97" \text{ Aft L.E.W.}$$

$$\text{TAIL WHEEL C.G.} = \frac{321 \times (159.38 + 3.25)}{3779} = \frac{13.81"}{16.78"} \text{ Aft L.E.W.}$$

C.G. As Weighed is 16.78" Aft. L.E.W.

THE WEIGHT EMPTY IS 3779 AND THE CORRECTED C.G. IS 16.78" AFT OF DATUM LINE.

WEIGHING WITNESSED BY

Tony Brunson

Tony Brunson
ASP 259/19585

12-01-91 REVISED SEE NEXT PAGE

DATE	DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE			BASIC WEIGHT EMPTY RUNNING TOTAL		
		WEIGHT (LBS)	HORIZONTAL C.G.		WEIGHT (LBS)	HORIZONTAL C.G.	
			*ARM	MOMENT		*ARM	MOMENT
7-22-89	Initial Aircraft Weight + Balance				3779.00	16.78	63411.62
12-1-90	Removed Bendix Transponder TR-641B S/N 1202	- 3.50	- 40	+ 140.00	3775.50		
12-1-90	Installed King Transponder KF76A S/N 77397	+ 3.10	- 40	- 124.00	3778.60		
4-24-91	Removed Narco Mk-12B S/N 14 EVO +VOA-5 VOR/LOC Ind. S/N 34 EVO	- 9.50	- 40	+ 380.00	3769.10		
4-24-91	Removed Narco Power Supply T24MP12A S/N 16 CMC	- 4.00	- 10	+ 40.00	3765.10		
4-24-91	Removed Narco Glide Slope Receiver UGR-2 S/N 126MS	- 2.10	- 52	+ 109.20	3763.00		
4-24-91	Installed King KX-155 S/N 89449 + KI209 VOR/LOC Ind. S/N 57249	+ 6.45	- 40	- 258.00	3769.45		
9-8-91	Removed Narco Marker Beacon MBT-12 S/N 20GR3	- 1.20	- 35	+ 42.00	3768.25		
9-8-91	Installed King Marker Beacon KR-22 S/N 8015	+ 0.40	- 35	- 14.00	3768.65		
12-5-91	Installed Tomorrow Loran-C Model 604 S/N 38429	+ 3.19	- 40	- 127.60	3771.84		
9-9-95	Removed Oil Screen #2 Engine	- .75	- 10	+ 7.50	3771.09		
9-9-95	Installed Cessna Oil Filter Adapter P/N 1250922-6 + CH 48108 Filter	+ 4.40	- 10	- 44.00	3775.49		
9-9-95	Removed Oil Screen #1 Engine	- .75	- 10	+ 7.50	3774.74		
9-9-95	Installed Cessna Oil Filter Adapter P/N 1250922-6 + CH 48108 Filter	+ 4.40	- 10	- 44.00	3779.14		

(CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE)

Serial No.



DATE	DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE			BASIC WEIGHT EMPTY RUNNING TOTAL		
		WEIGHT (LBS)	HORIZONTAL C.G.		WEIGHT (LBS)	HORIZONTAL C.G.	
			*ARM	MOMENT		*ARM	MOMENT
4-5-96	Removed R.C. Allen Div. Gyro Model 200-5 S/N 13350	- 2.90	- 35	+ 101.50	3776.24		
4-5-96	Removed King KE 209 VOR/LOC Ind. S/N 57249	- 1.20	- 35	+ 42.00	3775.04		
4-5-96	Installed Century H.I. NSD-360A S/N 1-8227	+ 4.80	- 35	- 168.00	3779.84		
4-5-96	Installed King KN-72 VOR/LOC Converter S/N 4254	+ 1.31	- 52	- 68.12	3781.15		
4-5-96	Installed Northern Air Tech. Remote Switch RS08 #V8510	+ 0.38	- 52	- 19.76	3781.53		
4-5-96	Removed King KX 170B NAV/COM S/N 53219	- 7.40	- 40	+ 296.00	3774.13		
4-5-96	Installed King KX 155 NAV/COM S/N 45107	+ 5.30	- 40	- 212.00	3778.43		
4-5-96	Removed KE 201C VOR/LOC Ind S/N 31740	- 2.40	- 35	+ 84.00	3777.03		
4-5-96	Installed King KE 209 VOR/LOC Ind S/N 57249	+ 1.20	- 35	- 42.00	3778.23		
1-30-97	Removed R.C. Allen Att. Ind. Gyro RCA 21-16 S/N 15415	- 2.20	- 35	+ 77.00	3776.03		
1-30-97	Installed Att. Ind. Gyro 52067	+ 2.70	- 35	- 94.50	3778.73		
1-30-97	Installed Century Roll Servo IC470-1-647R	+ 2.30	+ 37	+ 85.10	3781.03		
1-30-97	Installed Century Pitch Servo IC470-1-647P	+ 2.30	+ 158	+ 363.40	3783.33		
1-30-97	Installed Century Pitch Trim Servo IC649-6-647	+ 2.20	+ 125	+ 275.00	3785.53		
(CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE)							

Serial No. _____



DATE	DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE			BASIC WEIGHT EMPTY RUNNING TOTAL		
		WEIGHT (LBS)	HORIZONTAL C.G.		WEIGHT (LBS)	HORIZONTAL C.G.	
			*ARM	MOMENT		*ARM	MOMENT
1-30-97	Installed Century Amplifier 1C515-3	+ 2.30	- 45	- 103.50	3787.83		
1-30-97	Installed Century Altitude Hold 1-C407	+ 0.80	- 58	- 46.40	3788.63		
1-30-97	Installed Century Console 1C404	+ 1.30	- 22	- 28.60	3789.93		
1-30-97	Installed Century Relay Box 1A526-1	+ 0.25	- 45	- 11.25	3790.18		
1-30-97	Installed Century Electronic Pitch Trim Amplifier 1C709-24	+ 0.70	+ 125	+ 87.50	3790.88		
1-30-97	Installed Century Auto-Pilot cables	+ 2.20	- 10	- 22.00	3793.08		
1-30-97	Installed Century Radio Coupler 1C388-2 SN 5042	+ 1.00	- 35	- 35.00	3794.08	16.89	64086.59

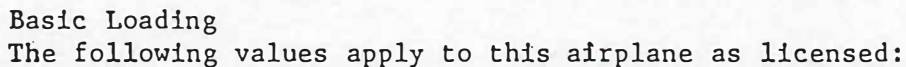
(CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE)

Serial No. _____



LOADING CHART

Maximum allowable take off weight	Land	<u> </u>
	Sea	<u> </u>



ITEM	Weight	Arm	H-MOM	Index
Empty weight				
Pilot				

*See p. 7 for latest Basic Weight & Index Unit

2. It is the responsibility of the owner and the pilot to insure that that the airplane is loaded properly. The Empty Weight and Empty Weight c.g. are listed on page 5 for this airplane as delivered from the factory. If the airplane has been altered, refer to the latest approved Alteration and Repair Form A.C.A.-337 for the information necessary to revise the Airplane Basic Weight on page 7 of this report.

WIDGEON LOADING CHART

COMPARTMENT LOADS

Lbs.	Comp't. Letter & Index Units				
	A	B	C	D	E
10	-1.70	-.06	+.19	+.52	+.90
20	-1.40	-.12	+.38	+1.04	+1.30
40	-2.80	-.24	+.76	+2.08	+3.60
60		-.36	+1.14	+3.12	+5.10
80		-.48	+1.52	+4.16	+7.20
100		-.60	+1.90	+5.20	+9.00
120		-.72	+2.28	+6.24	+10.60
140		-.84	+2.66	+7.28	+12.60
160		-.96	+3.04	+8.32	+14.40
180		-1.08	+3.42	+9.36	+16.20
200		-1.20	+3.80	+10.40	+18.00
220		-1.32	+4.18	+11.44	+19.80
240		-1.44	+4.56	+12.48	+21.60
260		-1.56	+4.94	+13.52	+23.40
280		-1.68	+5.32	+14.56	+25.20
300		-1.80	+5.70	+15.60	+27.00
320		-1.92	+6.08	+16.64	+28.80
340		-2.04	+6.46	+17.68	+30.60
360		-2.16	+6.84	+18.72	+32.40
380		-2.28	+7.22	+19.76	+34.20
400		-2.40	+7.60	+20.80	+36.00

FUEL (6#/gal.) (ARM +21)

Gal.	Lbs.	Index Units
5	30	.63
10	60	1.26
15	90	1.89
20	120	2.52
25	150	3.15
30	180	3.78
35	210	4.41
40	240	5.04
45	270	5.67
50	300	6.30
55	330	6.93
60	360	7.56
65	390	8.19
70	420	8.82
75	450	9.45
80	480	10.08
85	510	10.71
90	540	11.34
95	570	11.97
100	600	12.60
105	630	13.23
108	648	13.61
110	660	13.86
115	690	14.49

OIL 7.5 lbs. per gal.
Arm -20.0"

Gal.	LBS	Index Units
1	7.5	
2	15.0	
3	22.5	
4	30.0	
5	37.5	
6	45.0	

-.15
-.30
-.45
-.60
-.75
-.90

WIDGEON LOADING CHART
C.G. CHART

Weight C.G. Inches Aft of LEW	Index Units									Weight
	14.85	16	17	18	19	20	21	22	22.5	
	16.00	17.5	18.8	20.1	21.4	22.7	24.0	25.3	26.0	
3150	46.78	50.40	53.55	56.70	59.85	63.00	66.15	69.30	70.88	3150
75	47.15	50.80	53.98	57.15	60.32	63.50	66.68	69.85	71.44	75
3200	47.52	51.20	54.40	57.60	60.80	64.00	67.20	70.40	72.00	3200
25	47.89	51.60	54.82	58.05	61.28	64.50	67.72	70.95	72.56	25
50	48.26	52.00	55.25	58.50	61.75	65.00	68.25	71.50	73.12	50
75	48.63	52.40	55.68	58.95	62.22	65.50	68.78	72.05	73.69	75
3300	49.00	52.80	56.10	59.40	62.70	66.00	69.30	72.60	74.25	3300
25	49.38	53.20	56.52	59.85	63.18	66.50	69.82	73.15	74.81	25
50	49.75	53.60	56.95	60.30	63.65	67.00	70.35	73.70	75.38	50
75	50.12	54.00	57.38	60.75	64.12	67.50	70.88	74.25	75.94	75
3400	50.49	54.40	57.80	61.20	64.60	68.00	71.40	74.80	76.50	3400
25	50.86	54.80	58.22	61.65	65.08	68.50	71.92	75.35	77.06	25
50	51.23	55.20	58.65	62.10	65.55	69.00	72.45	75.90	77.62	50
75	51.60	55.60	59.08	62.55	66.02	69.50	72.98	76.45	78.19	75
3500	51.98	56.00	59.50	63.00	66.50	70.00	73.50	77.00	78.75	3500
25	52.35	56.40	59.92	63.45	66.93	70.50	74.02	77.55	79.31	25
50	52.72	56.80	60.35	63.90	67.45	71.00	74.55	78.10	79.88	50
75	53.09	57.20	60.78	64.35	67.92	71.50	75.08	78.65	80.44	75
3600	53.46	57.60	61.20	64.80	68.40	72.00	75.60	79.20	81.00	3600
25	53.83	58.00	61.62	65.25	68.88	72.50	76.12	79.75	81.56	25
50	54.20	58.40	62.05	65.70	69.35	73.00	76.65	80.30	82.12	50
75	54.57	58.50	62.48	66.15	69.82	73.50	77.18	80.85	82.68	75
3700	54.94	59.20	62.90	66.60	70.30	74.00	77.70	81.40	83.25	3700
25	55.32	59.60	63.32	67.05	70.78	74.50	78.22	81.95	83.81	25
50	55.69	60.00	63.75	67.50	71.25	75.00	78.75	82.50	84.38	50
75	56.06	60.40	64.18	67.95	71.72	75.50	79.28	83.05	84.94	75
3800	56.43	60.80	64.60	68.40	72.20	76.00	79.80	83.60	85.50	3800
25	56.80	61.20	65.02	68.85	72.68	76.50	80.32	84.15	86.06	25
50	57.17	61.60	65.45	69.30	73.15	77.00	80.85	84.70	86.62	50
75	57.54	62.00	65.88	69.75	73.62	77.50	81.38	85.25	87.19	75
3900	57.92	62.40	66.30	70.20	74.10	78.00	81.90	85.80	87.75	3900
25	58.29	62.80	66.72	70.65	74.58	78.50	82.42	86.35	88.31	25
50	58.66	63.20	67.15	71.10	75.05	79.00	82.95	86.90	88.88	50
75	59.03	63.30	67.57	71.55	75.52	79.50	83.48	87.45	89.44	75
4000	59.40	64.00	68.00	72.00	76.00	80.00	84.00	88.00	90.00	4000
25	59.77	64.40	68.42	72.45	76.48	80.50	84.52	88.55	90.56	25
50	60.14	64.80	68.85	72.90	76.95	81.00	85.05	89.10	91.12	50
75	60.51	65.20	69.28	73.35	77.42	81.50	85.58	89.65	91.69	75
4100	60.88	65.60	69.70	73.80	77.90	82.00	86.10	90.20		4100
25	61.26	66.00	70.12	74.25	78.38	82.50	86.62	90.75		25
50	61.63	66.40	70.55	74.70	78.85	83.00	87.15	91.30		50
75	62.00	66.80	70.93	75.15	79.32	83.50	87.68	91.85		75
4200	62.37	67.20	71.40	75.60	79.80	84.00	88.20	92.40		4200
25	62.74	67.60	71.82	76.05	80.28	84.50	88.72	92.95		25
50	63.11	68.00	72.25	76.50	80.75	85.00	89.25	93.50		50
75	63.48	68.40	72.68	76.95	81.22	85.50	89.78	94.05		75
4300	63.85	68.80	73.10	77.40	81.70	86.00	90.30	94.60		4300
25	64.23	69.20	73.52	77.85	82.18	86.50	90.82	95.15		25
50	64.60	69.60	73.95	78.30	82.65	87.00	91.35	95.70		50
75	64.97	70.00	74.33	78.75	83.12	87.50	91.88	96.25		75

WIDGEON LOADING CHART (CON'T)

C.G. CHART

Weight	Index Units									Weight
J.G. Inches										
Aft of LEW	14.85	16	17	18	19	20	21	22	22.5	
	16.00	17.5	18.8	20.1	21.4	22.7	24.0	25.3	26.0	
4400	65.34	70.40	74.80	79.20	83.60	88.00	92.40	96.80		4400
25	65.71	70.80	75.22	79.65	84.08	88.50	92.92	97.35		25
50	66.08	71.20	75.65	80.10	84.55	89.00	93.45	97.90		50
75	66.45	71.60	76.08	80.55	85.02	89.50	93.98	98.45		75
4500	66.82	72.00	76.50	81.00	85.50	90.00	94.50	99.00		4500
25	67.20	72.40	76.92	81.45	85.98	90.50	95.02	99.55		25
50	67.57	72.80	77.35	81.90	86.45	91.00	95.55	100.10		50
75	67.94	73.20	77.78	82.35	86.92	91.50	96.07	100.65		75
4600	68.31	73.60	78.20	82.80	87.40	92.00	96.60	101.20		4600
25	68.68	74.00	78.62	83.25	87.67	92.50	97.12	101.75		25
50	69.03	74.40	79.05	83.70	88.35	93.00	97.65	102.30		50
75	69.42	74.80	79.47	84.15	88.82	93.50	98.17	102.85		75
4700	69.79	75.20	79.90	84.00	89.30	94.00	98.70	103.40		4700
25	70.16	75.60	80.32	85.05	89.77	94.50	99.22	103.95		25
50	70.53	76.00	80.75	85.50	90.25	95.00	99.75	104.50		50
75	70.90	76.40	81.17	85.95	90.72	95.50	100.27	105.05		75
4800	71.27	76.80	81.60	86.40	91.20	96.00	100.80	105.80		4800
25	71.64	77.20	82.02	86.85	91.67	96.50	101.32	106.15		25
50	72.01	77.60	82.45	87.30	92.15	97.00	101.85	106.70		50
75	72.38	78.00	82.87	87.75	92.62	97.50	102.37	107.25		75
4900	72.75	78.40	83.30	88.20	93.10	98.00	102.90	107.80		4900
25	73.12	78.80	83.72	88.65	93.57	98.50	103.42	108.35		25
50	73.49	79.20	84.15	89.10	94.05	99.00	103.95	108.90		50
75	73.86	79.60	84.57	89.55	94.52	99.50	104.47	109.45		75
5000	74.23	80.00	84.99	90.00	94.99	100.00	105.00	110.00		5000
25			85.42	90.45	95.47	100.50	105.53	110.05		25
50			85.85	90.90	95.95	101.00	106.05	110.59		50
75			86.27	91.35	96.42	101.50	106.57	111.14		75
5100			86.70	91.80	96.90	102.00	107.10	111.69		5100
25			87.12	92.25	97.37	102.50	107.62	112.24		25
50			87.55	92.70	97.85	103.00	108.15	112.78		50
75			87.97	93.15	98.32	103.50	108.67	113.33		75
5200			88.40	93.60	98.80	104.00	109.20	113.88		5200
25			88.82	94.05	99.27	104.50	109.72	114.43		25
50			89.25	94.50	99.75	105.00	110.02	114.97		50
75			89.67	94.95	100.22	105.50	110.77	115.52		75
5300			90.10	95.40	100.70	106.00	111.13	116.07		5300
25			90.52	95.85	101.17	106.50	111.82	116.62		25
50			90.95	96.30	101.65	107.00	112.35	117.16		50
75			91.37	96.75	102.12	107.50	112.87	117.71		75
5400			91.80	97.20	102.60	108.00	113.40	118.26		5400

A	Pilot #170	F	Pilot #170
	Full Fuel		Copilot #170
B	Pilot #170		Full Fuel
	Copilot #170		Compt C #320
	Full Fuel		" D #320
C	Pilot #170	G	Pilot + Fuel
	Copilot #170		Copilot #170
	Pass - 1 #170		Compt D #320
	Full Fuel		" E #320
D	Pilot #170	H	Pilot #170
	Copilot #170		Copilot #170
	Pass - 1 #170		Full Fuel
	Pass - 2 #170		Compt C #320
	Full Fuel		E #320
E	Pilot #170	I	Pilot
	Copilot #170		Copilot
	Full Fuel		Full Fuel
	Compt C #213		Compt C #639
	" D 213		
	" E 213		

J Pilot

Co-Pilot

Full Fuel

Compt D #639

K Pilot

Co Pilot

Full Fuel

Compt E #639

L Pilot #170

Co Pilot #170

Pass-1 #170

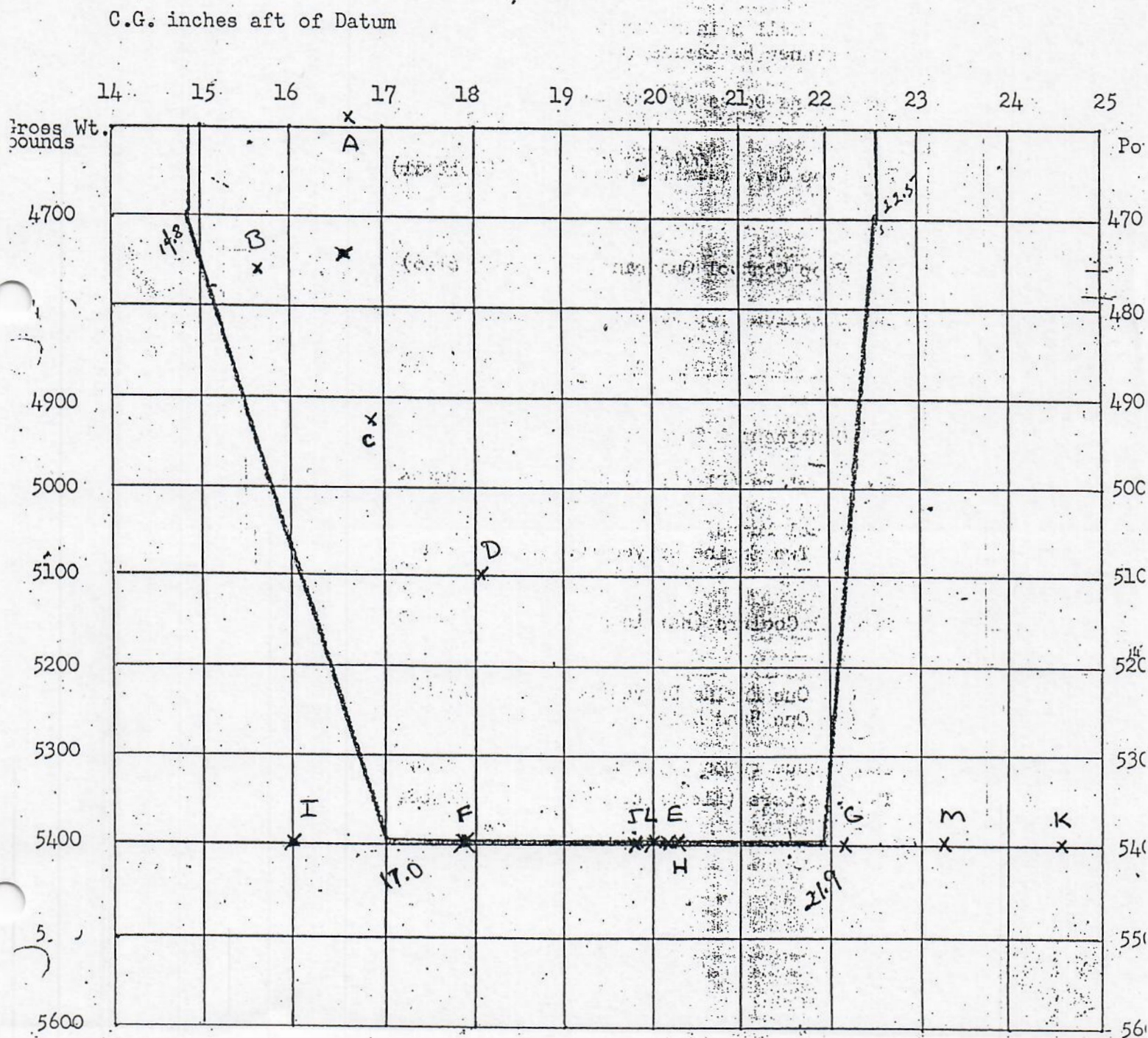
Compt C #156

" D #156

" E #156

Full Fuel

Graphic presentation of necessary constricting of C.G. Range between the gross weights of 4700 lbs and the present maximum gross weight of 5400 lbs as noted on AOA 337 Dated 12/23/59.



SECTION V

EQUIPMENT LIST

Engine and Accessories

	Wt. Each	Arm
2 ea. Continental Engine IO470D	426	-20.3
2 ea. Propeller-Hartzell HCA2XF-2/2A	73	-44.9
2 ea. Prop Spinner-Cessna #0850311-1		
2 ea. Prop Backplate-Cessna #0850300-6		
2 ea. Prop Governors-Hartzell B-3	4	-35.8
2 ea. Prop Controls Teleflex	1.8	-25.0
2 ea. Throttle Controls Teleflex	1.5	-20.0
2 ea. Mixture Controls Cessna #0861202-1	3.0	-6.0
2 ea. Oil Cooler-Harrison #626189	6.5	-35.0
2 ea. Alternator-Delco Remy #1100748		-9.5
2 ea. Starter Delco Remy #1109909	14.0	-7.5
2 ea. Tach Generator-Chicago Flex #5531-1	2.0	-7.0
2 ea. Vacuum Pump-Airborne #212CW	1.8	-7.0
1 ea. Hydraulic Pump Eng Driven Pesco #1P-349-L	3.5	-7.0
Hydraulic Pump Hand-Bowser #190	3.0	-15.0

Electrical

	Wt. Each	Arm
2 ea. Batteries Rebat R-35	27.0	+46.5
1 ea. Rotating Beacon Grimes #7080A		
2 ea. Position Lights Wing (Grimes Bulb # 1524)		
1 ea. Position Lights Rudder (GE Bulb #1683)		
2 ea. Fuel Boost Pump-Dukes #4404-00-1	2.1	
1 ea. Pitot Head-Heated Kollsman #369D-012		
2 ea. Landing Light (GE Bulb #4613)		
2 ea. Maplight Grimes #15-Q015-1 (GE Bulb #313)		
2 ea. Voltage Regulator-Delco Remey 1116399		
1 ea. Overvoltage Relay-RBM Controls #138-2		
1 ea. Master Solenoid #8780-2		
2 ea. Starter Solenoid Borg Warner #S-56		
1 ea. Leigh Share-7-E.L.T.	1.5	

Landing Gear and Floats

	Wt. Each	Arm
2 ea. Cleveland Wheels and Brakes Tires and Tubes	94	+3.25
2 ea. Wing Tip Floats-Struts and Wires	45	+14.0
1 ea 10" Tailwheel	5	+164.0

Bow Compartment

	Wt.	Each	Arm
Anchor and Rope			
1 ea. Vacuum Manifold-Airborne 1H5-1	.42		
2 ea. Vacuum Regulating Valve-Airborne 2H3-2	.32		
1 ea. Airborne Vacuum Filter D9-14-5			

Cockpit

1 ea. Rudder Bar	-33.0
1 ea. Dual Control Yoke Attachment	-22.0

Cabin

2 ea. Passenger Seat	19	+52.0
1 ea. Auxilliary Seat	10	+19.0

Aft Compartment

2 ea. Life Jackets-EAM-KS-9	1.1	+118.0
1 ea. Fire Extinguisher-AMEREX Model 352	4.88	+118.0

ELECTRONICS

	weight	arm
1 ea. King KX 170B NAV/COM S/N 53719	7.0	-30
1 ea. King KI 201C VOR IND S/N 31740	2.4	-30
1 ea. King KX 155 NAV/COM S/N 89149	5.25	-30
1 ea. King KI 209 VOR IND S/N 57249	1.2	-30
1 ea. King KR 22 Marker Beacon S/N 8015	.4	-30
1 ea. King KT 76A Transponder S/N 77397	3.1	-30
1 ea. King KA 25 Audio Amp.	1.31	-30
1 ea. Tomorrow Loran C mod 604 S/N 38429	3.19	-30
1 ea. Electronic Craftsmen power supply Mod. 28-14-4A	1.25	
1 ea. Dorn & Margolin DMNI-1 70-1 Transponder Ant.	.25	
2 ea. Dorn & Margolin DM-C-63-1A VHF COM Ant.	.4	
1 ea. Dorn & Margolin DMN-43-1 Marker Beacon Ant.	1.0	
1 ea. Dorn & Margolin DMN-48-1 VOR Ant.	1.13	
1 ea. Dorn & Margolin DMN-23-1 Triplexer	.25	
1 ea. David Clark 10B-A Headset		
1 ea. Narco M700B Microphone	.63	
2 ea. David Clark H10-40 Headset		
1 ea. SRC-10B Stereo Intercom	1.31	-30
1 ea. King KPN-050-1578-00 Voltage Changeover Kit	.46	
1 ea. ACK A30 Altitude Encoder	.44	