

FAA APPROVED
AIRPLANE FLIGHT MANUAL

HELIO AIRCRAFT LIMITED
PITTSBURG, KANSAS

MODEL H-700

SERIAL NUMBER _____

REGISTRATION NUMBER _____

THIS DOCUMENT MUST BE IN THE AIRPLANE AND
AVAILABLE TO THE PILOT DURING FLIGHT

FAA APPROVED A.R. Pardu, Jr.
FOR Manager, Wichita Aircraft Certification Office,
Central Region, Federal Aviation Administration
Wichita, Kansas

DATE: January 18, 1984

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HELIO MODEL H-700

LOG OF REVISIONS

Rev. No.	Page Numbers	Description	Date	Approved By*
Orig.	1 thru 8	Initial Flight Manual	Jan 18/84	A R PARDUHN, Jr

*Manager, Wichita Aircraft Certification Office.
Central Region, Federal Aviation Administration
Wichita, Kansas

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I. LIMITATIONS

The following limitations must be observed in the operation of this airplane:

- A. Engine: Lycoming TIO-540-J2B
- B. Engine Limits: 49 inches manifold pressure, 2575 RPM
- C. Fuel: 100/100LL Aviation fuel
120.5 gallons usable
Usable fuel main tanks (inboard tanks) 60.2
Transferable fuel aux. tanks (outboard tanks)
60.3
- D. Propeller: Hartzell Constant Speed:
Hub HC-E3YR-1RF
Blade: F9587A-10
Diameter: 87 in. max.
Pitch setting at 30 in. station:
Low $13^{\circ} +0.3^{\circ}$
High 31°
- E. Power Plant Instruments:
- Cylinder Head Temp. Green arc: $100^{\circ} - 475^{\circ} F$
Yellow arc: $475^{\circ} - 500^{\circ} F$
Red Radial: $500^{\circ} F$
- Turbine Inlet Temperature: Placard Limit $1550^{\circ} F$
- Manifold Pressure: Red Radial: 49" Hg.
- Tachometer: Green arc: 2200 to 2575 RPM
(Normal Operating Range)
Red Radial: 2575 RPM
- Fuel Pressure: Green arc: 34 to 55 psi
Red Radials: (Min) 34 and (Max) 55 psi
- Oil Temperature: Green arc: $120^{\circ} - 245^{\circ} F$
Yellow arc: $50^{\circ} - 120^{\circ} F$
Red Radial: $245^{\circ} F$

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I. LIMITATIONS (Cont'd)

E. Power Plant Instruments: (Cont'd)

Oil Pressure: Green arc: 60 to 90 psi
 Yellow arcs: 25 to 60 psi
 90 to 115 psi
 Red Radial: (Min) 25 and (Max) 115 psi

F. Airspeed Limits: (Calibrated Airspeed)

Never exceed (V_{ne}) 168 Kts (Red Radial)
Caution Range 133 - 168 Kts (Yellow Arc)
Design Cruising Speed (V_c) 133 Kts
Normal Operating Range 52 - 133 Kts (Green Arc)
Max. Design Maneuvering
Speed (V_p) 93 Kts
Max. Flap Extension Speed
(V_f) 83 Kts
Flap Operating Range 47 - 83 Kts (White Arc)
Approach Flap Speed - 15° 96 Kts

NOTE: Airspeed Instrument markings and their significance:

1. RED Radial line marks the never exceed speed.
2. YELLOW Arc denotes speeds for operating with caution.
3. GREEN Arc denotes normal operating speed range.
4. WHITE Arc denotes speed range in which flaps may be safely lowered.

G. Maneuvers: Normal Category maneuvers only are approved. Spins are prohibited.

H. Flight Load Factors: (At max. gross weight of 3800 lbs.)

Maneuvers: Positive: 3.8 g Negative: 1.5 g
Flaps extended: 2.0 g

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I. LIMITATIONS (Cont,'d)

- WARNING:
1. Use controls with caution above 93 Kts CAS.
 2. In gusty air, it is advisable to reduce cruising speed below normal, and in severe turbulence reduce speed below 93 Kts Flaps up and below 65 Kts Flaps down.

I. Maximum Weight: 3800 lbs.

J. Center of Gravity Limits: (101) to (108.5) at 3800 lbs.
(98) to (108.5) at 2600 lbs or less
Straight line variation bewteen points given

DATUM: Datum is 60 inches forward of fuselage station
0. (Station 0 is at upper attachment of engine
mount to fuselage.)

SEATS: Six (6)
Two at 103.5 inches aft of Datum
Two at 136 inches aft of Datum
Two at 162 inches aft of Datum

NOTE: It is the responsibility of the airplane owner and the pilot
to insure that the airplane is properly loaded.

K. Placards:

- a. 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.
2. No acrobatics, manuevers, including spins, approved.
3. Design maneuvering speed 93 Kts.

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II. PROCEDURES (Cont'd)

A. Normal Procedures: (Cont'd)

6. Altitude loss during the recovery from a stall may be as much as 600 feet at higher altitudes
7. Before T.O. check cargo door pins for security.
8. To transfer fuel - wait until main tank's quantity is less than 3/4. Monitor fuel quantity during transfer to avoid overflow. Transfer fuel in level flight only. Transfer lights indicate switch is ON.
9. To prevent mixture from becoming too rich above critical engine altitude DO NOT reduce manifold pressure below 30" Hg. before reducing fuel flow to 25 gal/hr.
10. If engine does not respond to throttle movement above critical engine altitude, retard throttle, turn propeller control two (2) turns counter clockwise to reduce rpm, and adjust mixture to start engine.
11. Use of the fuel boost pump above 12,000 feet may be desirable to maintain a steadier fuel pressure.
12. The Turbine Inlet Temperature "TIT" measures the Exhaust Gas Temperature just prior to its entering the turbine. The TIT has a direct reading - constant display gage. The TIT may be changed by leaning or richening the mixture. Do not lean when the manifold pressure exceeds 40 Hg. Do not allow the TIT to exceed 1550° F.
13. Move throttle slowly at altitudes above 15,000 critical engine altitude to prevent engine surge due to lag in turbine response.
14. Do not operate at more than 30" MP below 2400 RPM.

B. Abnormal Procedures:

1. ELECTRIC TRIM MALFUNCTION

If the electric trim MALFUNCTIONS depress the TRIM DISC button and hold depressed until the TRIM CONTROL circuit breaker has been pulled.

If the trim fails at either extreme position slow the airplane to 70 Kts or less and land as soon as practical.

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II. PROCEDURES (Cont,'d)

B. Abnormal Procedures: (Cont'd)

2. STATIC SOURCE MALFUNCTION

If the static source malfunctions move the STATIC PRESSURE SELECTOR VALVE to ALTERNATE SOURCE position, with the ALTERNATE SOURCE selected, subtract the following amounts from the indicated airspeed and altimeter readings to correct fro ALTERNATE SOURCE ERROR.

<u>Airspeed - Kts</u>	<u>A/S - Correction</u>	<u>ALT - Correction</u>
60	14	30
70	14	50
80	15	75
90	15	100
100	16	130
110	16	160
120	17	180
130	18	210
140	18	240

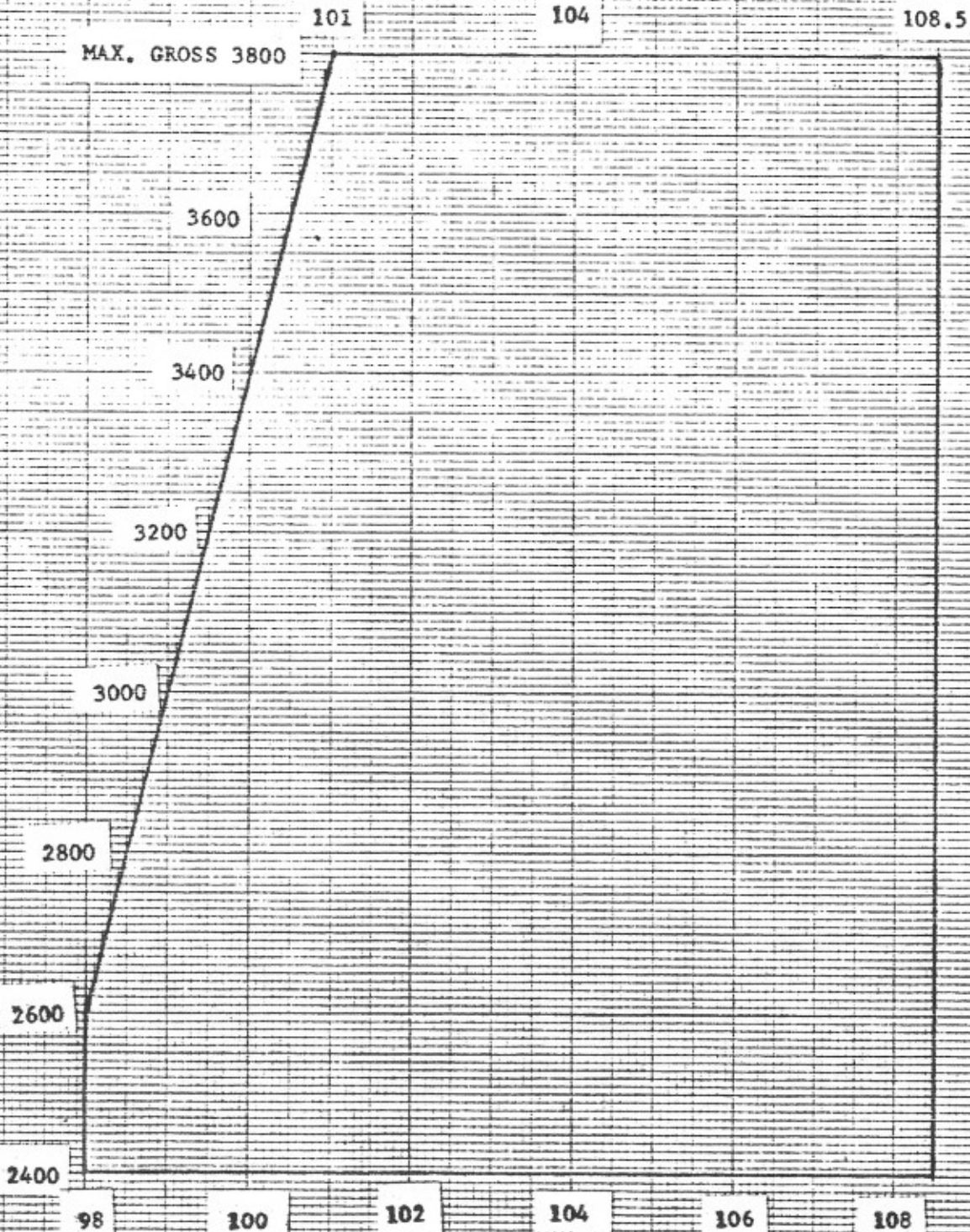
C. Emergency Procedures:

1. Engine Failure

To permit a landing flare, maintain an airspeed of at least 60 Kts.

HELIO MODEL H-700
WEIGHT AND BALANCE
CENTER OF GRAVITY ENVELOPE

MAX. GROSS 3800



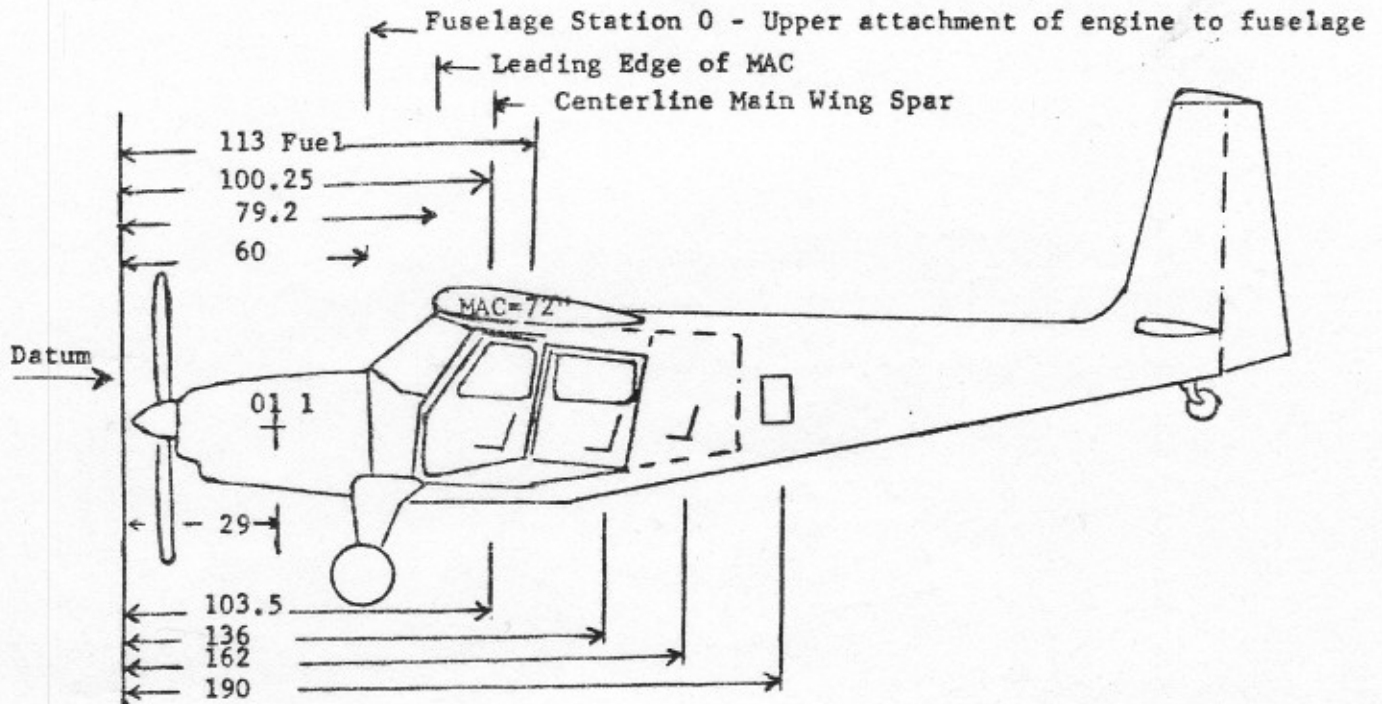
FURENE DIETZGEN CO.
MADE IN U. S. A.

NO. 340-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

HELIO MODEL H- 700

SERIAL NO. _____

WEIGHT and BALANCE



CENTER OF GRAVITY - MOMENT - WEIGHT

ITEM	WEIGHT	ARM	MOMENT
BASIC WEIGHT			
Pilot/CoPilot		103.5	
Passenger (40 lbs/square foot)		136	
Passenger (40 lbs/square foot)		162	
Fuel		113	
Baggage (10 lbs/square foot)		190	

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SAMPLE LOADING

Fwd C. G. Loading

<u>ITEM</u>	<u>WEIGHT</u>	<u>ARM</u>	<u>MOMENT</u>
Basic Weight	2455.5	97.8	240101.4
Pilot	170	103.5	17595
Co-Pilot	170	103.5	17595
Passengers	340	126	42840
Fuel (100 gal.)	600	113	67800
Baggage	64	162	10368
	<hr/>		<hr/>
	3799.5	104.3	396299.4

Aft C. G. Loading

<u>ITEM</u>	<u>WEIGHT</u>	<u>ARM</u>	<u>MOMENT</u>
Basic Weight	2455.5	97.8	240101.4
Pilot	170	103.5	17595
Cargo	600	144	86400
Baggage	40	190	7600
Fuel (89 gal.)	534	113	60342
	<hr/>		<hr/>
	3799.5	108.4	41033.4

POWER CHART - AVCO LYCOMING MODEL T10-540

PRESSURE ALTITUDE	STANDARD ALTITUDE TEMPERATURE	65%	75%	100%
		RPM-MP	RPM-MP	RPM-MP
	°F	2400	2400	2575
S.L.	59	29.6	33.5	43.0
1000	55	29.4	33.3	43.0
2000	52	29.3	33.2	43.0
3000	48	29.2	33.1	43.0
4000	45	29.1	33.0	43.0
5000	41	29.0	33.0	43.0
6000	38	28.9	33.0	43.3
7000	34	28.8	33.0	43.4
8000	31	28.6	32.9	43.6
9000	27	28.5	32.8	43.8
10000	23	28.4	32.8	44.0
11000	19	28.3	32.9	44.4
12000	16	28.2	32.9	44.8
13000	12	28.1	32.9	45.0
14000	9	28.1	33.0	45.5
15000	5	28.1	33.0	46.0
16000	1	28.1	33.0	46.5
17000	-2	28.1	33.1	47.0
18000	-6	28.2	33.2	46.5
19000	-9	28.2	33.4	46.1
20000	-13	28.3	33.5	46.0
21000	-17	28.4	33.8	45.0
22000	-20	28.6	33.9	44.5
23000	-24	28.8	- -	42.5
24000	-27	29.0	- -	40.5

NOTE 1: Actual MP varies with OAT.

NOTE 2: As the Deck Temperature (temperature of air from compressor to engine) increases, the Manifold Pressure increases. Therefore if the MP is running excessively high the air filter may be blocked, which causes hot air from the turbocharger area to enter the compressor through the alternate air bypass door.

AIRSPPEED SYSTEM CALIBRATION CURVE

HELIO H-700

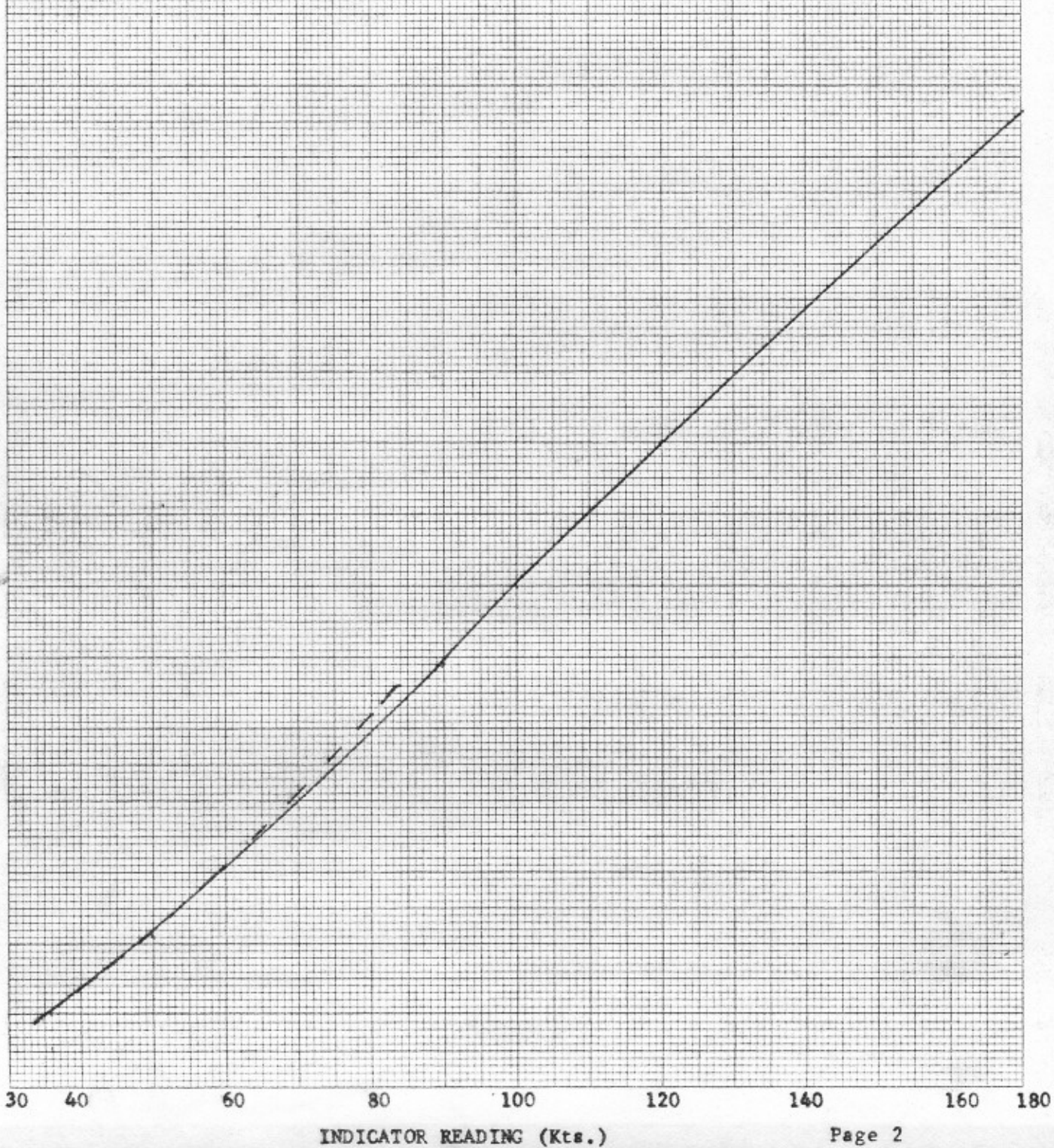
Lycoming TIO-540-J2B Engine

— Flaps UP (0°)
- - - Flaps DN (40°)

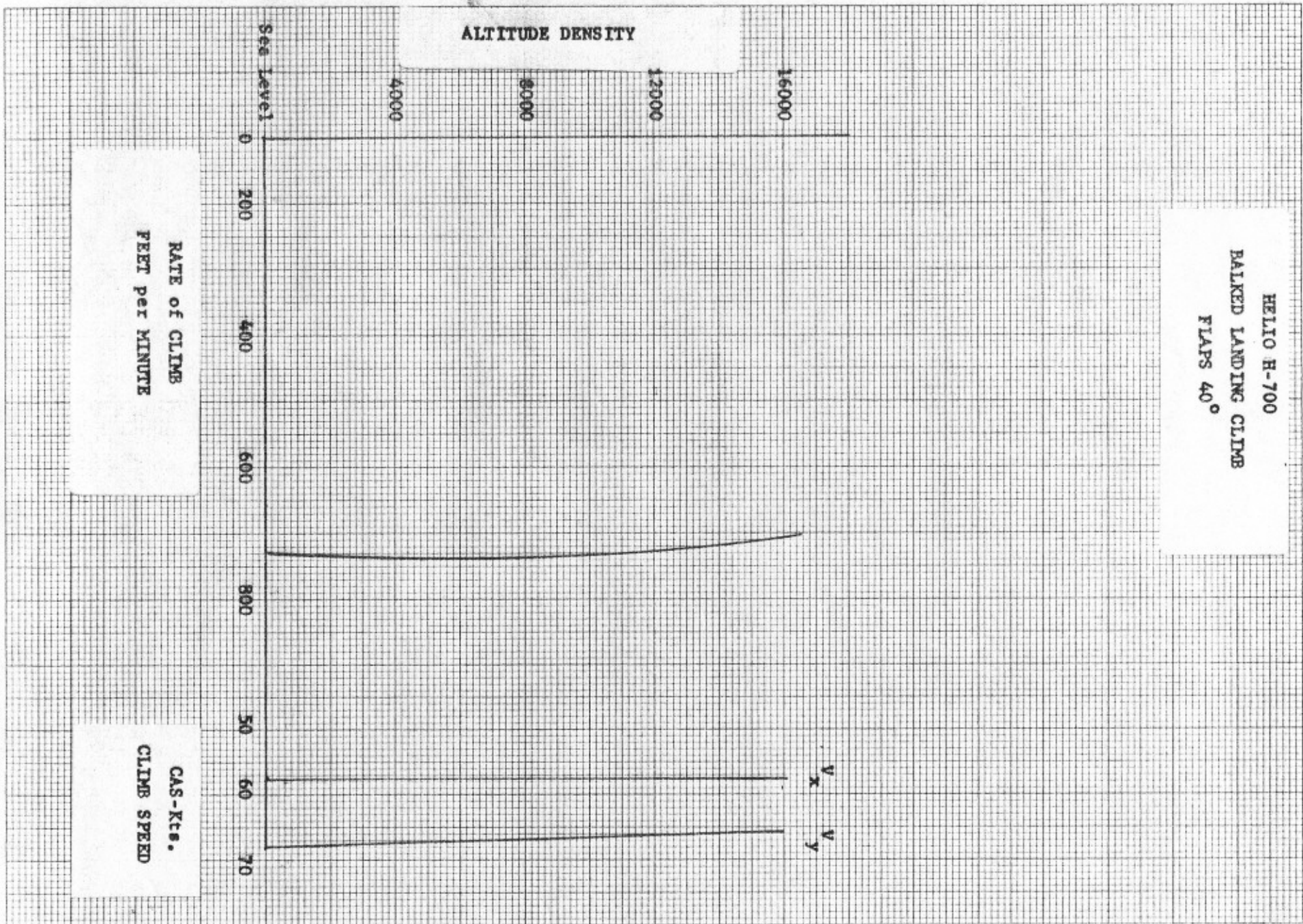
DIETZGEN CORPORATION
MADE IN U.S.A.

NO. 340-10 1/4 DIETZGEN GRAPH PAPER
10 X 10 PER HALF INCH

CALIBRATED AIRSPEED (kts.)



INDICATOR READING (Kts.)



HELIO H-700

CLIMB

0° FLAPS

28000

24000

46 1322

20000

16000

12000

8000

4000

Sea Level

Density Altitude - Feet

0

400

800

1200

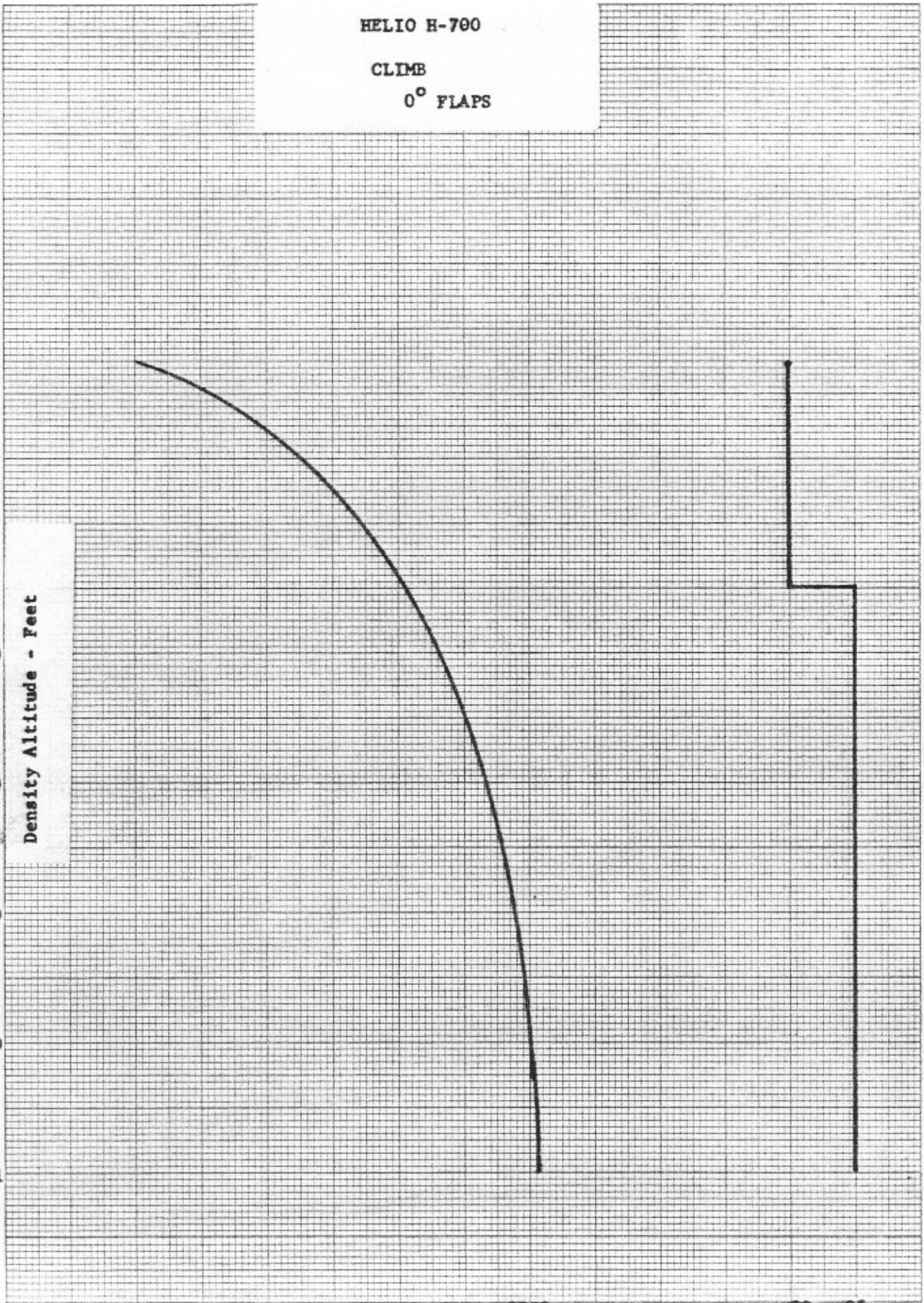
Rate of Climb-Feet/Min.

90

95

Climb Speed
Kts. CAS

K-E 10 X 10 TO 14 INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.



FUEL FLOW vs PERCENT RATED POWER
 AVCO LYCOMING MODEL T10, LT10-540J-N

COMPRESSION RATIO 7.30:1
 SPARK ADVANCE 20° BTC
 FUEL INJECTOR BENDIX RSA-10EDI
 TURBOCHARGER A2 REARCH TH06A60
 MIXTURE CONTROL - MANUAL TO FLOWMETER GAGE
 FUEL GRADE, MINIMUM 100/130

