C. A. A.

Approved Airplane Flight Manual

For the

Republic Model RC-3

This Manual must be carried in the aircraft at all times.

Serial Number	Registration Number
_____	_____

Those parts of the information contained herein noted as limitations are mandatory. All other data pertain to recommended operating practice and are not considered mandatory.

Approved by: (Charles F. Dyur)
Director, Aircraft and
Components Service

Date October 15, 1947

AMERICAN AVIATION CORPORATION
LOG OF REVISIONS

REV. NO.	PAGE NUMBER	CAA APPROVAL	DATE OF REVISION	REMARKS
1	2(a)	H. Hermes	8-23-56	Addition of HC-12X20-3E installation to those subject to -2 Plate limitations
2	3 (a)	H. Hermes	8-23-56	Addition of {Propeller Limitations applicable to HC-12X20-3E Assembly

TABLE OF CONTENTS

OPERATING LIMITATIONS

LOG OF REVISIONS

REVISION NUMBER	PAGE NO.	DATE	C.A.A. INSPECTOR	REVISION NUMBER	PAGE NO.	DATE	C.A.A. INSPECTOR
1	5f	1/6/47	(H.C. Faller)				
2	2a	1/30/47	(H.C. Faller)				
	3	1/30/47	(H.C. Faller)				
	3a	1/30/47	(H.C. Faller)				
	6	1/30/47	(H.C. Faller)				
3	2	5/20/47	(H.C. Faller)				
	2a	5/20/47	(H.C. Faller)				
	3	5/20/47	(H.C. Faller)				
	4	5/20/47	(H.C. Faller)				
	5a	5/20/47	(H.C. Faller)				
	5f	5/20/47	(H.C. Faller)				
4	2	8/20/47	(H.C. Faller)				
	2a	8/20/47	(H.C. Faller)				
	5a	8/20/47	(H.C. Faller)				
	5c	8/20/47	(H.C. Faller)				
	5d	8/20/47	(H.C. Faller)				
	5e	8/20/47	(H.C. Faller)				
5	2a	10/13/47	(H.C. Faller)				
	2b	10/13/47	(H.C. Faller)				

I. AIRPLANE OPERATING LIMITATIONS.

A. NOTE: For Weight and Center of Gravity Limitations - See Page 6.

B. Airspeed Limitations - The airspeed indicator is marked to include airspeed limitations for Normal Category Operation; markings for both Normal and Utility Category Operations as required by CAR 03.6100 are listed in Table 1. All speeds Listed are TRUE INDICATED AIRSPEEDS IN MILES PER HOUR.

TABLE 1. - AIRSPEED INDICATOR MARKINGS

		Limits			
		Normal Category 3150 lbs.		Utility Category 2810 lbs.	
SPEED	SYMBOL	Lower	Upper	Lower	Upper
•Never Exceed Speed	Red Radial Line		148		159
•Caution Range	Yellow Arc	117	148	117	159
•Normal Operating Range	Green Arc	61	117	53	117
•Flap Operating Range	White Arc	58	105	47	105
•Maneuvering Speed	No Marking		117		117

C. Maneuvers.
Normal Category - No acrobatic maneuvers including spins approved.

(Utility Category - No acrobatic maneuvers approved except those listed in Table 2.)

TABLE 2 - PERMISSIBLE MANEUVERS-UTILITY CATEGORY SEABEE

MANEUVER	ENTRY SPEED
Spin	Stall
Lazy Eights	115
Steep Turns	100
Chandelles	120
Stalls (except whip stalls)	Stall

D. Flight Load Factors.
The positive flight load acceleration limits are indicated in Table 3.

TABLE 3 – FLIGHT LOAD FACTOR	
CATEGORY	FACTOR
Utility (Gross Wgt. 2810 lbs.)	4.4 g
Normal (Gross Wgt. 3150 lbs.)	3.8 g

D. Flap Positions (See Table 4)

TABLE 4 – FLAP POSITIONS		
CONDITION	SEAPLANE	LANDPLANE
Take-off	Flaps Down (30°)	Flaps Up
Landing	Flaps Down (30°)	Flaps Down (30°)

E. OPERATING PLACARDS (NOTE: Use reverse pitch for taxiing only)

WARNING
REVERSING PROPELLER IN FLIGHT PROHIBITED

OPERATE REVERSE LEVER IN LOW PITCH ONLY

*NOTE: -2 plates used on airplanes equipped with engine ball-thrust bearings. Violation may result in complete loss of control. Applicable on airplanes with the following propeller hub and counterweight combination:

(a) HC-12X20-2 hubs 7" Cylinder with 4.50" Counterweights only (2,500 RPM)

(b) HC-12X20-3C hubs 10" cylinder with 4.50" counterweights (notched) relocated on hub (2,500 RPM)

WARNING
REVERSING PROPELLER IN FLIGHT PROHIBITED
MAX. RPM 1750 IN REVERSE PITCH
OPERATE REVERSE LEVER IN LOW PITCH ONLY

*NOTE: -1 plate used prior to installation of engine ball-thrust bearing. Reverse operation in excess of 1750 RPM Will cause bearing failure and possible seal rupture. Applicable to engine 23001 to 23280 inclusive unless modified to include ball thrust bearing.

(c) HC-12X20-3E hubs 10" cylinder with 4.25" counterweights (notched) relocated on hub (2,500 RPM)

WARNING
REVERSING PROPELLER IN FLIGHT PROHIBITED

MAX. RPM 2300 IN REVERSE PITCH

OPERATE REVCERSE LEVER IN LOW PITCH ONLY

- 3 PLATE

Note: Same as -2 plate except being applicable to airplanes with the following propeller hub and counterweight combinations:

(a) HC-12X20-3 hubs
10" cylinder with 4.650" counterweights (2,300 RPM)

(b) HC-12X20-3a hubs
10" cylinder with 4.50" counterweights to which have been added the 1/8" slugs (2,300 RPM)

F. BAGGAGE PLACARD

BAGGAGE COMPARTMENT LIMIT
200 LBS.
DO NOT PILE ABOVE BOTTOM EDGE OF DOOR FRAME

FOR LOADING INSTRUCTIONS SEE OPERATING MANUAL

G. STALLING SPEEDS (SEE TABLE 5)

TABLE 5 - STALLING SPEEDS

	FLAPS	GEAR	CATEGORY	
			NORMAL	UTILITY
Power off stall	Up	Up	61 mph TIAS	53 mph TIAS
Power off stall	Down	Down	58 mph TIAS	47 mph TIAS

II. POWER PLANT OPERATING LIMITATIONS

A. Engine Mfr. - Franklin Aircooled Motors
Model - Franklin 6A8-215-B9F

B. Powerplant operating limitations and markings are included in Tables 6, 7 and 8. Color coding for instrument marking is:

Red Radial Lines - Maximum or minimum (where applicable) indicators for safe operation.
Green Arc--------- Normal operating range.
Yellow Arc-------- Take-off and precautionary ranges.

TABLE 6 - TAKE-OFF POWER PLANT LIMITATIONS		
Condition	Reading	Marking
Maximum RPM	2500	Red Radial
Take-off RPM	2400 to 2500	Yellow Arc
Maximum Oil Temperature	260°F	Red Radial
Maximum Oil Pressure	65#	Red Radial
Precautionary Oil Pressure	60 to 65#	Yellow Arc

TABLE 7 - MAX. CONT. OPERATION LIMITS		
Condition	Reading	Marking
Maximum Continuous RPM	2000 to 2500	Green Arc
Maximum RPM	2500	Red Radial Line
Maximum Oil Temperature	260°F	Red Radial Line
		Green Arc to Low Limit of Indicator
Oil Pressure	30 to 60#	Green Arc
Fuel Pressure	2 to 9#	Green Arc

TABLE 6 - FUEL OCTANE RATING
Minimum Octane Rating of Fuel Required for satisfactory operation of power plant at limits of Tables 6 and 7 is 80 OCTANE.

C. Propeller Limits

Mfr: Hartzell Propeller, Inc. Model: HC-12X20-3 (Ship 351 and up) Type: Selective pitch and reversible	Mfr: Hartzell Propeller, Inc. Model: HC-12X20-3E Type: Selective pitch and reversible
High Pitch: +18° Reverse Pitch: -15° Low Pitch: 12½° Max. RPM to reverse prop: 1200 Min. RPM to come out of reverse: 1200	High Pitch: +19½° Reverse Pitch: -14° Low Pitch: 13½° Max. RPM to reverse prop: 1200 Min. RPM to come out of reverse: 1200

D. Operating Placards

See paragraph E of Section I.

III. NORMAL OPERATING INSTRUCTIONS

A. Normal procedures:

1. To start engine: Open throttle slightly, place mixture in full rich, ignition and battery switches on and engage starter. Do not engage starter for more than 30 seconds at any one time without allowing one minute rest before engaging starter again.

2. After starting engine set throttle for 900 RPM and warm up for several minutes. Check for RPM drop on single ignition; maximum permissible is 150 RPM. Check propeller pitch change a few times; this will also fill pitch changing cylinder with warm oil.

3. Before take-off check propeller reverse pitch lever for lock in the forward pitch position and put flaps down if permitted i.e., water take-off, by placing flap selector handle to “DOWN” position and pumping power pak handle. Controls are designed so that they are against the panel for take-off. No propeller pitch control is necessary; RPM will increase to desired climbing value by the time the airplane leaves the ground without changing pitch control if it is set at take-off position prior to take-off.

4. After take-off if gear is down place gear selector handle to up position and pump until signal indicates gear up. If flaps were down for take-off, gain altitude and retract flaps by placing flap selector handle in “UP” position and pumping until flaps are up.

5. During climb, if RPM exceeds the limit allowed, it may be decreased by pulling the propeller pitch control out until the desired value is reached.

6. To cruise at maximum economy, set propeller at high pitch and maintain high manifold pressure.

7. On landing approach maintain speed of approximately 75 IAS mph. After signal shows gear down, pump a couple of extra strokes on the pump handle for added certainty.

8. After landing, raise flaps and stop engine by turning ignition, battery and master switches off. Apply parking brake.

B. Emergency Procedures.

1. To shut off fuel flow in emergencies, pull control knob under pilot's seat forward.

2. Seat backs will support one person and may be used as life preservers.

3. In the event of electrical malfunctioning, the following procedures are applicable:

   a. On airplanes with split ignition (i.e., ignition switch marked bat-mag-both), in event of malfunctioning of battery ignition turn switch to magneto ignition; in this position ignition is taking place on one set of plugs only; therefore, land as soon as possible.

   b. On airplanes up to serial no. 1050, turn master and battery switches off; this will cut out electric supply to all circuits except the ignition circuit which is independent of the master and battery switches.

   c. On airplanes starting with serial no. 1051, the master and battery switch are combined in a single switch marked "BATTERY". Turning battery switch off cuts out electric supply to all circuits except the ignition circuit which is independent of the battery switch.

   d. On later airplanes the battery and master switch is marked "MASTER"; function of this switch is identical to the switch previously marked "BATTERY". Turning this master switch off cuts out electric supply to all circuits except the ignition circuit.

IV. PERFORMANCE INFORMATION

A. Sea Level Performance is as indicated in Table 9.

TABLE 9 – PERFORMANCE (SEA LEVEL)

	Value			
	Landplane		Seaplane	
	Normal	Utility	Normal	Utility
(a) Stalling speed at max. weight flaps down	58	47	58	47
(b) Stalling speed at max. weight with L.G. & Flaps retracted	61	53	61	53
(c) T.O. Distance over 50' obstacle	2135'	*	2645'	*
(d) Airspeed at 50' height at T.O.	79.3	*	75.5	*
(e) Landing Distance over 50' obstacle	1048'	*	1280'	*
(f) Steady Rate of Climb at Sea Level; Take-off Configuration	647 fpm	751 fpm	438 fpm	508 fpm
At T.I.A.S.	79	79	67	67
With power H.P.	208	208	208	208
R.P.M.	2500	2500	2500	2500
Manifold Pressure (In. Hg.)	28.1	28.1	28.1	28.1
With landing gear	UP	UP	UP	UP
And Flaps	UP	UP	DOWN	DOWN
(g) Steady Rate of Climb at Sea Level; Landing Configuration	455 fpm	528 fpm	438 fpm	508 fpm
At T.I.A.S.	68	68	67	67
With power H.P.	208	208	208	208
R.P.M.	2500	2500	2500	2500
Manifold Pressure (In. Hg.)	28.1	28.1	28.1	28.1
With landing gear	DOWN	DOWN	UP	UP
And Flaps	DOWN	DOWN	DOWN	DOWN
(h) Stalling Speed (b) at 0° bank	61	53	61	53
Stalling Speed (b) at 10° bank	62	54	62	54
Stalling Speed (b) at 20° bank	63	55	63	55
Stalling Speed (b) at 30° bank	65	57	65	57
Stalling Speed (b) at 40° bank	70	60	70	60
Stalling Speed (b) at 50° bank	76	65	76	65
Stalling Speed (b) at 60° bank	86	74	86	74

For variations of take off and landing distances and rate of climb with altitude and temperature changes see the following charts.

*To be considered as Normal Category until additional information is furnished.

B. Charts

NOTE: To obtain take-off and landing distances for ski operation add to the appropriate distances noted herein for landplane operation distance increments as follows:

	Packed Snow	
	Wet	Dry
Take-Off	+650 ft.	--------
Landing	+400 ft.	+1500 ft.

DISTANCE REQUIRED TO TAKE-OFF AND CLEAR 50' OBSTACLE **LAND TAKE-OFF** ON PAVED SURFACE RUNWAY

FLAPS UP
GEAR DOWN

WEIGHT - 3150 LBS
NORMAL CATEGORY
FULL THROTTLE, PROPELLER IN TAKE-OFF POSITION: TAKE-OFF AND CLIMB
SPEED **79 MPH** TIAS; ZERO WIND

TEMP °F / P. ALT	-40	-20	0	20	40	60	80	100
S.L.		1600	1710	1835	1985	2150	2315	2510
2000		1950	2125	2315	2525	2740	2985	3270
4000	2120	2505	2815	3090	3435	3755	4170	4610
6000	3075	3470	3840	4320	5050	5670	6480	7320
8000	4400	5100	6055	6910	8130	9790	11670	

DISTANCE REQUIRED TO TAKE-OFF AND CLEAR 50' OBSTACLE **WATER TAKE-OFF**

FLAPS DOWN
GEAR UP

WEIGHT - 3150 LBS
NORMAL CATEGORY
FULL THROTTLE. PROPELLER IN TAKE-OFF POSITION: TAKE-OFF AND CLIMB
SPEED **75 MPH** TIAS; ZERO WIND

TEMP °F / P. ALT	0	20	40	60	80	100
S.L.	1980	2160	2375	2665	2940	3315
2000	2605	2935	3355	3830	4405	5220
4000	----	----	5480	6855	8940	12600
6000	----	----	13690	----	----	----

TOTAL LANDING DISTANCES OVER 50' OBSTACLE

WATER LANDINGS NORMAL CATEGORY
FLAPS DOWN WEIGHT - 3150 LBS
GEAR UP ZERO WIND

THROTTLE CLOSED-PROPELLER IN TAKE-OFF POSITION: APPROACH SPEED 75 MPH TIAS

TEMP °F		0	10	20	30	40	50	60	70	80	90	100
PRESSURE ALTITUDE	S.L.	1200	1212	1226	1239	1252	1266	1279	1295	1309	1326	1340
	2000	1245	1259	1275	1291	1307	1322	1338	1353	1370	1384	1401
	4000	1300	1316	1334	1350.5	1368	1385	1404	1421	1440	1454	1470
	6000	1360	1382	1398	1418	1438	1456	1473	1491.5	1509	1525	
	8000	1430	1450	1471	1490	1507	1524	1540				

TOTAL LANDING DISTANCES OVER 50' OBSTACLE

LAND LANDINGS NORMAL CATEGORY
FLAPS DOWN WEIGHT - 3150 LBS
GEAR DOWN ZERO WIND

THROTTLE CLOSED-PROPELLER IN TAKE-OFF POSITION:
APPROACH SPEED 75 MPH TIAS

TEMP °F		-40	-30	-20	-10	0	10	20	30	40	50
PRESSURE ALTITUDE	S.L.	946	956	966	975	986	996	1007	1017	1028	1038
	2000	978	988	1000	1010	1022	1032	1044	1056	1066	1076
	4000	1013	1025	1037	1049.5	1062	1072.5	1084	1096	1108	1119
	6000	1052.5	1066	1077.5	1090.5	1103	1117	1128	1142	1156	1168.5
	8000	1094	1108	1122.5	1137	1150	1164.5	1180	1194	1209	1224

(Continued from above)

TEMP °F		60	70	80	90	100
PRESSURE ALTITUDE	S.L.	1048	1058.5	1068	1079	1089
	2000	1087	1097.5	1109	1119	1134
	4000	1132	1144	1157	1170	1182
	6000	1180.5	1195.5	1210	1226	1240
	8000	1239	1254	1269	1284	1299

Total Landing Distance = Distance from Clearance of 50' Obstacle to End of Roll

VARIATION OF RATE OF CLIMB

WITH ALTITUDE AND TEMPERATURE

FLAPS UP - GEAR UP

WEIGHT 3150 LBS.

FULL THROTTLE: PROPELLER IN TAKE-OFF POSITION

NORMAL CATEGORY LANDPLANE

RATE OF CLIMB - FT/MIN

PRESS ALT / MPH TIAS*	TEMPERATURE - °F							
	-40	-20	0	20	40	60	80	100
SL / 79	795	765	735	705	675	645	622	590
2000 / 78	673	641	612	582	553	525	501	473
4000 / 77	550	520	490	460	431	404	381	354
6000 / 76	428	398	368	339	311	283	260	234
8000 / 75.5	306	275	247	218	190	165	140	116
10000 / 75.5	185	153	124	96	69	44	19	0

*CLIMB SPEED

VARIATION OF RATE OF CLIMB

WITH ALTITUDE AND TEMPERATURE

FLAPS DOWN - GEAR UP

WEIGHT 3150 LBS.

FULL THROTTLE: PROPELLER IN TAKE-OFF POSITION

NORMAL CATEGORY - SEAPLANE

RATE OF CLIMB - FT/MIN

PRESS ALT / MPH TIAS*	TEMPERATURE - °F							
	-40	-20	0	20	40	60	80	100
SL / 67	575	543	512	485	460	435	412	380
2000 / 66.5	456	425	395	370	345	320	295	265
4000 / 66.5	340	310	280	255	225	202	180	150
6000 / 65	225	193	163	138	110	87	65	40
8000 / 64	110	76	50	23	7	0	--	--

*CLIMB SPEED

VARIATION OF RATE OF CLIMB

WITH ALTITUDE AND TEMPERATURE

FLAPS DOWN – GEAR DOWN

WEIGHT 3150 LBS.

FULL THROTTLE: PROPELLER IN TAKE-OFF POSITION

NORMAL CATEGORY – LANDPLANE

RATE OF CLIMB – FT/MIN

PRESS ALT / MPH TIAS*	TEMPERATURE – °F							
	-40	-20	0	20	40	60	80	100
SL / 68	595	565	535	505	477	450	430	402
2000 / 67	480	48	418	390	360	335	315	290
4000 / 67	360	330	300	275	245	225	200	175
6000 / 66	245	212	185	160	130	105	85	60
8000 / 66	127	95	70	45	15	---	---	---
10000 / 65	10	---	---	---	---	---	---	---

*CLIMB SPEED

AIRSPEED CALIBRATION

PITOT INSTALLATION POSITION ERROR

(SHIP 170 AND UP)

Indicator Reading MPH	True Indicated Airspeed MPH
45	47
50	51
55	56
60	60
65	65
70	69
75	74
80	78
85	83
90	87
95	92
100	96.5
105	101
110	106
115	110
120	115
125	119
130	124
135	128
140	133
145	137
150	142

V. WEIGHTS

WEIGHT AND BALANCE DATA

Republic RC-3 Airplane

ATC No. 769

Mfg. Serial No. ___

NOTE: It is the responsibility of the Airplane owner and the Pilot to insure that the Airplane is loaded properly. The Empty Weight, Empty C.G. and Useful Load for this Airplane as delivered from the factory are noted on page 7 of the Operations Manual. If the Airplane has been altered, refer to the latest Approved Alteration and Repair Form (ACA-337) for this information.

DATE: 5-2-47 Approved R.A.C. _____

AIRCRAFT WEIGHING FORM

OWNER _____ DATE WEIGHED _____

ADDRESS _____ PLACE WEIGHED _____

MODEL Republic RC-3 REG. NO. _____ SER. NO. _____

WEIGHING POINT	SCALE READING	TARE OR CORRECTION	NET WEIGHT	ARM (INCHES)	MOMENT
LEFT MAIN WHEEL					
RIGHT MAIN WHEEL					
SUB-TOTAL (BOTH MAIN)					
TAIL SCALE REF. DATUM					
TOTAL (AS WEIGHED)					

WEIGHING RECORD

DESCRIPTION	NET WEIGHT	ARM	MOMENT	INDEX
TOTAL (AS WEIGHTED)				
Remove Eng. Oil: No useable fuel on board during weighing Empty Wt. & Empty Wt. C.G.				

C.G. IN PERCENT M.A.C. _____ C.G. IN INCHES FROM REF. DATUM _____

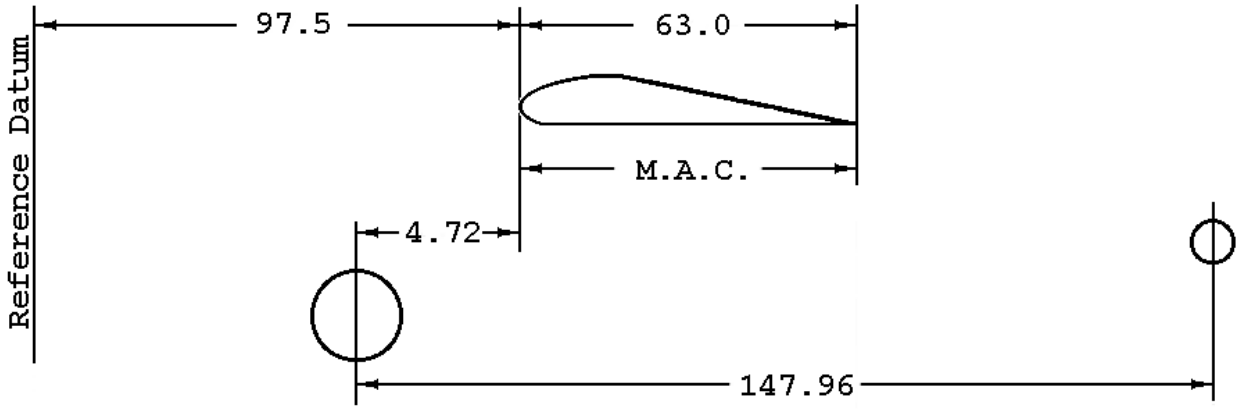
This aircraft Weighed in a level flight attitude.
Useful load is _____ lbs. @ 3250 lbs. Gross Wt.
Scale S/N: _____.
Cal. Date: _____.

*Oil Weight and arm amended by page two (next page)

WEIGHED BY _____

WEIGHING DIAGRAM

As Weighed _____ (Date)



	Weight	Arm	Moment
Left Main	_____	_____	_____
Right Main	_____	_____	_____
Total	_____	_____	_____
Tail Wheel	_____	_____	_____

Distance from Datum to main wheel c.line = 97.5 - 4.72 = 92.78 inches

C.G. is aft of Datum - _____ (inches)

	Weight	H-Arm	H-Moment
Empty - Less Ballast Permanent Ballast Missing Items Items to be Subtracted Oil in Gal. - @ 7.5 lbs./Gal.			
Weight Empty -			