A. Brakes Set.
B. Fuel Selector on.
C. Electrical Equip off
D. Cowl flaps open
E. Clear! (Soundoff Clear)
F. Master Switch on.
G. MF starting Procedure
H. After Engine starts
I check oil & fuel pressure,
(oil pressure within 30 sec in
Summer, 60 seconds in Winter)
If does not, Shut off Engine

= Pre take off "

C.A.A.
Approved Airplane Flight Manual

For

Ercoupe Model E

Serial Number	Registration Number
4947	NC 94831

This airplane is certificated under the Civil Aeronautics Regulations, Part 03, in the Normal Category. Limitations herein are mandatory as noted. All other data pertain to recommended operating practices and are not considered mandatory.

Temporarily
Approved by /s/ H. M. Toomey

Supt., Aircraft & Components Service

Date July 1, 1948

NOTE

This airworthiness certificate for this aircraft is based on a tentative approval of the aircraft model and is subject to revision at the time of final approval. In addition, further modification of the aircraft may be required at that time. It will be the owner's responsibility to comply with all pertinent provisions of the final AIRCRAFT SPECIFICATION and AIRWORTHINESS DIRECTIVE.

Part I

APPROVED OPERATING MANUAL
TABLE OF CONTENTS

Log of Revisions

Revision No.	Page No.	Date	C.A.A. Inspector

A. Airplane Operating Limitations

1. Weight and Center of Gravity:

The center of gravity location for any given gross weight must be between 17.1% M.A.C. (26.4 inches from datum) and 24% M.A.C. (30.3 inches from datum).

The maximum gross weight is 1400 pounds.

2. Airspeed:

Never exceed speed	144 M.P.H.	TIAS
Design cruising speed	114 M.P.H.	TIAS
Maneuvering speed	108.5 M.P.H.	TIAS

3. Maneuvers:

No acrobatic maneuvers of any kind approved.

4. Positive Flight Load Acceleration:

The positive flight load acceleration is 3.5 Gs.

5. Operations Authorized:

Contact flight rules (Night - not for hire).

6. Operating Placards:

The following placards must be prominently displayed in front of and in clear view of the pilot:

(a) This airplane must be operated as a Normal Category Airplane in Compliance with the Approved Airplane Flight Manual.

C. Operating Procedures

Cockpit Check List

Starting:

1. Check quantity of fuel and oil.
2. Both fuel valves on.
3. Mixture - Full Rich at all times.
4. Carburetor - Air Heat off.
5. Prime 2 to 6 strokes - lock plunger
6. Crack throttle 4 notches.
7. Ignition on - Pull starter.
8. Warm up - 900 - 1200 R.P.M.
9. Carburetor Heat can be used during warm up.

Before Take-off:

1. Carburetor air heat off (use full heat in icing conditions).
2. Oil temperature 90°F Minimum.
3. Oil Pressure - 35 lb./sq. inch (above 1900 RPM)
4. Full throttle 1950 to 2050 R.P.M. approx.
5. Ignition Check - Maximum 75 R.P.M. Drop on either magneto.

Flight:

1. Oil pressure 30 to 40 lb./sq. inch
2. Oil temperature range 100° to 225°F
3. Apply carburetor heat under icing conditions
4. Above 5,000 feet, mixture control can be adjusted for best R.P.M. This must be re-adjusted with changes in throttle or carburetor heat.

Landing:

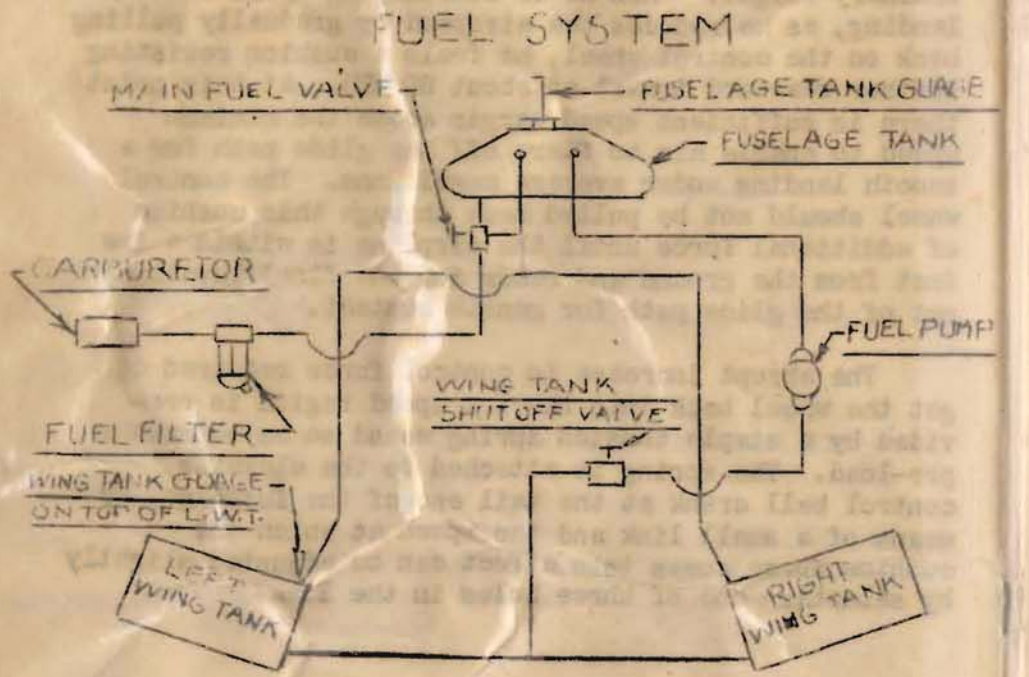
1. Carburetor heat - FULL ON.
2. Mixture control - FULL RICH.
3. Open throttle periodically in a glide to clear cylinders.

Low Speed Warning Cushion

A signal is provided to let the pilot know when he is in the region of low speeds below that required in ordinary flight. When he is starting an approach to a landing, as he reduces the airspeed by gradually pulling back on the control wheel, he feels a cushion resisting further rearward travel at about 60 MPH. At this point there is sufficient speed margin above the minimum speed to enable him to flare off the glide path for a smooth landing under average conditions. The control wheel should not be pulled back through this cushion of additional force until the airplane is within a few feet from the ground and ready for the final levelling out of the glide path for gentle contact.

The abrupt increase in control force required to get the wheel back into the low speed region is provided by a simple tension spring wound so as to have a pre-load. The spring is attached to the elevator control bell crank at the tail end of the fuselage, by means of a small link and the speed at which the cushion force comes into effect can be adjusted slightly by selecting one of three holes in the link.

For Operating instructions in greater detail refer to Ercoupe Instruction Manuel.



Fuel System - Reference Figure I

The engine driven fuel pump moves gasoline from the wing tanks to the six gallon fuselage tank. Excess fuel drains from the fuselage tank overflow back to the wing tanks.

Fuel is gravity fed from the fuselage tank to the engine. In case of fuel pump failure the engine will continue to function until the six gallon fuselage tank is drained.

Main Fuel Valve

The main fuel valve is located approximately half way between the brake handle and the left control wheel shaft and directly behind the instrument panel.

This main valve should be ON at all times except in case of emergency.

Wing Tank Shut-Off Valve

This valve is located on the right side skin forward of the seat. The valve handle should be ON, (lined up fore and aft) except in case of fuel line failure.

When the valve is turned OFF, the fuel cannot be pumped from the wing tank to the fuselage tank and the engine fuel supply is limited strictly to the capacity of the fuselage tank.

Wing Tank Caps

Wing gasoline tank cap gaskets must be tight in order to maintain equalized pressure in the two wing tanks, thus preventing gasoline overflow from one tank. Do not use caps with vents in this model Ercoupe.

Fuel Gages

The wing tank gage indicates quantity of gasoline in both wing tanks as fractions of 18 gallons. The fuselage tank gage indicates the quantity in the fuselage gravity tank. When the gage is fully up 6 gallons are available. Just as it reaches the fully down position at least one sure gallon (or 10 minutes of cruising flight) is left, the exact amount depending on the condition of the cork float.

Electrical System - Reference Figure II

Battery

Located in back of right seat under baggage compartment. May be inspected by opening zipper in bottom of baggage compartment.

Ammeter

The ammeter is located in the extreme right hand corner of the instrument panel and indicates the general operating condition of the battery generator circuit.

Navigation Light Switch

The navigation light switch is a circuit breaker located on the right side of the instrument panel. It will automatically snap off if the circuit becomes overloaded.

Master Switch

Located on right side of deck aft of seat. Must be ON at all times during aircraft operation, otherwise the generator may be damaged by open circuit operation.

Generator

Located on engine accessory case in direct drive from engine.

The charging rate of this unit is completely controlled by the generator output regulator. It is protected by a 40 ampere fuse located adjacent to the ammeter.

Generator Output Regulator

The generator output regulator consists of three units; a cut-out relay, a current regulator, and voltage regulator, mounted on the same base with a single cover. The cut-out relay closes at 12.4 to 13.4 volts. The current regulator limits voltage to approximately 14 volts.

A normal operation would indicate a charging rate between 11 and 13 amperes for periods of time up to twenty minutes after starting. The charging rate should reduce to two amperes or less in a shorter period of time than two hours of operation. Lesser rates would indicate a favorable condition of the battery. When the charging rates exceed these stated, the system should be checked to determine the trouble.

Radio

The radio is a combination of transmitter and receiver and the main unit is mounted in the instrument panel. Antenna is of the fixed type. Tuning coil is pre-set at the factory and is mounted under the rear deck, accessible thru the baggage compartment. The power supply unit is shock mounted behind the seat and is accessible by opening zipper in bottom of baggage compartment. The power lead is taken from the master switch. The fuse (10 amp) in this line is of the connector type and is forward of the instrument panel, accessible from inside the cockpit.

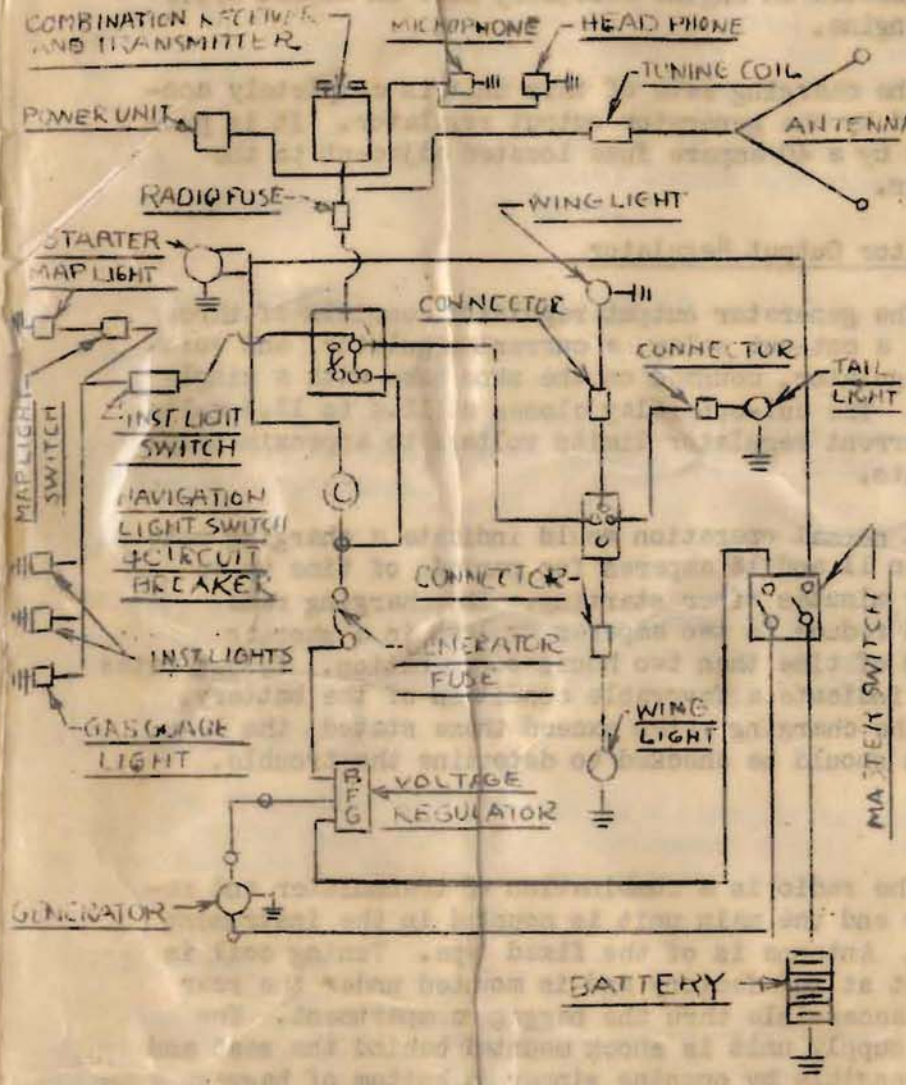


Figure II

D. Performance Information *

Note: All speeds listed in the following data are true indicated airspeeds (TIAS). For indicated airspeeds (IAS) see Chart No. 1, page 17.

1. Stall Speed

Power off at 56 MPH, TIAS, (with center of gravity at 17.1% M.A.C.)

2. Distance to Take-off and Climb 50 Ft.

Take-off distance to clear a 50 foot obstruction at 1400 lbs., gross weight, full throttle, 72 M.P.H., TIAS, zero wind and paved runway.

DISTANCE IN FEET

Pressure Altitude	0°F	20°F	40°F	60°F	80°F	100°F
S. L.	1850	1950	2000	2100	2200	2300
2000 Ft.	2350	2450	2550	2700	2800	3000
4000 Ft.	3000	3200	3350	3600	3800	4050
6000 Ft.	4050	4450	4700	5000	5450	5900

* Note: Performance figures shown herein apply to a fixed pitch wood propeller having a static RPM of 1950. This data will be conservative when applied to any other propellers certificated for use on this model aircraft.

3. Distance to Land & Stop from a Height of 50 Ft.

Landing distance over a 50 foot obstruction at 1400 lbs. gross weight, center of gravity at 17.1% M.A.C., power off, zero wind and paved runway. Approach speed 72 M.P.H. (The 72 M.P.H. airspeed represents a conservative glide speed higher than recommended for small fields.)

DISTANCE IN FEET

Pressure Altitude	0°F	20°F	40°F	60°F	80°F	100°F
S. L.	1600	1650	1700	1750	1800	1850
2000 Ft.	1700	1750	1800	1850	1900	1950
4000 Ft.	1800	1850	1900	1950	2000	2100
6000 Ft.	1900	1950	2000	2100	2150	2200

4. Climb Data

Rate of climb at 1400 lbs. gross weight, full throttle, standard pressure and 70 M.P.H. TIAS.

RATE OF CLIMB IN FEET PER MINUTE

Pressure Altitude	0°F	20°F	40°F	60°F	80°F	100°F
S. L.	585	565	545	525	505	485
2000 Ft.	495	475	455	435	415	395
4000 Ft.	405	385	365	345	325	305
6000 Ft.	315	295	275	255	235	215

5. Stalling speed variation with angle of bank at 1400 lbs. gross weight and power off.

Angle of Bank (Deg.)	0	10	20	30	40	50	60
Power Off Stall Speed (MPH)	56	56	58	60	64	70	79

6. Airspeed Calibration

Calibration of the airspeed indicating system with true indicated airspeed vs indicated airspeed is shown in table following:

True Indicated Airspeed	Indicator Reading
60 M.P.H.	56 M.P.H.
70 M.P.H.	67 M.P.H.
80 M.P.H.	78 M.P.H.
90 M.P.H.	89 M.P.H.
100 M.P.H.	100 M.P.H.
110 M.P.H.	111 M.P.H.
120 M.P.H.	122 M.P.H.
130 M.P.H.	133 M.P.H.
140 M.P.H.	142 M.P.H.
144 M.P.H.	144 M.P.H.

7. Cross-wind Operation

Maximum recommended wind velocity for cross-wind operation - 25 M.P.H. In cross-wind landings touch down should be made at minimum speed.

E. Weight and Balance Data

1. Weight & Center of Gravity Limitations

Maximum gross weight - 1400 pounds.
Center of gravity limits - 17.1% of the Mean Aerodynamic Chord to 24% of the MAC. (M.A.C.)

2. Normal Loading

Airplane empty weight with wood propeller	-	815 lb.
Radio and Antenna	-	16 lb.
Pilot	-	170 lb.
Passenger	-	170 lb.
Fuel (R. Wing Tank)	-	54 lb.
Fuel (L. Wing Tank)	-	54 lb.
Fuel (Fuselage Tank)	-	36 lb.
Oil	-	8 lb.
Baggage	-	65 lb.
Miscellaneous Useful Weight	-	12 lb.
		1400 lb.

Actual weight and balance in envelope on back cover of this manual.

a. Do not exceed 1400 lb. Gross Weight
b. Do not exceed 17.1% M.A.C. for forward C.G. loadings.
c. Do not exceed 24% M.A.C. for rearward C.G. loadings.
d. Do not exceed 65 lb. in baggage compartment. (This is the maximum load for which this compartment is approved.)

% of Mean Aerodynamic Chord - % M.A.C.

3. Standard Equipment List

Spec No.	Item	Unit Wt.	Arm
1	Propeller - fixed pitch wood	14 lbs.	-32
101	Carburetor Air Heater	5 lbs.	-2
102	Fuel Pump	2 lbs.	-27
—	Engine	166 lbs.	-22
201	Landing Gear (Main)	28 lbs.	+44
202	Landing Gear (Nose)	9 lbs.	-16
301	Battery (12 volt)	25 lbs.	+55
103	Starter	14 lbs.	-7
302	Generator	10 lbs.	-8
—	Voltage Regulator	2 lbs.	-50
TR-1B	Radio and Antenna	16 lbs.	+18

4. Optional Equipment List

Item	Unit Wt.	Arm
Bendix (VHF) PATR-10	7 lbs.	+18
Bendix Loop	1.4 lbs.	+32
Bendix Speaker	1.3 lbs.	+60
Turn and Bank (Electric)	1.6 lbs.	+21
Turn and Bank Vac. (With Venturi)	2.0 lbs.	+21
Clock 2 1/4"	.4 lbs.	+21
Sensensitive Altimeter	1.2 lbs.	+21
Rate of Climb Indicator	1.2 lbs.	+21
Free Air Thermometers	0.5 lbs.	+45
Directional Gyro	4 lbs.	+20
Gyro Horizon	4.5 lbs.	+20
McCauley Propeller	26 lbs.	-32
Hartzel Propeller	18 lbs.	-32
Aeromatic Propeller	31 lbs.	-32
Engine Shielding	4 lbs.	-18
Fuel Injector System	1.5 lbs.	-20
Flares, Electrically operated	18 lbs.	+95
Landing Lights	4 lbs.	+35
Fire Extinguisher, quart capacity	7 lbs.	+33
Shoulder Harness	3 lbs.	+56
All-Over Paint Job	12 lbs	+55
Skiis, including all fittings - (Not installed)	Use actual Weight Change	
Extra large Nose Wheel * (6.00 x 6 Tire)	4.8 lbs.	+16

* 4.8 lbs more than regular 5.00 x 5 nosewheel assembly

F. Maintencance Record Sheets

Aircraft Maintenance Record
Section 1
Weight and Equipment Changes

Note: Record in this section only those repairs and alterations (Form 337) that involve a change in the weight or the empty center of gravity.

Aircraft Serial No. Identification Mark

Repair & Alteration Form dated: By (Agency name & number): Location and brief description of change or equipment:

850 (New E. W.) 550 (New Useful Load) +25.49 (New Empty C. G.)
10/5/52

Aircraft Serial No. Identification Mark

Repair & Alteration Form dated: By (Agency name & number): Location and brief description of change or equipment:

851 (New E. W.) 549 (New Useful Load) 26.44 (New Empty C. G.)

Aircraft Serial No. Identification Mark

Repair & Alteration Form dated: By (Agency name & number): Location and brief description of change or equipment:

New E. W. New Useful Load New Empty C. G.

Aircraft Maintenance Record
Section II
Record of Repairs and Alterations

Note: Repairs and alterations involving changes in weight and empty center of gravity must be recorded in Section I of this record.

Aircraft Serial No. Identification Mark

Repair and Alteration Form Dated: By (Agency name & number): Location and brief description of repair:

Aircraft Serial No. Identification Mark

Repair and Alteration Form dated: By (Agency name & number): Location and brief description of repair:

Aircraft Serial No. Identification Mark

Repair and Alteration Form dated: By (Agency name & number): Location and brief description of repair:

COPY

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SANDERS AVIATION, INC.

BY

ENGINEERING & RESEARCH CORPORATION
RIVERDALE, MARYLAND

WEIGHT AND BALANCE

ERCOUPE MODEL E

Serial No. 4947 N C 94831

PRODUCTION CERTIFICATE NO.

Approved by: Thomas M. Mountjoy
Weight and Balance Engineer

Date of Manufacture June 29, 1948

EMPTY WEIGHT DATA

	NET WEIGHT	
	Actual	Computed
Rear Right Wheel		298
Rear Left Wheel		298
Nose Wheel		237
Total Weight		833
	Model E	Model E
Gross Weight	1400#	1400#
Useful Load		567

ENGINEERING AND RESEARCH CORPORATION

RIVERDALE, MARYLAND

APPROVED AIRPLANE FLIGHT MANUAL

ERCOUPE MODEL E