

A-1
(2) copies

Rev 29 11-53

~~RESTRICTED~~

Classification Cancelled
Auth: CG. AMC
Date: 5 November 1941
By: *BK Plummer*
capt ac

Master File
Do Not Remove From Office
Flight Operating Instructions Branch
AN OF 140000

Master File
Do Not Remove From Office
Flight Operating Instructions Branch

FLIGHT HANDBOOK

USAF SERIES
ZL-4A, ZL-4B AND L-4H
AIRCRAFT



REVISION NOTICE

LATEST REVISED PAGES SUPERSEDE THE SAME PAGES OF PREVIOUS DATE

Insert revised pages into basic publication. Destroy superseded pages.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE
AND THE CHIEF OF THE BUREAU OF AERONAUTICS

~~RESTRICTED~~

AF BAFB ALA 9/11/53 3M

5 SEPTEMBER 1943
REVISED 15 JULY 1953

30 pp

Reproduction for non-military use of the information or illustrations contained in this publication is not permitted without specific approval of the issuing service (BuAer or AMC). The policy for use of Classified Publications is established for the Air Force in AFR 205-1 and for the Navy in Navy Regulations, Article 1509.

LIST OF REVISED PAGES ISSUED

INSERT LATEST REVISED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the current revision is indicated by a vertical line in the outer margins of the page.

<i>Page No.</i>	<i>Date of Latest Revision</i>
* i	15 July 1953
* ii	15 July 1953
* iii	15 July 1953
* iv	15 July 1953
* 1	15 July 1953
* 2	15 July 1953
3	9 September 1949
* 4	15 July 1953
* 9	15 July 1953
*10	15 July 1953
*11	15 July 1953
*12	15 July 1953
*13	15 July 1953
15	30 November 1943
16	30 November 1943
17	9 September 1949
*19	15 July 1953
21	30 November 1943

* The asterisk indicates pages revised, added or deleted by the current revision.

ADDITIONAL COPIES OF THIS PUBLICATION MAY BE OBTAINED AS FOLLOWS:

USAF ACTIVITIES.—In accordance with Technical Order No. 00-5-2.

NAVY ACTIVITIES.—Submit request to nearest supply point listed below, using form NavAer-140; NASD, Philadelphia, Pa.; NAS, Alameda, Calif.; NAS, Jacksonville, Fla.; NAS, Norfolk, Va.; NAS, San Diego, Calif.; NAS, Seattle, Wash.; ASD, NSC, Guam.

For listing of available material and details of distribution see Naval Aeronautics Publications Index NavAer 00-500.

TABLE OF CONTENTS

Section	Page
I Description	1
1. General Description	1
2. Flight Personnel	2
3. Interior of the Cockpit.....	2
<i>a.</i> Emergency Equipment	2
<i>b.</i> Instrument Panel	2
<i>c.</i> Lower Right Side.....	3
<i>d.</i> Upper Right Side.....	3
<i>e.</i> Upper Left Side.....	3
<i>f.</i> Lower Left Side.....	3
<i>g.</i> Observer's Desk	3
<i>h.</i> Floor Arrangement	4
<i>i.</i> Lubricating System	4
4. Fuel and Oil	4
II Pilot Operating Instructions.....	9
1. Flight Restrictions	9
1A. Minimum Crew Requirement.....	9
2. Before Entering the Cockpit.....	9
3. On Entering the Cockpit.....	9
4. Starting Engine	10
5. During Warm-up	10
6. Emergency Take-off	11
7. Taxiing Instructions	11
8. Take-off	11
9. Climb	11
10. General Flying Characteristics.....	11
11. Approach and Landing.....	11
11A. Post Flight Check.....	12
12. Stopping of Engine.....	12
13. Check Before Leaving the Cockpit.....	12
14. Tying Down	12
III Flight Operation Data	
Specific Engine Flight Chart.....	13
IV Operational Equipment	15
1. Communication Equipment and Operation.....	15
2. Electrical Equipment	16
Appendix	
I (Deleted)	17
II Flight Operating Chart; Weight and Balance Data	19
1. Take-off, Climb, and Landing Chart.....	19
2. Weight and Balance Chart (L-4A).....	20
3. Weight and Balance Diagram (L-4A).....	21
4. Weight and Balance Diagram (L-4B), (L-4H)	22
5. Weight and Balance Chart (L-4B).....	23
6. Weight and Balance Chart (L-4H).....	24

IMPORTANT

**In order to gain the maximum benefit from this handbook,
it is imperative that you read these pages carefully.**

This handbook contains all the information necessary for safe and efficient operation of the L-4A, B and H series airplanes. These instructions do not teach basic flight principles, but are designed to provide you with a general knowledge of the airplane, its flight characteristics, and specific normal and emergency operating procedures. Your flying experience is recognized, and elementary instructions have been avoided.

The only source of technically accurate and constantly current information is contained in your Flight Handbook. This information is based upon the technical knowledge of the aircraft manufacturer and the Air Force as well as the experience of the using commands. You would never recognize these new books as your old familiar, undesirable -1 technical order. To help solve your specific problems, these new books have been made attractive, accurate, current, and easy to use. Not all of the books have been prepared to the new requirements, but you can easily tell the old from the new. The new type handbook has a full page cover illustration whereas the old book has a small "spot" illustration.

Each flight crew member, except those attached to an administrative base, is entitled to have a personal copy of the Flight Handbook while he is stationed at a given base. Air Force Regulation 5-13, issued in 1953, specifically makes that provision.

The technical order distribution system will work if you do your part; order your required quantity of handbooks before they are needed instead of waiting until the need arises. If you order them early, the Air Force will print enough to cover your requirements; if you delay, you will probably be kept waiting a long time when you do order because sufficient copies may not have been originally printed to cover your request.

The technical order system is easy to cope with; Technical order 00-5-2 explains, in just a few pages, the easy means by which you can set the automatic machinery into motion. Actually, all you have to do is reflect your requirement quantities on the Publications Requirements Table T.O. 00-3-1, and all the revisions, reissues, and supplements will be automatically forwarded to you in the same quantities. Your base supply officer is charged with the responsibility of ordering and securing quantities of the technical orders in accordance with your requirements—check with him. Of course, each base must develop a system of feeding these books and related data to their flight crew members so that no one will be using an obsolete book.

One more thing—it takes a certain amount of time to revise the Flight Handbook. Since the time lag is excessive for safety of flight information a new program has been put into effect to get such information to you in a hurry. This is done by means of safety of flight supplements which use the same number as your Flight Handbook except for the addition of a suffix letter. Supplements covering loss of life will get to you in 48 hours; those concerning serious damage to equipment will be delivered in 6 days. And what do you have to do to get these supplements? Absolutely nothing—if you have ordered your Flight Handbook on the Publications Requirements Table, you will automatically receive all supplements pertaining to your aircraft.

Your comments and questions regarding any phase of the Flight Handbook program are invited and should be directed to the Wright Air Development Center, Attention: WCOSF-3.

WCS

This handbook is divided into four sections and an appendix as follows:

SECTION I, DESCRIPTION.

A detailed picture of the airplane, its equipment, systems, and all controls which are essential to flight.

SECTION II, PILOT OPERATING INSTRUCTIONS.

Operating instructions arranged in proper sequence from the time the airplane is approached by the pilot until it is left parked on the ramp after completion of a routine flight. Also included are flight restrictions and general flying characteristics of the airplane.

SECTION III, FLIGHT OPERATING DATA.

A specific engine flight chart.

SECTION IV, OPERATIONAL EQUIPMENT.

Description of, and normal operating instructions for, the communications equipment and electrical equipment.

APPENDIX II, FLIGHT OPERATING CHARTS.

Flight information charts and diagrams of value to the pilot, such as Take-off, Climb, Weight and Balance Charts.

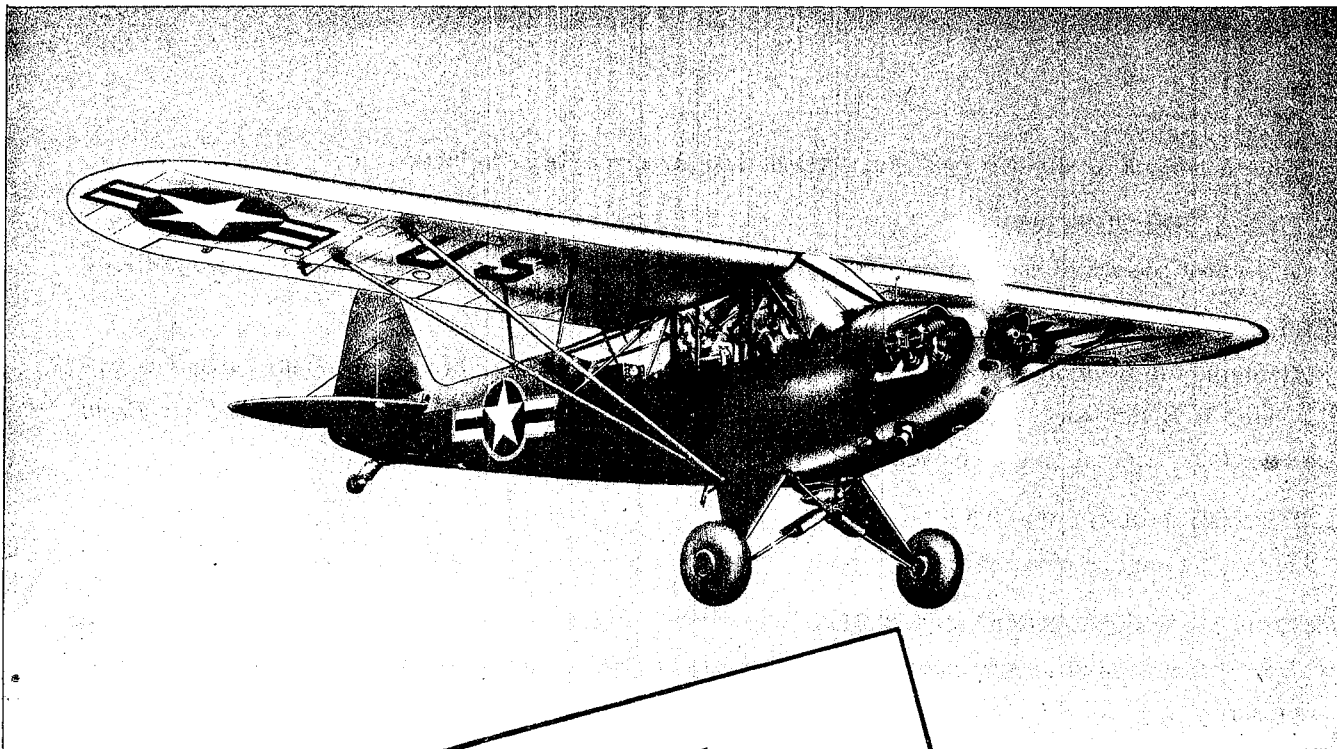
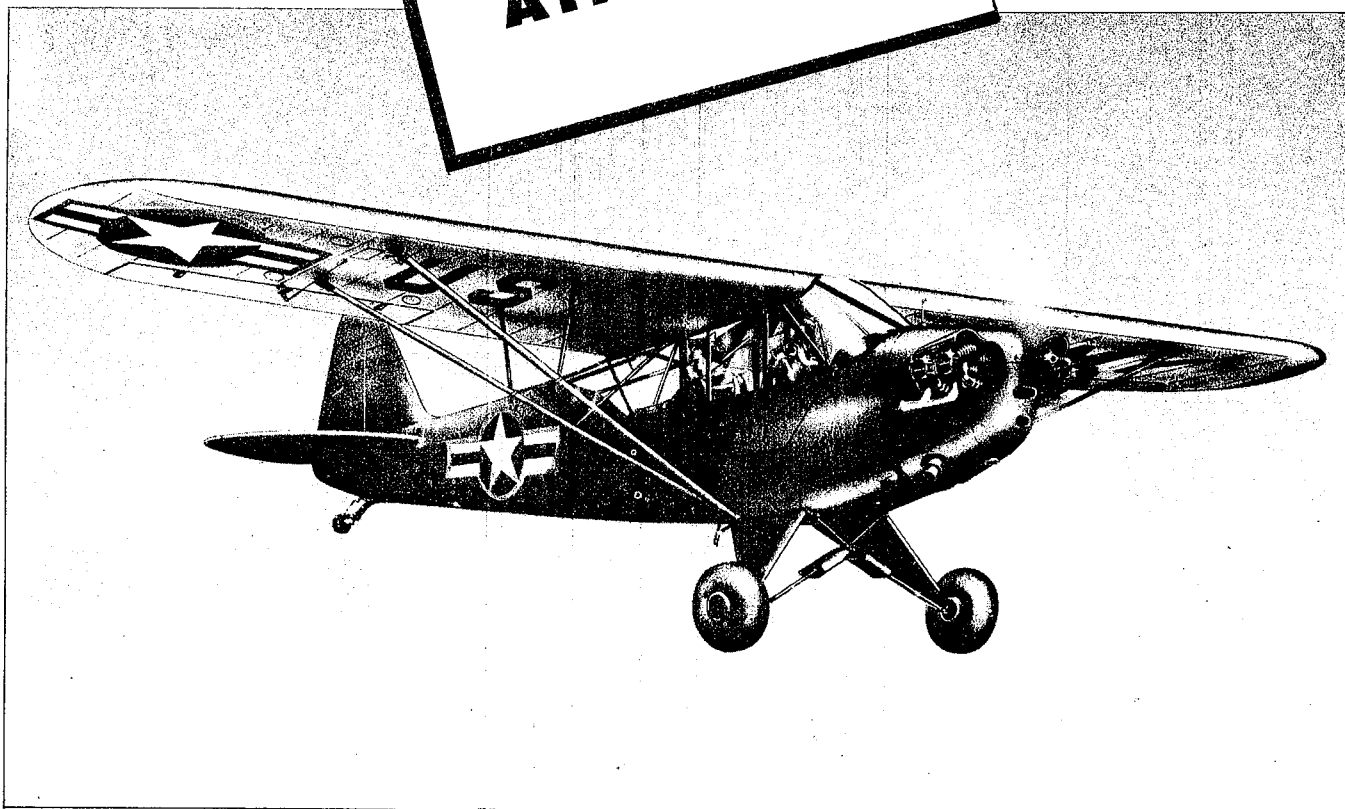


Figure 1—
The Model L-4A
in Flight

**L-4
AIRPLANE**

Figure 2—
The Model L-4B and
L-4H in Flight



SECTION I
DESCRIPTION

1. GENERAL DESCRIPTION.

a. The models L-4A, L-4B, and L-4H Short-range Observation and Liaison Airplanes are manufactured by Piper Aircraft Corporation. These light monoplanes have high strut-braced wings without flaps.

b. The model L-4A airplane is differentiated from the L-4B and L-4H in that a communication system is installed.

c. (Deleted)

d. The model L-4H does not have a fixed communications equipment, with the exception of antenna and antenna reel, and is also differentiated by the type of brakes and the windshield attachment. Provision is made for a portable radio in both the L-4B and L-4H.

e. The fuselage is a welded steel tubular framework, fabric-skinned. It is provided with seats for two crew members in tandem. The landing gear is of the fixed split-vee type, consisting of individually sprung wheels on which are mounted low-pressure 8.00 x 4-inch tires. The steerable tail wheel is mounted on steel spring leaves. Its solid-rubber tire size 6 x 2.00 inches. The cockpit enclosure is covered with transparent sheets on the top and sides, from the windshield to a point approximately 30 inches aft of the wing trailing edge. (See figures 1, 2, and 4.) The tactical mission of these airplanes is making short-range reconnaissance trips and acting as liaison agents for the use of ground commanders.

f. The airplane is powered with one Continental A65-8 (AF designation 0-170-3 or -7) air-cooled, horizontally opposed engine mounted in the nose. The engine is rated at 65 horsepower at 2,250 rpm at sea

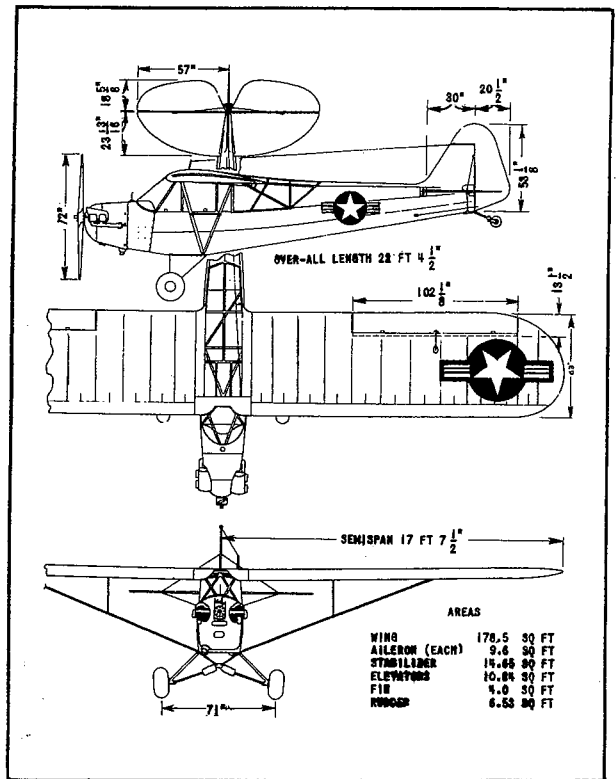


Figure 3—Deleted

Figure 4—Top, Side, and Front Views

level. The engine lubricating oil is admitted to the oil sump through the oil filler neck on the right side of the engine. (See figure 5.) The oil gage is part of the cap assembly. The fuel tank, with a capacity of 12 U. S. gallons, is located in the fuselage between the instrument panel and the fire wall. The fuel is admitted to the tank through the filler neck which penetrates the fuselage cowl forward of the windshield. The fuel gage is part of the tank cap assembly. It is not calibrated but shows the proportion of fuel remaining in the tank by the length of rod which extends beyond the cap. A full tank is represented by approximately 11 inches of visible rod.

g. The propeller is directly driven, having two fixed-pitch wooden blades with a diameter of 6 feet and a ground clearance of 1 foot, 2½ inches in level flight position.

2. FLIGHT PERSONNEL.

The cockpit provides two seats in tandem with each person having a complete set of controls. The instrument panel is arranged so that the instruments are visible from either seat, and visibility is excellent from either front or rear seat in a flight or landing attitude. The rear seat is placed so that the occupant can face forward (operating airplane) or aft (observing). This alternative is determined before starting flight. There is a placard in the left side of the cockpit giving directions to the observer to remove the rear stick when facing aft.

3. INTERIOR OF THE COCKPIT.

a. EMERGENCY EQUIPMENT. (See figures 6 and 7.)—A 1 U. S. quart carbon tetrachloride hand fire extinguisher is clipped to the floor between the front and rear seats. It is easily removed with a quick upward movement after the safety catch is released. The

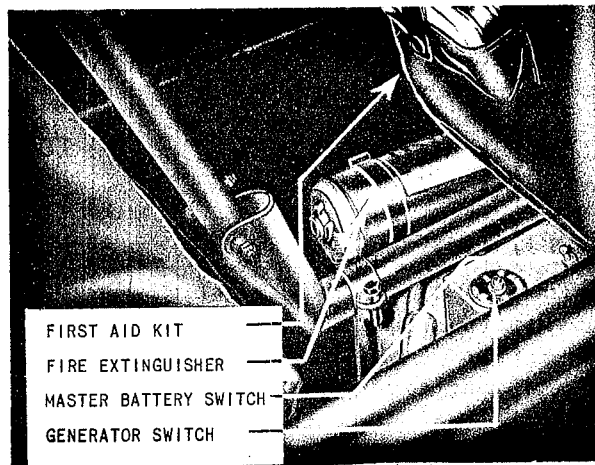


Figure 6—Emergency Equipment on the Model L-4A

first-aid kit is located in the upholstery pocket on the back of the front seat. Back-type parachutes may be worn in either seat. When wearing a back-type parachute, the occupant of the front seat should remove the seat-back cushion.

b. INSTRUMENT PANEL.

(1) On the model L-4A the instrument panel contains a battery condition indicator, tachometer, air-speed indicator, compass, compass deviation card, altimeter, oil temperature, and oil-pressure gages, primer knob, and cabin heater knob. (See figure 8.)

(2) On the model L-4B the instrument panel is identical to above panel with the exception that it does not contain a battery condition indicator. (See figure 9.)

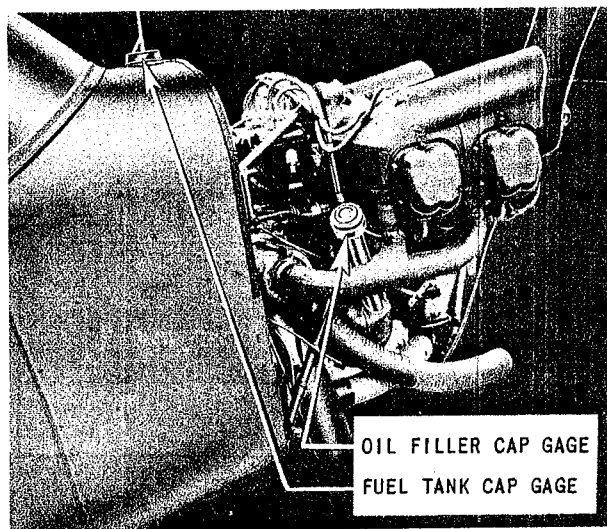


Figure 5—Engine of the Model L-4A, L-4B, and L-4H

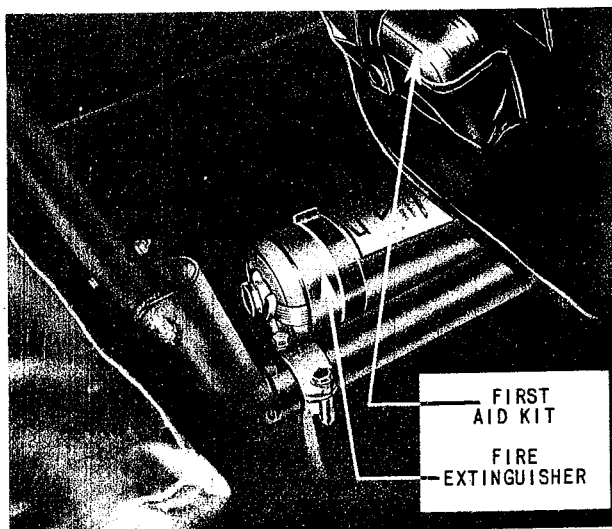


Figure 7—Emergency Equipment on the Model L-4B and L-4H

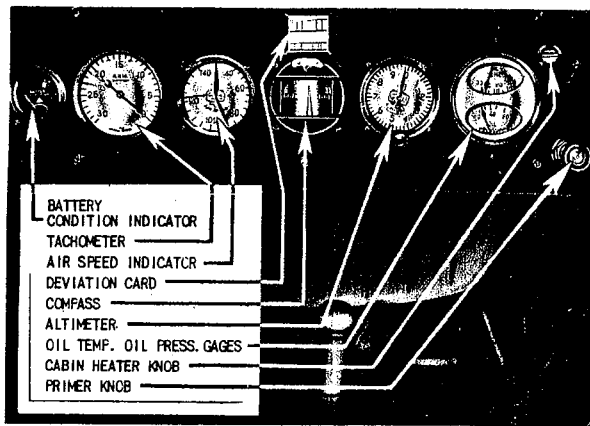


Figure 8—Instrument Panel on the Model L-4A

(3) On the model L-4H (figure 10), the instrument panel contains an oil-temperature and oil-pressure gages, primer knob, and cabin heater knob. The tachometer, compass, air-speed indicator, and altimeter are mounted on a shock-mounted panel in the middle of the instrument panel.

c. LOWER RIGHT SIDE. (See figure 11.)—The only control on the lower right side of the cockpit is the carburetor air heater. Pushing forward applies the heat. When the control is fully forward, the heater is at its maximum. A valve in the air box below the carburetor permits taking heated air from the exhaust manifold shroud into the carburetor. The use of the carburetor heater is necessary to prevent icing or to remove the ice formation in the carburetor and around the throttle valve. This causes loss of power and, therefore, should be used only when necessary. Pull back the control as far as possible in order to shut off the heater completely.

d. UPPER RIGHT SIDE. (See figure 17.)—Only one model, the L-4H, has any operating equipment located on the upper right side; this is the ignition switch which is installed over the upper enclosure door.

e. UPPER LEFT SIDE. (See figure 12.)—On the model L-4A, the antenna entrance fair-lead, the antenna reel, the remote control panel, the radio receiver, and the ignition switch are located on the upper left side. These are all accessible from either seat.

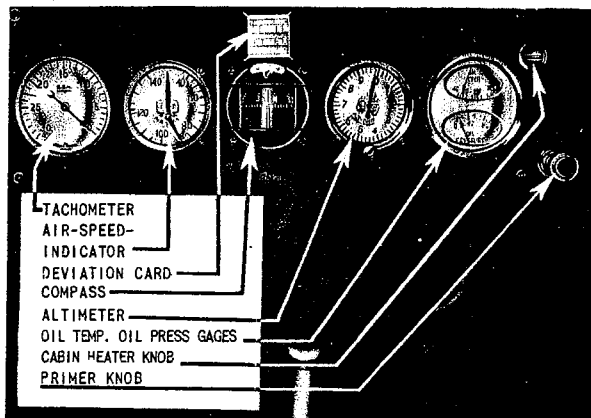


Figure 9—Instrument Panel on the Model L-4B

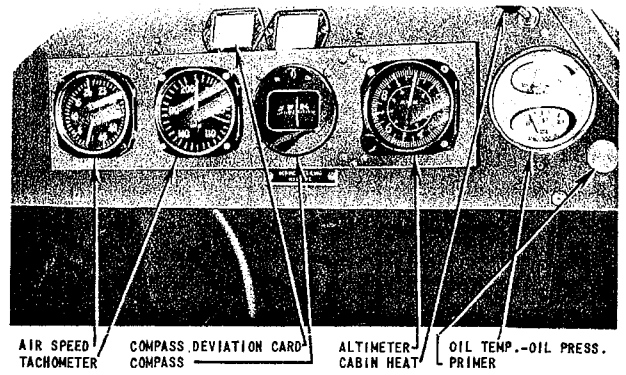


Figure 10—Instrument Panel on the Model L-4H

On the model L-4B the only control located on the upper left side is the ignition switch which is accessible from both seats. (See figure 13.)

On the model L-4H the antenna entrance fair-lead and the antenna reel are located on the upper left side and are accessible from either seat. (See figure 14.)

f. LOWER LEFT SIDE. (See figure 18.)—The fuel throttle levers are located along the window ledge. The fuel shut-off control, which is connected to the fuel shut-off valve on the bottom of the gas tank, is recessed below the throttles. A placard, in the recessed opening, gives directions for operating the control ("Push-On;" "Pull-Off"). There is no manual mixture control provided. The stabilizer-adjustment control is located below the fuel shut-off control. The motion of the crank is transmitted to the screw at the stabilizer mechanism by an endless cable. (Turn crank clockwise to cause the nose to go down and counterclockwise to bring the nose up.)

Note

Do not allow any lubricating oil or grease to get on this cable as it will cause it to slip on the pulleys.

g. OBSERVER'S DESK. (See figures 15 and 16.)—The observer's desk is located aft of the rear seat. On the model L-4A the radio transmitter, radio instruction card and control stick holder clips are located on the

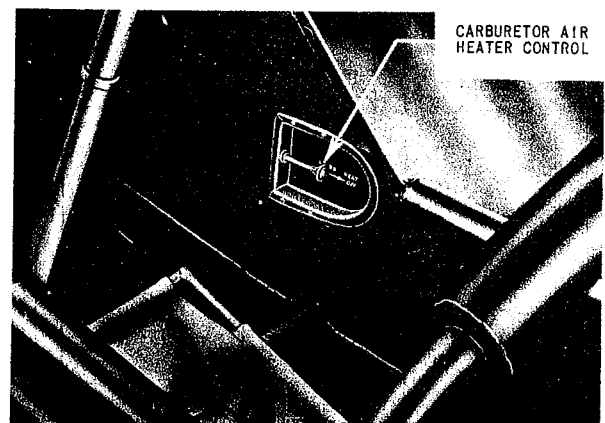


Figure 11—Lower Right Side of the Cockpit

desk. The map case is located underneath the desk on the right side. On the models L-4B and L-4H the observer's desk contains only the control stick holder clips. The map case is located underneath the desk on the right side.

b. FLOOR ARRANGEMENT. (See figures 19 and 20.)—Dual rudder pedals, dual brake pedals, with exceptions as noted below, the control stick assembly, and emergency equipment are identical on all models. On the model L-4A, the battery box is located in front of the front control stick and the master battery switch and generator switch box are located between the front and rear seats. The generator switch turns on the wind-driven generator. Stevens master cylinder brakes are used on this model.

On the model L-4B there is no electrical equipment installed. Stevens master cylinder brakes are used on this model. (See figure 20.)

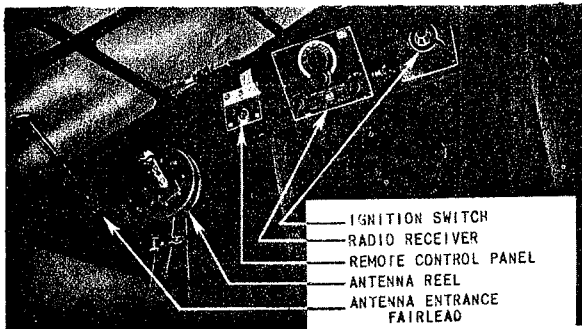


Figure 12—Upper Left Side of the Cockpit, Model L-4A

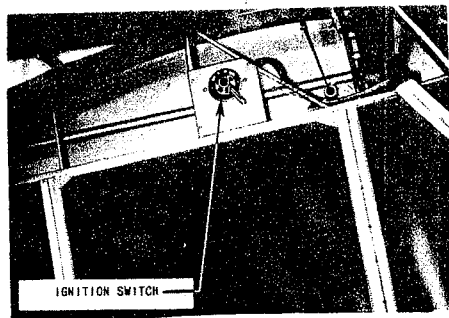


Figure 13—Upper Left Side of the Cockpit, Model L-4B

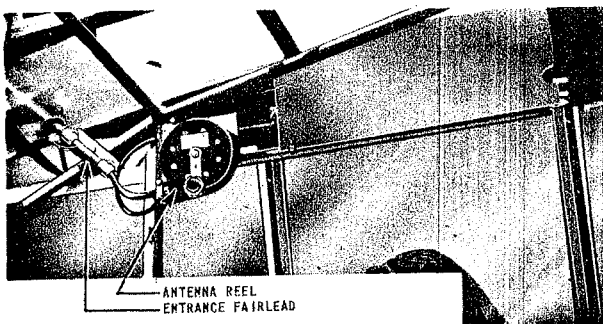


Figure 14—Upper Left Side of the Cockpit, Model L-4H

On the model L-4H there is no electrical equipment installed. Scott master cylinder brakes are used on this model (See figure 20.)

i. LUBRICATING SYSTEM. (See figures 5, 8, 9, 10, and 22.)—The lubrication of the power plant is internal, the only external features are the oil pressure and oil-temperature gages, oil filler neck and cap, and a 1 U. S. gallon oil tank or sump.

4. FUEL AND OIL.

a. FUEL.—The recommended fuel for this airplane shall be in accordance with Specification MIL-F-5572, Grade 80. As an alternate, fuel in accordance with U. S. Army Specification No. 2-103, Grade 80 shall be used.

b. OIL.—The preferred oil shall be in accordance with Specification AN-2-104, Grade 30. As an alternate, oil in accordance with Specification MIL-L-6082A, Grade 1100 summer, Grade 1065 winter shall be used.

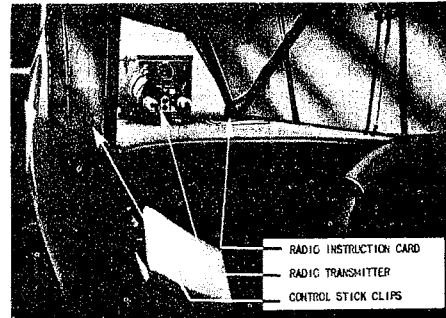


Figure 15—Observer's Desk on the Model L-4A

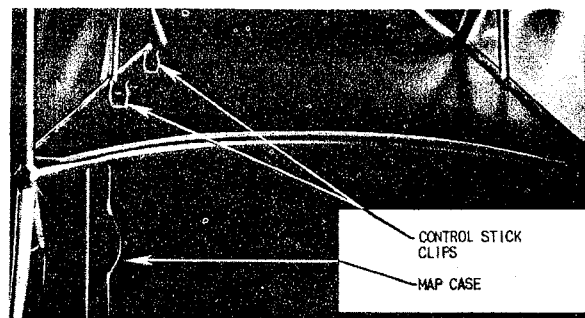


Figure 16—Observer's Desk on the Models L-4B, L-4H

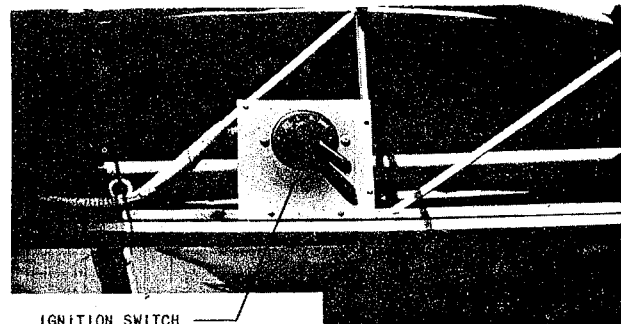


Figure 17—Upper Right Side of the Cockpit, Model L-4H

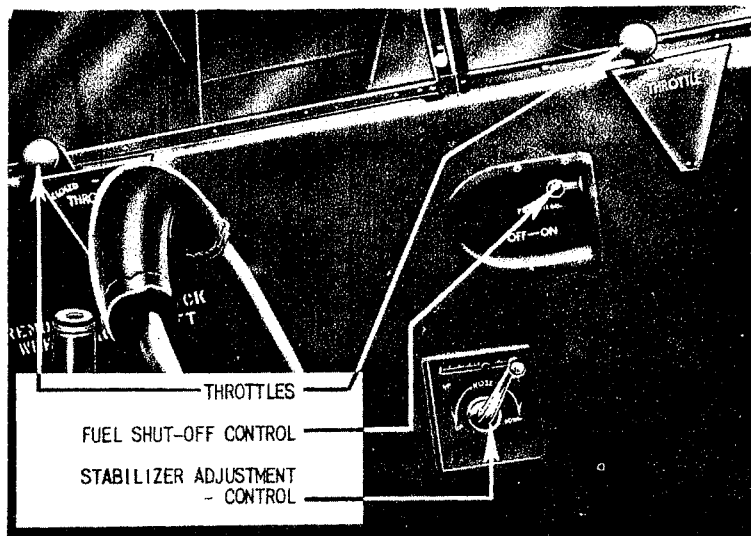


Figure 18—
Lower Left Side
of the Cockpit

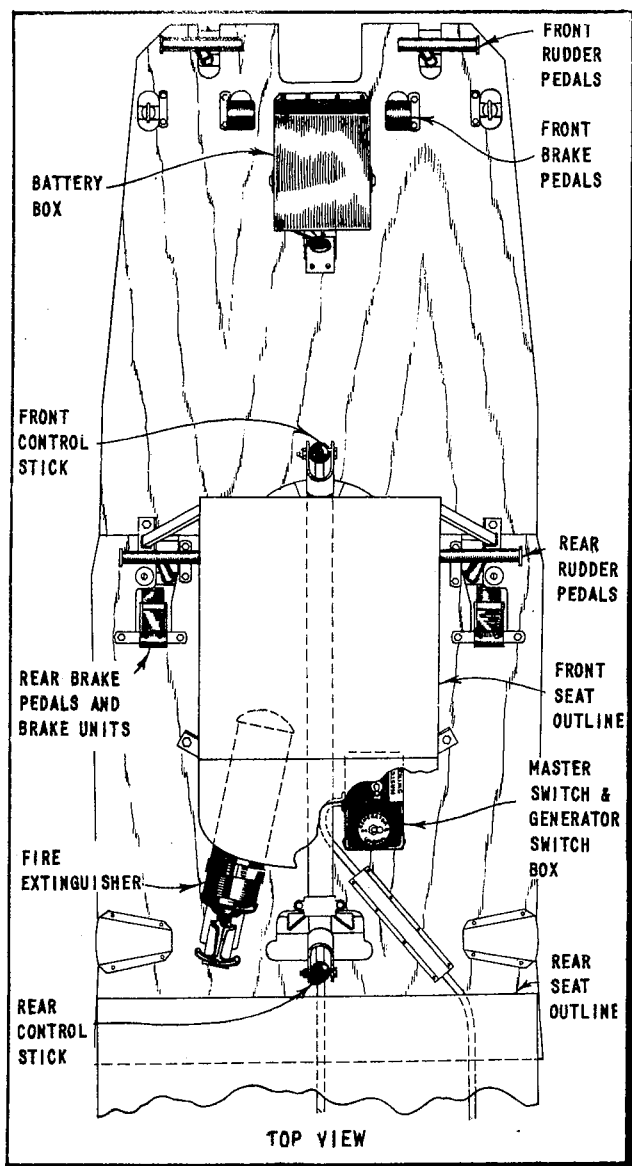


Figure 19—Cockpit Floor on the Model L-4A

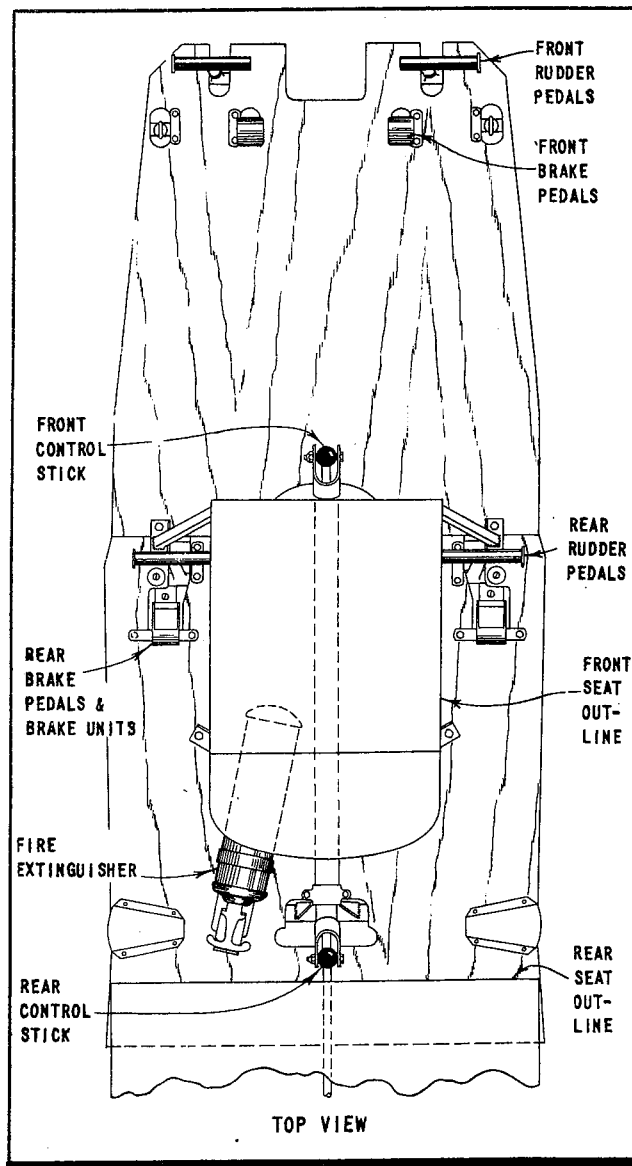


Figure 20—Cockpit Floor on the Models L-4B and L-4H

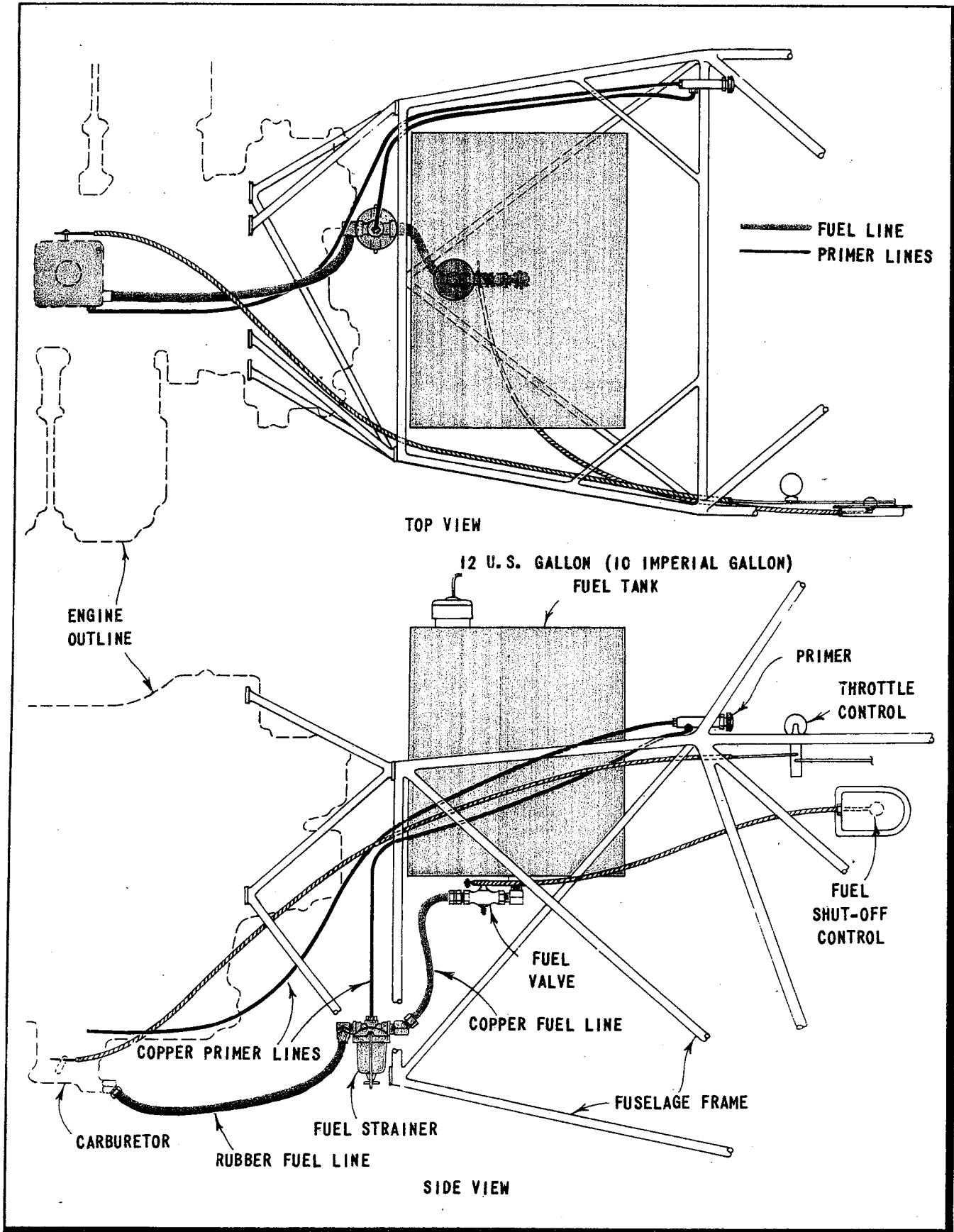


Figure 21—Fuel System Diagram

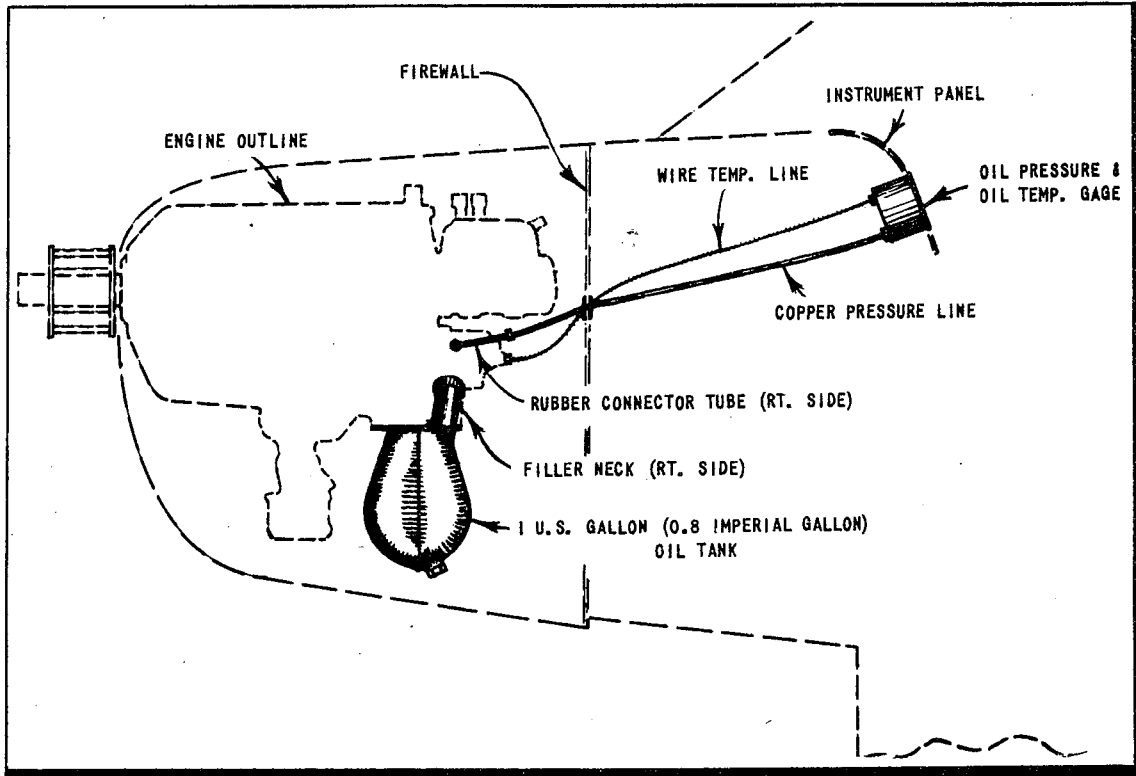


Figure 22—Oil System Diagram

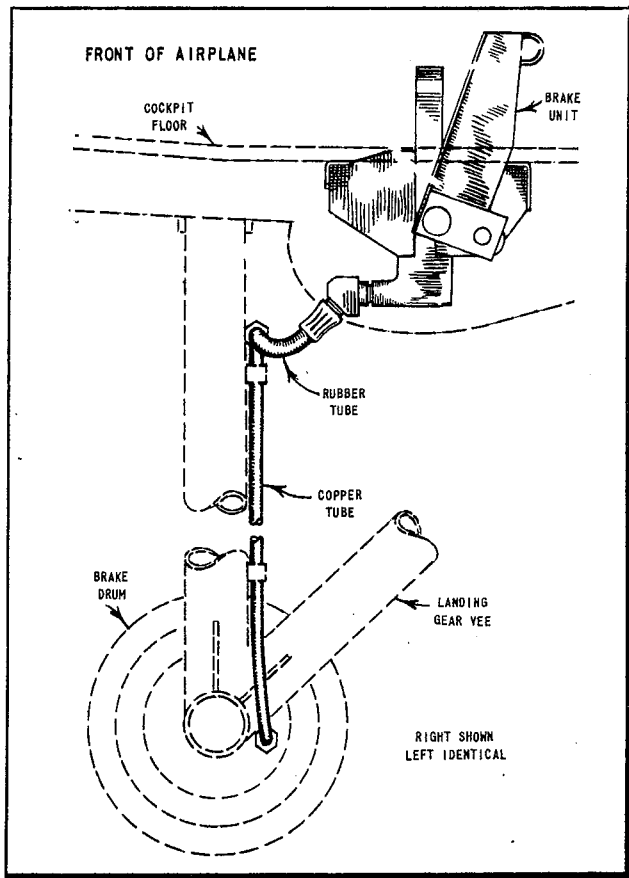


Figure 23—Hydraulic System, Models L-4A, L-4B

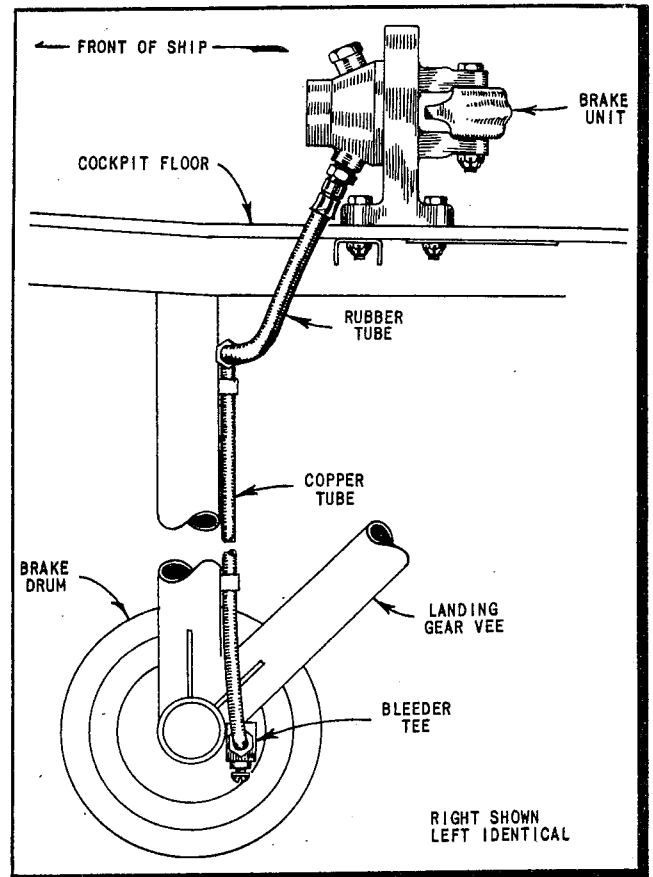


Figure 24—Hydraulic System, Model L-4H

SECTION II

PILOT OPERATING INSTRUCTIONS

1. FLIGHT RESTRICTIONS.

a. **MANEUVERS PROHIBITED.**—Violent acrobatics and abrupt pull-ups are not to be performed in this airplane.

WARNING

If the engine stops in flight for any reason, **DO NOT TRY TO START IT BY DIVING.** This engine will not windmill due to high compression peaks and light propeller.

b. **STALLS.**—The full load stalling speed is approximately 37.5 mph. There is a noticeable softening of aileron control; the airplane mushes with the tail low, and then the nose drops. The tendency of the airplane to fall off on one wing or the other can be overcome by using the rudder. If the airplane is allowed to fall off on one wing, it will go into a spin.

c. **SPINS.**—For recovery from spins, whether voluntary or involuntary, use the following sequence of operations:

- (1) Close throttle.
- (2) Apply full opposite rudder.
- (3) Make one-quarter of a turn.
- (4) Push stick forward.

(5) **ALTERNATIVE.**—Recovery may also be effected by a simultaneous or reverse order of these operations, but the time or number of turns required to recover from the spin is greater than that of the above procedure. It is important that the controls are not slackened during recovery, as slackening results in slower recovery.

d. **DIVING.**—The airplane is not designed for diving but, in case of emergency, a steep glide can be safely taken providing a speed of 122 mph is not exceeded. Maximum permissible engine overspeed is 2,530 rpm.

CAUTION

Do not make steep glides in gusty air nor make abrupt pull-outs.

1A. MINIMUM CREW REQUIREMENT.

The minimum crew requirement for this airplane is one pilot in the rear seat. Additional crew members as required may be added at the discretion of the Commanding Officer.

2. BEFORE ENTERING THE COCKPIT.

a. The flight characteristics of the airplanes are normal in all respects. The only difference between the L-4A, L-4B, and L-4H is in the gross weight and empty weight. L-4A airplanes have radio equipment installed, the receiver and remote control panel in the upper left and the transmitter on the observer's desk. L-4B and L-4H airplanes are not equipped with radio. The gross

weight, including pilot, observer, and parachutes, of the L-4A and L-4B is 1,170 pounds. The gross weight of the L-4H is 1,220 pounds. Solo flying in all models is from the rear seat.

CAUTION

Before entering rear seat, hook front safety belt across seat so that it will not interfere with the operation of the controls during flight or when taxiing.

b. The pilot and observer enter the cockpit from the right side and from behind the wing lift struts. The enclosure door on this side is in two sections which open outward. If the sections are latched shut, they can be opened by lowering the sliding window on the left side of the fuselage and reaching through the cockpit.

3. ON ENTERING THE COCKPIT.

a. BEFORE STARTING ENGINE.

(1) Make preflight routine check of gasoline supply, control mechanisms, communication equipment, and instruments. The visible fuel gage, which is an integral part of the gasoline tank cap, will not show the number of gallons but will show the proportion of fuel in the tank by the length of the rod which extends upward from the cap; a full tank, 12 U. S. gallons, is represented by approximately 11 inches of rod extending beyond the cap.

(2) If the observer intends to sit facing aft, remove the rear stick by removing the bolt and nut at the stub. Place the stick in the holders on the desk and replace the bolt and nut on the stub. If the observer intends to sit facing forward, this need not be done. Check the action of the stick to see that it has free motion in all directions.

(3) Since the steerable tail wheel is connected directly to the rudder, movement of the rudder pedals when the airplane is not in motion will cause a slight side-to-side motion of the fuselage. Push the brake pedals to check brake action; the brakes should hold the airplane motionless without using full travel when the engine is running at full throttle. On the models L-4A and L-4B, it is possible to pump the brakes and "self-bleed" the line by using several full strokes of the pedals. The pedals should be allowed to return all the way after each stroke. The Scott brakes on the model L-4H cannot be self-bled. Check the operation of the tachometer, oil pressure, and oil temperature gages. The tachometer reading for idling should be between 500 and 700 rpm.

(4) Oil pressure for idling speed should be 10 pounds per square inch.

(5) Adjust the altimeter to read zero before take-off.

(6) Adjust the stabilizer to approximate level flight position to fit the loading conditions. The cover plate shows the direction to turn the crank to produce "nose-up" or "nose-down" condition. Readjustment can be made after the airplane is in flight.

(7) Check radio transmitter and receiver operation.

(8) Check generator switch—"ON" (L-4A).

4. STARTING ENGINE.

a. Ignition switch "OFF." (See figures 12, 13 and 17.)

b. Set throttle "OPEN" approximately $\frac{1}{4}$ inch.

c. Turn "ON" fuel shut-off. (See figure 18.)

d. Place carburetor heat control in the "OFF" position. Have mechanic turn engine over by hand several times. This frees the cylinders of exhaust gases or oil and fills the cylinders with the fuel mixture.

e. If the engine is cold or has not been run for 2 hours or more, have mechanic turn it over four or five times by hand. This frees the cylinders of oil that might cause bent or broken rods. It also replaces the exhaust gases in the cylinders with a fresh charge of fuel and air.

CAUTION

Always treat propeller as if ignition switch were on. Stand as far in front of propeller as possible. Use both hands on the same blade. Do not overgrasp the blade. Be sure there are chocks in front of the wheels.

f. Turn ignition switch "BOTH."

g. Start engine by pulling propeller through with a snap.

b. If the engine does not start, turn ignition switch "OFF." Turn primer knob (figure 8) to unlock, and pull out; pump three or four times and reseal primer plunger and lock by turning knob in the opposite direction.

CAUTION

Avoid overpriming, it is wasteful and causes the raw gasoline to wash the lubricating oil from the cylinder walls. Do not prime a warm engine.

i. Repeat starting procedures f. and g.

j. If engine loads up, turn ignition switch "OFF," open throttle wide and turn the engine backward to unload the excess gasoline vapors and raw gasoline from the cylinders.

k. In case of fire, turn off ignition and fuel at once. A hand fire extinguisher is located on the floor behind the front seat.

5. DURING WARM-UP.

a. As soon as the engine starts, open the throttle enough to maintain a speed of about 700 rpm. Check the oil pressure gage. If the gage does not indicate pressure within 30 seconds, stop the engine and correct the trouble before continuing operation. Oil pressure should be at least 10 pounds for idling and 25 to 40 pounds in the operating range.

b. After the engine has run approximately 3 minutes between 700 and 800 rpm, increase throttle gradually until tachometer shows from 1200 to 1500 rpm and run at least an additional minute or until the oil temperature reaches 49°C.

c. Set engine speed at 700 rpm. Turn ignition switch to "OFF" momentarily and observe that



Figure 25—Three-Quarter Rear View Showing Entrance

engine completely ceases firing. If the engine does not stop, the magneto ground wire is open, in which case personnel should be kept clear of the propeller. Perform this check as rapidly as possible in order to prevent a severe backfire when the switch is again turned on.

d. Adjust the engine speed to 1700 rpm and note the manifold pressure. This reading should not vary more than 1 inch.

e. Check the magnetos at 1700 rpm. The engine speed with a given throttle should not drop more than 75 rpm, on either "L" or "R" magneto from a "BOTH" magneto operating position.

f. Check the acceleration and deceleration of the engine. The engine should accelerate rapidly and smoothly with no tendency to backfire. The maximum rpm during acceleration should not exceed 1700 rpm.

g. Check the idle speed at 600 rpm.

CAUTION

Do not operate engine on either single magneto for more than 30 seconds at a time. Avoid prolonged periods of operation at idling rpm or full throttle rpm while on the ground.

6. EMERGENCY TAKE-OFF.

a. Emergency take-off may be made as soon as the engine will take full throttle without missing.

7. TAXIING INSTRUCTIONS.

a. Open throttle to put airplane in motion; after airplane is in motion, close throttle to a point sufficient to keep momentum.

CAUTION

Do not taxi too fast; fast taxiing is hazardous and causes unnecessary wear on the chassis structures. Taxiing speed should not exceed a brisk walk.

b. The airplane is equipped with a steerable tail wheel connected to the rudder which will permit the pilot to turn the airplane very sharply.

CAUTION

Do not use the brakes for turning the airplane as this causes unnecessary wear on the brakes and tires.

8. TAKE-OFF.

a. Immediately before take-off set brakes, hold stick back and open to full "OPEN" for approximately 10 seconds to check individual magneto operation. Minimum rpm with both magnetos should be 2020. Check oil pressure and oil temperature and be sure carburetor air heater control is on "OFF."

b. The take-off distance in calm air for full gross weight on a hard dry surface is about 632 feet to clear a 50-foot object at sea level. (See Take-Off, Climb, and Landing Chart.)

c. Move stick forward to raise tail. When flying speed is attained, stalling speed is approximately 37.5 mph, apply back pressure on stick for take-off.

d. Relax pressure on stick to gain air speed of approximately 55 mph.

CAUTION

This speed is necessary as a precaution against engine failure. If the engine fails, the airplane can be maneuvered for a forced landing.

9. CLIMB.

a. During climb of 300 feet per minute to 5,000 feet, maintain air speed of approximately 55 mph. (See Take-off, Climb, and Landing Chart.)

b. During take-off and climb the throttle should be kept at full "OPEN." On arriving at cruising altitude, the engine should be throttled down.

10. GENERAL FLYING CHARACTERISTICS.

a. Do not fly for any great length of time at full throttle; 3 minutes maximum for take-off or emergency. Use 2,150 rpm for the most satisfactory service; this will provide an air speed of approximately 75 mph.

b. Use carburetor air heater (*figure 11*) if tachometer shows drop in rpm, which may be due to ice forming in the carburetor. Tachometer should recover to within 50 rpm below normal when using heater. Push heater to "OFF" and, if the condition has been cleared, the rpm should return to normal. Continued use of the carburetor heater will only cause inefficient operation of the engine.

c. Oil temperature should not rise above 93°C (200° F) and oil pressure should not fall below 25 pounds per square inch. (See *figure 8* and Specific Engine Flight Chart.)

CAUTION

If a drop in oil pressure or an unusual rise in temperature is noted, a landing should be made without delay and the trouble corrected.

11. APPROACH AND LANDING.

a. Push "ON" carburetor air heater.

b. Glide at 60 mph; throttle slightly "OPEN."

c. At 600-foot altitude, head into wind.

d. When 10 to 15 feet from ground, break glide by a slight continuous back pressure on stick; close throttle so that engine is idling.

e. Level off.

f. Ease stick full back as airplane settles.

NOTE

If glide takes a considerable length of time, "clear" the engine by opening the throttle every 150 to 200 feet of descent.

g. CROSS-WIND LANDING.—Since the airplane is light in weight, it is well to exercise extra care in cross-wind landings. Drop the upwind wing sufficiently to overcome wind drift effect, stop turning tendencies caused by this lowered wing with enough pressure on the opposite rudder.

b. Emergency take-off if landing is not complete. Since the throttle has been slightly "OPEN," the engine is "clear" and will take full throttle if it is needed because of overshooting or undershooting the field.

11A. POST FLIGHT CHECK.

After the last flight of the day, set the parking brakes and accomplish the following checks:

- a. Ignition switch check—Same as preflight.
- b. Power check—Same as preflight.
- c. Ignition system check—Same as preflight.
- d. Idle speed check—Same as preflight.

12. STOPPING OF ENGINE.

a. Never cut the switch immediately after the landing as this tends to cool the engine too rapidly.

b. When engine is idling, it is advised to switch to either "R" or "L" magneto for 30-second intervals to allow the engine to cool gradually. This tends to prevent overheating of the plug insulators to a point where "after-firing" might occur. The lubrication on the cylinder walls is left in a cool condition and does not drain off too rapidly.

13. CHECK BEFORE LEAVING THE COCKPIT.

a. Be sure the following controls are turned off.

- (1) Fuel.
- (2) Throttle.
- (3) Ignition.
- (4) Carburetor air heater.
- (5) Cabin heat.
- (6) Communication equipment (L-4A).
- (7) Battery switch (L-4A only)—leave generator switch "ON."

b. Wrap front seat belt completely around rear stick, tighten and buckle in conventional manner to lock ailerons and elevators to prevent wind damage. (See figure 26.)

c. If any defects have occurred during flight, make a report of them upon landing.

14. TIEING DOWN.

a. Use tie-down kit type D-1.

b. Use the following procedure:

- (1) Place airplane with tail into wind.
- (2) Drive ground-breaking pin (short, arrow-pointed pin) into ground below tail-wheel spring at a rearward angle. Remove pin.
- (3) Place mooring arrow on end of long driving rod and drive it in the hole made with the ground-breaking pin for a distance of about 18 inches.
- (4) Remove driving rod.
- (5) Insert blunt end of threaded anchor rod into anchor arrow and turn it until it is tight.
- (6) Attach eye fitting to squared end above ground.
- (7) Tie rope to eye and tail-wheel spring.
- (8) Break ground with ground-breaking pin (see paragraph (2), preceding) below each front lift strut spar fitting. Drive pin at a forward angle.
- (9) Follow procedure, paragraphs (3) to (6), preceding, inclusive.
- (10) Tie rope to eye and to lift strut above pulley fitting.

CAUTION

In all cases be sure that ropes are tightly stretched. A loose rope will snap.

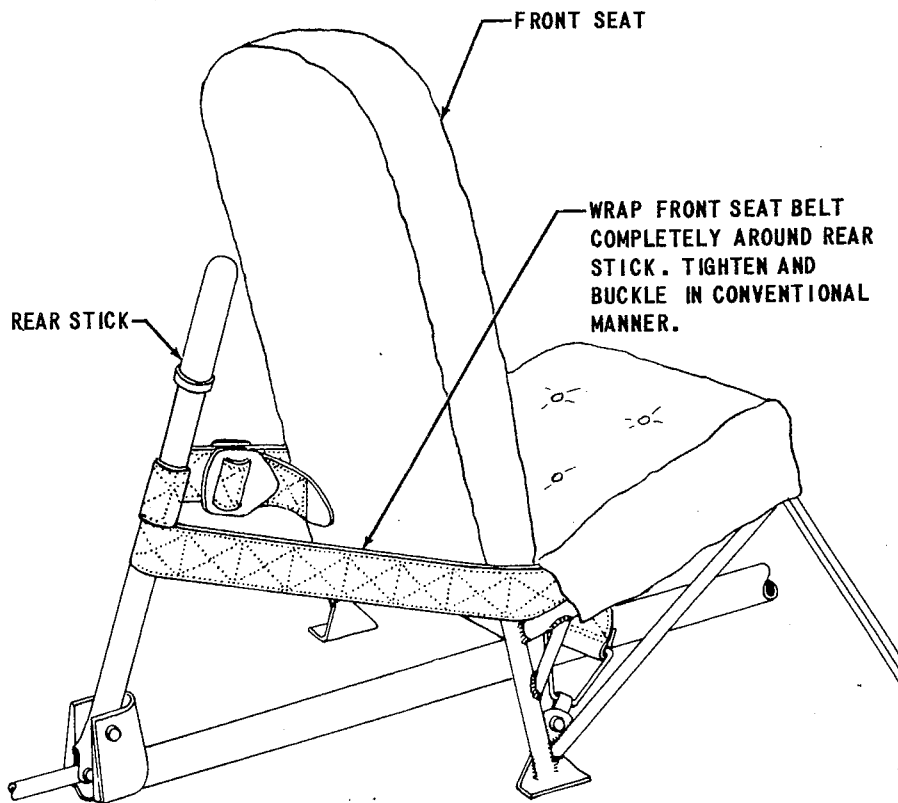


Figure 26—Aileron and Elevator Lock

SECTION III FLIGHT OPERATION DATA

FORM ASC-512A	AIRPLANE MODELS <u>L4A, L4B and L-4H</u>	SPECIFIC ENGINE FLIGHT CHART	ENGINE MODELS <u>0-170-3 or -7</u>																																					
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">CONDITION</th> <th rowspan="2">FUEL PRESSURE (LB/SQ. IN.)</th> <th rowspan="2">OIL PRESSURE (LB/SQ. IN.)</th> <th colspan="2">OIL TEMP.</th> <th colspan="2">COOLANT TEMP.</th> </tr> <tr> <th>C</th> <th>F</th> <th>°C</th> <th>°F</th> </tr> <tr> <td>DESIRED</td> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">GRAVITY FEED</td> <td>35</td> <td>71</td> <td>160</td> <td colspan="2">AIR COOLED</td> </tr> <tr> <td>MAXIMUM</td> <td>40</td> <td>93</td> <td>200</td> <td colspan="2">AIR COOLED</td> </tr> <tr> <td>MINIMUM</td> <td>25</td> <td>49</td> <td>120</td> <td colspan="2">AIR COOLED</td> </tr> <tr> <td>IDLING</td> <td>10</td> <td>49</td> <td>120</td> <td colspan="2">AIR COOLED</td> </tr> </table>	CONDITION	FUEL PRESSURE (LB/SQ. IN.)	OIL PRESSURE (LB/SQ. IN.)	OIL TEMP.		COOLANT TEMP.		C	F	°C	°F	DESIRED	GRAVITY FEED	35	71	160	AIR COOLED		MAXIMUM	40	93	200	AIR COOLED		MINIMUM	25	49	120	AIR COOLED		IDLING	10	49	120	AIR COOLED				MAX. PERMISSIBLE DIVING RPM: 2530
CONDITION	FUEL PRESSURE (LB/SQ. IN.)				OIL PRESSURE (LB/SQ. IN.)	OIL TEMP.		COOLANT TEMP.																																
		C	F	°C		°F																																		
DESIRED	GRAVITY FEED	35	71	160	AIR COOLED																																			
MAXIMUM		40	93	200	AIR COOLED																																			
MINIMUM		25	49	120	AIR COOLED																																			
IDLING		10	49	120	AIR COOLED																																			
SUPERCHARGER TYPE: NONE.																																								
OPERATING CONDITION	RPM	MANIFOLD PRESSURE (BOOST)	HORSE-POWER	CRITICAL ALTITUDE		BLOWER	USE LOW BLOWER BELOW:	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.)		MAXIMUM CYL. TEMP.		MAXIMUM DURATION (MINUTES)																											
				WITH RAM	NO RAM				U.S.	IMP.	°C	°F																												
TAKE-OFF	2300 MAX	F. T.			SEA LEVEL				5.45				3																											
WAR EMERGENCY								SEE REMARKS																																
MILITARY																																								
NORMAL RATED (MAX. CONT.)	2300		65		SEA LEVEL				5.45																															
MAXIMUM CRUISE	2200 2100		57.5 50.		SEA LEVEL				3.8																															
MINIMUM SPECIFIC CONSUMPTION																																								
REMARKS: AUTOMATIC MIXTURE CONTROL, NO MANUAL CONTROL PROVIDED.																																								

This Page Left Blank Deliberately

SECTION IV OPERATIONAL EQUIPMENT

1. COMMUNICATION EQUIPMENT AND OPERATION.

a. COMMUNICATION EQUIPMENT FOR THE L-4A.

(1) The radio receiver is mounted on the upper left side of the cockpit. (See figures 12 and 27.) It contains a jack for connecting the headphones.

(2) The transmitter system includes:

(a) The radio transmitter mounted on the observer's desk. (See figure 15.) Its fuse protects all radio equipment.

(b) The transmitter remote control panel is mounted on the upper left side aft of the receiver. (See figure 12.) The microphone can be plugged into the jack on the remote control panel for both pilot's and observer's use or it can be plugged into the transmitter jack for observer's use.

(c) Two cards, the transmitter tuning chart and transmitter operating instructions, are attached to the observer's desk beside the transmitter.

(3) The antenna system includes:

(a) Antenna reel located below the remote control panel on the upper left side. (See figure 12.)

(b) The antenna entrance fail-lead. This is a black bakelite tube which penetrates the roof of the cockpit; in the cockpit, it extends to within approximately 3 inches of the antenna reel.

(c) The antenna wire, fully extended, is 125 feet long. It is retractable and its length can be varied by rotating the reel. At the rudder it passes through a ceramic insulator to the drag unit.

(d) The drag unit, a rubber-covered sock with the base connected to the antenna wire by means of a swivel connection aft of the ceramic insulator on the rudder.

b. OPERATION (MODEL L-4A).

(1) The above units comprise the complete aircraft communication installation for communication from the aircraft to ground stations or to other aircraft. The equipment is simple and direct in operation.

(2) When the antenna is reeled in, it constitutes a fixed antenna. Crank clockwise in flight only to play out antenna. Observe transmitter tuning chart to determine number of turns for required frequency in use. (See figure 15.)

CAUTIONS

The transmitter must not be operated in a hangar, while the airplane is being fueled, or near fuel supplies.

To avoid the possibility of the microphone cord becoming entangled with the airplane controls, make sure the microphone is hung up on the hook when not in actual use.

Be sure that the antenna is clear of any airplane or structure which might act as a ground when testing the radio before flight.

Be sure to reel in antenna wire before landing.

(3) The steps of recommended operation may be found on the transmitter operating chart. They are as follows:

(a) Plug headphones and microphone in respective jacks.

(b) Throw airplane's master battery switch to "ON" position.

(c) Turn receiver on by rotating volume control clockwise.

(d) Set VAR crystal switch to variable tuning. Crystal tuning is available only when crystals are used in receiver.

(e) Tune receiver carefully to desired signal. The use of CW (Telegraph) position is very helpful in spotting desired signal when waiting for desired signal to appear.

(f) For CW reception throw CW-PHONE switch to "CW;" for phone reception throw CW-PHONE switch to "PHONE."

(g) To operate transmitter, throw ON-OFF switch on either remote control panel or transmitter to "ON" position. Jewel lights on remote control panel and transmitter panel should glow, indicating that transmitter is on. Receiver must be on before transmitter can be turned on.

(h) Allow 30 seconds for filaments to warm up.

(i) Set controls on transmitter and antenna length for desired frequency and selected operation as indicated on tuning chart.

(j) Press microphone button and talk directly into front of microphone with lips just touching mouth-piece.

(k) To turn transmitter off, reverse above procedure. Receiver and transmitter can both be turned off by means of receiver volume control.

(1) Master battery switch must always be turned "OFF" before leaving airplane.

NOTE

Antenna current must always register on meter when transmitting. Failure to do so may be caused by improper adjustments, especially with transmitter TUNING control being set too sharp (too much towards the low-number side). Always use antenna length which gives highest reading on meter after other controls are set according to tuning chart. For further information see instruction book.

c. The Communication Equipment on Model L-4H consists of the following antenna equipment:

(1) The antenna reel located below the support panel on the upper left side. (See figure 14.)

(2) The antenna entrance fair-lead. This is a black bakelite tube which penetrates the roof of the cockpit; in the cockpit, it extends to within approximately 3 inches of the antenna reel.

(3) The antenna wire, fully extended, is 125 feet long. It is retractable and its length can be varied by rotating the reel. At the rudder, it passes through a ceramic insulator to the drag unit.

(4) The drag unit, a rubber-covered sock with the base connected to the antenna wire by means of a swivel connection aft of the ceramic insulator on the rudder.

2. ELECTRICAL EQUIPMENT.

a. On the model L-4A a 6-volt battery, in a metal battery box, is located on the floor aft of the fire wall.

b. Master fuses and spares, 25 amperes, are on the battery box.

c. Battery-condition indicator is at the extreme left on instrument panel board. (See figure 8.) Switch on generator if instrument indicates battery is below normal. Switch off generator if battery is above normal. When operating with generator off, the indicator will show approximately half scale if battery is fully charged.

d. Master switch ("OFF" backward and "ON" forward) is located to the right in the rear of front seat on floor board. (See figure 6.) This switch controls the electrical supply from the battery. It does not control the magnetos. Keep "OFF" when radio equipment is not in actual use.

e. Generator switch is mounted on same bracket with master switch. (See figure 6.) Observe placard mounted on floor board along side of master switch box.

NOTICE

Be sure generator control switch reads "OFF" when operating below cruising speed (70 mph) or when standing on ground.

f. Generator, wind-driven, is located directly below the fuselage on cabane vee of landing gear. (See figures 1 and 3.)

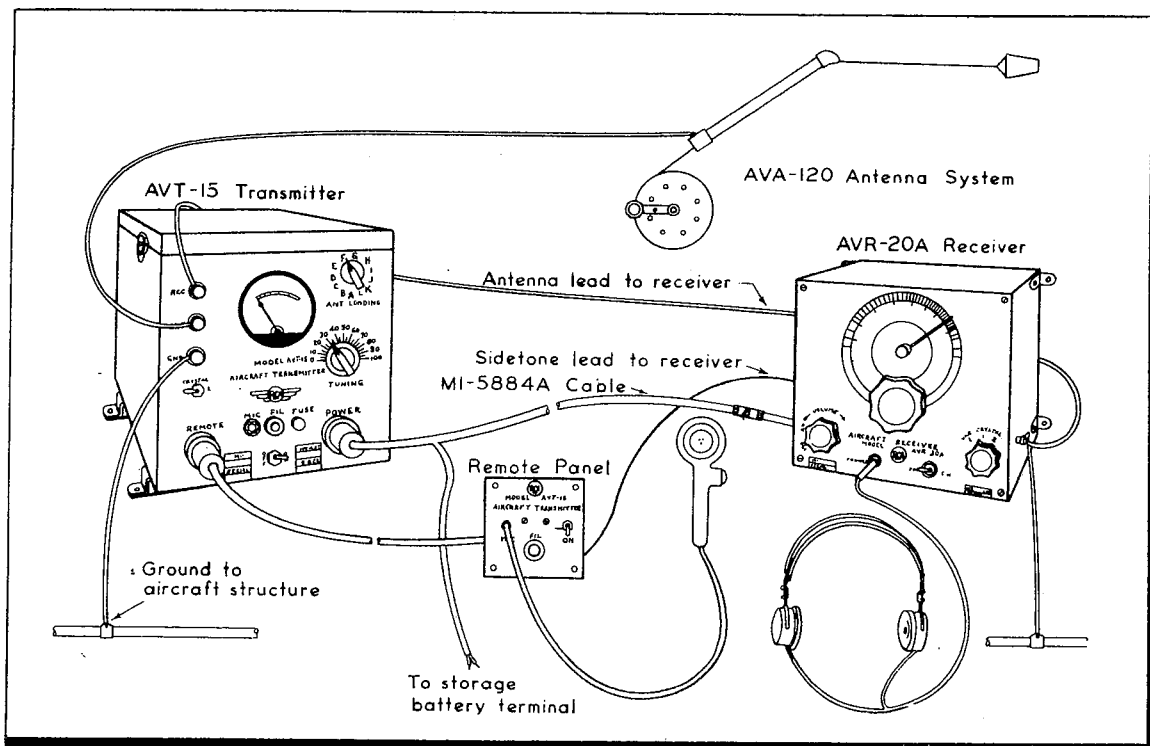


Figure 27—Communication Equipment, Model L-4A

APPENDIX I DELETED

AN 01-140DA-1

APPENDIX II

FLIGHT OPERATING CHART; WEIGHT AND BALANCE DATA

This section contains the flight information charts and diagrams of value to the pilot. These are:

1. Take-off, Climb, and Landing Chart
2. Weight and Balance Chart (L-4A)
3. Weight and Balance Diagram (L-4A)
4. Weight and Balance Diagram (L-4B and L-4H)
5. Weight and Balance Chart (L-4B)
6. Weight and Balance Chart (L-4H)

AIRPLANE MODELS Model L-4A-1, L-4B L-4H		ENGINE MODELS 0-170-3 or -7									
TAKE-OFF, CLIMB & LANDING CHART		TAKE-OFF DISTANCE (IN FEET)									
GROSS WEIGHT (IN LBS.)	HEAD WIND	HARD SURFACE RUNWAY			SOD-TURF RUNWAY			SOFT SURFACE RUNWAY			
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	
	MPH	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
1170	0	330	632		347	694					
	15										
	30										
1220	0	361	651		352	737					
	15										
	30										
	45										

GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	COMBAT MISSIONS USE 2300 RPM & F.T.		CLIMB DATA		FERRY MISSIONS USE 2150 RPM & F.T.	
		S.L. TO BEST I.A.S.	FT. ALT.	TIME FROM S.L.	FT. ALT.	TIME FROM S.L.	FT. ALT.
		MPH	MPH	U.S.	U.S.	U.S.	U.S.
1170	COMBAT	60	15				
	FERRY	333	15				
1220	COMBAT	60	17.5				
	FERRY	300	17.5				
	COMBAT						
	FERRY						

GROSS WEIGHT (IN LBS.)	BEST I.A.S. APPROACH	HARD DRY SURFACE			FIRM DRY SOD			WET OR SLIPPERY			
		AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	AT SEA LEVEL	AT 3,000 FT.	AT 6,000 FT.	
		GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.
1170	60	590	335	605	350	630	390				
	60	625	380								
1220	60										

NOTE: INCREASED ELAPSED CLIMBING TIME % FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE 1 % FOR EACH 20°F ABOVE 32°F) FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL.

REMARKS 1170 GROSS WEIGHT FOR MODELS L-4A-1 AND L-4B
1220 GROSS WEIGHT FOR MODEL L-4A-2

I.A.S.: Indicated Air Speed
M.P.H.: Miles Per Hour
S.L.: Sea Level
U.S.: U.S. Gallons
NOTE: All Distances are Average

WEIGHT & BALANCE CHART

CG LIMITS - % M.A.C.

SPEC. AN-H-8
DEC. 18, 1942
FORM ASC-513

AIRPLANE MODELS

CONDITION

F'W'D

AFT

.....
L-4A
.....

TAKE-OFF
LANDING

16.8
16.8

36
36

BASIC WEIGHT ITEMS

POUNDS

WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL) AND RADIO.

740

EQUIPMENT:

NAVIGATION _____ LB. PHOTOGRAPHIC _____ LB. OXYGEN _____ LB.

PYROTECHNICS (FLARES, ETC.) _____ LB.

ARMAMENT:

FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.

FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.

CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.

RADIO: MODEL(S) _____

TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)

740

ITEMS OF USEFUL LOAD

ALTERNATE LOADINGS (POUNDS)

MAXIMUM
FUEL

PILOT (200 LB. INCLUDING PARACHUTE)

170

CREW (200 LB. EACH INCLUDING PARACHUTE)

170

PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)

BAGGAGE (10 LB. MAXIMUM)

10

FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.): 12 U.S. GAL. (IMP. GAL.)

12 (-)

70

()

()

()

()

()

OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.): 1 (-)

()

10

EXTRA TANK(S) INSTALLATION

BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH

() EXTERNAL AT _____ LB. EACH

TORPEDO INSTALLATION

AMMUNITION

() RD. OF _____ CAL.; () RD. OF _____ CAL.

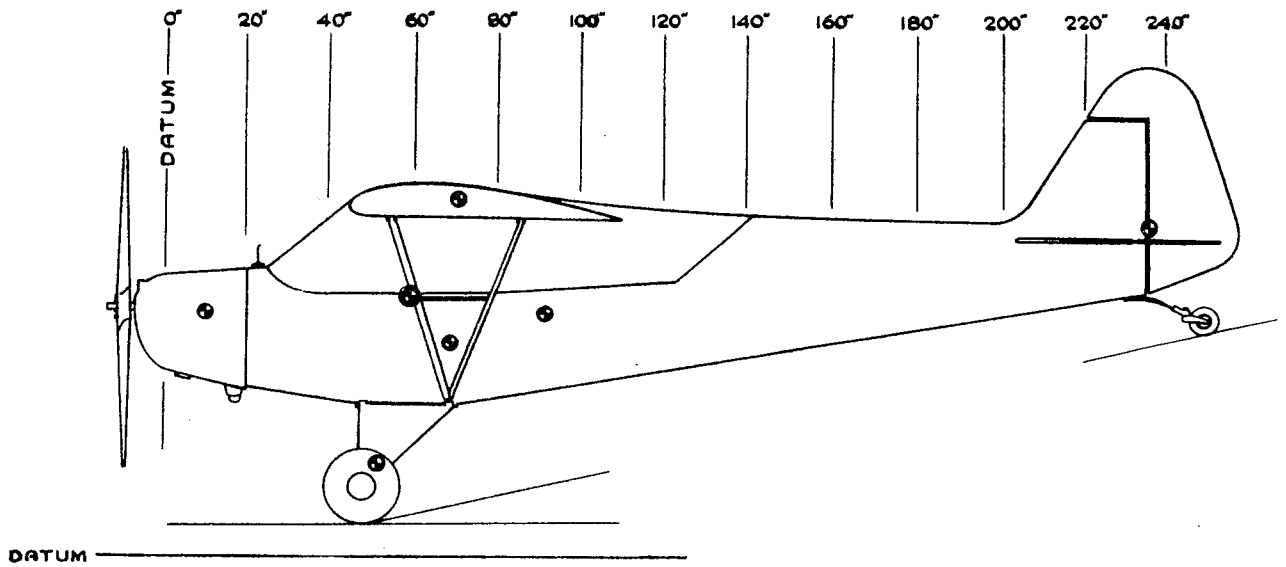
() RD. OF _____ MM.; () RD. OF _____ MM.

GROSS WEIGHT

1170

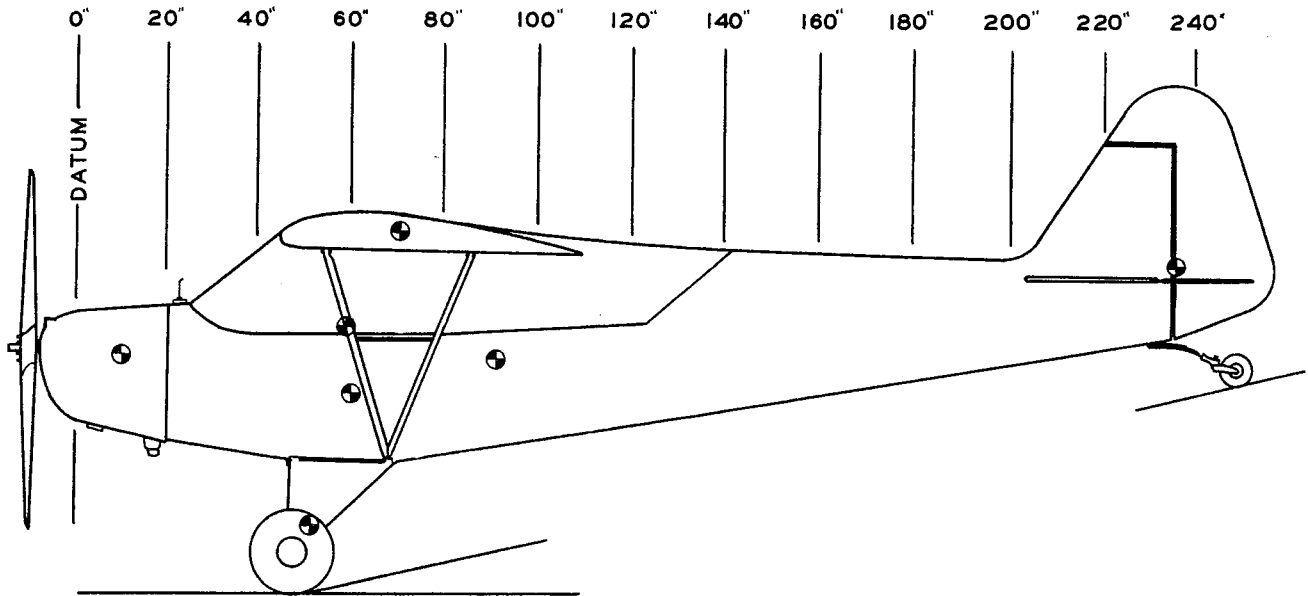
DISTANCE (IN INCHES) THAT CG IS AFT OF REFERENCE DATUM LINE % M.A.C.

28



NO.	ITEM	WEIGHT (LB)	HORIZONTAL ARM AFT DATUM	VERTICAL ARM AFT DATUM
1	WING GROUP	166	73	86
2	TAIL GROUP	29	236	82
3	BODY GROUP	135	95	61
4	ALIGHTING GEAR	65	52	25
5	POWER PLANT GROUP	246	10	62
6	FIXED EQUIPMENT GROUP	99	70	56
WEIGHT EMPTY		740	60.2	64

Weight and Balance Diagram (L-4A)



NO.	ITEM	WEIGHT	V. ARM ABOVE DATUM	H. ARM AFT DATUM
1	WING GROUP	182	73	86
2	TAIL GROUP	30	236	82
3	BODY GROUP	137	95	61
4	ALIGHTING GEAR	60	52	25
5	POWER PLANT GROUP	249	10	62
6	FIXED EQUIPMENT GROUP	50	60	56
WEIGHT EMPTY		708	59.3	67

Weight and Balance Diagram (L-4B), (L-4H)

WEIGHT & BALANCE CHART

CG LIMITS - % M.A.C.

SPEC. AN-H-8
DEC. 18, 1942
FORM ASC-913

AIRPLANE MODELS

CONDITION

F'W'D

AFT

.....
L-4B
.....

TAKE-OFF
LANDING

16.8
16.8

36
36

BASIC WEIGHT ITEMS	POUNDS
WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)	695
EQUIPMENT:	
NAVIGATION _____ LB. PHOTOGRAPHIC _____ LB. OXYGEN _____ LB.	
PYROTECHNICS (FLARES, ETC.) _____ LB.	
ARMAMENT:	
FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.	
FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.	
CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.	
RADIO: MODEL(S) _____	
TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)	695

ITEMS OF USEFUL LOAD	ALTERNATE LOADINGS (POUNDS)			
	MAXIMUM FUEL			
PILOT (200 LB. INCLUDING PARACHUTE)	170			
CREW (200 LB. EACH INCLUDING PARACHUTE)	170			
PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)				
BAGGAGE (57 LB. MAXIMUM)	55			
FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)				
12 (-)	70			
()				
()				
()				
()				
()				
OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.):	10			
(-)				
()				
EXTRA TANK(S) INSTALLATION				
BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH				
() EXTERNAL AT _____ LB. EACH				
TORPEDO INSTALLATION				
AMMUNITION				
() RD. OF _____ CAL.; () RD. OF _____ CAL.				
() RD. OF _____ MM.; () RD. OF _____ MM.				
GROSS WEIGHT	1170			
DISTANCE (IN INCHES) THAT CG IS AFT OF REFERENCE DATUM LINE % M. A. C.	28			

SPEC. AN-H-8
DEC. 18, 1942
FORM ASC-513

WEIGHT & BALANCE CHART

CG LIMITS - % M.A.C.

AIRPLANE MODELS

CONDITION

F'W'D

AFT

.....
L-4H
.....

TAKE-OFF
LANDING

16.8
16.8

36
36

BASIC WEIGHT ITEMS

POUNDS

WEIGHT EMPTY (INCLUDING TRAPPED FUEL AND OIL)

708

EQUIPMENT:

NAVIGATION _____ LB. PHOTOGRAPHIC _____ LB. OXYGEN _____ LB.

PYROTECHNICS (FLARES, ETC.) _____ LB.

ARMAMENT:

FIXED GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.; GUN SIGHT _____ LB.

FLEXIBLE GUN INSTALLATION(S): () _____ CAL. _____ LB.; () _____ CAL. _____ LB.

CANNON INSTALLATION(S): () _____ MM. _____ LB.; () _____ MM. _____ LB.

RADIO: MODEL(S) _____

TOTAL BASIC WEIGHT (CG _____ INCHES AFT OF REFERENCE DATUM LINE)

708

ITEMS OF USEFUL LOAD

ALTERNATE LOADINGS (POUNDS)

MAXIMUM
FUEL

PILOT (200 LB. INCLUDING PARACHUTE)

170

CREW (200 LB. EACH INCLUDING PARACHUTE)

170

PASSENGERS (200 LB. EACH INCLUDING PARACHUTES)

BAGGAGE (92 LB. MAXIMUM)

92

FUEL (6 LB/U.S. GAL. OR 7.2 LB/IMP. GAL.): U.S. GAL. (IMP. GAL.)

12 (-)

70

()

()

()

()

()

OIL (7.5 LB/U.S. GAL. OR 9 LB/IMP. GAL.): 1 (-)

10

()

EXTRA TANK(S) INSTALLATION

BOMB INSTALLATION(S): () INTERNAL AT _____ LB. EACH

() EXTERNAL AT _____ LB. EACH

TORPEDO INSTALLATION

AMMUNITION

() RD. OF _____ CAL.; () RD. OF _____ CAL.

() RD. OF _____ MM.; () RD. OF _____ MM.

GROSS WEIGHT

1220

DISTANCE (IN INCHES) THAT CG IS AFT OF REFERENCE DATUM LINE