PILOT'S FLIGHT OPERATING INSTRUCTIONS

FOR

ARMY MODELS

B-25C and D Series

NAVY MODELS

PBJ-1C and PBJ-1D

BRITISH MODEL

MITCHELL II

This publication contains specific instructions for pilots, and should be available for Transition Flying Training as contemplated in AAF Reg. 50-16.

This publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of the enemy.

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General.

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LIST OF REVISED PAGES ISSUED

NOTE: A heavy black vertical line, to the left of the text on revised pages, indicates the extent of the revision. This line is omitted where more than 50 percent of the page is revised.

Page No.	*Latest Revised Date*
30	15 April 1944
78	15 July 1944
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80	15 July 1944

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AAF ACTIVITIES.—Submit requisitions through the Air Inspector, Technical, whenever practicable, in accordance with T. O. No. 00-25-3 to the Commanding General, Fairfield Air Service Command, Patterson Field, Ohio. Attn: Publications Distribution Branch, as outlined in AAF Regulation 5-9. For details of Technical Order distribution, see T. O. No. 00-25-3.

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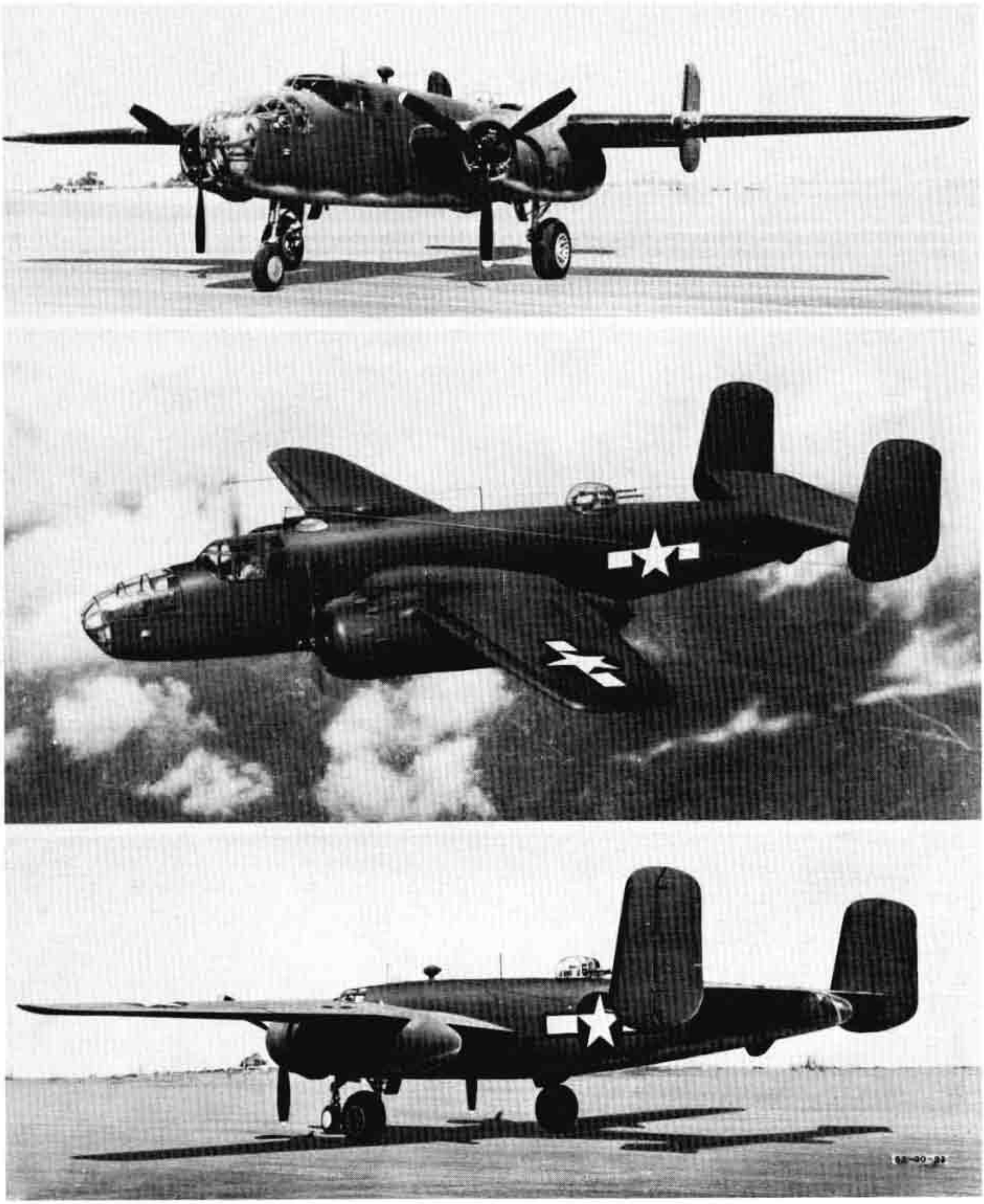


Figure 1—Three Views of Airplane

SECTION I
DESCRIPTION

1. GENERAL.

The North American B-25C and B-25D Medium Bombardment Airplanes are midwing land monoplanes powered by two Wright Cyclone R-2600-13 or -29 engines. Characteristic features are a tricycle landing gear and a double fin and rudder empennage. The airplane is equipped to carry bombs, and provisions may be made to carry a torpedo. The approximate over-all dimensions are:

Span	67 feet 6 inches
Length	53 feet
Height	15 feet 9 inches

2. BLOCK NUMBERING SYSTEM.

To clarify the relationship between the various groups of serial numbers used on B-25C and B-25D airplanes, the following block numbering system has been adopted:

Block Numbers	*Serial Numbers Included*
B-25C	AC41-12434 to 13038
B-25C-1-NA	AC41-13039 to 13296
B-25C-5-NA	AC42-53332 to 53493
B-25C-10-NA	AC42-32223 to 32382
B-25C-15-NA	AC42-32383 to 32532
B-25C-20-NA	AC42-64502 to 64701
B-25C-25-NA	AAF42-64702 to 64801
B-25D	AC41-29648 to 29847
B-25D-1-NA	AC41-29848 to 29947
B-25D-5-NA	AC41-29948 to 30172
B-25D-10-NA	AC41-30173 to 30352
B-25D-15-NA	AC41-30353 to 30532
B-25D-20-NA	AC41-30533 to 30847
	AC42-87113 to 87137
B-25D-25-NA	AC42-87138 to 87452
B-25D-30-NA	AC42-87453 to 87612
	AC43-3280 to 3619
B-25D-35-NA	AC43-3620 to 3869

3. DUTIES OF CREW MEMBERS.

The pilot has the full responsibilities of flight operation of the airplane. In addition, on later airplanes, the pilot fires the fixed .50-caliber nose gun and may operate the bombing equipment. The copilot aids the pilot and operates the command radio. The navigator-bombardier navigates the airplane, operates the bombing equipment, and fires the flexible nose gun. The radio operator operates the liaison radio and the lower turret. The upper turret gunner also operates the camera and serves as tail observer. See figure 2 for fuselage arrangement.

4. FLIGHT CONTROLS.

a. GENERAL.—The rudders, elevators, and ailerons are controlled by duplicate cable systems so that the loss of any one control cable will not seriously cripple the airplane. The rudders and ailerons are equipped with combination booster and controllable trim tabs. The elevators have controllable trim tabs which are set for no boost. A bungee installed in the elevator control system reduces stick loads. A locking system affecting all of the control surfaces simultaneously is controlled by a handle on the floor in front of the pilot's control column.

b. AUTOMATIC FLIGHT CONTROL SYSTEMS.—B-25C and B-25D airplanes are equipped with either the automatic flight control equipment or the Sperry type A-3 automatic pilot. The Sperry type A-3 automatic pilot is installed in B-25C airplanes, serial Nos. AC41-12457, AC41-12459, AC41-12461, AC41-12463, AC41-12465, AC41-12467, AC41-12469, AC41-12471, AC41-12473, AC41-12475, AC41-12477, AC41-12479, AC41-12517, and subsequent blocks, and B-25D airplanes AC41-29848 and subsequent blocks. Automatic flight control equipment is installed in all other B-25C and B-25D airplanes.

(1) AUTOMATIC PILOT.—The automatic pilot consists of a turn gyro control unit, a bank-and-climb gyro control unit, a gyro control mount assembly, servo control units, and accessories. The automatic pilot provides complete automatic control for lateral, longitudinal, and directional motions of the airplane. It is an integral part of the pilot's instrument panel and continuously indicates the movements of the airplane, whether being flown by automatic or manual control.

NOTE

There may be certain minor differences between the appearance of the panel instruments, etc., in the airplane and in the illustrations in the Handbook. This is explained by the fact that the type A-3 (Sperry Gyroscope Co.) and type A-3A (Jack & Heintz) automatic pilots are interchangeable, and that either one may be installed, or portions of each may be installed in the same airplane.

(2) AUTOMATIC FLIGHT CONTROL EQUIPMENT.—The automatic flight control equipment units are located in the upper rear end of the bombardier's compartment and are accessible during flight. A pilot director indicator and telltale lights are mounted on the pilot's instrument panel. An attitude wheel is on the control pedestal and control switches are on the pedestal switch panel. Banking and banking motor

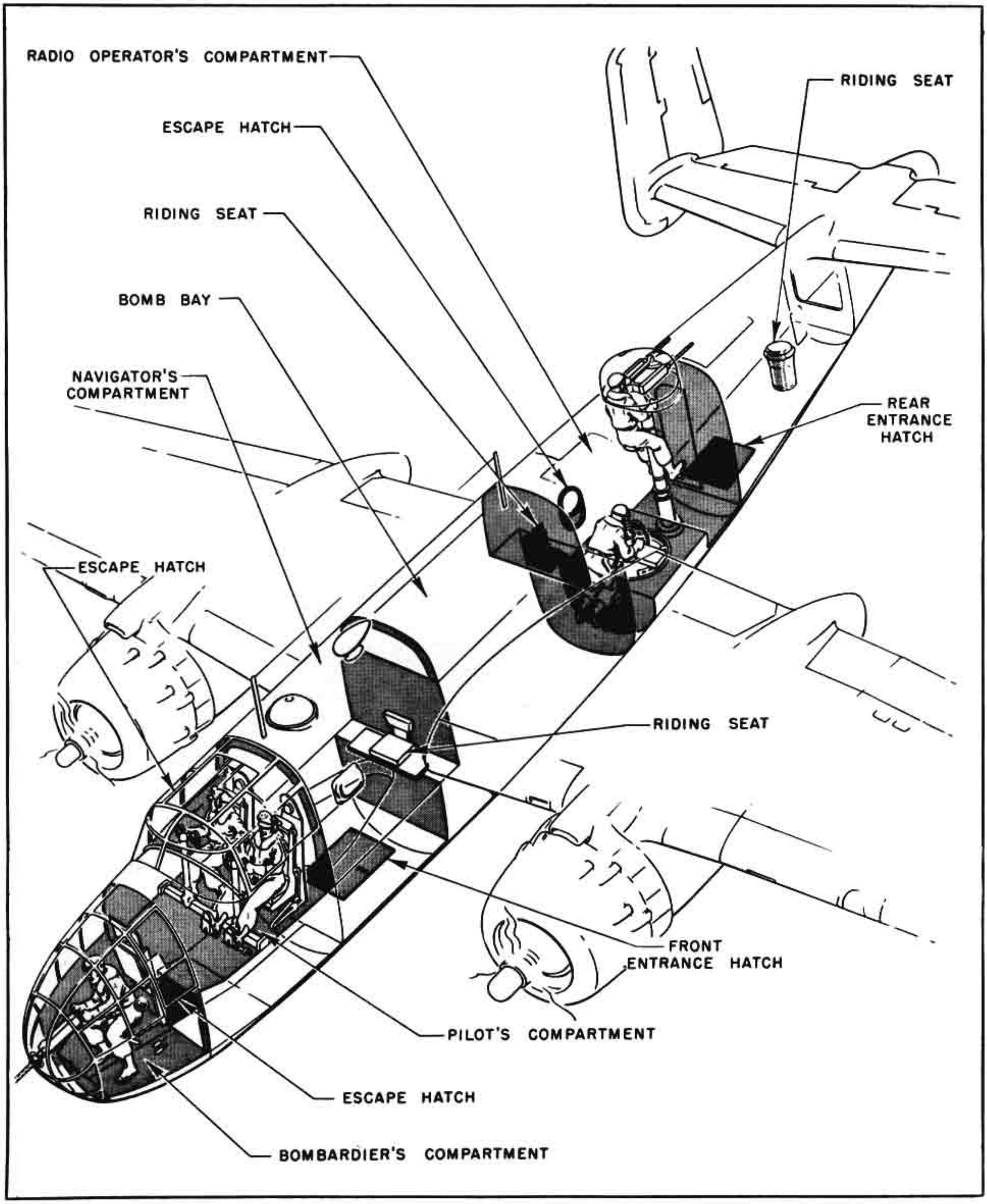


Figure 2—Fuselage Arrangement

cut-off switches are provided for the bombardier, and a precessing switch for the navigator. A signal light communication system is provided between the pilot's and bombardier's compartments. Metal padlocked doors are utilized to prevent access to the equipment.

5. LANDING GEAR.

a. GENERAL.—The landing gear is hydraulically operated. The main gear retracts into the engine nacelles, and the nose gear into the fuselage. Doors cover the gear openings in both the retracted and extended positions.

b. NOSE GEAR.—The swivel-type nose gear strut incorporates a centering device which operates when the strut is fully extended (wheel off ground). A hydraulic shimmy damper on the strut resists side loads occurring in taxying, taking off, and landing, thus preventing a sudden movement of the wheel. The nose wheel may be released from the shimmy damper for towing purposes.

6. WHEELS AND BRAKES.

The wheels are of the smooth-contour type. The nose wheel tire is equipped with a dual-seal inner tube for protection against a blow-out or puncture. The main wheels are equipped with dual multiple-disc hydraulic brakes. An air brake system is provided for use in the event of a complete hydraulic failure.

7. HYDRAULICS.

a. NORMAL.—A single high-pressure system operates the tricycle landing gear, wing flaps, engine cowl flaps, bomb bay doors, and brakes. (See figures 3, 4, and 5.) If one of the engine-driven hydraulic pumps fails, the other will provide sufficient pressure for the operation of the hydraulic system.

b. EMERGENCY.—An emergency hydraulic system, (figure 6), with hand-pump and selector valve located to the right of the pilot's seat, permits operation of the system even though both engine-driven pumps fail, or with the airplane on the ground and the engines inoperative. On B-25C-15-NA and B-25D-10-NA and subsequent blocks, a separate hydraulic system provides for the emergency lowering of the landing gear in the event of complete failure of the general system, with loss of fluid. Earlier airplanes are provided with an emergency mechanical lowering system. All airplanes are equipped with emergency mechanical systems for the operation of the wing flaps and bomb bay doors. A small reserve of fluid is retained under pressure in the accumulator for use if the engine pumps fail. This reserve is not adequate for completely raising or lowering the landing gear, but is sufficient for a one-way operation of the wing flaps, engine cowl flaps, or the bomb bay doors. The brake accumulator retains sufficient pressure for approximately three brake pedal applications (both wheels) even though both engine pumps should fail.

8. POWER PLANT.

a. ENGINES.—The airplane is powered by two Wright R-2600-13 or -29 air-cooled, 14-cylinder engines. Low gear supercharger ratio is 7.06:1 and high gear ratio is 10.06:1. The propeller gear ratio is 16:9. Engine equipment includes a Holley carburetor incorporating an electric primer valve. Use fuel conforming to Specification No. AN-F-28, grade 100-130. Under certain conditions when the airplane is within the continental United States, Specification No. AN-F-26, grade 91 fuel should be used. Use oil conforming to Specification No. AN-VV-O-446, grade 1120.

b. ENGINE RATINGS.

Ratings	*Brake HP*	*RPM*	*Blower*
Sea Level	1500	2400	Low
Take-off	1700	2600	Low
Normal	1500	2400 at 6700 ft	Low
	1350	2400 at 13,000 ft	High
Military	1700	2600 at 5500 ft	Low
	1450	2600 at 13,500 ft	High

c. CARBURETOR AIR.—The carburetor air induction system control lever has two positions, "NORMAL" and "ICING." Each air scoop is equipped with a filter which may be replaced by a baffle when necessary.

NOTE

Unfortunately, the impression exists among some mechanics and pilots that the carburetor air filter causes a serious loss in airplane performance. The effect of installing a filter is merely equivalent to closing the throttle slightly. This means that for all altitudes less than critical, where manifold pressure limits prevent full throttle opening, the filter has no effect on engine power output or airplane performance. Manifold pressure affords the best indication of engine power, and at a given manifold pressure the engine will develop the same power regardless of whether or not a filter is installed. The only time that airplane performance would benefit from removal of the filter is when the throttle is full open and still more manifold pressure would be permissible. With the filter installed, only cold ram air passes through the filter element.

d. PROPELLER.—The Hamilton Standard Hydromatic, full-feathering propellers have a blade diameter of 12 feet 7 inches and are controlled by double-capacity governors which are set by means of levers on the pilot's control pedestal. The electrically driven feathering pumps are controlled by two push buttons on the control pedestal switch panel. Propeller pitch settings are 22 degrees low and 90 degrees high.

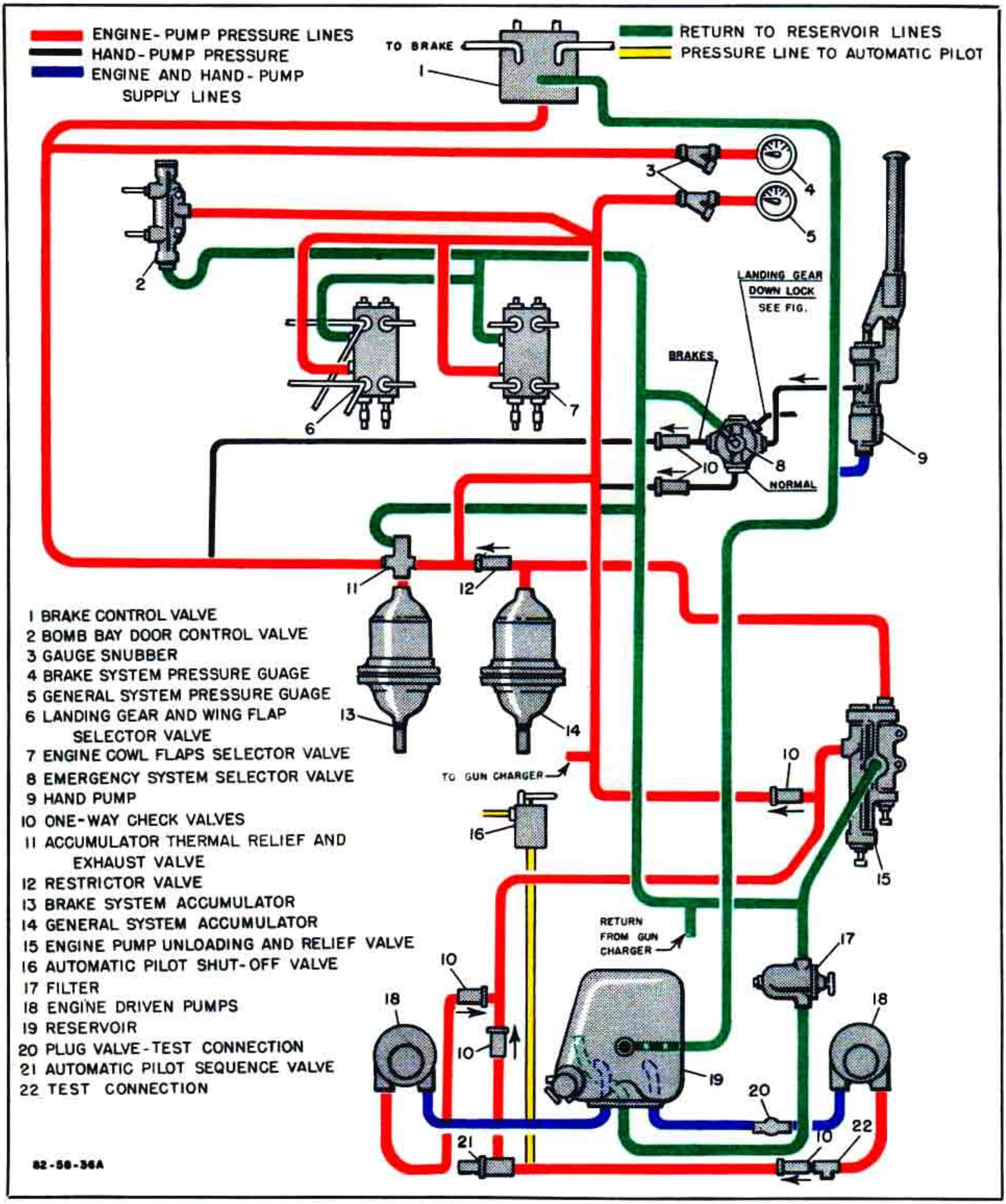


Figure 3—Hydraulic Power System

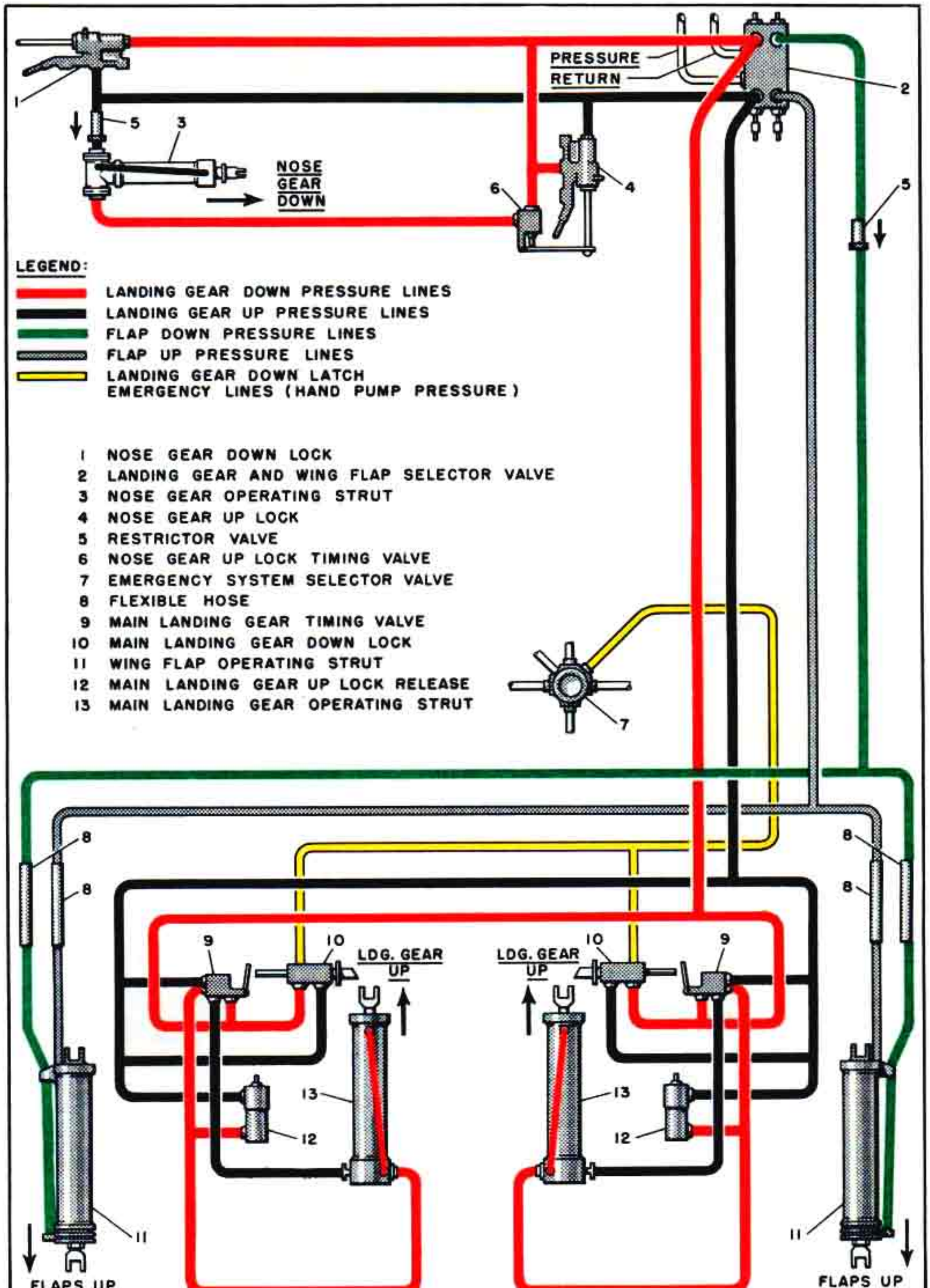


Figure 4—Hydraulic System—Landing Gear and Wing Flaps

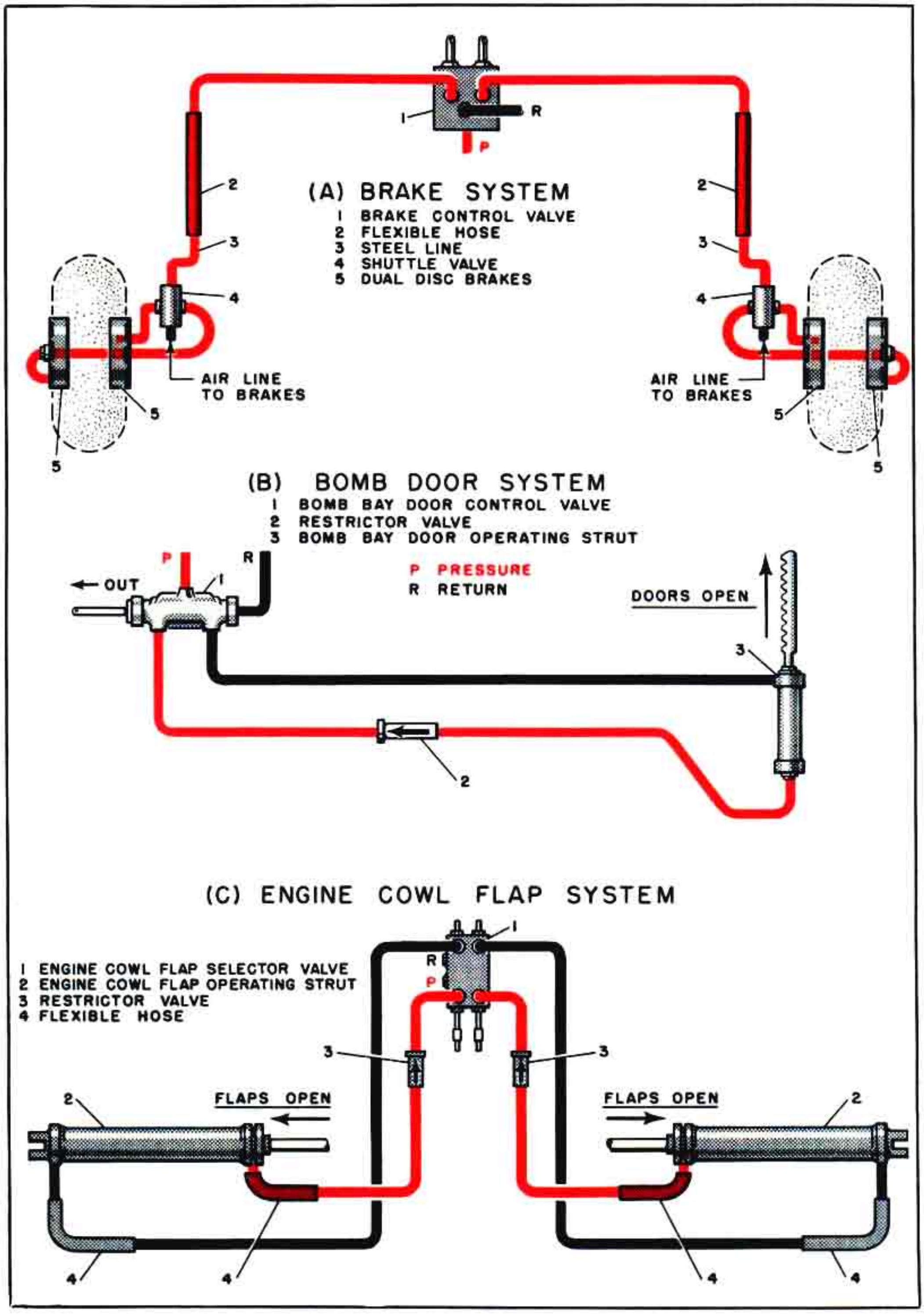


Figure 5—Hydraulic System—Brake, Bomb Doors, and Cowl Flaps

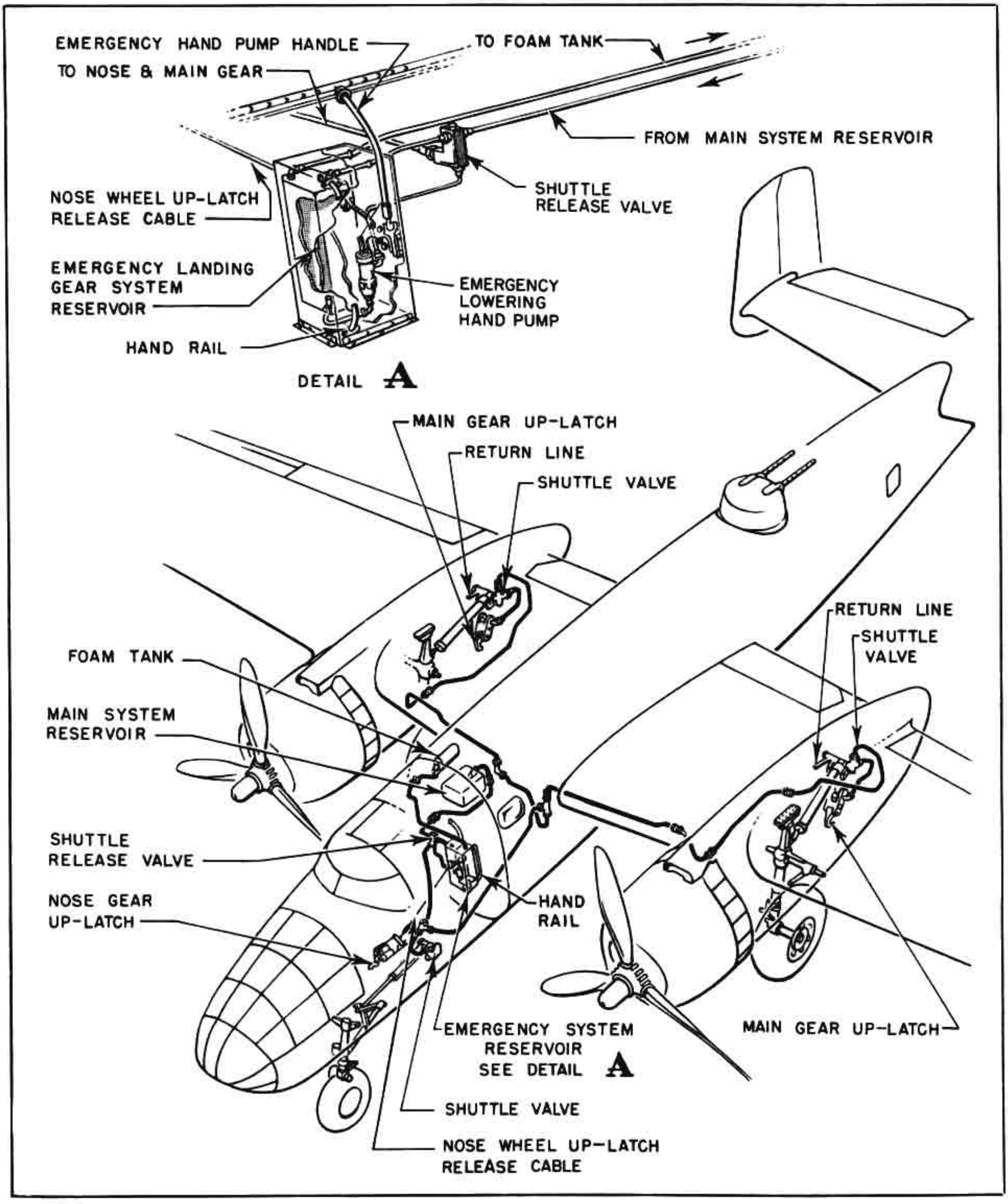


Figure 6—Hydraulic System—Landing Gear Emergency Lowering

9. FUEL SYSTEM.

a. GENERAL.—An independent fuel system is provided for each engine. (See figures 7 and 8.) The main source of fuel supply is from four large self-sealing wing tanks, two located in each wing center section between the fuselage and the engine nacelle. Later airplanes have an auxiliary fuel supply, consisting of six smaller self-sealing tanks installed in groups of three in each wing center section outboard of the main fuel tanks. Additional fuel for ferrying operations on earlier airplanes is carried in a droppable bomb bay tank. On later airplanes, a fixed self-sealing tank in the upper portion of the bomb bay and a small droppable bomb bay tank are used for ferrying operations. The fuel flow is from the main tank, through a booster pump to a fuel strainer, then to the engine-driven fuel pump which delivers the fuel to the carburetor. Fuel transfer and fuel cross-feed systems are installed on later airplanes. All transfer and main feed lines are of the self-sealing type.

b. CROSS-FEED FUEL SYSTEM.

(1) FUNCTIONS.—The cross-feed system is used only in the event of certain emergencies. The situations in which cross-feed is used are:

(a) Failure of one engine, in which case all of the fuel remaining in the tanks can be used by the other engine.

(b) Loss of fuel in the cells in the wing on one side of the airplane, in which event the fuel remaining in the other wing cells can be used by both engines.

(2) DESCRIPTION.—The cross-feed fuel system comprises a fuel line connecting the two main feed lines which serve the respective engines, a valve in this cross-connecting line, and two check valves. The two check valves are located in the fuel line leading to the shut-off valve, one on either side of the bomb bay forward of the fuel booster pump. These check valves are connected by the cross-feed fuel line, which is carried across the top forward end of the bomb bay. The cross-feed valve is mounted in the upper right-hand corner of the bomb bay on the after side of the bulkhead separating the navigator's compartment from the bomb bay. The cross-feed valve control is on the forward side of the bulkhead to the right of the other fuel system controls. The cross-feed valve is similar in construction and principle to the fuel shut-off valves. Each check valve consists of a housing, an inlet port, two outlet ports, and a gravity-loaded flapper valve hinged so that it lies flat on its seat except when it is forced up and open by pressure from underneath. One of the outlet ports leads to the shut-off valve, the other to the cross-feed valve. Both outlet ports are above the flapper valve.

WARNING

Do not allow one fuel tank to run completely dry before switching to another tank!

10. OIL SYSTEM.

Each engine is provided with an independent oil system. (See figure 9.) A self-sealing oil tank is located in each nacelle, and oil is taken from the tank outlet to supply the propeller feathering system. Scavenged oil flows through two oil temperature regulators in each wing. Air enters a scoop at the leading edge of each wing, passes through the oil radiators, and exits through apertures on the upper trailing edge of the wing. The air ducts are equipped with full-closing shutters which are operated by levers on the pilot's control pedestal. On earlier airplanes, an oil compartment of metal construction only is built semi-integral with each wing center section. Airplanes prior to B-25C-5-NA and B-25D-5-NA have a reserve oil supply for propeller feathering.

11. HEATING AND VENTILATING SYSTEM.

(See figure 10).

a. GENERAL.—Earlier B-25C and B-25D airplanes are equipped with a single heater which supplies heated air for the entire airplane. Later airplanes are provided with an additional heater. The heaters can be operated only when the engines are running.

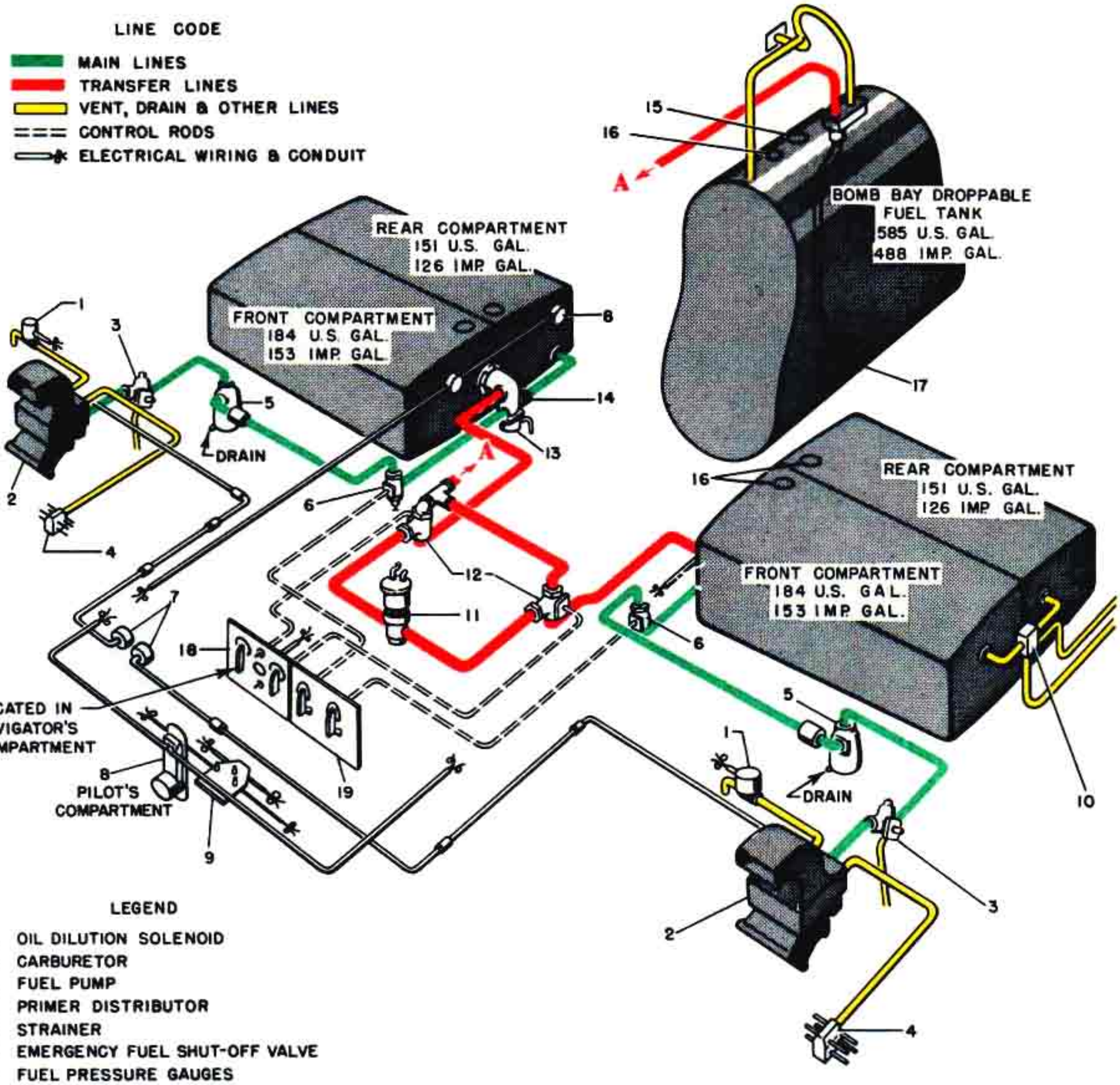
b. FORWARD HEATER.—A heater burning a fuel-air mixture is located in the left wing center section, and outlet ducts are installed in each forward compartment. Earlier airplanes are equipped with ducts running from this heater to an outlet in the radio operator's compartment. With the heater off, the duct system may be used for ventilation in flight. Ventilators for outside air are provided in the pilot's and bombardier's compartments.

c. AFT HEATER.—On later airplanes, an additional heater burning a fuel-air mixture is located in the radio operator's compartment. A fan on the heater serves to circulate compartment air through the heater. A ventilator for outside air is on the right side of the radio operator's compartment.

d. DEFROSTING SYSTEM.—There are provisions on the airplane for defrosting the pilot's windshields, bombsight window, and any glass area in the various compartments.

12. ELECTRICAL SYSTEM.

a. GENERAL.—The electrical system is of the 24-volt direct-current, single-wire type, the structure of the airplane serving as a common ground return circuit. Two engine-driven generators supply power to operate the various electrical units and to charge the batteries, which are used when the generators are not operating. The generator output is regulated to 28 volts by voltage regulators. Either battery, one installed inside each engine nacelle immediately aft of the fire wall, has sufficient capacity to operate the airplane's electrical system.



LEGEND

1. OIL DILUTION SOLENOID
2. CARBURETOR
3. FUEL PUMP
4. PRIMER DISTRIBUTOR
5. STRAINER
6. EMERGENCY FUEL SHUT-OFF VALVE
7. FUEL PRESSURE GAUGES
8. LIQUIDOMETER FUEL GAUGE UNITS
9. CONTROL PEDESTAL SWITCH PANEL
   BOOSTER PUMP SWITCHES
   PRIMER SWITCH
10. DRAIN AND VENT VALVE
11. TRANSFER PUMP
12. TRANSFER VALVE
13. BOOSTER PUMP
14. CHECK VALVE
15. FUEL GAUGE (FLOAT TYPE)
16. FILLER FLANGE
17. SUMP
18. FUEL TRANSFER CONTROLS
    PUMP SWITCH
    DIRECTIONAL FLOW SWITCH
    PUMP OPERATING LIGHT
19. EMERGENCY SHUT-OFF
    VALVE CONTROLS

NOTE:
FUEL CAPACITY ON SOME AIRPLANES IS 12 U.S. GAL. LESS 10 IMP. GAL. LESS
FUEL TANKS AND HOSE ARE SELF SEALING

Figure 7—Fuel System—Early Airplanes

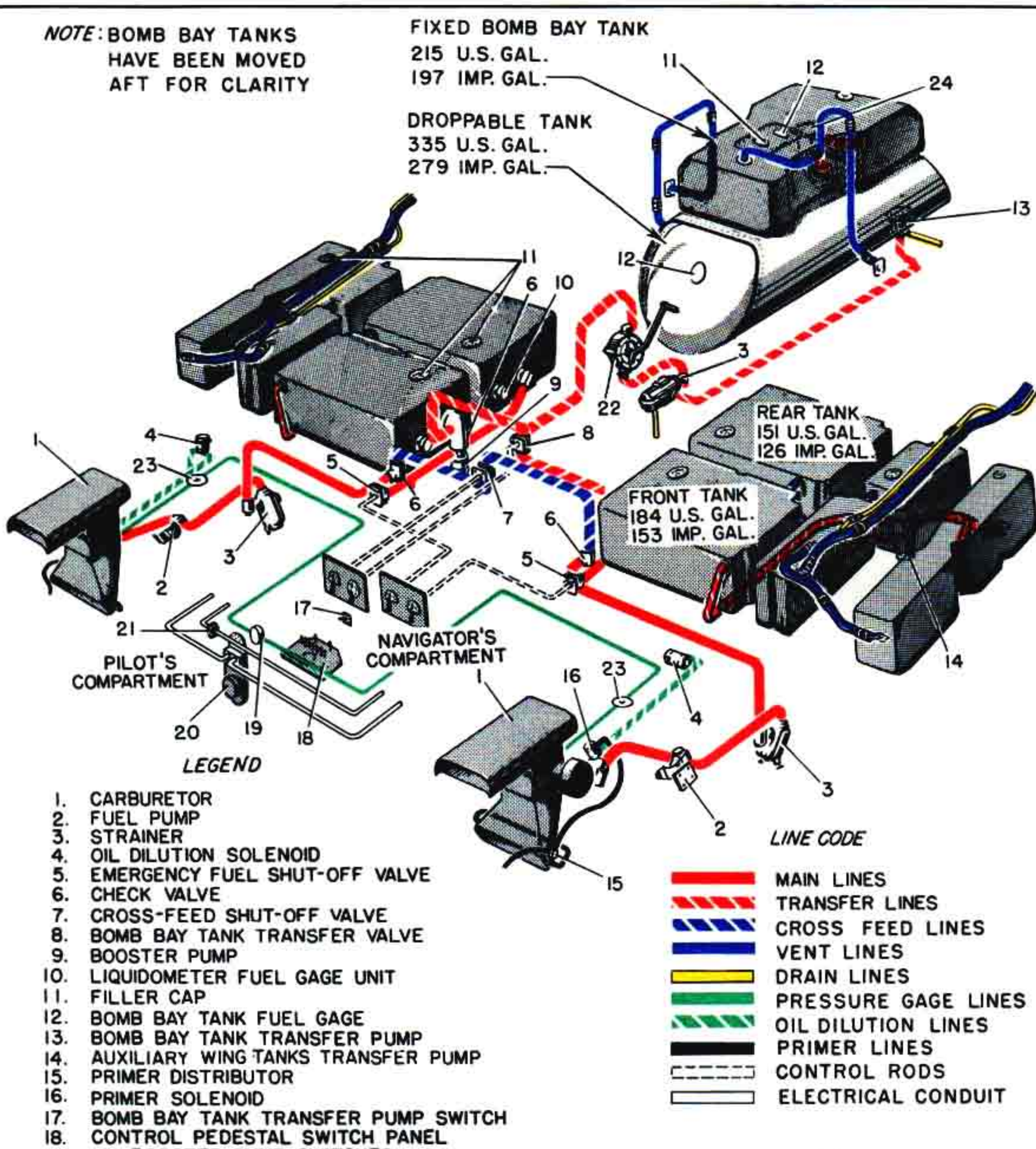


Figure 8—Fuel System—Late Airplanes

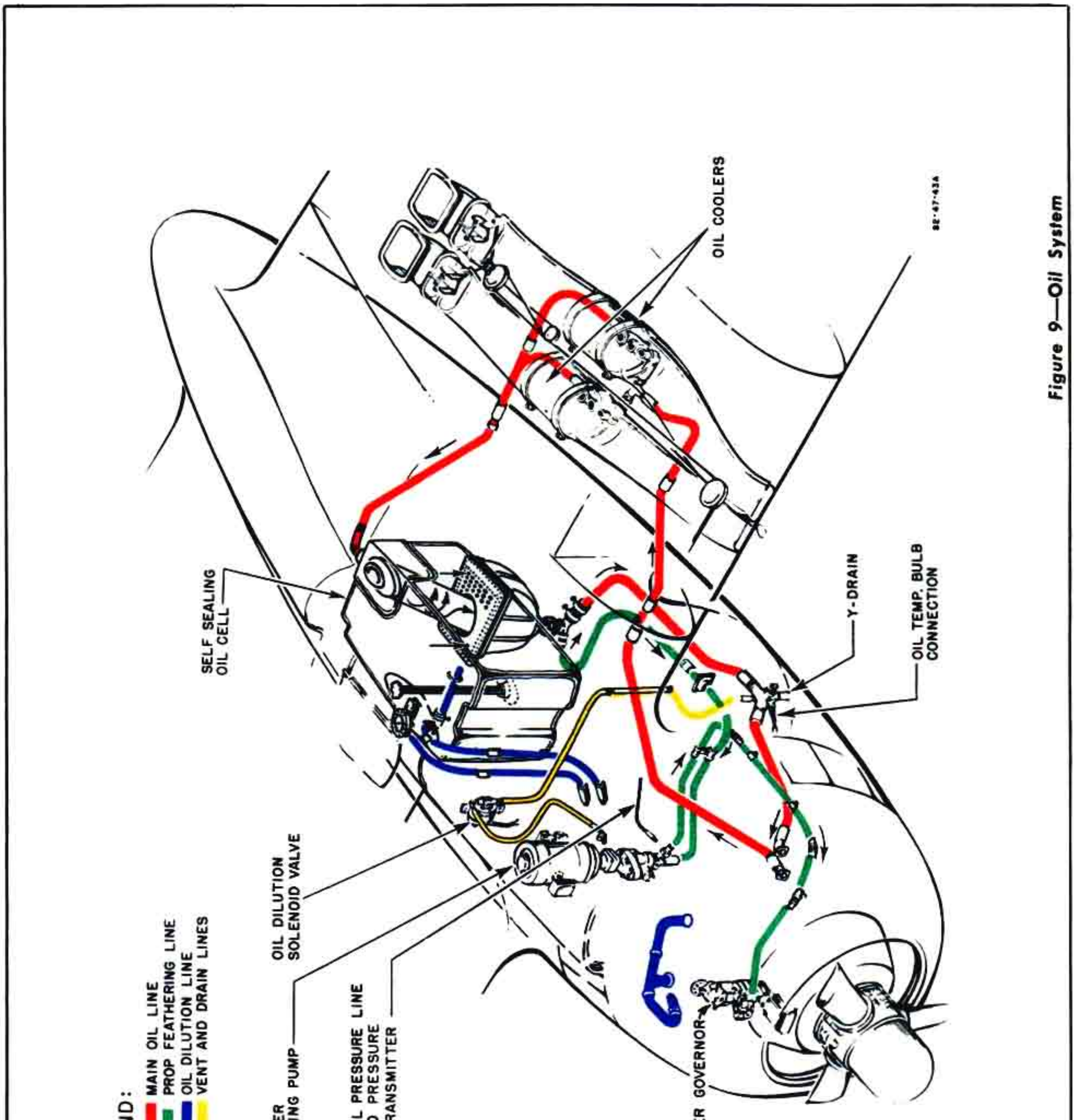


Figure 9—Oil System

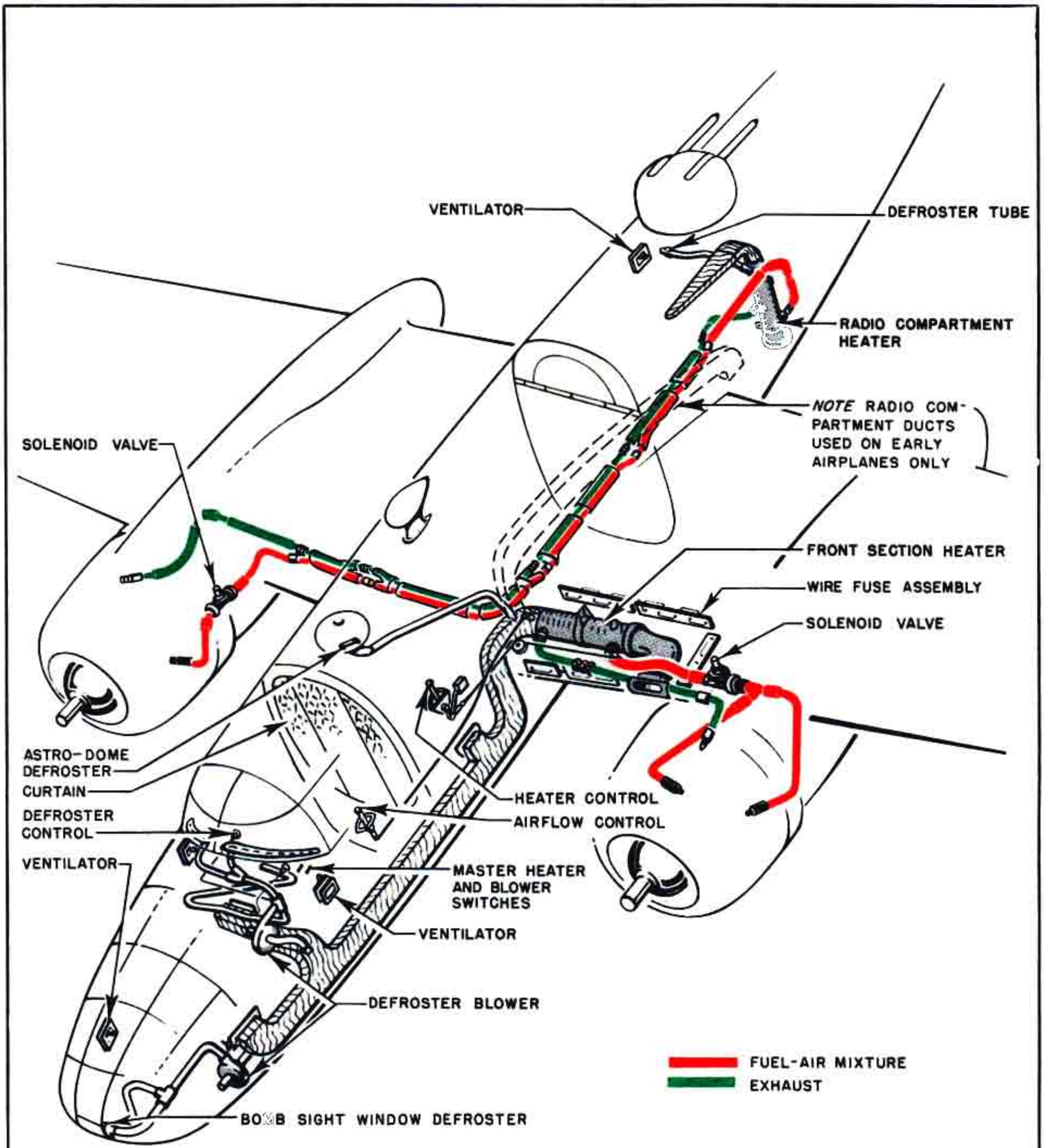
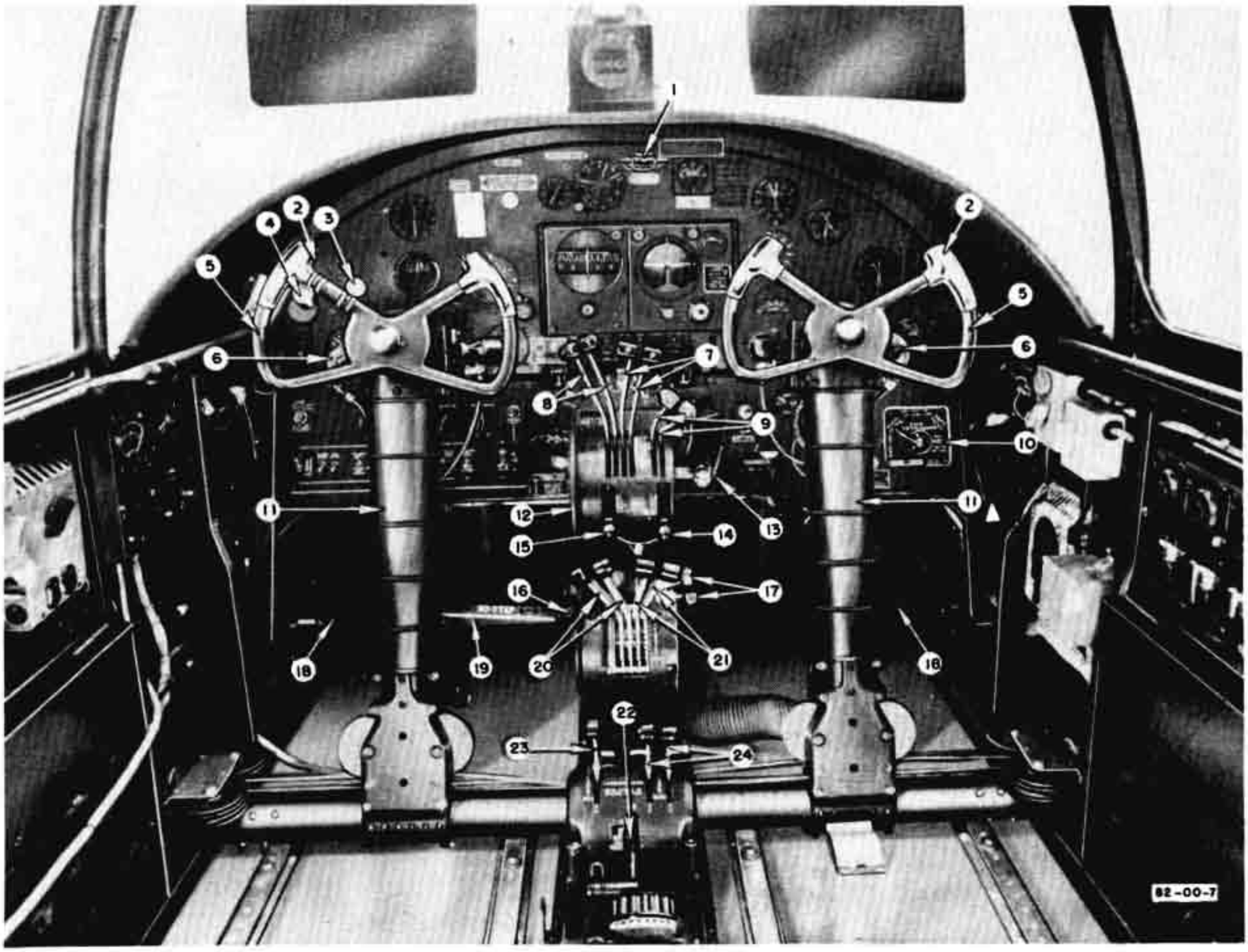
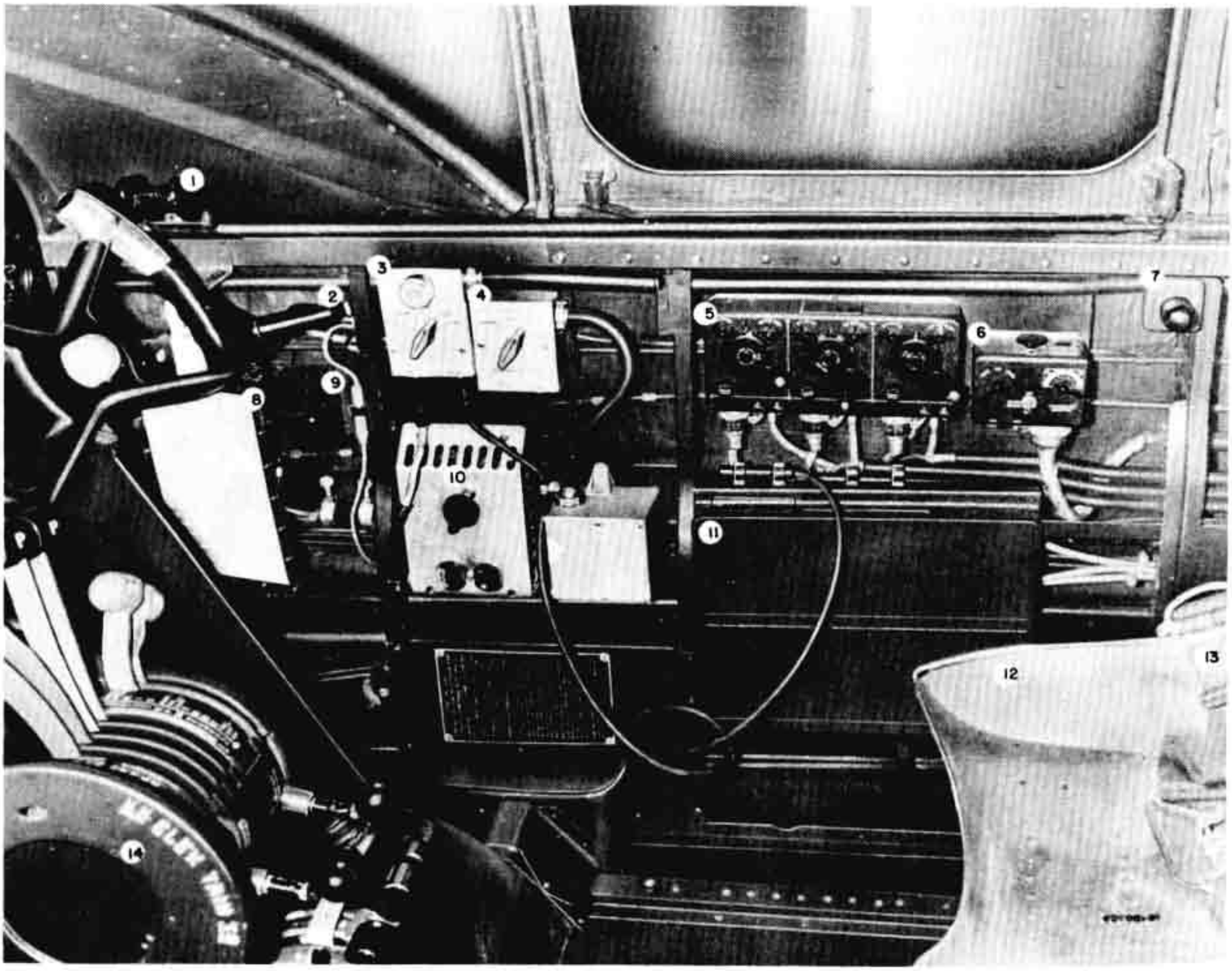


Figure 10—Heating and Ventilating System



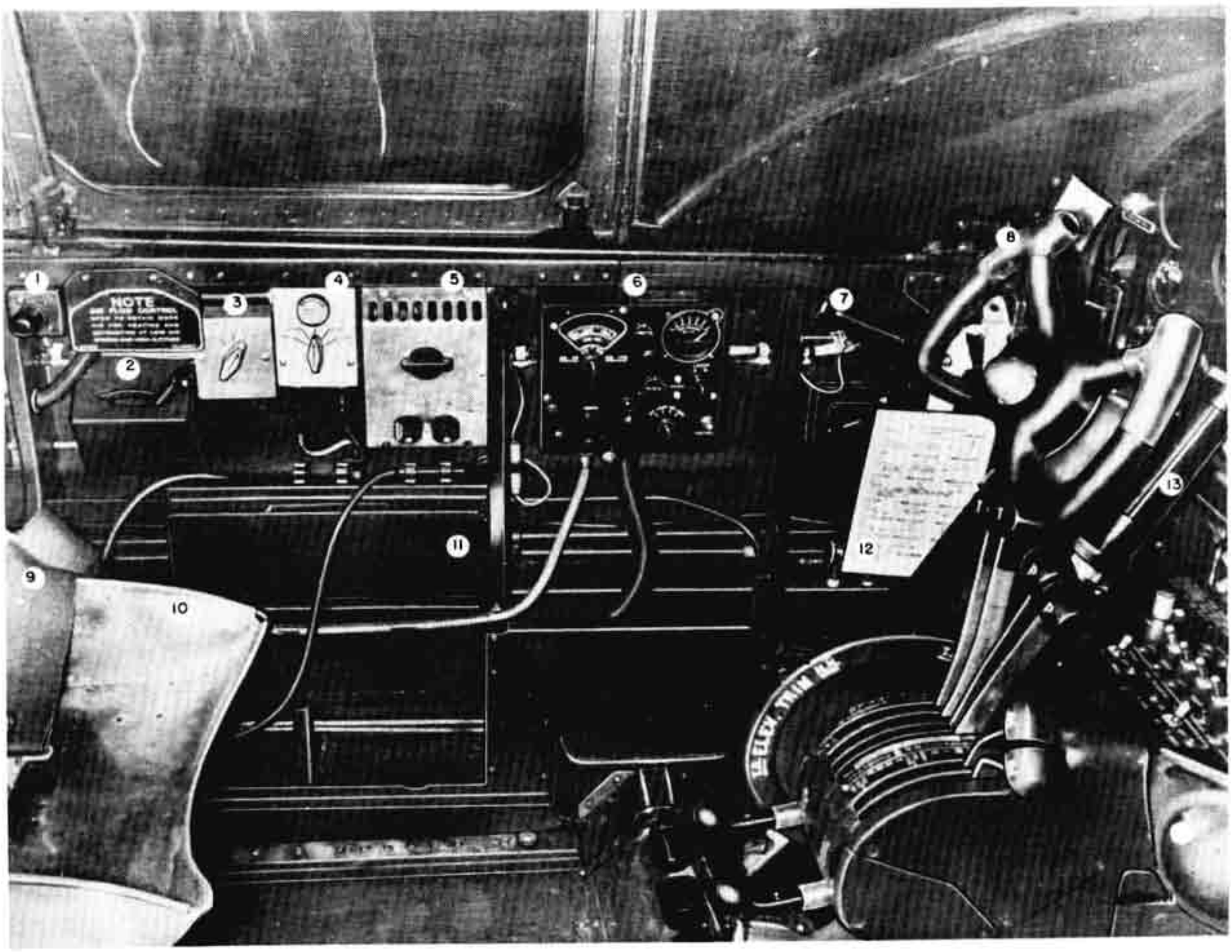
1. Emergency Bomb Release Handle
2. Throat Microphone Switch
3. Bomb Release Switch
4. Gun Trigger Switch
5. Aileron Control Wheel
6. Fluorescent Light Rheostat
7. Propeller Controls
8. Throttle Controls
9. Mixture Controls
10. Engine Fire Extinguisher Selector Valve
11. Elevator Control Column
12. Elevator Trim Tab Control Wheel
13. Parking Brake Handle
14. Propeller and Mixture Controls Friction Lock
15. Throttle Controls Friction Lock
16. Automatic Pilot "ON-OFF" Control
17. Carburetor Air Controls
18. Rudder Pedal
19. Surface Control Lock Handle
20. Supercharger Controls
21. Oil Cooler Shutter Controls
22. Landing Gear Control
23. Wing Flap Control
24. Engine Cowl Flap Controls

Figure 11—Pilot's Compartment—Forward View



1. Sliding Window Handle
2. Spotlight
3. Interphone Jack Box
4. Filter Control Box
5. Command Radio Receiver Controls
6. Command Radio Transmitter Controls
7. Cockpit Light
8. Pilot's Check List
9. Ventilator
10. Heated Clothing Rheostat
11. Map Case
12. Co-pilot's Seat
13. Safety Belt
14. Elevator Trim Tab Control Wheel

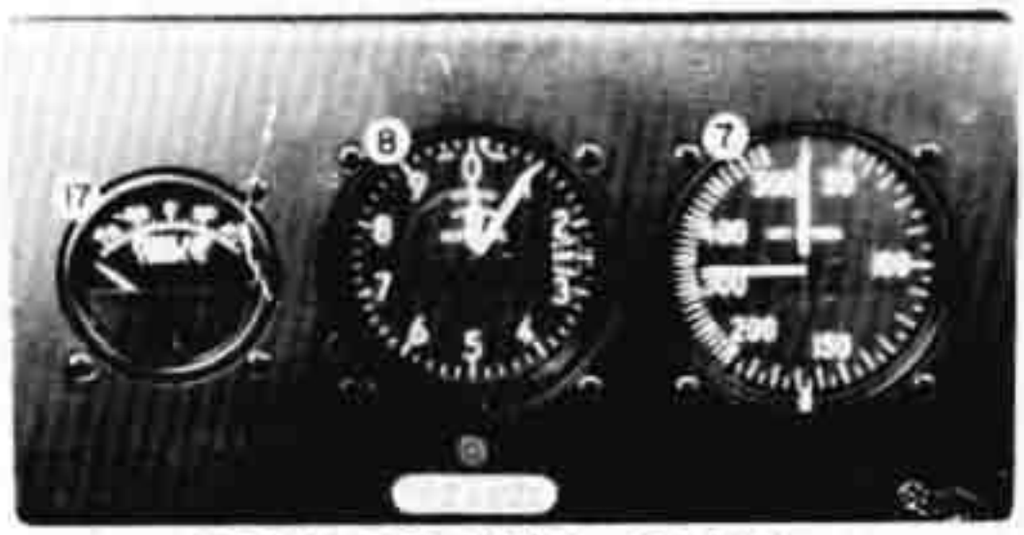
Figure 12—Pilot's Compartment—Right Side



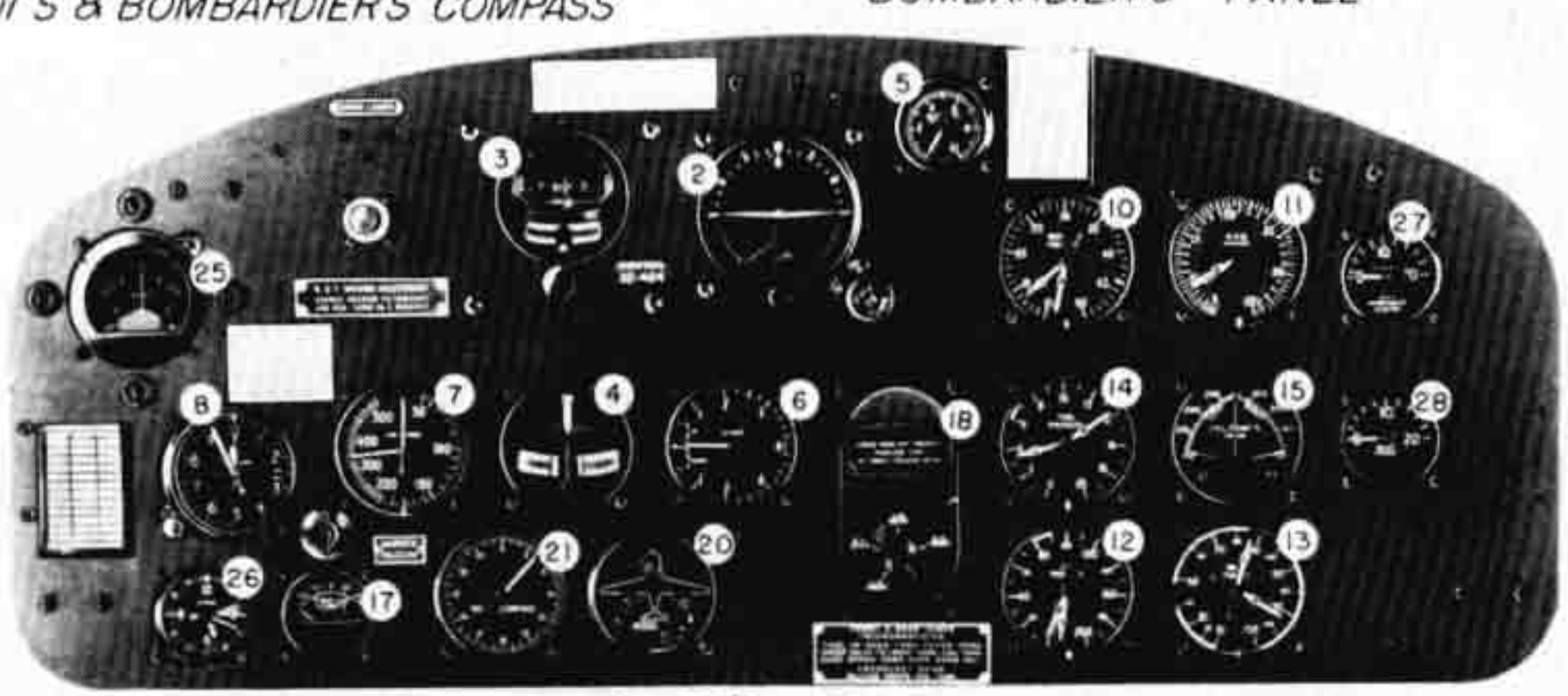
1. Cockpit Light
2. Airflow Control
3. Filter Control Box
4. Interphone Jack Box
5. Heated Clothing Rheostat
6. Radio Compass Control Box
7. Spotlight
8. Aileron Control Wheel
9. Safety Belt
10. Pilot's Seat
11. Map Case
12. Check List
13. Fluorescent Light
14. Ash Tray

Figure 13—Pilot's Compartment—Left Side

PILOT'S & BOMBARDIER'S COMPASS



BOMBARDIER'S PANEL



PILOT'S PANEL

PILOT'S AND BOMBARDIER'S INSTRUMENTS—AFCE

PILOT'S & BOMBARDIER'S COMPASS

BOMBARDIER'S PANEL

PILOT'S PANEL

Figure 14—Instrument Panels

NOMENCLATURE FOR FIGURE 14

1. Automatic Pilot Control Units and Oil Pressure Gage
2. Flight Indicator
3. Turn Indicator (Gyro)
4. Bank-and-Turn Indicator
5. Suction Gage
6. Rate-of-Climb Indicator
7. Airspeed Indicator
8. Altimeter
9. Static Pressure Selector Valve
10. Manifold Pressure Indicator
11. Tachometer Indicator
12. Oil Pressure Indicator
13. Oil Temperature Indicator
14. Fuel Pressure Indicator
15. Cylinder Temperature Indicator
16. Nose Wheel Position Indicator Lights
17. Free Air Temperature Indicator
18. Main Fuel Level Gage
19. Auxiliary Fuel Level Gage
20. Landing Gear and Wing Flap Position Indicator
21. Radio Compass Azimuth Indicator
22. Magnetic Compass
23. Remote Compass Indicator
24. Accelerometer
25. Pilot Director Indicator
26. Clock
27. Hydraulic System Pressure Gage
28. Brake System Pressure Gage

NOTE

The batteries are adequate only for a short period of direct use, and then only if they are in a properly charged condition, and all electrically operated equipment not essential is turned off to conserve battery power.

An external power socket is located on the right engine nacelle. An external power source is used in lieu of the airplane batteries for starting the engines and operating the electric system while the airplane is on the ground. An adapter for connecting the British type of external power supply is stowed in the external socket compartment.

b. FUSES AND LAMPS.—All fuses and lamps are replaceable during flight and are located as shown in the following table:

Location	*Active and Spare Fuses*	*Spare Lamps*
Bombardier's Control and Instrument Panel	Bomb Equipment	Bomb Station Indicator
Instrument Distribution Box (upper rear end of bombardier's compartment)	Pilot's Instruments	
Pilot's Switch Panel	Engine Primers Anti-icer Pump Motors Free Air Temperature Indicators Dome Lights Cockpit Light Pilot's Extension Light Formation Lights Recognition Lights Passing Light Turret Signal Light Pitot Heater Landing Lights Propeller Feathering Switches Pilot-Bombardier Signal Carburetor Air Temperature Indicator Warning Horn Navigation Lights Oil Dilution Solenoid	

Location	*Active and Spare Fuses*	*Spare Lamps*
Pilot's Instrument Panel		Compass Bomb Release Signal
Navigator's Fuse (General Control) Panel	Inverters Dome Lights Fuel Booster Pumps De-icer Distributor Valve Motor Starter Engaging Solenoid Cabin Heater Fuel Level Indicator Landing Gear and Wing Flap Indicator Navigator's Extension Light	

13. MISCELLANEOUS EQUIPMENT.

a. COVERS.—Weatherproof dust covers are provided for the forward part of each engine nacelle, for the transparent parts of the pilot's and bombardier's compartments, the upper turret, and the tail cone.

b. BLIND-FLYING HOOD.—A fabric hood is provided for enclosing the pilot's station for practice instrument flying. The hood may be fastened to the cockpit ceiling in such a way that the pilot may lift the sides or front to look out when he desires. The hood is stowed in a cloth bag under the left side of the navigator's chart table.

c. CURTAINS.—A heat and sound-insulating curtain is installed between the pilot's and the navigator's compartments. It is a three-piece curtain; the side pieces are normally left in position and the center section may be unhooked to permit access between compartments. The rear end of the bomb bay crawlway is provided with a curtain which may be opened or closed by a zipper fastener.

d. DATA CASES, HOLDERS, AND WRITING TABLES.—A flight report form holder, a cloth airplane flight manual holder, a check-list holder, and two map cases are provided in the pilot's compartment. A transparent bomb data book container and a map and data stowage box are provided for the bombardier. A navigation form box, a chart case, a sextant stowage holder, and a line-of-position computor stowage box are provided for the navigator. A data case is also provided for the radio operator. Folding tables are provided for bombardier, navigator, and radio operator. A cloth mooring and handling equipment stowage kit is at the right side of the navigator's compartment. A maintenance check-list holder is provided on the right rear side of the curtain between the pilot's and navigator's compartments. Ash trays are provided for the pilot, copilot, navigator, and radio operator.

e. SUNSHADES.—An adjustable sunshade and sun visor are provided for the pilot and copilot, and on some airplanes a special canopy is installed in the bombardier's compartment.

f. LADDER.—A service ladder is stowed on the right side of the aft compartment behind the camera position. It is secured to the side of the fuselage by three brackets and straps, and may be removed through the aft hatch.

SECTION II

PILOT'S OPERATING INSTRUCTIONS

NOTE

A pilot's check list in the pilot's compartment is available for a quick check of airplane operations.

1. FLIGHT RESTRICTIONS.

The following maneuvers are prohibited:

Loop	Immelmann	Vertical Bank
Spin	Inverted Flight	
Roll	Vertical Dive	

2. BEFORE ENTERING PILOT'S COMPARTMENT.

Make sure that the airplane has been serviced and is ready for flight, particularly in regard to proper quantities of fuel, oil, hydraulic fluid, and oxygen.

a. Ascertain that the amount of fuel, oil, ammunition, and special equipment carried is suited to the mission to be performed and that allowable limits of weight and center of gravity are not exceeded. (See AN 01-1-40.)

b. See that airplane is headed into the wind.

c. Make certain nose gear towing pin is engaged (cap on).

d. Enter navigator's compartment and check the following:

(1) Switch "ON" the generator-disconnect, active inverter, and inverter emergency cut-out switches, located on the navigator's control panel.

(2) Make certain that the fuel cross-feed valve and bomb bay tank transfer valve are "OFF," and the fuel shut-off valves are "ON." These controls are located at the rear of the navigator's compartment.

(3) Check emergency brake air pressure (550 to 600 pounds per square inch).

(4) Check hydraulic and brake accumulator pressure gages for a minimum of 375 pounds per square inch.

(5) On earlier airplanes, see that emergency nose gear lowering mechanism operating pawl is "OFF."

3. ON ENTERING PILOT'S COMPARTMENT.

a. The following procedure should be carried out prior to all flights:

(1) Have radio operator make certain that wing flap emergency crank and main gear emergency lowering mechanism (early airplanes) are stowed.

(2) Have navigator make certain that bomb door emergency crank is stowed, and on earlier airplanes that nose gear emergency lowering crank is stowed.

(3) Have crew members unlock emergency ground escape hatches.

(4) See that ignition switches are "OFF."

(5) Set parking brakes.

(6) Unlock flight controls and check for free and proper movement, watching control surfaces for correct response.

(7) When glide bombing attachment is removed, have bombardier make certain the selector valve in the bombardier's compartment is safetied in the "ALTERNATE SOURCE" position.

(8) Have bombardier make sure that the bomb release handle is in the "DOORS CLOSED" position, the antisalvo guard is in place, and the bomb fusing switch is "SAFE."

(9) On later airplanes, see that the safety switch for fixed nose gun is in "SAFE."

(10) Set the altimeter to the correct barometric pressure. (See figure 14-8.)

(11) On later airplanes test gun sight illumination by operating rheostat control on pilot's instrument panel.

b. When night-flying is anticipated, the following additional check should be made (battery-disconnect switch "ON"):

(1) Test fluorescent instrument light by operating rheostat control on left side of control column.

(2) Test cockpit extension light on right-hand instrument subpanel, and adjustable focusing lights on either side of pilot's compartment.

(3) Test position lights by moving switches on pilot's switch panel to "BRIGHT" and "DIM."

(4) Test landing lights by operating switches on control pedestal switch panel.

WARNING

Do not leave the landing lights on when the airplane is on the ground, as the heat generated by the lamps will melt the Plexiglas lenses.

(5) Test cockpit lights by operating switch on pilot's switch panel.

(6) Test operation of recognition lights. Switches are located on control pedestal switch panel.

(7) Instruct crew members to check operation of lighting equipment in their respective compartments.

4. STARTING ENGINES.

(See figure 15.)

a. The sequence of operations listed below should be followed when starting the engines:

(1) Have ground personnel turn the propellers three to four revolutions by hand.

(2) Open throttles ¾ inch (1000 to 1200 rpm). As engine starts, retard throttle slightly.

Figure 15—Control Pedestal Switch Panel

NOTE

No priming action or fuel discharge is accomplished by pumping the throttle.

(3) Move propeller controls to full "INCREASE RPM."

(4) Move mixture controls to "IDLE CUT-OFF."

(5) Make certain that the supercharger controls are locked in "LOW."

(6) Open cowl flaps; then place controls in neutral position.

NOTE

Always return the cowl flap controls to neutral position immediately after obtaining the desired position of the flaps. In this position, fluid will not be pumped overboard should a cowl flap line break.

(7) Move carburetor air controls to "NORMAL."

(8) Move oil cooler shutter controls to "CLOSED" position.

(9) Have navigator make certain fuel shut-off valve controls are "ON."

(10) On airplanes equipped with an engine fire extinguisher system, turn extinguisher selector valve handle to either "RIGHT MOTOR" or "LEFT MOTOR," according to the engine being started. By doing this, in case of fire when starting the engine, all that is necessary is to pull the handle.

(11) Turn "ON" the battery-disconnect switches, located on the pilot's switch panel *(See figure 16.)*

(12) Turn "ON" the fuel booster pump switches, located on the control pedestal switch panel. Check the fuel pressure gage for 4 to 5 pounds pressure.

(13) Turn "ON" the ignition safety switch, located on the pilot's control pedestal.

(14) Turn the ignition switch for the engine to be started first to the "BOTH" position.

(15) Press starter energizing switch on control pedestal switch panel to "LEFT" or "RIGHT," depending on which engine is being started first. On airplanes equipped with Eclipse starters, energize for a minimum

Figure 16—Pilot's Switch Panel

of 30 seconds. On airplanes equipped with Jack & Heintz starters, energize for a maximum of 10 seconds when using an external power supply (battery chart), or 20 seconds when using the airplane's batteries.

NOTE

Whenever possible, an external power supply should be used to start the engines. If external power is not available, use a portable energizer or handcrank. Do not use airplane's batteries to start engines except in an emergency.

(16) While energizing, prime engine 2 seconds.

(17) Check to see if propeller is clear.

(18) Press MESH switch to "LEFT" or "RIGHT," depending on which engine is being started first. Prime the engine intermittently while engaging until it fires evenly.

(19) As engine starts, move mixture control to "FULL RICH."

(20) Check oil pressure. If pressure is not up to 40 pounds within 30 seconds, stop engine, and investigate.

(21) Follow procedures (10), and (14), through (20) for starting other engine.

5. ENGINE WARM-UP.

Warm engine at 1200 rpm until oil temperature shows a definite increase and oil pressure remains steady when throttle is opened. Open oil cooler shutters at oil temperature of 40°C (104°F).

6. EMERGENCY TAKE-OFF.

Use oil dilution to obtain proper oil pressure at moderate power, and as soon as the engine will take the throttle, taxi out and take off. Apply throttle slowly but steadily.

WARNING

Overdilution may easily result in very low oil pressure after the engine is warm; therefore dilution should be used carefully.

7. ENGINE AND ACCESSORIES GROUND TEST.

a. After starting, engines should be warmed up and ground tested as follows:

(1) Turn booster pumps "OFF" and check for a fuel pressure of 6 to 7 pounds.

(2) Check propeller controls at 1600 rpm by pulling controls back to full "DECREASE RPM" and noting rpm drop of approximately 350 to 400 rpm. Return controls to full "INCREASE RPM."

(3) Check left and right magnetos at 2000 to 2100 rpm, maximum rpm drop 100. If rpm drop is greater, return switch to "BOTH," run engine to 40 inches Hg manifold pressure for a few seconds and then recheck at 2000 to 2100 rpm.

(4) At 700 rpm check "OFF" position of ignition switches.

(5) Check supercharger clutch operation: Set propeller to full "INCREASE RPM," engine speed to 1700 rpm, and supercharger to "HIGH" blower. Open throttle to 30 inches Hg maximum manifold pressure, and shift to "LOW" blower. Manifold pressure should show a sudden decrease of not less than 1½ inches Hg.

(6) Check operation of cowl flaps and wing flaps.

(7) At 1600 rpm, check voltage at 28-28.5, amperes 20-60 per generator, and suction 3.75-4.25 inches Hg.

(8) Check hydraulic pressure (800 to 1100 pounds per square inch).

(9) Check brake pressure (1000 to 1200 pounds per square inch).

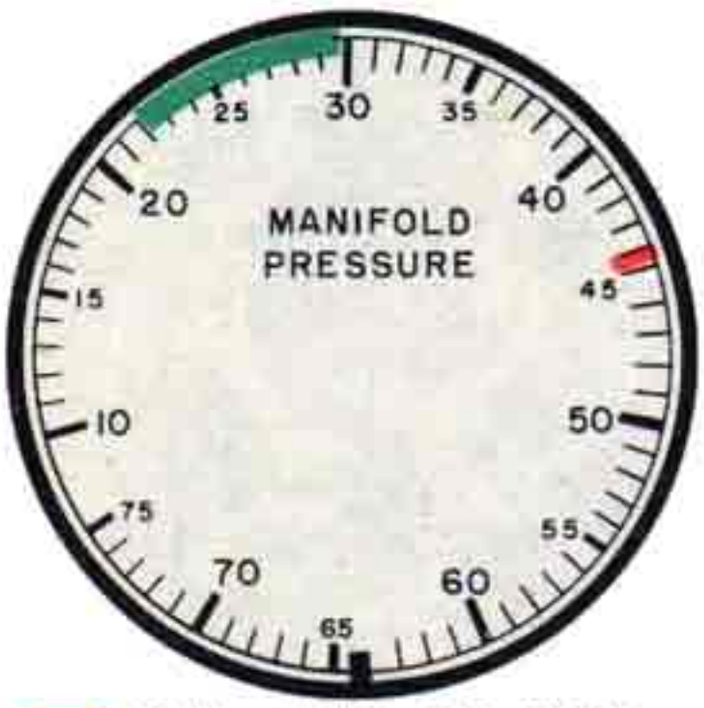
(10) Check with crew members to see that entrance hatches are closed.

(11) Check automatic pilot as follows:

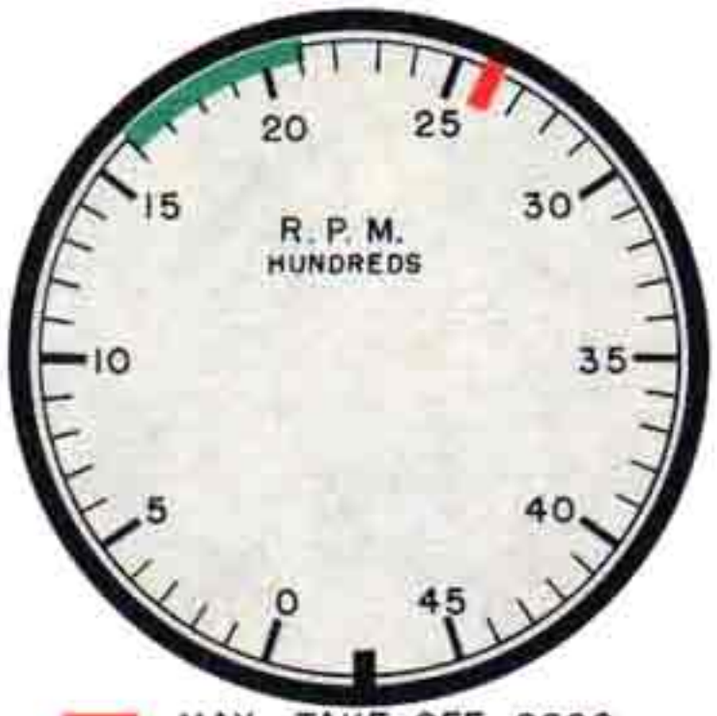
(a) See that automatic pilot vacuum gage reads 3 to 5 inches Hg.

(b) Check automatic pilot oil pressure gage for 90 to 100 pounds per square inch.

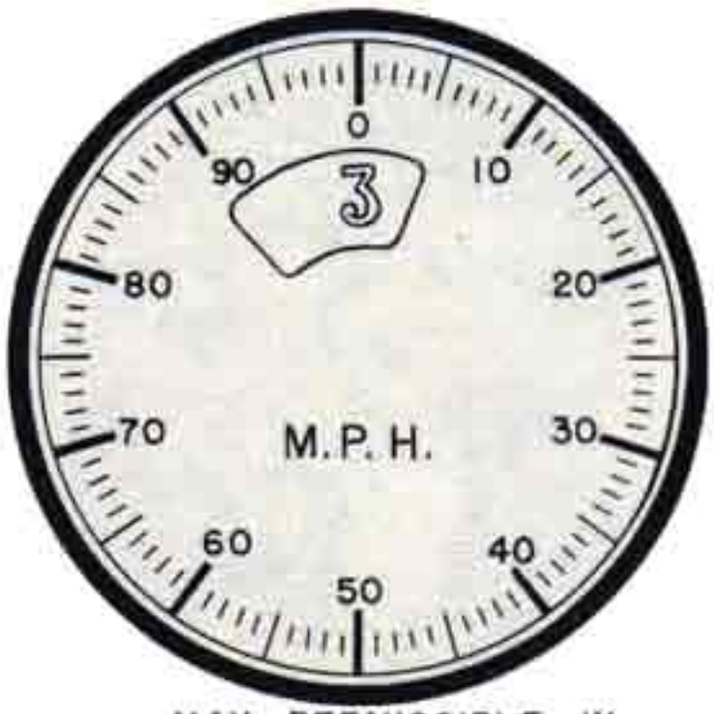
(c) Set and uncage directional gyro.



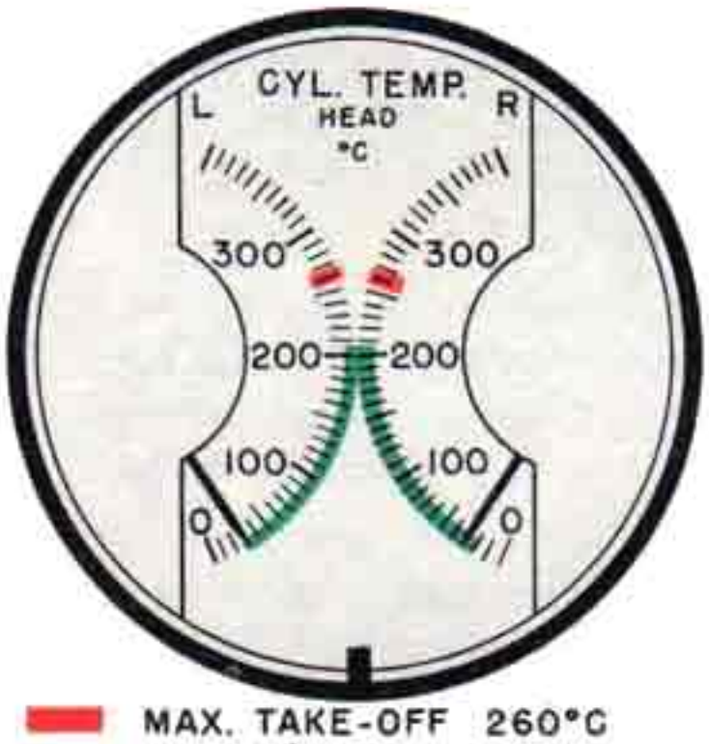
- MAX. TAKE-OFF MANIFOLD PRESSURE 44.3 IN. HG.
- OPERATING RANGE 22 TO 29.5 IN. HG.



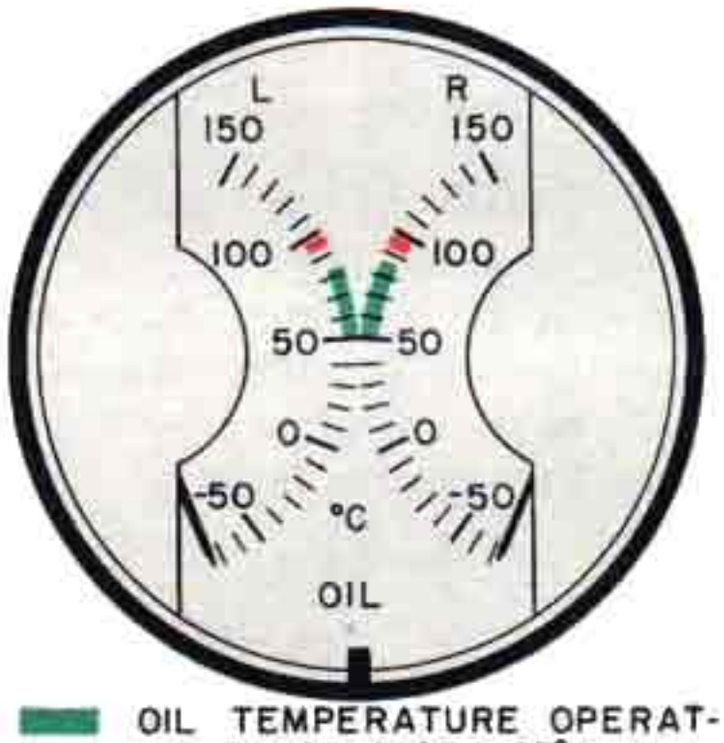
- MAX. TAKE-OFF 2600 R.P.M.
- OPERATING RANGE 1600 TO 2100 R.P.M.



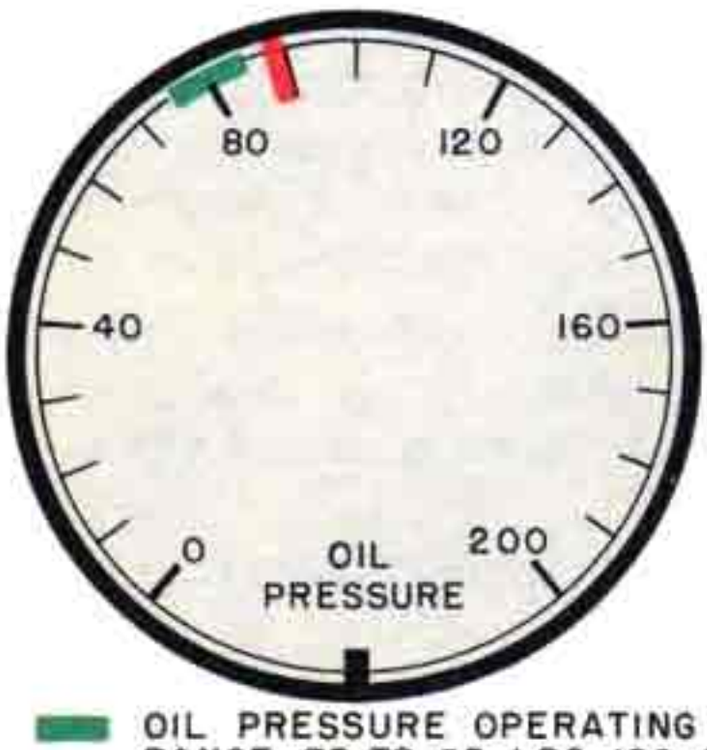
- MAX. PERMISSIBLE INDICTATED AIRSPEED 340 M.P.H.



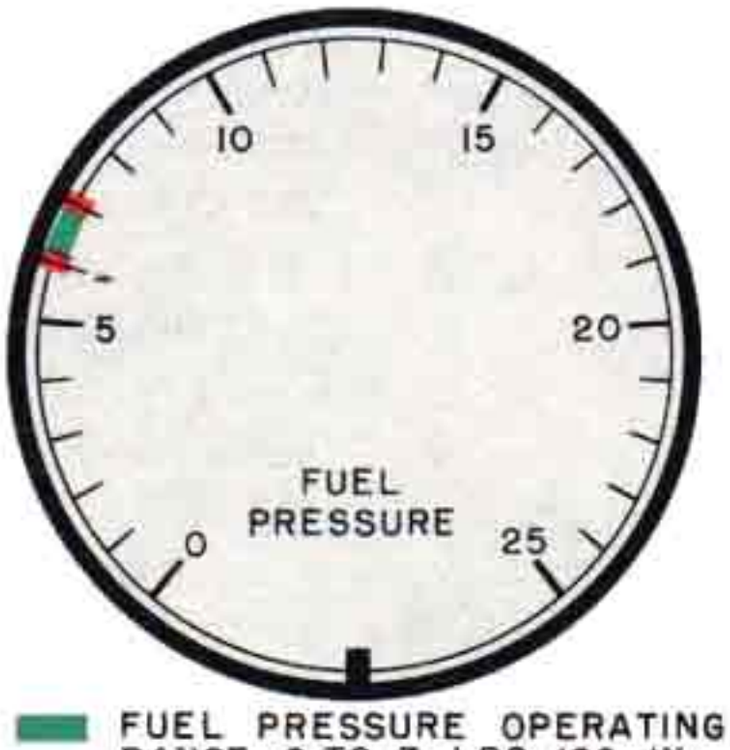
- MAX. TAKE-OFF 260°C (500°F)
- OPERATING RANGE 25° TO 205°C (77° TO 401°F)



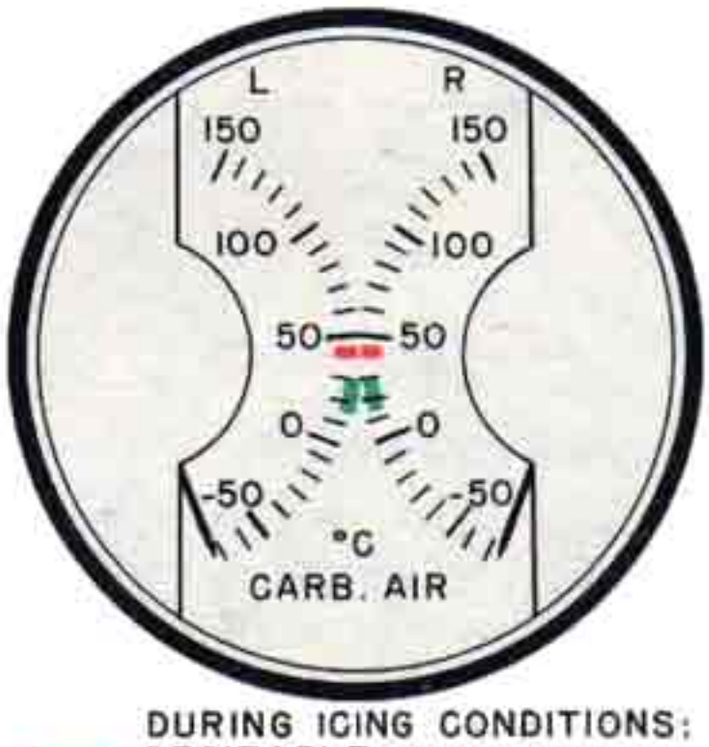
- OIL TEMPERATURE OPERATING RANGE 50° TO 85°F (122° F TO 185° F)
- MAX. PERMISSIBLE OIL TEMPERATURE 95° C (203°F)



- OIL PRESSURE OPERATING RANGE 75 TO 85 LBS./SQ. IN.
- MAX. OIL PRESSURE 90 LBS./SQ. IN.



- FUEL PRESSURE OPERATING RANGE 6 TO 7 LBS./SQ. IN.
- MAXIMUM FUEL PRESSURE 7 LBS./SQ. IN. MINIMUM 6 LBS./SQ. IN.



- DURING ICING CONDITIONS: DESIRABLE CARB. AIR TEMP. RANGE + 15°C (59°F) TO + 30°C (86°F)
- MAXIMUM + 40°C (104°F)

98-51-105

Figure 17—Instrument Limitations

(d) Engage automatic pilot and check operation by turning each control knob.

(e) Check for air in servo units by operating normal surface controls.

(f) Disengage automatic pilot. Leave gyros uncaged.

(12) Check operation of command radio. Have radio operator check liaison radio for proper operation.

8. TAXYING INSTRUCTIONS.

a. GENERAL.—When taxying, the airplane must begin to roll freely from its stationary position before any attempt is made to change direction of motion. No turn should be attempted until the initial direction of motion has been determined by "giving the airplane its head" through the even application of the engines without the use of brakes.

NOTE

This restriction is necessary because of the excessive side loads developed in the nose wheel assembly.

b. TURNS IN MUD OR SAND.—While taxying in mud or sand, turn the airplane by moderate use of the brakes and engines, avoiding pivoting on one wheel. The minimum radius of turn of the inside wheel can be approximately 10 feet. When attempting to straighten the airplane out of a turn, it will be found that the nose wheel has less tendency to trail properly as the depth of the tire sink (depth of rut) increases.

c. NOSE WHEEL TURN INDICATOR.—On later airplanes, an indicator containing two warning lights is installed on the instrument panel. (See figure 14-16.) These lights serve to warn the pilot when the nose wheel is turned beyond 15 degrees in either direction. Their action is fully automatic. The brilliancy of the lights may be adjusted by twisting the jewel light caps to "DAY" or "NITE."

NOTE

Upon reaching the take-off position, stop the airplane cross-wind so that approaching airplanes may be plainly seen.

9. BEFORE TAKE-OFF.

a. Check the following:

(1) Cabin heat switch "OFF."

(2) Upper turret pointing directly aft; lower turret retracted.

(3) Check flying controls for free movement (watch control surfaces).

(4) Check elevator, aileron, and rudder trim.

(5) Generator, active inverter, and inverter emergency cut-out switches "ON."

(6) De-icer control "OFF."

(7) Check fuel levels.

(8) Fuel booster pumps "ON." Fuel pressure 6 to 7 pounds.

(9) Propeller full "INCREASE RPM."

(10) Mixture "FULL RICH" (lock snug).

(11) Supercharger "LOW" (locked).

(12) Oil cooler shutters "OPEN."

(13) Carburetor air "NORMAL."

(14) Cowl flaps "OPEN" (control neutral).

(15) Emergency hydraulic selector valve "NORMAL."

(16) Emergency brake control safetied. Air pressure 550 to 600 pounds.

(17) Pilot's static pressure selector valve in "AIRSPEED TUBE" position.

10. TAKE-OFF.

a. When the field is clear, quickly check the following:

(1) Wing flaps 20 degrees down for normal take-off, 30 degrees down for obstacle clearance (control neutral).

(2) The gyro instruments should be left uncaged at all times except during violent maneuvers.

(3) Cylinder temperature 260° C (500° F) maximum for 5 minutes.

(4) Oil pressure 75 to 90 pounds.

(5) Oil temperature 20° C (68° F) minimum, 95° C (203° F) maximum.

b. Open throttles to 44.3 inches Hg manifold pressure, and take off at 2600 rpm (5 minutes maximum).

11. ENGINE FAILURE DURING TAKE-OFF.

a. The chances of an engine's failing during take-off can be greatly reduced by observing the following practices:

(1) Run up engine carefully and check thoroughly before take-off.

(2) Hold the airplane down so as to reach single engine control speed as soon as possible.

(3) Retract the landing gear as soon as the airplane is definitely air-borne.

(4) Retract the flaps as soon as the airplane reaches a safe altitude.

b. If an engine fails during take-off, the pilot must at once decide whether he can feather the propeller and continue flight, or cut the good engine and land straight ahead. The decision to continue flight will be based on the gross weight of the airplane and the air speed attained at the time of engine failure. If sufficient air speed for single-engine operation has been reached, the propeller on the inoperative engine should be feathered immediately and the flight continued. Closing the cowl flaps on the dead engine will also lower the drag. The gear should be retracted before this point is reached. Remember that the performance is greatly reduced with the gear and flaps extended.

c. If the engine fails immediately after take-off before single-engine flying speed is attained, act quickly as follows:

(1) Depress the nose at once so that the air speed does not drop below stalling speed.

(2) If bomb bay tank is installed, release immediately.

(3) Make sure the landing gear has started to come up. There is no time to take further action; and even if it is only unlocked and on the way up, the gear will collapse on landing.

(4) Lower the wing flaps fully, if possible.

(5) Move mixture control to "IDLE CUT-OFF" and turn off the ignition safety switch.

(6) Turn off battery-disconnect switch.

(7) Land straight ahead, only changing direction sufficiently to miss obstructions.

d. If engine flying speed is attained, proceed as follows:

(1) Feather propeller on dead engine.

(2) Retract landing gear as quickly as possible.

(3) If bomb bay tank is installed, drop to lighten load. Close bomb doors to cut drag.

(4) Raise the flaps slowly to prevent spilling airplane.

(5) Shut off fuel to dead engine.

(6) Turn "OFF" ignition and booster pump switches for dead engine.

(7) Keep the air speed well above the stalling speed for the gross weight at which you are flying.

(8) Build up flying speed and altitude until a safe landing can be made.

12. CLIMB.

a. As soon as the airplane is sufficiently clear of the ground, proceed as follows:

(1) Unlock landing gear control handle and move to "UP" position. Note landing gear position as shown by indicator on instrument panel (see figure 14-20).

(2) Raise the flaps when sufficient air speed is attained and all obstacles are sufficiently cleared. (Raise flaps by placing control in "UP" position and then returning to neutral.)

(3) Adjust cowl flaps and oil cooler shutters as required.

(4) Check the cylinder head and oil temperatures and the oil pressure.

(5) Check fuel pressure. Have booster pumps "ON" below 1000 feet and above 10,000 feet. Booster pumps may be turned "ON" as required between 1000 and 10,000 feet.

(6) As the rate of climb can vary widely, depending on weight being carried and altitude, refer to the take-off, climb, and landing charts in appendix II for the rate of climb applicable to the particular mission to be conducted.

13. DURING FLIGHT.

a. GENERAL.

(1) Set propeller and throttle controls to desired rpm and manifold pressure.

(2) Periodically check for these desired instrument readings:

Oil Pressure	80 to 85 pounds (75 pounds minimum, 90 pounds maximum)
Oil Temperature	50°to70°C (122° to 158°F) 40°C (104°F) minimum, 85°C (185°F) maximum continuous, 95°C (203°F) maximum for 15 minutes
Fuel Pressure	6 to 7 lbs
Cylinder Head Temperature	Military power 260°C (500°F) maximum for 5 minutes Maximum continuous power climb 260°C (500°F) maximum for 15 minutes Maximum continuous power level flight 218°C (425°F) maximum Cruising power 205°C(401°F) maximum
Voltage	28-28.5
Suction	3.75-4.25 in. Hg

(3) When altitude warrants, shift supercharger from "LOW" to "HIGH" at 1700 rpm. In prolonged flight in "HIGH" ratio, shift to "LOW" ratio every 2 hours for 15 minutes to remove sludge from clutch.

(4) For engine operation, see specific engine flight chart, (figure 20), section III.

b. OPERATION OF AUTOMATIC PILOT.—To operate the automatic pilot, proceed as outlined below:

(1) Trim airplane "HANDS OFF."

(2) See that servo speed control valves are open. Recommended setting is at 4.

(3) Set rudder follow-up card (figure 18-2) to match directional gyro card by turning rudder knob.

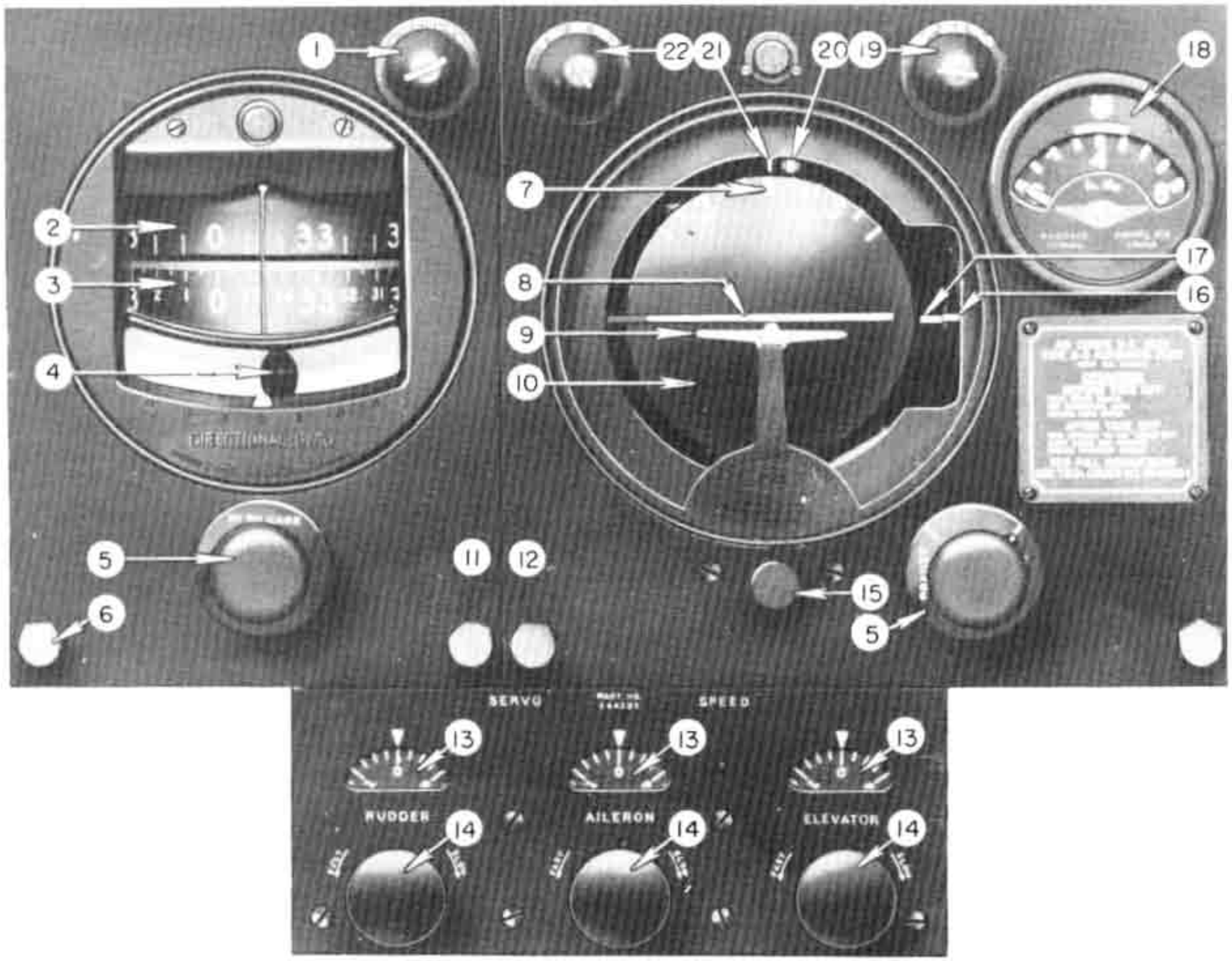
(4) Set aileron follow-up index (figure 18-20) to match bank index by turning aileron knob.

(5) Set elevator follow-up index (figure 18-17) to match elevator alignment index by turning elevator knob.

CAUTION

Do not align elevator follow-up index with horizon bar, (figure 18-8) as relative movement between elevator alignment index (figure 18-16) and horizon bar is in opposite directions.

(6) Engage automatic pilot by slowly moving the "ON-OFF" control to the "ON" position. The pilot can feel the automatic pilot take over the control.



1. Rudder Control Knob
2. Rudder Follow-up Card
3. Directional Gyro Card
4. Ball Bank Indicator
5. Caging Knobs
6. Installation Bolts
7. Banking Scale
8. Horizon Bar
9. Miniature Airplane
10. Horizon Dial
11. Directional Gyro Unit
12. Bank-and-Climb Gyro Unit
13. Valve Adjustment Reference Dials
14. Valve Adjustment Knobs
15. Miniature Airplane Adjustment Knob
16. Elevator Alignment Index
17. Elevator Follow-up Index
18. Suction Gage
19. Elevator Control Knob
20. Aileron Follow-up Index
21. Bank Index
22. Aileron Control Knob

Figure 18—Automatic Pilot Control Units

(7) Set servo speed valves for desired speed of control. Turn control to stop oscillation of corresponding control surface.

(8) Change course by slowly turning rudder knob. (See figure 18-1.) Set in bank with aileron knob if making a sharp turn.

(9) Set desired fore-and-aft attitude with elevator knob. (See figure 18-19.)

CAUTION

Do not allow airplane to get too far out of trim.

c. RESTRICTED USE OF AUTOMATIC PILOT.—Since experience in flying airplanes equipped with automatic pilots has demonstrated that abrupt control responses of the automatic mechanism under conditions

of sideslip or stall may result in a spin, the following restrictions in the use of the automatic pilot are hereby made effective for B-25 airplanes:

(1) Do not operate airplane by the automatic pilot in extremely turbulent air, when de-icer system is operating, or when the right engine is not delivering normal power output.

(2) Do not place airplane under control of the automatic pilot at any speed or attitude until the pilot has determined by manual operation that the existing flight conditions permit safe control by the automatic pilot, and in no case will automatic pilot be used when the airplane is flying at less than an indicated air speed of 40 mph above the stalling speed.

(3) Do not operate airplane under control of the automatic pilot without one rated pilot remaining "on watch" and maintaining a close check of the airplane and instruments.

(4) Do not engage automatic pilot when follow-up indices are not lined up.

(5) Do not make course and attitude changes with rapid knob movements. Turn slowly and smoothly.

(6) Do not allow airplane to get too far out of trim.

(7) Do not forget that automatic pilot can be overpowered.

(8) Do not turn any of the three speed controls to "OFF" or lowest speed when automatic pilot is engaged as this would lock the corresponding surface controls in whatever position they happened to be.

NOTE

Caution must be exercised to keep the gyros caged during acrobatics, or during maneuvers which would exceed the operating limits of the instruments. These limits are 50 degrees from the vertical for the bank-and-climb gyro control unit (figure 18-12) and 55 degrees for the directional gyro control unit (figure 18-11.) At all other times the gyros should be uncaged.

WARNING

At no time during flight should the operator manually control the automatic pilot over 15 degrees from the level flight position laterally, longitudinally, or directionally. If movements of more than the 15 degrees are desired, turn off the automatic pilot and manually operate the controls.

14. FUEL SYSTEM MANAGEMENT.

a. AUXILIARY FUEL — LATER AIRPLANES. — Fuel in the auxiliary cells must be transferred to the main fuel cells before it can be fed to the engine. To transfer fuel, start one or both of the auxiliary fuel cell transfer pumps by placing the switches on the control pedestal switch panel in the "ON" position. There are no valves to be opened or closed during this operation. Whenever the quantity of fuel in a main fuel cell has been reduced sufficiently, as shown on the liquidometer fuel level indicator, fuel should be transferred from the auxiliary cells. During this transfer the selector switch on the liquidometer indicator should be set to the front main cell to which the fuel is being transferred, in order to inform the pilot when to turn off the transfer pump. The transfer pump should not be kept running after the cell is full, since leaky filler caps may cause loss by overflow. If there is no leakage at the filler caps, fuel will be circulated back to the auxiliary fuel cells through the vent connections.

b. BOMB BAY TANK FUEL—LATER AIRPLANES.—Before the fuel carried in the bomb bay tank may be used, it is necessary to transfer the fuel to the left or right front main fuel cell. To transfer fuel, proceed as follows:

(1) Turn fuel transfer valve control from "OFF" to either "FUS TANK TO LEFT WING" or "FUS TANK TO RIGHT WING."

(2) Turn "ON" transfer pump switch on generator control panel.

(3) Set main liquidometer selector switch to the main fuel cell to which fuel is being transferred. Watch gage in order that transferring operation may be stopped when cell is full, to avoid overflow.

NOTE

It is usually desirable to keep the main fuel cells as nearly full as possible by transferring fuel from the bomb bay tank at frequent intervals. This is advisable because it might become necessary to salvo the bomb bay tank. If such a situation should arise, it would be desirable to have as much of the total fuel supply as possible in the self-sealing wing cells. No provision is made for transferring fuel from the wing cells back into the bomb bay tank.

(4) When transfer operations are finished, shut "OFF" transfer pump switch and place fuel transfer valve control in "OFF" position.

c. EMERGENCY FUEL TRANSFER—LATER AIRPLANES.—If bomb bay tank transfer pump fails, proceed as follows:

(1) Set transfer valve control to desired position and unstrap handle on pump at aft end of navigator's compartment.

(2) Move handle back and forth. This action draws fuel from the bomb bay tank and pumps it into whichever main cell has been selected.

(3) When transfer operation is completed, return handle to stowed position and strap in place. Return selector valve control handle to "OFF" position.

d. BOMB BAY FUEL TANK—EARLIER AIRPLANES.—Before the fuel carried in the bomb bay

tank may be used, it is necessary to transfer the fuel to the left or right front main fuel cell. To transfer fuel, proceed as follows:

(1) Connect tanks desired as shown on fuel transfer control dials.

(2) Select direction of fuel flow with switch on fuel transfer control panel.

(3) Turn "ON" transfer pump switch. When the transfer pump is operating, the light on the control panel illuminates.

(4) Set main liquidometer selector switch to the main fuel cell to which the fuel is being transferred. Watch gage in order that transferring operation may be stopped when cell is full, to avoid overflow.

NOTE

With this fuel transfer system, it is possible to transfer fuel from both main tanks on either side to the bomb bay tank, if desired. If transfer valve is set to an "OFF" position while the transfer pump is operating, the transfer pump switch will trip to "OFF."

e. OPERATION OF CROSS-FEED FUEL SYSTEM. —To use the cross-feed system it is necessary to open the cross-feed valve, and desirable to turn "ON" one of the fuel booster pumps. However, when the cross-feed valve is open, both fuel booster pumps should NOT be used. With the right-hand booster pump "ON," the right-hand cross-feed check valve remains open, but the left-hand check valve closes due to the excess pressure on its top side from the booster pump that is running. Fuel then flows from the right wing cells to both engines, but not back into the left wing cells because of the closed left-hand check valve. With the left-hand booster pump "ON," the right-hand check valve closes and the left-hand one remains open. In this case, fuel flows from the left wing cells to both engines. If one of the engines is out of commission, the fuel shut-off valve on that side can be closed, allowing the entire flow to go to the other engine.

15. ENGINE FAILURE DURING FLIGHT.

For information on this subject see section IV, paragraph 3.

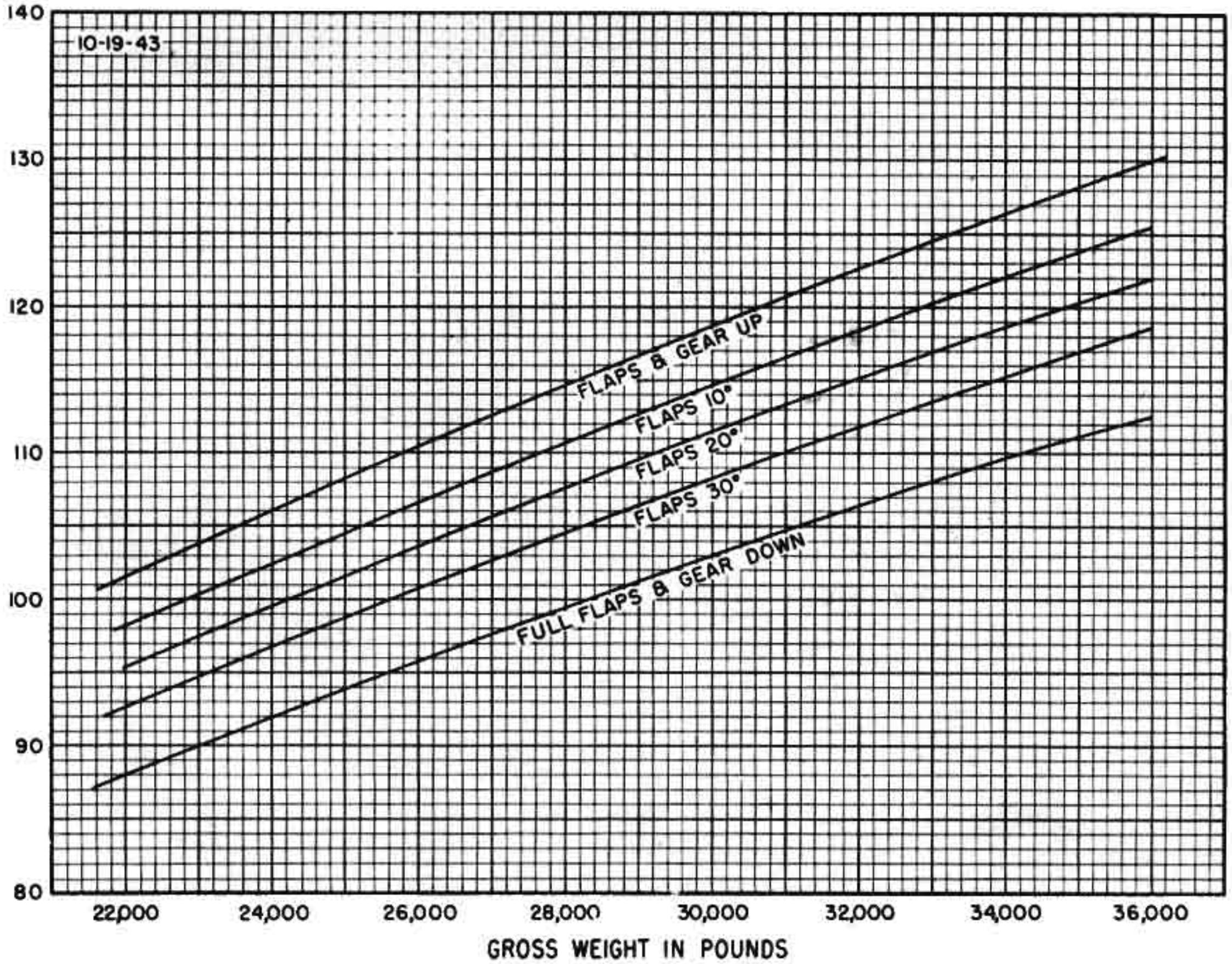


Figure 19—Stalling Speed Chart

16. GENERAL FLYING CHARACTERISTICS.

The general flying characteristics of the airplane are conventional, and no special emphasis need be placed on any particular normal condition of flight. The normal accepted technique and procedure governing the flying of twin-engine bombardment aircraft should be adhered to in flying this airplane.

17. MANEUVERS PROHIBITED.

a. Only normal flying attitudes are permitted when the airplane is loaded to a specified maximum loaded weight for safe flight.

b. The following maneuvers are prohibited:

Loop	Inverted Flight
Spin	Vertical Dive
Roll	Vertical Bank
Immelmann	

18. STALLS.

The airplane has excellent stall characteristics. The stalls are not violent and recovery can be made by simply dropping the nose of the airplane. A slight rolling tendency is easily counteracted by the application of opposite aileron control or a slight amount of rudder. The stalling characteristics of the airplane are not affected by changes of the gross weight, the setting of the wing flaps, or the operation of the de-icer shoes. The stalling speed, however, is affected by the above-mentioned variables (See figure 19.) The application of power tends to reduce the stalling speed further, dependent upon the amount of power used, the thrust component of which is converted into lift. A warning is given several miles per hour above the actual speed of the stall by a slight buffeting on the elevator and the horizontal stabilizer. There is no reversal of elevator force during the stall.

19. SPINS.

Recovery from spins is accomplished in the conventional manner.

20. DIVING.

The maximum indicated diving air speed is 340 mph at normal gross weight. Recovery from dives should not be too abrupt in order to avoid placing excessive load factors on the structure. Dives and subsequent pull-outs should be tempered in accordance with the roughness of the air and the gross weight of the airplane.

21. NIGHT FLYING.

a. In flying this airplane at night, the sequence outlined for daylight operation should be even more strictly observed. In addition, the pilot and crew members should familiarize themselves with the location of the different lights and their control switches.

(1) INSTRUMENT LIGHTING.—Turn on the fluorescent lamp by turning the rheostat knob (on the left side of the control column) to "START" until the light comes on; then switch to either "ON" or "DIM." Rotating the lens housing selects the visible or invisible illumination for the instruments.

(2) COCKPIT EXTENSION LIGHT.—An extension light with a 6-foot cord is mounted on the right-hand instrument subpanel for use when a small amount of light is desired.

(3) POSITION LIGHTS.—The position light switches are on the pilot's switch panel. Two intensities of light are available: "BRIGHT" and "DIM."

(4) LANDING LIGHTS.—Switches for the landing lights are located on the control pedestal switch panel.

(5) RECOGNITION LIGHTS.—Set the switches, located on the control pedestal switch panel, for the light or combination of lights desired. Place the switches in "STEADY" position for continuous operation and in "KEY" position for intermittent operation, by means of the keying switch. The keying switch is located directly above the bank of four recognition light switches.

NOTE

Do not operate recognition lights longer than 10 seconds on the ground.

(6) DOME LIGHT.—The dome light is controlled by the switch on the pilot's switch panel.

(7) COCKPIT LIGHTS.—The cockpit lights are turned on by the switch on the pilot's switch panel. To produce a spot of floodlight beam, turn the knob at the rear of the lamp assembly clockwise or counterclockwise.

22. APPROACH AND LANDING.

a. APPROACH.—When the airplane approaches the field, this sequence of operation should be followed:

(1) De-icer control "OFF."

(2) Upper turret pointing directly aft; lower turret retracted.

(3) Fuel booster pumps "ON."

(4) General hydraulic pressure 800 to 1100 pounds per square inch.

(5) Brake pressure 1000 to 1200 pounds per square inch.

(6) Set propeller controls at 2100 rpm.

(7) Set mixture controls at "FULL RICH" (lock snug).

(8) Set supercharger controls in "LOW" (lock).

(9) Open oil cooler shutters.

(10) Close cowl flaps (controls neutral).

(11) Lower landing gear to "DOWN" position and lock. Do not lower gear above 170 mph. Check position of gear by indicator and warning light.

(12) Master heater switch "OFF."

(13) Lower wing flaps. (Do not lower flaps above 170 mph.)

WARNING

Do not exceed 170 mph with flaps down. If landing is not made, raise flaps slowly after sufficient altitude and speed are obtained.

b. LANDING.

(1) Having turned into the field and lowered the flaps, maintain a correct gliding speed. Adjust the elevator trim tabs to assist in landing. Having stopped after landing, raise the flaps and turn "OFF" the fuel booster pumps. Open cowl flaps before taxying.

(2) Make a normal landing in mud or sand, holding the airplane straight by use of the rudder with minimum use of the brakes. This action minimizes the possibility of skidding, which may occur on a slick surface.

23. STOPPING ENGINES.

a. To stop engines, proceed as follows:

(1) Set propeller controls at full "INCREASE RPM."

(2) Prior to stopping, run the engines at a speed of 800 to 1000 rpm and shift the supercharger levers from "LOW" to "HIGH" at 30-second intervals for a period of 5 minutes. This procedure serves to wash out any sludge which may have accumulated in the supercharger clutches. Lock the supercharger levers in "LOW."

(3) Idle at 800 to 1000 rpm to cool engines.

(4) When a cold weather start is anticipated, follow the oil dilution procedure outlined in appendix III.

(5) Run engines at 1200 rpm for not more than 30 seconds to permit efficient scavenging of crankcase oil; then move mixture controls to "IDLE CUT-OFF," and simultaneously open throttle. Do NOT move mixture controls from "IDLE CUT-OFF."

24. BEFORE LEAVING PILOT'S COMPARTMENT.

a. After engines stop, proceed as follows:

(1) Turn "OFF" all switches.

(2) Set parking brakes.

CAUTION

Do not set parking brakes while they are hot.

(3) Fasten landing gear control lock.

(4) Lock flying controls.

(5) When engine is sufficiently cool, close cowl flaps.

(6) Place carburetor air control handle in "ICING" position.

(7) If airplane is not to be serviced by ground crew, lock all entrance hatches upon leaving airplane.

FORM ASC-5112A

AIRPLANE MODELS

B-25C & B-25D

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS

R-2600-13 OR

R-2600-29

CONDITION	FUEL PRESSURE (LB/SQ. IN.)	OIL PRESSURE (LB/SQ. IN.)	OIL TEMP. °C	OIL TEMP. °F	COOLANT TEMP. °C	COOLANT TEMP. °F		
DESIRED	6-7	80-85	50-70					
MAXIMUM	7	90	85 95(CL IHB)					
MINIMUM	6	75						
IDLING	6-7	25						

MAX. PERMISSIBLE DIVING RPM: 2880

CONDITION	ALLOWABLE OIL CONSUMPTION
NORMAL RATED (MAX. CONT.)	28 U.S.QT/HR IMP.PT/HR
MAX. CRUISE	15 U.S.QT/HR IMP.PT/HR
MIN. SPECIFIC	— U.S.QT/HR IMP.PT/HR

OIL GRADE: (S) 1120 (W) 1100

SUPERCHARGER TYPE:

FUEL GRADE: 100 OCTANE

OPERATING CONDITION	RPM	MANIFOLD PRESSURE (BOOST)	HORSE-POWER	CRITICAL ALTITUDE WITH RAM	CRITICAL ALTITUDE NO RAM	BLOWER	USE LOW BLOWER BELOW:	MIXTURE CONTROL POSITION	FUEL FLOW (GAL/HR/ENG.) U.S.	FUEL FLOW (GAL/HR/ENG.) IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM CYL. TEMP. °F	MAXIMUM DURATION (MINUTES)
TAKE-OFF	2600	44.3	1700	SEA LEVEL		LOW	ALWAYS	FULL RICH	215	179	260		5
WAR R-2600-13 EMERG R-2600-29	2600 2600	47.5 46	1850 1800		SEA LEVEL	LOW	ALWAYS	FULL RICH	230	191	250		5
MILITARY	2600	41.5 44	1700 1400	4500 13,000		LOW HIGH	10,500	FULL RICH	215 203	179 169	260		5
MAXIMUM CONTINUOUS	2400	37.5 41	1500 1300	6700 13,500		LOW HIGH	11,000	FULL RICH	180 190	150 159	218		CONT.
MAXIMUM CRUISE	2100 2100	28.5 29.5	1005 905	12,500 18,500		LOW HIGH	16,000	CRUISING LEAN	80 85	67 71	205		CONT.
MINIMUM SPECIFIC CONSUMPTION	1600 1800 1900 2100 2000	29.5 27 26 F.T. F.T.	710 750 800 920 820	SEA LEVEL 5000 10,000 15,000 20,000		LOW LOW LOW LOW HIGH	16,000	CRUISING LEAN	51 55 59 73 74	43 46 49 61 62	205		CONT.

REMARKS: MINIMUM SPECIFIC CONSUMPTION FIGURES ARE FOR AVERAGE MAXIMUM RANGE CONDITIONS.

Figure 20—Specific Engine Flight Chart

SECTION III
FLIGHT OPERATING DATA

1. AIR SPEED LIMITATIONS.

a. Do not exceed an air speed of 340 IAS.

b. Do not exceed an engine speed of 2880 rpm.

c. Do not lower landing gear at a speed in excess of 170 IAS.

d. With landing gear down and wing flaps up do not exceed an air speed of 200 IAS.

e. Do not lower main landing gear or nose gear by means of emergency lowering system at a speed in excess of 150 IAS.

f. Do not lower wing flaps or fly airplane with wing flaps down at a speed in excess of 170 IAS.

g. Do not lower wing flaps by means of the emergency mechanical system, or fly airplane after flaps are lowered by mechanical system at indicated air speeds in excess of 150 IAS.

h. Do not open bomb bay doors at an air speed in excess of 290 IAS.

i. Do not operate de-icer system at speeds above 230 IAS.

2. AIR SPEED CORRECTION CHART.

Calibrated Indicated Airspeed—mph	*IAS*	*Altimeter Error (feet) (Add to Altimeter Reading)* S.L.	*15,000*
100	99	20	30
120	118	25	40
140	137	30	50
160	156	40	65
180	176	50	80
200	195	65	100
220	214	80	130
240	234	100	160
260	253	125	200
280	272	150	240
300	291	180	290

3. LOAD AND BALANCE.

A load adjuster with carrying case and a Weight and Balance Data Handbook (AN 01-1-40) are furnished with each airplane. The load adjuster, which is similar to a slide rule, is used to check the load and balance from basic airplane to loaded airplane to ensure that the weight distribution of all items loaded will not produce an unsafe balance condition. The airplane model designation stamped on every load adjuster indicates that the instrument may be used for balance calculations on any airplane of that particular model. However, the *index figure* entered in the carrying case identification card, or on chart C of the Handbook, is correct only for the airplane whose serial number is printed on the card or Handbook, and represents the balance moment of only that one particular basic airplane.

4. SPECIFIC ENGINE FLIGHT CHART.

(See figure 20.)

a. Operating limitations and characteristics of the R-2600-13 or -29 engine, with which this airplane is powered, are summarized for ready reference on the Specific Engine Flight Chart. Flight operating personnel should be thoroughly familiar with this information.

b. Engine power ratings shown on the chart are defined as follows:

(1) TAKE-OFF. — Maximum recommended for take-off under specified time limit of 5 minutes.

(2) MILITARY. — Maximum recommended for operation for periods not exceeding 5 minutes.

(3) MAXIMUM CONTINUOUS. — Maximum recommended for operation with rich mixture in climb and level flight.

(4) MAXIMUM CRUISE. — Maximum recommended for operation with lean mixture.

(5) MINIMUM SPECIFIC CONSUMPTION.— The power at which greatest range can be obtained under average loading conditions.

SECTION IV

EMERGENCY OPERATING INSTRUCTIONS

1. GENERAL.

All emergency instructions have been assembled in this section to facilitate quick reference by the flight crew who should thoroughly acquaint themselves with this information before their first flight in this airplane. Ground drills in emergency operations, exiting from airplane, and ditching are highly recommended.

2. EMERGENCY EXITS ON GROUND.

In addition to the forward and aft hatches, an emergency exit from the airplane may be made through the top of the cockpit enclosure, through the two cockpit side window sliding panels, through the window on the right side of the fuselage opposite the lower turret, and through the left side of the bombardier's enclosure.

3. ENGINE FAILURE DURING FLIGHT.

a. SINGLE-ENGINE FAILURE.—If only one engine fails, refer to the single-engine cruising charts in appendix II and follow these instructions:

NOTE

The flying characteristics of this airplane with single-engine failure are exceptionally good and the airplane need not be abandoned unless the fuel is depleted. For maximum range conditions, fly at the lowest possible altitude and use the engine operating conditions as shown on the charts.

(1) Feather the propeller on the dead engine immediately by pushing the propeller feathering control momentarily. To unfeather, set propeller control, in "DECREASE RPM" push feathering control, and release at 800 rpm.

NOTE

In practice feathering while flying, the period of time the propeller is left in the feathered position should not exceed 15 minutes.

(2) Close cowl flaps fully.

(3) Shut off the fuel to the dead engine. The controls for the shut-off valves are above the shelf in the aft end of the navigator's compartment.

(4) All electrical equipment not necessarily required for flight should be turned off to prevent excessive current drain on the remaining generator.

(5) The airplane may be easily trimmed to fly hands off with one engine inoperative.

(6) Land with the live engine in full "INCREASE RPM," in case full power is needed.

(7) In the single-engine approach to a landing, gradually reduce the power and trim the rudders accordingly to prevent sudden yaw. During the approach, maintain sufficient power to control the airplane and do not lower flaps fully until safe landing is assured. It must be remembered that after the glide is started, with subsequent lowering of air speed, level flight cannot be resumed, even with full power, until the airplane has been dived to regain the air speed lost.

NOTE

The pilot should practice single-engine operation.

b. TWO-ENGINE FAILURE.—With two-engine failure the airplane may be abandoned, ditched, or brought in for a dead-stick landing, as the case requires. The dead-stick landing qualities of this airplane are very good. For a landing with both engines dead, follow these instructions:

(1) Depress the nose of the airplane to remain above stalling speed.

(2) Turn off the ignition safety switch.

(3) If it is necessary to stretch the glide, feather both propellers. Windmilling propellers help in short landings.

(4) Order navigator to shut off the fuel to both engines.

(5) Release bomb bay tank if installed. If hydraulic system has failed, order navigator to crank the doors open by the mechanical linkage.

(6) Lower the flaps by use of hydraulic handpump if system is intact. If the hydraulic system has failed, order the radio operator to lower the flaps by use of the hand crank.

(7) Do not lower the landing gear. There is less chance of injury to the crew if the airplane is landed on its belly.

(8) Turn off battery-disconnect switch just before landing.

(9) Land into the wind in normal landing attitude, only changing direction sufficiently to avoid obstructions.

4. EMERGENCY EXITS DURING FLIGHT.

(See figure 21.)

During flight, emergency egress should be made through the hatch in the navigator's compartment or the

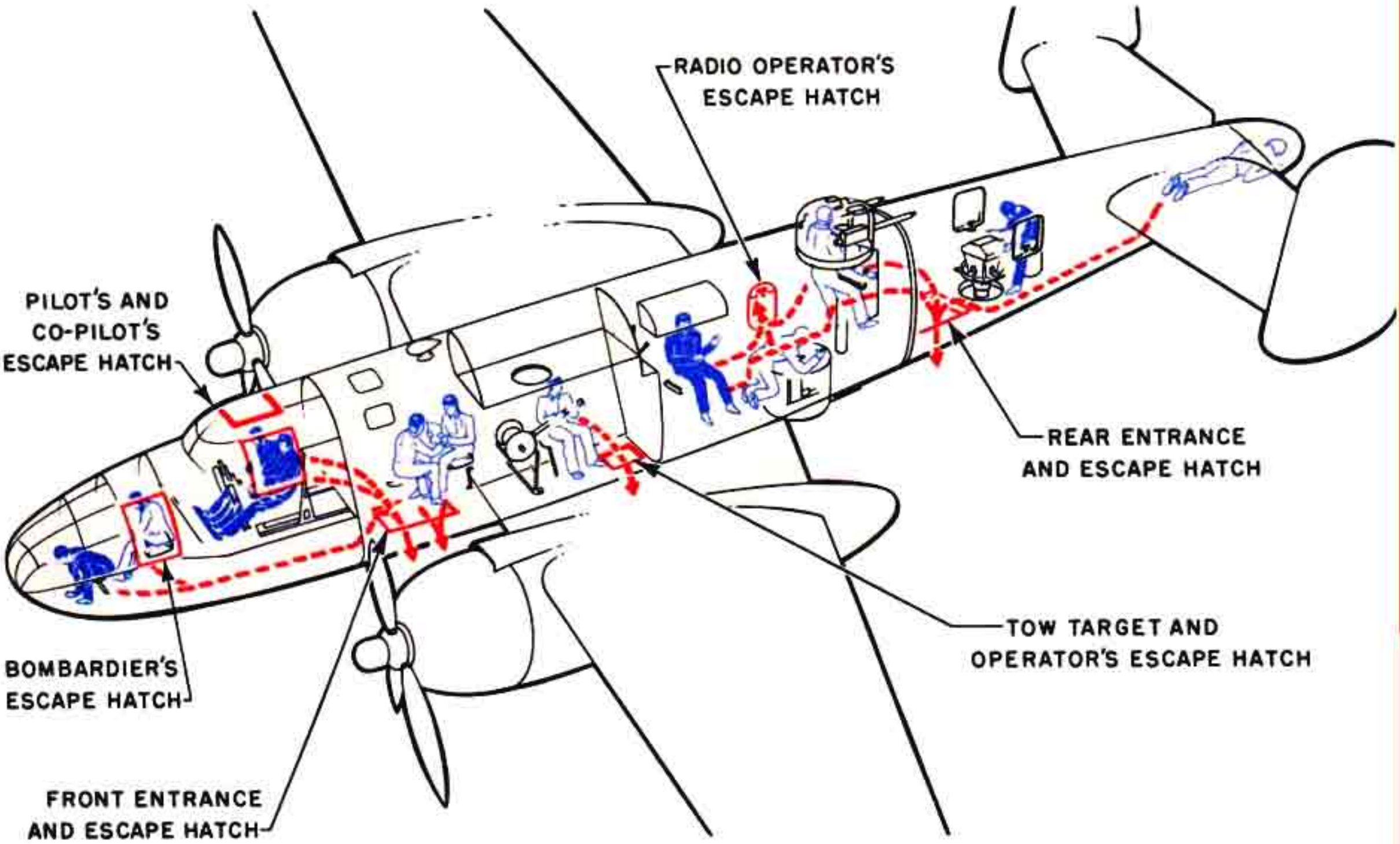


Figure 21—Emergency Exits

aft hatch. The airplane is to be abandoned upon command of the pilot over the interphone or by a prearranged signal of the warning bells. To use bombardier's escape hatch, pilot's escape hatch, or pilot's side windows, as a means of escape during flight, the propellers must be feathered and the airplane under control.

WARNING

If possible, cut or retract trailing antenna before using floor hatches.

5. DITCHING.

a. GENERAL.—These instructions are for the general guidance of all members of the crew in the event of a forced landing at sea, which is called "Ditching."

NOTE

In these instructions the life raft is referred to as the "Dinghy."

b. AVOIDING DITCHING.—Many ditchings could have been avoided by proper operation of the airplane and a thorough knowledge of its operating characteristics under all circumstances. The pilot should be thoroughly familiar with the Flight Operation Charts in appendix II of this Handbook. The pilot should know the proper method of flying this airplane in event of a single-engine failure (paragraph 3, this section), and he should fully understand the operation and limitations of the fuel system, particularly those controls which are used to transfer fuel from one tank to another or to shut off the fuel supply to an engine. The pilot should be practiced in flying the airplane at different weights at heights above 3000 feet, with one engine inoperative. It is extremely important that the pilot know the best speed and altitude for maintaining flight at reduced power under various kinds of circumstances.

c. LIGHTENING THE LOAD.—If height cannot be maintained above a reasonable altitude because of failure of one engine, icing conditions or other circumstances, lighten the load of the airplane by jettisoning these items:

(1) The bomb load and/or torpedo

(2) The bomb bay droppable fuel tank, if not required to reach a friendly base

(3) All ammunition, if not liable to attack

(4) Camera and other equipment not essential to the navigation of the airplane

d. PREPARATION FOR DITCHING.—If the pilot is certain he cannot reach land, preparation for ditching must begin immediately.

(1) THE SIGNAL.—The pilot must command the crew by interphone to prepare for ditching. There should also be a prearranged signal, such as the letter "D" repeated three times. In addition, the warning

bells may be used as a signal. Each member of the crew must acknowledge the command of the pilot by the answer "navigator ditching," "radio operator ditching," etc., and should then remove his parachute and go to his ditching station so the pilot can adjust trim and lower the flaps.

(2) DUTIES OF PILOT AND COPILOT.—The pilot coordinates the work of the crew and makes certain they are carrying out the proper ditching procedure. In addition, the pilot, with the assistance of the copilot, must carry out these tasks:

(a) Destroy confidential equipment by pushing both detonator buttons simultaneously.

(b) Destroy secret papers.

(c) Be sure that bombs, torpedo, or ferrying tank has been dropped and that the bomb doors are closed.

(d) Release pilot's upper escape hatch.

(e) Check that the landing gear is up.

(f) Switch on the landing lights if darkness or hazy weather conditions make this necessary and provided the lights do not cause reflections which disturb vision.

NOTE

Although the surface of the water may be seen in the beam of the landing lights, judgment of height by this means may not be correct.

(3) NAVIGATOR'S DUTIES.—The navigator should have a constant knowledge of wind, speed, direction, drift, and fixed position of the airplane. He should always know the fuel consumption in relation to his estimated time of arrival. At the pilot's command, the navigator will:

(a) Calculate position of airplane.

(b) Advise pilot of position, course, and speed maintained.

(c) Advise pilot of estimated position of ditching.

(d) Inform pilot of surface wind and direction.

(e) Destroy secret papers and place charts, with latest position marked on them, in satchel.

(f) Make certain lower hatch is securely closed.

(4) RADIO OPERATOR'S DUTIES.—In accordance with the situation, the radio operator should use one of the three priority calls:

(a) S. O. S. or May Day by radio telephone.

(b) I may require assistance.

(c) I may be forced to land without further signal. Give a time and position, transmit course, height, and ground speed maintained, and transmit the estimated position of ditching (this information secured from navigator). On pilot's order, clamp down key and move to ditching station.

(5) UPPER TURRET OPERATOR'S DUTIES.—If he is not needed for combat, and if there is sufficient altitude, the upper turret operator shall remove the hand ax from its stowage bracket and chop out the observation window in the tail of the airplane. This will give the upper turret operator and radio operator an additional escape hatch. The upper turret operator shall check to see that the rear entrance hatch is securely fastened shut, and shall then open the emergency escape hatch. Immediately afterward, he shall place beside the escape hatch aperture all equipment that will be taken into the life raft when the airplane is abandoned. If possible, he shall tie the equipment to some portion of the lower turret and then go to his ditching station. After the airplane has landed on the water, it will be his duty, with the aid of the radio operator, to remove the above-mentioned equipment from the airplane.

e. SEA AND WIND CONDITIONS AFFECTING DITCHING.

(1) GENERAL.

(a) With a calm sea, there may be little or no wind, making it essential to ditch with the lowest IAS possible. Such a sea is deceptive with regard to judgment of altitude, particularly if the surface is "glassy." If there are ripples upon the surface, judgment of altitude is improved.

(b) Waves always move with the wind except when close in shore and in fast flowing estuaries. Waves are the direct result of the wind which creates and maintains them.

(c) "Swell" is an undulating movement of the surface caused by past or distant disturbances by action of the wind. A swell does not necessarily move with the wind, and it has no breaking crests. If the wind is blowing across the swell, a cross sea is created with the waves (which are moving down-wind) running on the swell.

(2) WIND DIRECTION.—In the absence of any fixed mark (land, lightship, etc.) or floating object not under way, the pilot can only judge his motion relative to the motion of the waves.

(a) Waves move down-wind and the line of the wind can be taken to be at right angles to the lines of the wave crests.

(b) If there is sufficient wind, waves break, and they break down-wind. This can readily be observed from a low altitude. If the aircraft is flown at right angles to the breaking waves, the direction of drift will be apparent.

(c) If there is enough wind to blow the spray off the wave crests, the direction in which the spray moves is reliable.

(d) Where the surface is not broken up, it is possible to watch gusts rippling the surface in great sweeps, which indicate the wind direction.

(e) Wind on the surface of the sea sometimes produces a series of lines known as "wind lanes," which appear as alternate strips of light and shade. This is a reliable indication of surface wind direction.

(3) STRENGTH OF WIND.

(a) The roughness of the sea is an indication of the strength of the wind, it has been blowing at the same strength in the same direction for some time.

(b) The wind will be stronger than the appearance of the sea suggests if it is freshening, blowing off a nearby shore, running with the tide or swell, and during heavy rain.

(c) Breaking waves may be due to shallow water, and in such circumstances must not be used as a means of calculating wind speed and direction.

(d) General indications of wind speed are as follows:

A few white crests	10 to 20 mph
Many white crests	20 to 30 mph
Streaks of foam along the water	30 to 40 mph
Spray from crests	40 to 50 mph

f. PROCEDURE DURING DITCHING.

(1) GENERAL.

(a) The pilot must maintain intercommunication with the crew until the last moment and warn them of the impending impact. It is absolutely essential that the crew be braced against impact when the airplane is ditched. However, it is not reasonable to expect a crew to remain braced for long periods; and if they are not in communication with the pilot, the temptation to get up and see how things are progressing may end in one of them being caught out of a ditching station with consequent injury.

(b) The crew must not relax or release themselves in their ditching stations until the airplane has come to rest. The first impact of the tail should not be mistaken for the shock against which they are on guard; it will be followed by a much greater shock as the nose strikes the water after a correct tail-down ditching.

NOTE

Serious casualties have occurred in those cases where crew members have not taken up proper ditching stations, or where they have relaxed before the final impact. These drills are the result of experience based on many ditchings, and such advice and instruction should be implicitly followed. If there are apparent defects in the official drill, the attention of higher authority must be drawn to the fact. There is still much to learn concerning ditching, and improvements in drill can still be made.

(2) HANDLING THE AIRPLANE.—The following procedures are recommended during ditching:

(a) Ditch airplane before fuel is exhausted, in order to maintain power during landing operations.

(b) Lower flaps to medium setting ONLY. (A steep nose-down descent is dangerous due to possible erroneous altitude conception.)

(c) Use engines to flatten out approach.

(d) With only one engine available, use only a little power to flatten approach.

CAUTION

Maintain a margin of rudder power in hand right down to the stall. DO NOT open up engine during final stages of landing.

(e) If no power is available, use normal glide approach speed to ensure control and some margin of speed after flattening out.

(f) Choose point for ditching:

1. Towards an oncoming swell preferred.
2. Steep swell—along top.
3. Long ocean swell—upwind; on upslope towards top.
4. Along a swell across wind—on upslope of swell.

(g) If possible, hold off until all excess speed above stall is lost at the normal three-point (slow landing) altitude.

(b) In a short, moderate, or calm sea, if the airplane bounces, the control column should be held hard back. In the average short sea, the tail should touch the crest of a wave; and as soon as it does so, the nose should be kept up as much as possible. This should cause the forward section to touch down approximately under the center of gravity on the next wave crest.

WARNING

From the air, the open sea always appears much more calm than it actually is.

g. DITCHING CHARACTERISTICS.—The airplane should land tail down. There will be primary slight impact as the rear of the airplane strikes, and this will then be followed by a very severe impact with violent deceleration, in most cases. If the airplane has been brought down too fast, a bounce will occur. The nose will bury as the airplane comes to rest; however, if the landing has been carried out correctly, the effect of the nose burying will be minimized and the structure may not collapse.

h. ABANDONING AIRPLANE.

(1) GENERAL.—There are two critical periods in ditching:

(a) The actual handling of the airplane on the water; this is the sole responsibility of the pilot.

(b) The immediate abandonment of the airplane in an orderly manner after ditching; this requires the perfect coordination of the entire crew. Even in a training fuselage in a hangar this cannot be done efficiently without a great deal of advance practice. Far less can be expected after a severe shock in a fuselage rapidly filling with water unless the drill has been painstakingly planned and practiced. Every crew member must know his job in the drill to the last detail. Many crews have saved themselves by carrying out a well-executed drill. It requires advance practice—a great deal of it.

(2) PROCEDURE.—The drill procedure after the airplane has come to rest is as follows:

(a) The crew must not release themselves until the airplane comes to rest.

(b) The airplane has a dinghy (life-raft) release in the radio operator's compartment and (on later airplanes) in the pilot's compartment. If these mechanisms fail, the dinghy may be released from outside the airplane by pulling on the dinghy stowage compartment handle located above the left-hand flap trailing edge in the fuselage.

CAUTION

Operate the manual release of the dinghy as soon as the airplane comes to rest, but not before. Pulling the release before or during ditching can result in inadvertent release of the dinghy as the airplane strikes the water, and the possibility of the dinghy drifting out of reach.

(c) As soon as the airplane comes to rest after the final impact, rise from the ditching stations and collect the equipment detailed to you in the drill. Leave in the correct order by the hatch assigned to you. Remember that the dinghy radio (figure 22) is the most vital piece of equipment required in the dinghy to assist rescue.

(d) On emerging, inflate your life jacket. Do not be surprised to find that waves may be breaking high and that it is possible to be swept off the airplane. Hold on to the outside of the hatch and await a favorable moment to board the dinghy, but be careful not to block the escape hatch or to hinder the tempo of the drill to any great extent.

(e) If the dinghy should inflate inverted, an endeavor should be made to right it from the wing, if the airplane is not sinking rapidly; otherwise, one (and one only) of the crew should jump into the sea and right it. There are two methods of doing this, depending on the type of the dinghy.

1. If there are handling patches on the bottom of the dinghy, pull on them with both hands, placing your knees on the buoyancy chamber. While still hauling on the handling patches, lean back and prepare to become submerged for a moment. Even the largest dinghy will turn over.

2. If the dinghy has a ladder arrangement on it rather than the handling patches, place your toe on the bottom of the ladder and grasp the two nearest stablizing pockets. Lean back and haul on the pockets while pressing on the ladder with your foot.

NOTE

Do not jump onto an inverted dinghy, as that expels air trapped beneath it and makes righting more difficult. The painter which attaches the dinghy to the airplane is light so that it will break if the airplane sinks while the dinghy is still attached.

i. BOARDING THE DINGHY.

(1) If the ditching has been made into the wind, the dinghy should float toward the empennage and the boarding should not be difficult.

(2) If a cross-wind ditching has been made, the airplane will tend to swing into the wind. If the dinghy is on the upwind side of the airplane, there is danger of it becoming wedged beneath the wing as the airplane rolls and swings into the wind. If the dinghy is on the down-wind side there is danger of its getting beneath the fuselage or tail assembly, which may be thrashing up and down as the airplane weathercocks into the wind.

CAUTION

Look out for jagged edges which might puncture the dinghy.

(3) Do not jump into the dinghy; doing so could damage it and endanger the lives of the entire crew.

(4) One man in the dinghy can be of great assistance in helping the others aboard.

(5) Avoid getting any wetter than is absolutely necessary. Wet clothes must NOT be taken off; it is far warmer with wet clothes on than off. In hot weather the body should be covered from the sun.

(6) On every dinghy there is a heaving line to be used in aiding crew members to reach the dinghy.

(7) All the above actions concerning boarding the dinghy are comparatively simple if the life jacket is fully inflated. If this jacket has been partly inflated by mouth, the mouth valve must be closed before using the CO_2 bottle. A nonswimmer can feel quite confident in a fully inflated jacket, providing the leg straps are secure.

j. ABOARD THE DINGHY.

(1) GENERAL.

(a) Once everyone is aboard, the pilot should call the roll, give the order to cast off, and then the crew should paddle away from the airplane.

(b) The whole crew should then rig the dinghy cover.

(c) Once the dinghy cover is rigged, bail out most of the water.

Figure 22—Dinghy Emergency Radio

(d) The crew member, so detailed, should check for leaks and repair them with the material provided. Another member of the crew is also detailed to connect up the inflating bellows and inflate until the dinghy is rigid. If any of the crew are in the water, inflation of the dinghy will make boarding easier.

(2) USE OF EMERGENCY RADIO TRANSMITTER.—The SCR-578 radio equipment consists of a transmitter, antenna accessories, and a parachute, all contained in two canvas bags stowed above the left observation window in the navigator's compartment on late B-25D airplanes (see figure 22.) The importance of ensuring that this equipment reaches the dinghy after ditching cannot be too highly stressed. It is the duty of the whole crew to know where this equipment is stowed, so that it will reach the dinghy. Follow these instructions:

(a) PREPARING THE TRANSMITTER.—Remove the transmitter from the bag and place it on the floor of the raft, securing it to the raft if possible. Remove the crank from its stowed position on top of the transmitter case and install it. There is only one crank, so it must be handled with care.

CAUTION

Do not attempt to operate the radio equipment when there is lightning; severe injury to personnel could result.

(b) RAISING ANTENNA.—There are two antennas, one attached to a kite and the other to a balloon. The kite is easier to handle, but if there is not sufficient wind velocity, it will be necessary to use the balloon.

1. THE KITE.—Remove the kite from the accessory bag and assemble it by pushing the "spiders" outward into a "snap" position (similar to an umbrella). Attach the antenna swivel clasp to one of the eyelets of the kite. Then, while standing in the raft (if possible), slowly let out the antenna through the hands, being careful to prevent the kite from touching the water. The pigtail at the lower end of the antenna is used to attach the antenna to the life raft.

NOTE

It is important that the antenna be fully extended.

2. INFLATION OF THE BALLOON.—Carefully remove the balloon from the can. The inflating tube is screwed into the top of the generator; remove generator stowage plugs. Wet the needle of the inflating tube and insert it into the balloon valve up to the shoulder. Lower the generator into the water to the depth of the first red line, and hold it there for 10 minutes. Then lower the generator to the second red line and hold there until the balloon is completely inflated. Keep the balloon neck from crimping.

NOTE

If a bubbling sound is heard, raise the generator to the lower red line until it stops. At no time raise the generator out of the water. More complete information will be found in the booklet stowed in the accessory case attached to the transmitter.

(c) OPERATING TRANSMITTER.—After strapping the transmitter between the legs and releasing the ground wire into the water, set the switch on the face of the transmitter to the desired position. Then turn the crank with sufficient speed to light the indicator lamp and the transmitter will radiate a signal or the signal lamp will be lit. The transmitter is adjusted to the antenna by turning the tuning control for maximum brilliancy of the "TUNE TO BRIGHTEST" indicator.

(3) OTHER MEANS OF ASSISTING RESCUE.

(a) When craft are in a position to see signals, fire the dinghy pistol or any available pyrotechnics, but conserve as much as possible.

(b) Floating flashlights should be carried by each member of the crew. At night these will allow any member of a crew to show his position if he is separated from the others in the water. These lamps can also be used for signaling. They should be tested periodically without breaking the seal.

(4) RATIONING OF FOOD AND WATER.—This is the duty of the pilot. If he is not there, this duty falls to the copilot.

(a) WATER.—For the preservation of life, water is more valuable than food. It is of the greatest importance that the drinking water available reaches the dinghy and that extreme care is taken to avoid any loss. Drink nothing the first 24 hours. Thereafter, drink 1 pint daily, in small quantities at a time. Do not try to conserve the supply by limiting your intake to less than this. Diminish the loss from sweating by keeping as cool as possible and exerting yourself as little as possible during the heat of the day. In hot weather keep the body cool by dampening (not soaking) the clothing with sea water.

(b) SOLID FOODS.—The pilot will take stock of available rations in the dinghy and make provisions for rationing on a basis of three meals a day for at least 6 days. The number of days over 6 for which the pilot makes provisions will depend on the distance from shore and the success of aircraft and dinghy signals.

(c) ENERGY TABLETS.—These tablets are packed in the Emergency Flying Ration. Use these tablets strictly in accordance with the instructions printed on the container.

6. LANDING GEAR EMERGENCY LOWERING SYSTEM—LATE AIRPLANES.

a. GENERAL.—An emergency hydraulic lowering system is provided for the concurrent operation of the main landing gear and nose gear. The system consists of an emergency hand-pump and a hydraulic fluid reservoir, both in the navigator's compartment, the necessary automatic valves to regulate normal and emergency flow of fluid to the operating struts, a nose gear uplock release cable interconnecting the hand-pump handle with the uplock latch, and fluid transmission lines. The emergency reservoir is connected to the main system reservoir in such a manner that it is automatically filled when the main system reservoir is filled, and is available for emergency lowering of the landing gear EVEN IF THE MAIN HYDRAULIC SYSTEM FLUID IS COMPLETELY LOST.

b. OPERATION.—The following is the procedure to be followed when operating the landing gear emergency hydraulic lowering system.

(1) The landing gear control handle in the pilot's compartment must be in the "DOWN" position.

(2) Unlatch bail to release emergency lowering pump handle on the forward wall of navigator's compartment.

WARNING

The nose gear uplock is released by a cable interconnected with the emergency hand-pump handle. The first stroke must therefore be a full one. Check pilot's landing gear position indicator to see that the nose gear is partially extended; if it has not been released from the uplock, give the pump handle another full stroke to release the gear from the uplock.

(3) Operate emergency hand-pump until gear is down and locked.

(4) Retard throttle momentarily to ascertain that gear is locked down. Failure of warning light to appear, or (on early airplanes) warning horn to sound, is evidence that the gear is locked.

(5) Return the emergency pump handle to the "UP" position and latch it. Keep pump handle latched when not in use.

WARNING

DO NOT lower the landing gear by means of the emergency hydraulic system above 150 mph indicated air speed. The airplane should be in level flight or preferably in a gliding attitude.

NOTE

The landing gear cannot be retracted by the emergency hydraulic system.

c. EMERGENCY HYDRAULIC OPERATION OF MAIN LANDING GEAR DOWN-POSITION LATCHES.

IMPORTANT

The following emergency operation should be accomplished whenever the main landing gear down-position lockpins fail to engage automatically, regardless of the method used to lower the main landing gear. (Yellow flags on position indicator instrument are visible when lockpins are not engaged.)

(1) With gear fully extended (check position indicator), turn emergency hydraulic selector valve to "LATCH."

(2) Operate pilot's hydraulic hand-pump until position indicator shows main landing gear lockpins in place.

CAUTION

Main landing gear must be fully down prior to using hand-pump, and airplane speed must not be greater than 150 mph. Pressure sufficient to damage lockpin linkage can be obtained with the hand-pump if operated when gear is not fully down.

(3) If the lockpin should inadvertently be pumped to the latched position before the gear is fully extended, the following procedure may be attempted:

(a) Turn the emergency selector valve to "NORMAL" to relieve hand-pump pressure on the lockpins.

(b) Again operate the hand-pump as instructed above, to force the gear past the lockpins.

(c) With the gear fully extended (check position indicators), return the emergency hydraulic selector valve to "LATCH" and operate the hand-pump until the position indicator registers that the lockpins are in place. However, as the above procedure may not work in every case, do not rely on it but consider it rather as a corrective procedure to be attempted only in an extreme emergency.

7. LANDING GEAR EMERGENCY LOWERING SYSTEM—EARLY AIRPLANES.

a. MAIN LANDING GEAR EMERGENCY MECHANICAL OPERATION.

(1) The emergency mechanical lowering system for the main landing gear consists of a mechanism located just aft of the bomb bay and a cable running from the mechanism through the tail ribs aft of the rear spar to an arm mounted on the landing gear trunnion.

(2) The importance of the following paragraph should be impressed on all personnel:

(a) The screw jack provided for lowering the main gear is very powerful, and if the handle continues to be turned after the gear is down and locked, damage to the cable will result. Therefore, when the emergency system is used it is imperative that contact

between the pilot's compartment and the radio operator should be made on the interphone system, so that when the gear locks, as shown by the indicators on the pilot's instrument panel, the pilot can notify the operator to back off slightly on the screw jack. This will relieve all tension on the cable.

(b) It is very important, however, not to return the lowering screw handle to its original position until the airplane is safely landed. Another method for checking the down-locked position can be accomplished by retarding the throttle. If the landing gear is not locked down, a warning horn will sound to warn of an unsafe landing condition.

(c) The following is the procedure for operating the main gear emergency mechanical lowering system:

1. Move hydraulic landing gear control handle in pilot's compartment to "DOWN" position.

2. Pull pin and fold down adjustment rod of lower turret operator's chest support. (On Amplidyne installation, raise the support and latch it.)

3. Lower radio operator's table to useful position.

4. Release main landing gear operating screw assembly (held to forward wall of radio compartment with finger-type Dzus fastener).

5. Rotate assembly away from wall until it locks in a fore-and-aft position.

6. Pull main landing gear up-position latch release located adjacent to lowering screw. This control releases the main gear up-position latches only, and allows the main gear to partially lower due to its own weight.

7. Check visually or on pilot's landing gear position indicator that both main gears are partially lowered before using lowering mechanism.

8. Turn lowering screw handle clockwise (when facing handle) until indicators register that the main gear is down and locked.

WARNING

DO NOT lower the main landing gear by means of the emergency mechanical lowering system above 150 miles per hour indicated air speed; also the airplane should be in a level flight or preferably a gliding attitude.

NOTE

The main gear cannot be raised mechanically.

b. NOSE WHEEL EMERGENCY MECHANICAL OPERATION.

(1) The emergency lowering system for the auxiliary nose gear consists of a mechanism, a cable, pulley, and pulley brackets. The cable runs from the mechanism in the navigator's compartment down through the floor and forward through the fuselage frames beneath the bombardier's tunnel, and attaches to the nose gear hydraulic operating cylinder.

(2) A clock-type spring is attached to a shaft which in turn is attached to the drum on which the cable is wound. The spring is installed so that the drum tries to turn clockwise, thereby putting tension on the cable.

(3) When nose gear is retracted, the cable is unwound from the drum and the spring is wound up. When gear is lowered by the hydraulic cylinder, the spring causes the drum to rewind the cable. This cycle is repeated every time the nose gear is raised and lowered.

(4) The following is the procedure for operating the nose wheel emergency mechanical lowering system:

(a) Ascertain that the landing gear control handle in pilot's compartment is in the "DOWN" position.

(b) Pull nose gear emergency lock release located on top of mechanism. This releases the nose gear and allows it to lower partially due to its own weight. Check on pilot's landing gear position indicator, or by means of the drift meter, to see that auxiliary gear is partially lowered before using lowering mechanism.

(c) Remove safetypin and turn pawl to "ON" position.

(d) Place crank (stowed at side of mechanism) on shaft and turn clockwise until gear indicator registers down and locked.

WARNING

DO NOT lower nose gear by means of the mechanical lowering system, above an indicated air speed of 150 miles per hour. The airplane should be in level flight or in a gliding attitude.

CAUTION

DO NOT return pawl to "OFF" position until ship is safely on ground. Otherwise the operation of the main gear may set up a surge in the hydraulic system which will cause the nose wheel down-position latch to release, allowing the nose wheel to partially retract.

c. AFTER LANDING.—After airplane is landed, if the landing gear has been lowered mechanically, the following must be accomplished prior to operating the landing gear hydraulically. Serious damage to the emergency lowering system can occur if the following is not adhered to:

(1) Turn nose gear emergency lowering mechanism pawl control to "OFF" position and stow crank on side of drum housing. To turn pawl control "OFF," it is necessary to relieve tension on pawl by exerting pressure on crank handle.

(2) Turn main landing gear emergency lowering screw handle counterclockwise to return handle to its original position and stow assembly with fastener provided.

8. WING FLAP EMERGENCY LOWERING EQUIPMENT.

a. To operate the wing flap emergency control proceed as follows:

(1) Move the hydraulic flap control in the pilot's compartment to the extreme "DOWN" position.

(2) Remove the hand crank from its stowage position on the forward bulkhead of the radio operator's compartment, and engage it with the shaft which is located under a flap on the ledge of the bulkhead above the crank stowage position.

(3) Rotate the crank clockwise until the flaps are in the desired position.

(4) To lock the flaps, remove the crank.

(5) When it is desired to return the flaps to normal operation, engage the crank and turn it counterclockwise as far as it will go; then remove the crank and restore it to its stowed position.

9. EMERGENCY BRAKE OPERATION.

a. EMERGENCY HYDRAULIC BRAKE OPERATION.—Before landing airplane, if there is less than 1000 pounds/square inches pressure indicated on the brake system pressure gage, build pressure in the brake system accumulator as follows:

(1) Turn emergency hydraulic selector to "BRAKE."

(2) Operate hydraulic hand-pump until brake system pressure gage indicates at least 1000 pounds/square inches and not more than 1450 pounds/square inches.

IMPORTANT

While applying brakes after landing, operate hand-pump continuously to maintain as much pressure as possible in the brake system accumulator as the initial accumulator pressure alone is not adequate for the amount of brake application required for a normal landing. Apply brakes slowly and do not pump pedals. In this way accumulated pressure will be conserved.

(3) If a pressure of at least 600 pounds/square inch cannot be built up in the brake system accumulator prior to landing, a field with at least 1 mile runway should be found in order to land the airplane safely.

b. EMERGENCY AIR BRAKE CONTROL.

(See figure 23.)

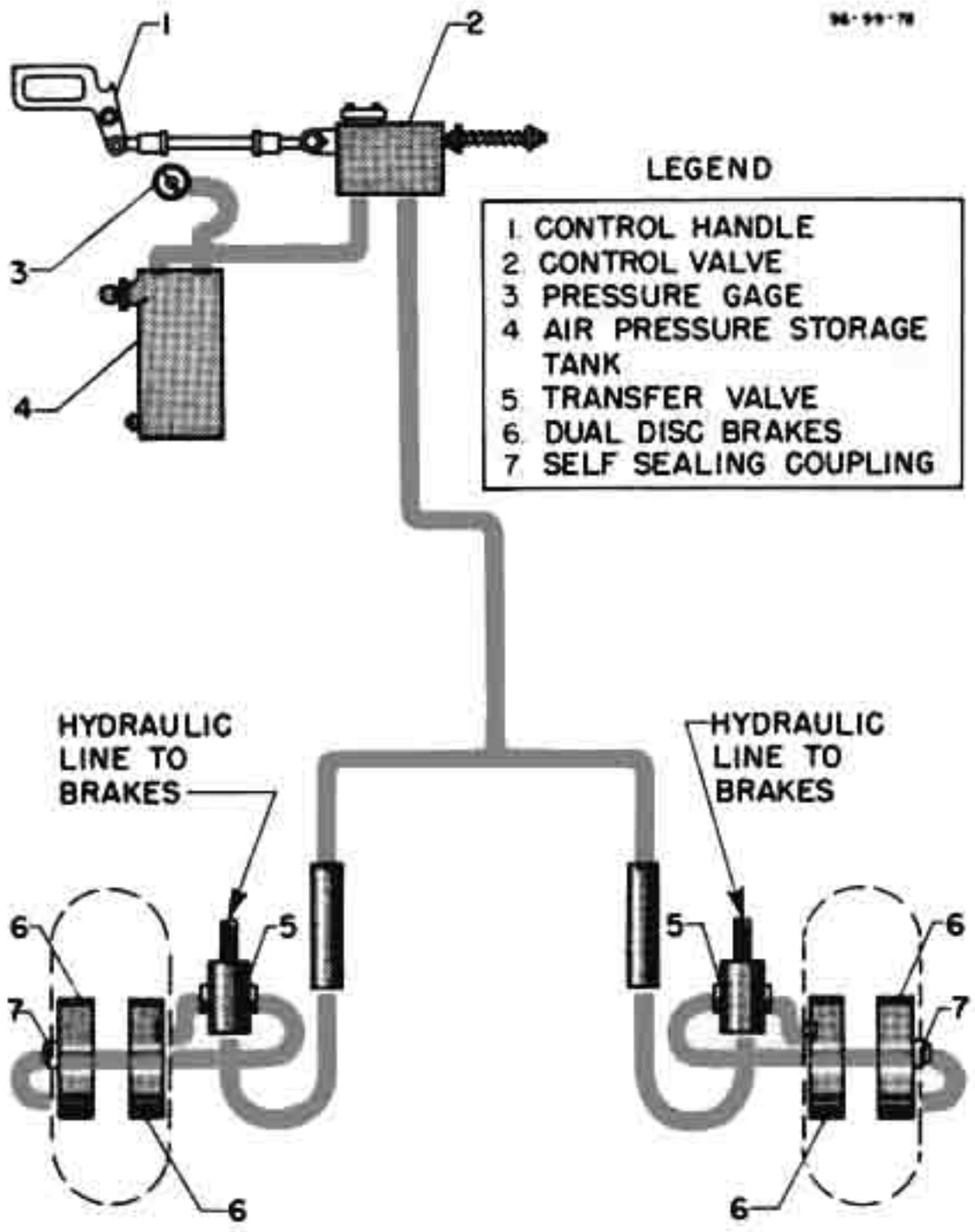


Figure 23—Air Brake System

IMPORTANT

The air pressure brake system will be used only as a last resort to stop the airplane if the emergency hydraulic hand-pump operation outlined above cannot be accomplished, or if the pressure obtained with the hand-pump is inadequate for stopping the airplane on the landing field available. WHEN IT IS KNOWN IN ADVANCE THAT THE EMERGENCY AIR PRESSURE BRAKE SYSTEM MAY HAVE TO BE USED DURING LANDING, CHOOSE THE LONGEST RUNWAY AVAILABLE AND MAKE THE SHORTEST LANDING POSSIBLE. The airplane should be allowed to lose as much speed as possible, consistent with safety, prior to applying the air brakes. As brakes cannot be applied selectively, the pilot must be ready to counteract any uneven action with the throttle.

(1) To apply the emergency air brake, pull up sharply on the control handle (in order to break safety wire) and lower handle halfway almost immediately. Repeat this operation, applying brakes by very quick, successive upward pulls of the handle from the intermediate position until the desired amount of brake action is obtained. Spring action aids in lowering the handle to the halfway (intermediate) position; in this position the air pressure to the brakes will be maintained.

(2) To release the emergency air brakes, it is only necessary to push handle fully down to its normal position.

(3) The air brake may be reapplied with reduced force after having released the pressure in the above manner, by again pulling up on the control handle. The amount of brake action obtained during a second application is dependent upon the length of time the handle was held up during the first application. For example, full pressure is exerted upon the brake discs when the handle is held up for 2 to 3 seconds. By applying the brakes in this manner only one-third of maximum pressure can be obtained during second application. However, the pilot should depend on only one application.

WARNING

To place the handle in the intermediate position, the handle must be lowered by hand. If handle is released suddenly, a spring will return the handle to its normal position and release the pressure from the brakes. After a landing during which the air brakes were used, taxying should be done very carefully as little, if any, brake pressure will be available. Before air brakes are released, it may be necessary for ground crews to block the wheels.

(4) After using emergency air brake system, the hydraulic brake system must be bled.

10. EMERGENCY GUN TURRET OPERATION.

NOTE

The hand crank stowed on the lower turret shall also be used for manual control of the upper turret. A crank extension shaft is provided to be used only for the upper turret elevation gun control.

a. UPPER TURRET.—In case of turret power failure, it is possible to stow the guns manually by means of the hand crank, as follows:

(1) To lower the guns, attach the extension shaft to the elevation speed reducer, located forward of gun sight. Attach the hand crank to the extension shaft and turn the hand crank to position the guns to clear the fuselage when they are moved to their aft position.

(2) To rotate the turret, engage the hand crank with the end of the azimuth shifter shaft, located at the base of the turret. Using the hand crank, pull the shaft out approximately ½ inch; then rotate the turret so that the guns are in their aft position. The turret rotates clockwise when the crank is turned counterclockwise (looking from the shaft end).

b. LOWER TURRET.—To retract the turret manually in an emergency, proceed as follows:

(1) Remove both sections of the turret windshield on either side of the steady grip.

(2) Install the hand crank on the manual gun control shaft, which is attached to the hanger arm assembly.

(3) To raise the guns in elevation, push down on the crank and turn it clockwise (looking down). Turn the crank until the guns are in the stowing position, which is slightly (2 to 6 degrees) below horizontal.

(4) Remove the hand crank from the manual gun control shaft and install it on the end of the shifter shaft in the azimuth gear housing. Using the crank, pull the shifter shaft out about ½ inch from the azimuth gear housing.

(5) With the hand crank, rotate the turret until the guns are pointing slightly to the left of the aft position (as viewed by operator). Depress and lock the retract lever and then slowly rotate the turret clockwise.

(6) When the guns reach their aft position, the turret will index and begin to retract. The turret may then be cranked to its fully stowed position.

NOTE

Always turn the hand crank counterclockwise when retracting the turret. Stop cranking when the pad on the turret housing aft hanger arm strikes the retract limit switch, located on the underside of the aft spider arm.

(7) Replace the sections of the windshield on the turret deck.

c. TURRET EMERGENCY HYDRAULIC SHUT-OFF VALVE.—On later airplanes, an emergency hydraulic fluid shut-off valve is located on the left-hand side of the radio operator's compartment below the liaison receiver. If a gun charger or connecting line is damaged in action, this valve should be turned off to prevent a loss of hydraulic fluid.

11. EMERGENCY BOMB, TORPEDO, OR DROPPABLE FUEL TANK RELEASE.

When the hydraulic system is functioning normally, bombs, torpedo, or the droppable fuel tank may be released by pulling the pilot's emergency bomb release handle on the top center of the instrument panel. This causes the bomb doors to open automatically, and the bombs, torpedo, or droppable fuel tank to be released. To close the bomb doors from the bombardier's compartment, move the bomb control handle to the "SALVO" position. This action recocks the emergency release unit if it has been tripped. After the emergency release unit is recocked, return the bomb control to the "DOORS CLOSED" position.

To close the bomb doors from the pilot's compartment, it is necessary to push down and pull out the auxiliary bomb door control knob located on the right side of the control pedestal. It will be necessary to open the doors with the auxiliary door control before the system can be operated normally again.

WARNING

Prior to releasing bombs in an emergency, position the bomb nose fusing switch as desired; always move the switch to "SAFE" if over neutral territory.

NOTE

In case of hydraulic system failure, crank the bomb bay doors open mechanically as described in the paragraph following.

12. BOMB BAY DOORS EMERGENCY OPERATION.

Manual operation of the bomb bay doors should be carried out only in the event of complete hydraulic pressure failure. The bomb bay doors fall approximately two-thirds open when there is no hydraulic system pressure, regardless of the position of the bomb controls. However, the bomb control handle, on the left side of the bombardier's compartment, must be positioned for the desired movement of the bomb doors before operating the hand crank. When the bomb bay door position indicator light illuminates, the doors are open, and bombs (or droppable bomb bay fuel tank) may be released in the desired manner. Open the bomb doors as follows:

a. Move the bomb control handle to the "DOORS OPEN" position.

b. Remove the bomb bay door operating hand crank from its stowage on the lower right longeron, and mount it on the drive socket just aft of the front entrance hatch. Install the hand crank with the handle positioned upward. Turn the crank clockwise to open the doors, and counterclockwise to close the doors. An automatic clutch mechanism in the crank enables it to be operated in either direction and helps hold the doors in position.

IMPORTANT

After closing the bomb bay doors with the crank, thread the strap on the crank handle through the tie-down loop on floor below crank, and tighten securely. This is necessary as the brake action of the crank clutch mechanism is not sufficient to hold doors closed. Normally, the doors are held in the open and closed position by hydraulic pressure. It is not necessary to secure operating crank with the strap to hold bomb bay doors in the open position.

WARNING

If it is necessary to make an emergency exit through the front entrance hatch when the bomb bay door hand crank is installed, remove the hand crank, raise the inner door of the hatch, reinsert the hand crank, and crank the bomb bay doors shut. DO NOT stand on outer door of entrance hatch while inner door is open. Fasten crank in position with strap. Emergency exit can then be made without danger of striking bomb doors.

13. MISCELLANEOUS EMERGENCY EQUIPMENT.

a. ALARM BELLS.—The alarm bells located at all crew stations are controlled by a switch in the lower left section of the pilot's switch panel. The switch lever is red and bears the word "ALARM."

b. LIFE RAFT.—A life raft, stowed in the upper forward left corner of the radio operator's compartment, is provided for use after a forced water landing. Necessary emergency equipment, including rations, oars, hand-pump, signal flare pistol, rubber patches, etc., are stowed in the life raft. A CO_2 cylinder for the inflation of the raft is also a part of the unit.

c. LIFE PRESERVER.—The back cushions on the pilot's and copilot's seats are filled with kapok and may be used as life preservers.

d. EMERGENCY FUEL PUMP.—On later airplanes, an emergency fuel transfer hand-pump is located on the floor of the navigator's compartment. In the event of failure of the electric pumping system, fuel may be transferred from the bomb bay tanks to the wing tanks by the operation of this hand-pump.

e. EMERGENCY FUEL SHUT-OFF VALVE.—Two emergency fuel shut-off valves are on the shelf at the aft end of the navigator's compartment.

f. PYROTECHNIC RECOGNITION SIGNAL PISTOL.—On later airplanes, an M-8 type pyrotechnic pistol is stowed in a canvas holster in the navigator's compartment as loose equipment. When it is to be used, the pistol is placed in the mount in the forward left upper corner of the compartment by removing the friction-type cover cap and inserting the muzzle so that the lugs fit into the slots, then turning the pistol to right or left as far as it will go while depressing the mount release trigger above the pistol barrel. The pistol may then be loaded by moving the breech lock lever, behind the mount release trigger, and applying force on the butt until the breech opens; then inserting the signal into the chamber and closing the breech, which automatically cocks the pistol.

WARNING

As no safety is provided, the pistol should not be loaded except when it is in the mount.

g. RADIO DEMOLITION SWITCH.—On later airplanes, a switch controlling the charge for demolishing the identification radio in an emergency is located on the right instrument subpanel. Both buttons must be depressed simultaneously to set off the charge.

h. FIRST-AID KITS.—On later airplanes, two first-aid kits are furnished; one is stowed on the left side of the navigator's compartment and the other on the

right side of the radio operator's compartment. These kits include a supply of compresses, dressing, iodine swabs, jelly, morphine tartrate, and sulfanilamide crystals and tablets, as well as a pair of scissors and a tourniquet.

i. HAND AX.—A hand ax for emergency use is mounted on the right side of the fuselage in the radio operator's compartment.

j. FIRE EXTINGUISHERS.

(1) NACELLE.—On some airplanes, a carbon tetrachloride fire extinguisher is mounted on the inner side of the door on the lower outboard side of each engine nacelle.

(2) FUSELAGE.—A carbon dioxide fire extinguisher is installed at the right side of the navigator's compartment and at the right side of the radio operator's compartment.

(3) ENGINE.—On some airplanes, a single pressure-type CO_2 fire extinguisher is provided for both engines and is controllable from the copilot's station. A safety fuse for indicating a premature discharge is located on the right side of the fuselage, above the nose wheel.

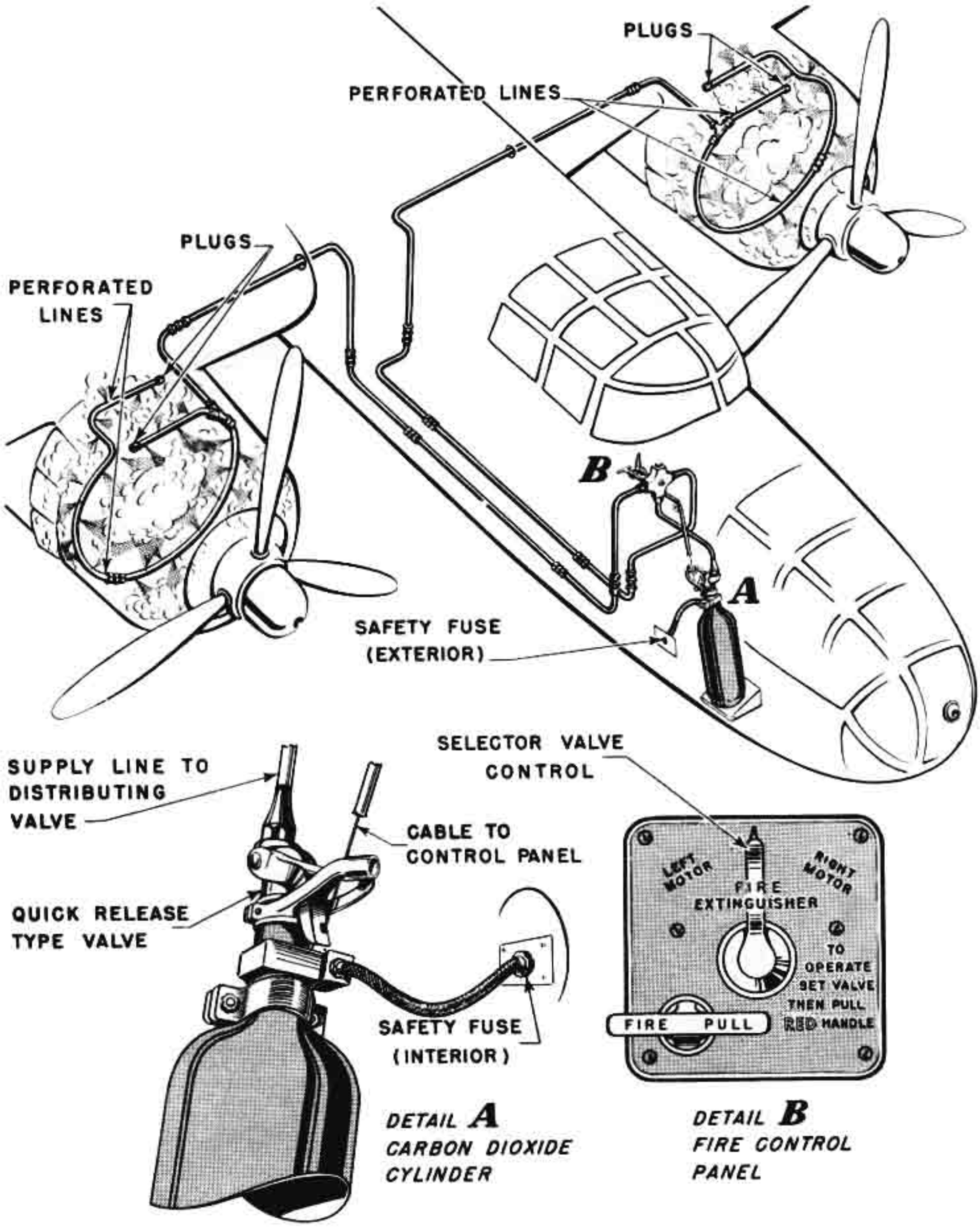


Figure 24—Engine Fire Extinguisher System

SECTION V
OPERATIONAL EQUIPMENT

1. PILOT.

NOTE

The following instructions apply only to operational equipment not normally used by the pilot during flight. For flight operating instructions, see section II.

a. AUXILIARY BOMB DOOR CONTROL.—On B-25C-5-NA, B-25D-10-NA, and subsequent blocks of airplanes, an auxiliary bomb door control at the right side of the pilot's control pedestal may be used to close the bomb bay doors after an emergency release of the bombs, or to release the bomb bay droppable fuel tank without repositioning the bomb control handle in the bombardier's compartment. This control is also used when releasing the torpedo.

CAUTION

When the doors are closed by this control after an emergency release by the pilot, they must be reopened by the same control before the system can be restored to its normal condition.

b. TORPEDO EQUIPMENT.

(1) DESCRIPTION.—On later airplanes a torpedo may be carried as an alternate bomb load. With the torpedo installed, the bomb bay doors are only partially closed and rest against the pads on the torpedo rack. The doors must be fully opened before dropping the torpedo. The torpedo may be released electrically or by the pilot's emergency release. After the torpedo is released, the protruding parts of the torpedo rack automatically retract and the bomb doors

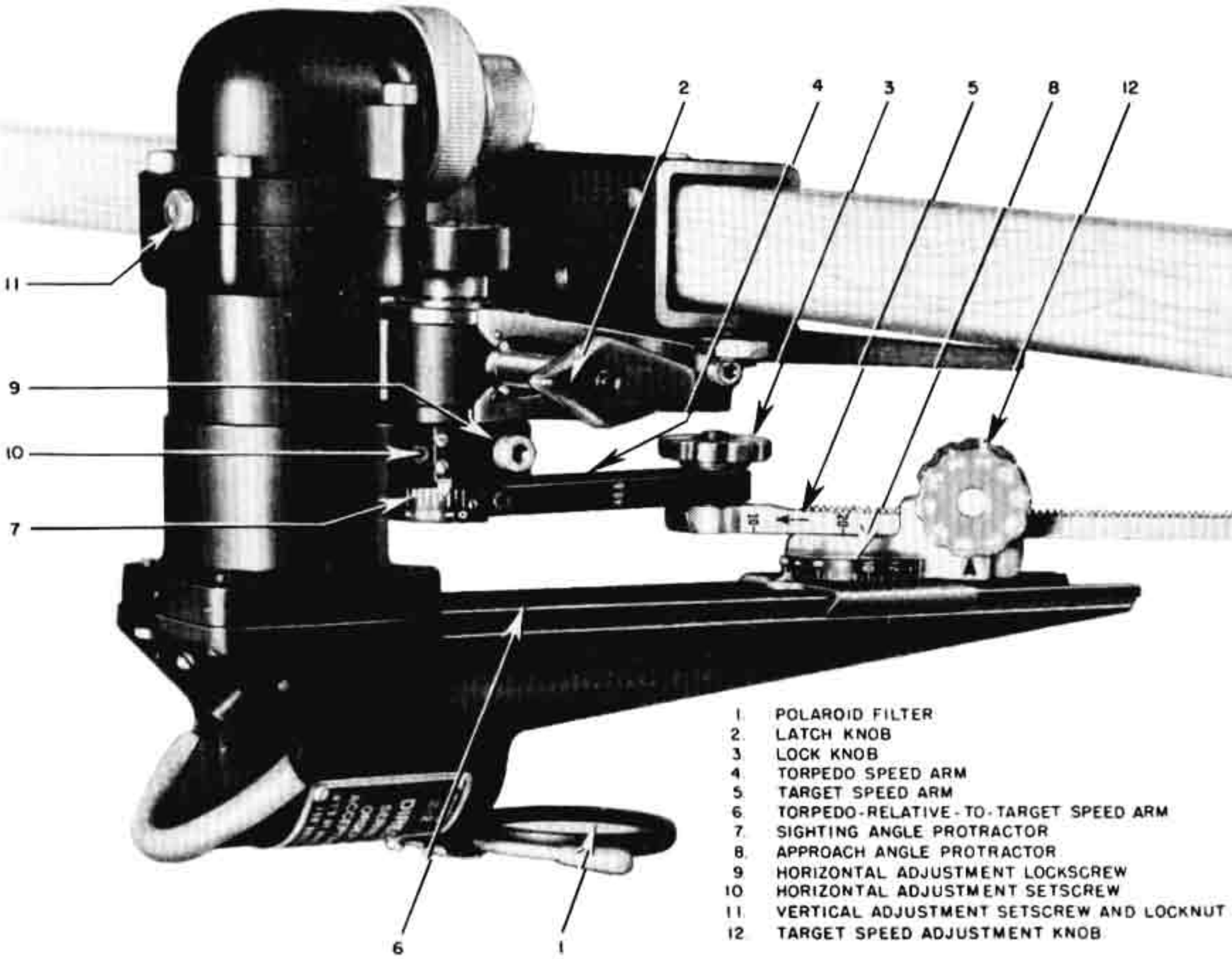


Figure 25—Torpedo Director

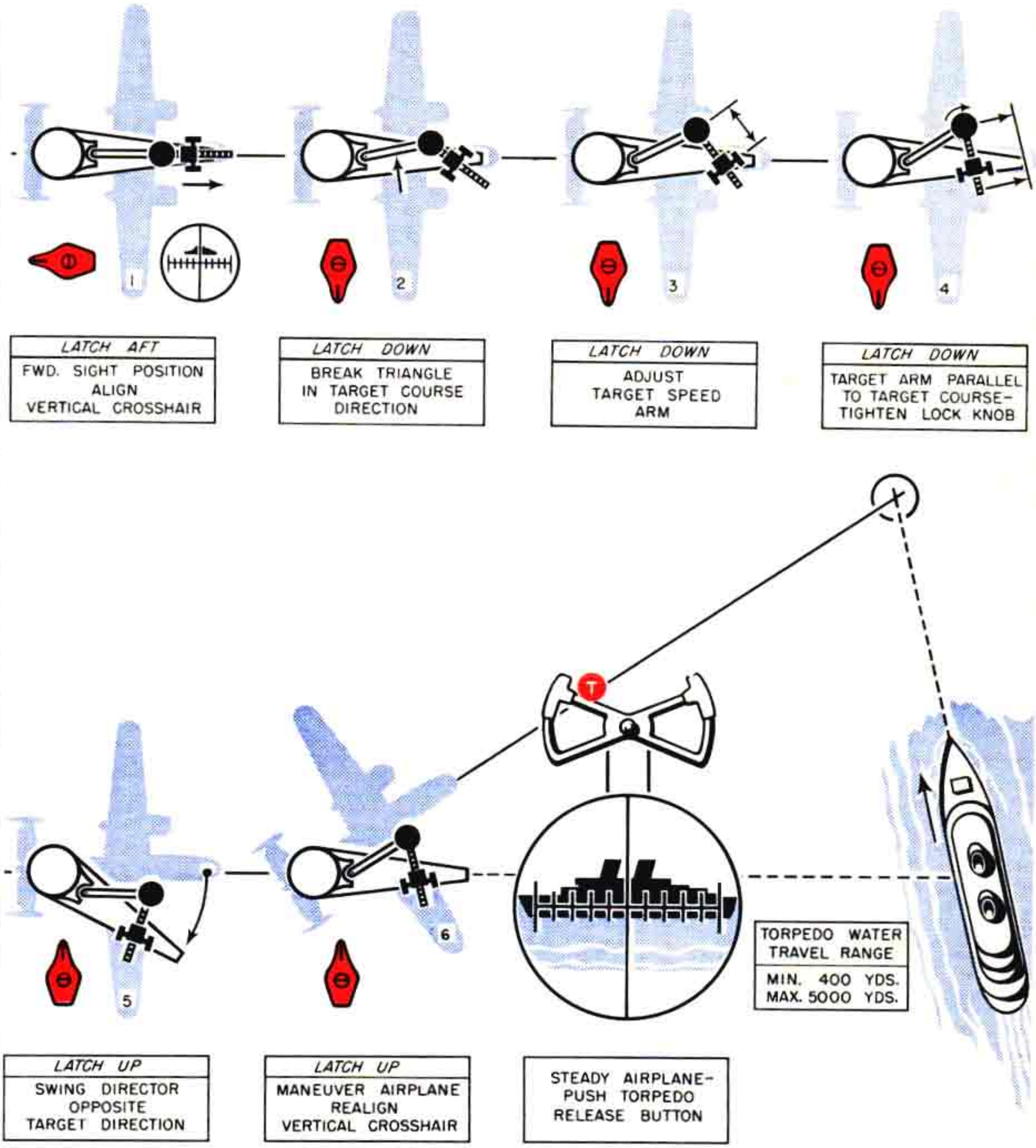


Figure 26—Operation of Torpedo Director

may then be closed. No bombs can be carried in the bomb bay when the torpedo rack is installed.

(2) OPERATION.—The torpedo is released as follows:

> Prior to take-off the bombardier's bomb door control handle must be in the "SEL" position, and the bomb bay doors must be closed as far as possible by means of the auxiliary bomb door control.

(a) Open bomb doors by pressing down on auxiliary bomb door control and pushing handle forward.

NOTE

> On some early airplanes the auxiliary bomb door control is on the right side of the navigator's compartment. To open doors, have navigator move control handle aft. When bomb door signal light illuminates, pilot can release torpedo.

(b) Prior to launching torpedo, the airplane must be maneuvered and corresponding adjustments made on the torpedo director as follows:

1. Approach target from desired direction. With the latch knob (figure 25-2) aft and the director locked in the forward position, align the airplane so that the luminous vertical cross hair appears on target.

2. With lock knob (figure 25-3) loosened and the target arm unlatched by turning knob (figure 25-2) down, break the linkage out into a triangle so that the small engraved arrow on the target arm is pointing in the direction of the target course.

3. Estimate the target speed in knots and adjust the target speed adjustment knob. (See figure 25-12.)

4. Estimate direction of target course and rotate target arm to appear reasonably parallel to target course. Lock the triangle by tightening the lock knob. (See figure 25-3.)

5. Turn latch knob (figure 25-2) up and swing the director sight into the position where torpedo arm (figure 25-4) latches forward.

(c) Maneuver the airplane left or right so that target is brought anew into coincidence with the luminous vertical cross hair.

(d) As soon as the airplane is steadied on the new interception course, press torpedo release button.

(e) Close bomb bay doors by means of auxiliary bomb door control.

c. FIXED .50-CALIBER NOSE GUN.

(1) DESCRIPTION.—On later airplanes one fixed .50-caliber machine gun is mounted on the right side of the bombardier's compartment. A 300-round ammunition box is secured to the aft right side of the

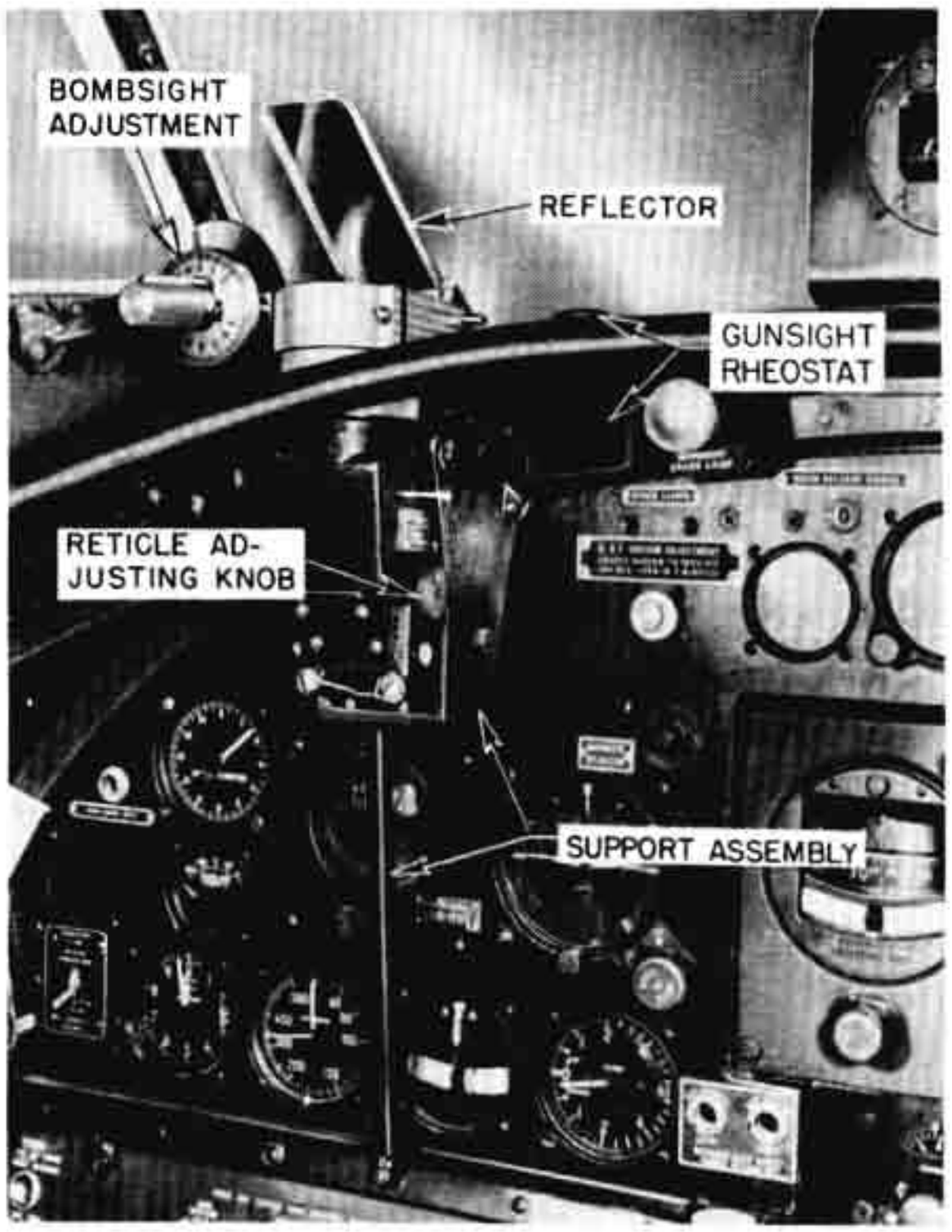


Figure 27—Gun Sight

compartment floor. The gun is fired by the pilot and is charged by the bombardier on earlier airplanes, and by the pilot on later airplanes. A type N-3B optical gun sight is mounted on the left side of the instrument cowl on later airplanes.

(2) OPERATION OF FIXED NOSE GUN.

(a) Turn gun safety switch, on left side of pilot's switch panel to "FIRE."

(b) Latch torpedo director in the sight forward position for use as a gun sight.

(c) Fire gun by pressing button marked "GUNS" on control wheel.

(d) After firing, turn safety switch to "SAFE."

(e) Before landing, have bombardier unload gun.

d. RADIO COMPASS.—A radio compass control box is located to the left of the pilot's control column. The radio compass may be operated by either the pilot or navigator, but not by both at the same time. For additional information, see paragraph 3, following.

e. MARKER BEACON.—The marker beacon receiving equipment (RC-43), consisting of a receiver, antenna, and an indicating or signal light, receives signals transmitted from instrument landing systems,

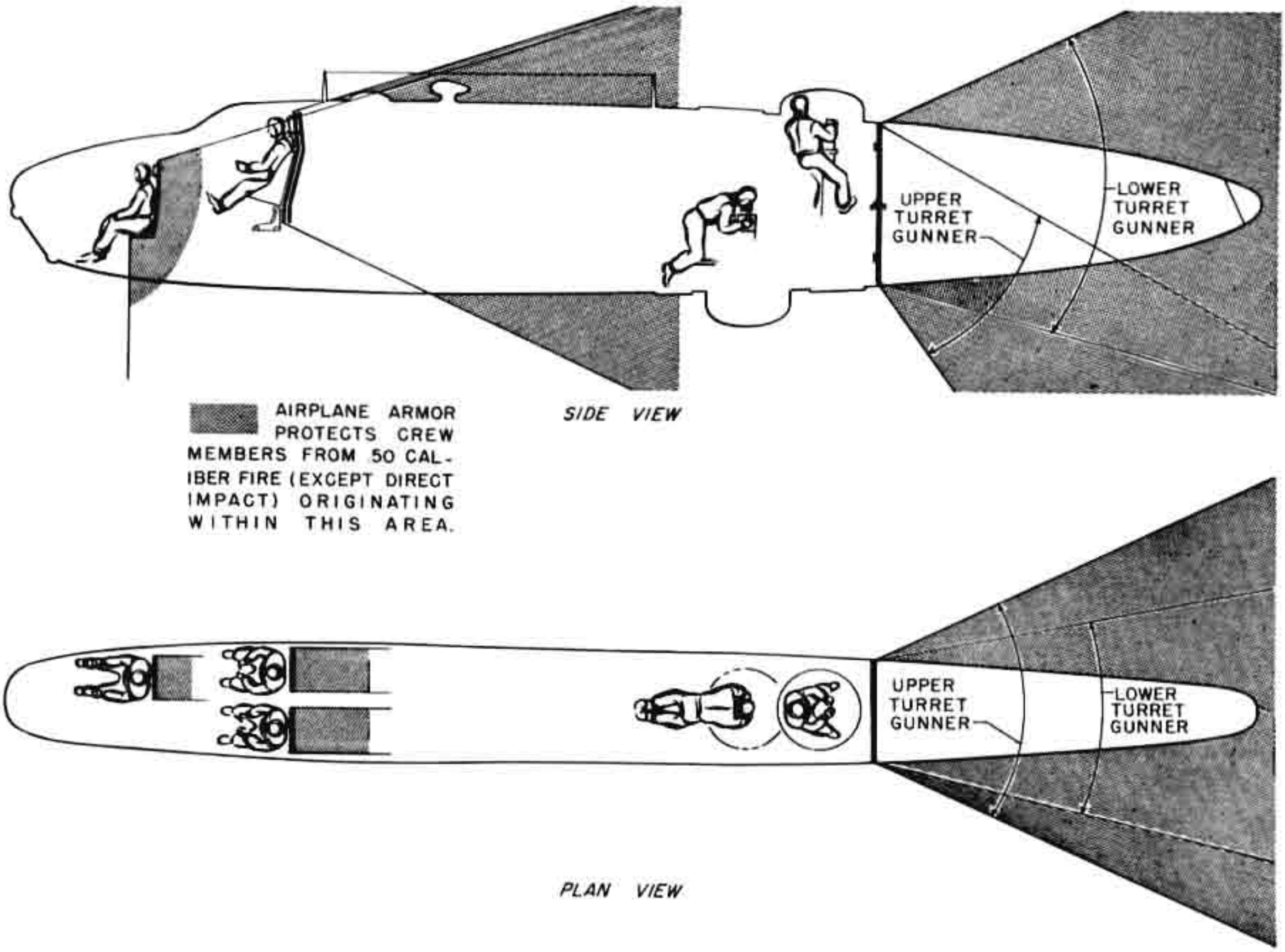


Figure 28—Armor Protection

fan stations, cone of silence stations, and other facilities employing 75 megacycles horizontally polarized transmission patterns. The marker beacon receiver is located on the left side of the navigator's compartment floor where it may be easily reached for adjustment or maintenance. The marker beacon indicator, a signal lamp with an amber jewel cover, is located on the pilot's instrument panel. The operation of the marker beacon equipment is fully automatic.

f. HEATING, VENTILATING, AND DEFROSTING.—On late airplanes, operation of the radio compartment heater is controlled by a master switch on the pilot's switch panel. This switch is for emergency use and provides a means by which the pilot may keep the radio compartment heater from operating during take-off and landing. A hot-air outlet is just forward of the pilot's control pedestal, and late airplanes have a flexible defroster tube on the floor at the right of the lower pedestal. Heat is also directed to the windshield by means of manual controls. There is a ventilator at each side of the compartment, just aft of the instrument panel. Hot-air outlets may be used for ventilation as well as heating. Operation of the pilot's heating and defrosting equipment is as follows:

(1) AIRFLOW CONTROL.—Move control, located at left of pilot's seat, to "OPEN" to admit more air through the heating system. Move control to "CLOSED" to shut off air. For ventilation when heater is not operating, open airflow control.

(2) CABIN AIR.—This control is on the left instrument subpanel. Pull "OUT" to admit hot air; push "IN" to shut off hot air.

(3) CABIN AND WINDSHIELD DEFROSTERS (LATE AIRPLANES).—Turn "ON" defroster blower switch on pilot's switch panel. Pull "OUT" control on right side of control pedestal to direct heater air through flexible defroster tube; push control "IN" to defrost windshield.

(4) WINDSHIELD DEFROSTER (AIRPLANE WITH A.F.C. EQUIPMENT).—On these airplanes a defroster control is located at the base of each windshield.

1. INTERPHONE JACK BOX
2. FILTER SWITCH
3. COMMAND RECEIVER CONTROLS
4. COMMAND TRANSMITTER CONTROLS
5. FILTER BOX
6. HEADPHONE EXTENSION CORD
7. COMMAND TRANSMITTER DYNAMOTOR
8. FORWARD ANTENNA MAST
9. ANTENNA RELAY
10. COMMAND RECEIVERS
11. COMMAND TRANSMITTERS
12. COMMAND ANTENNA

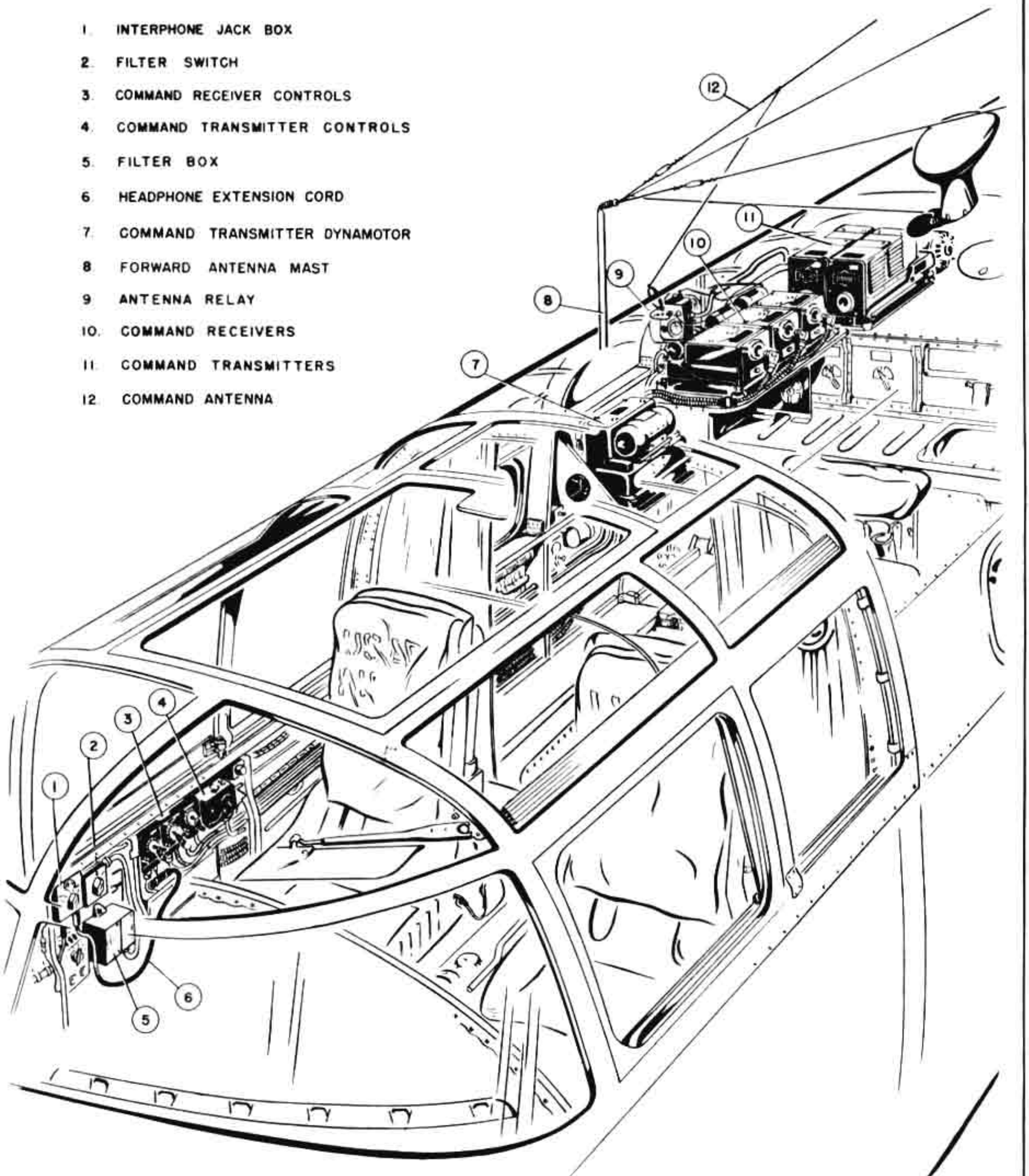
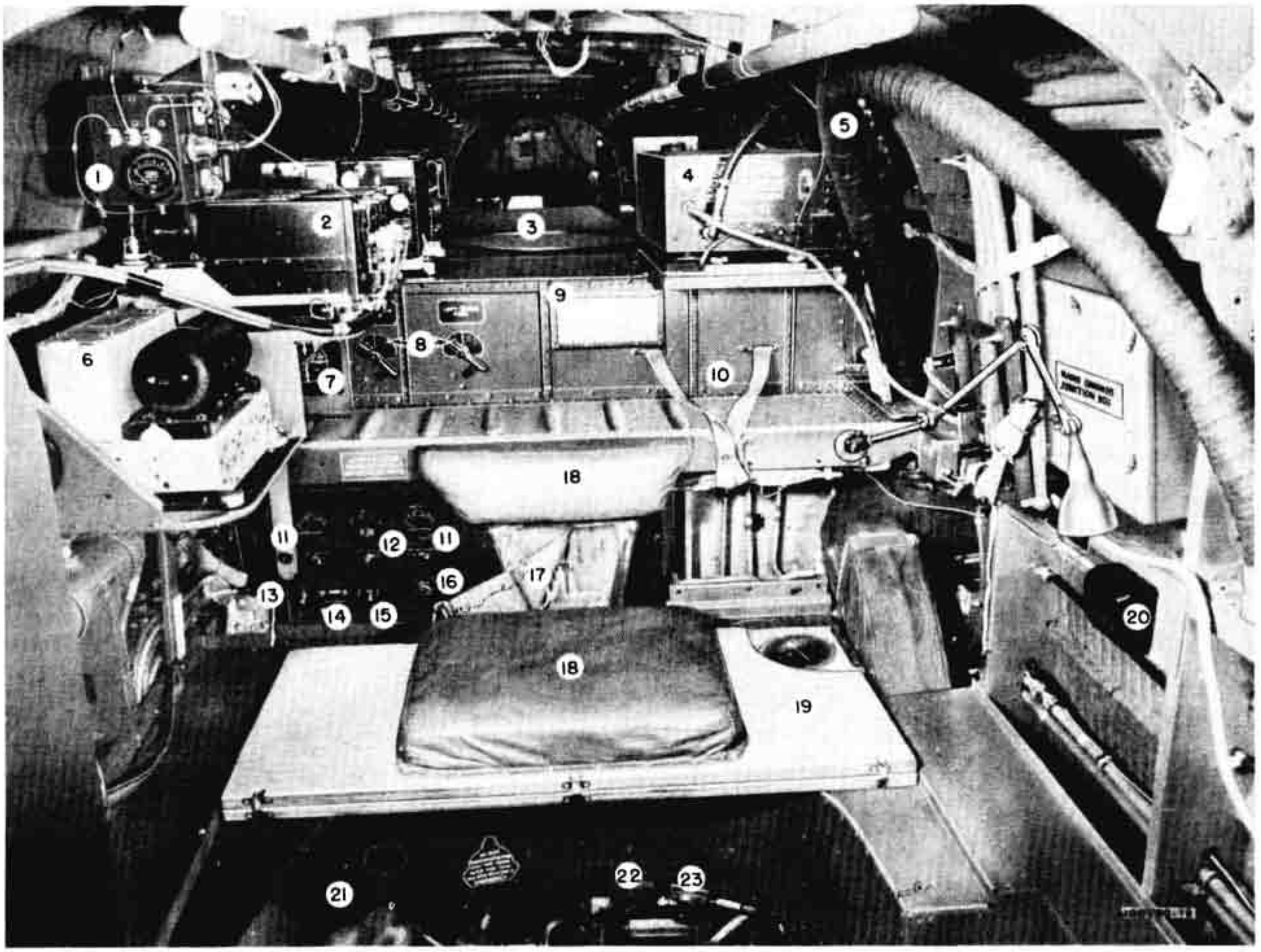


Figure 29—Command Radio Equipment



1. Antenna Switching Relay
2. Command Receivers
3. Bomb Bay Crawl Deck
4. Radio Compass Receiver
5. Defroster Hose
6. Command Set Modulator
7. Fuel Transfer Control
8. Fuel Shut-off Control
9. Fuel Transfer System Diagram
10. Parachute Stowage
11. Generator Switch
12. Generator Voltmeter Switch
13. Inverter Cutout Switch
14. Inverter Switch
15. Bomb Bay Tank Transfer Pump Switch
16. Chart Table Light Control
17. Safety Belt
18. Riding Seat and Backrest
19. Chart Table
20. Ash Tray
21. Relief Tube
22. De-icer System Shut-off Valve
23. Entrance Hatch Handle

Figure 30—Navigator's Compartment—Aft View

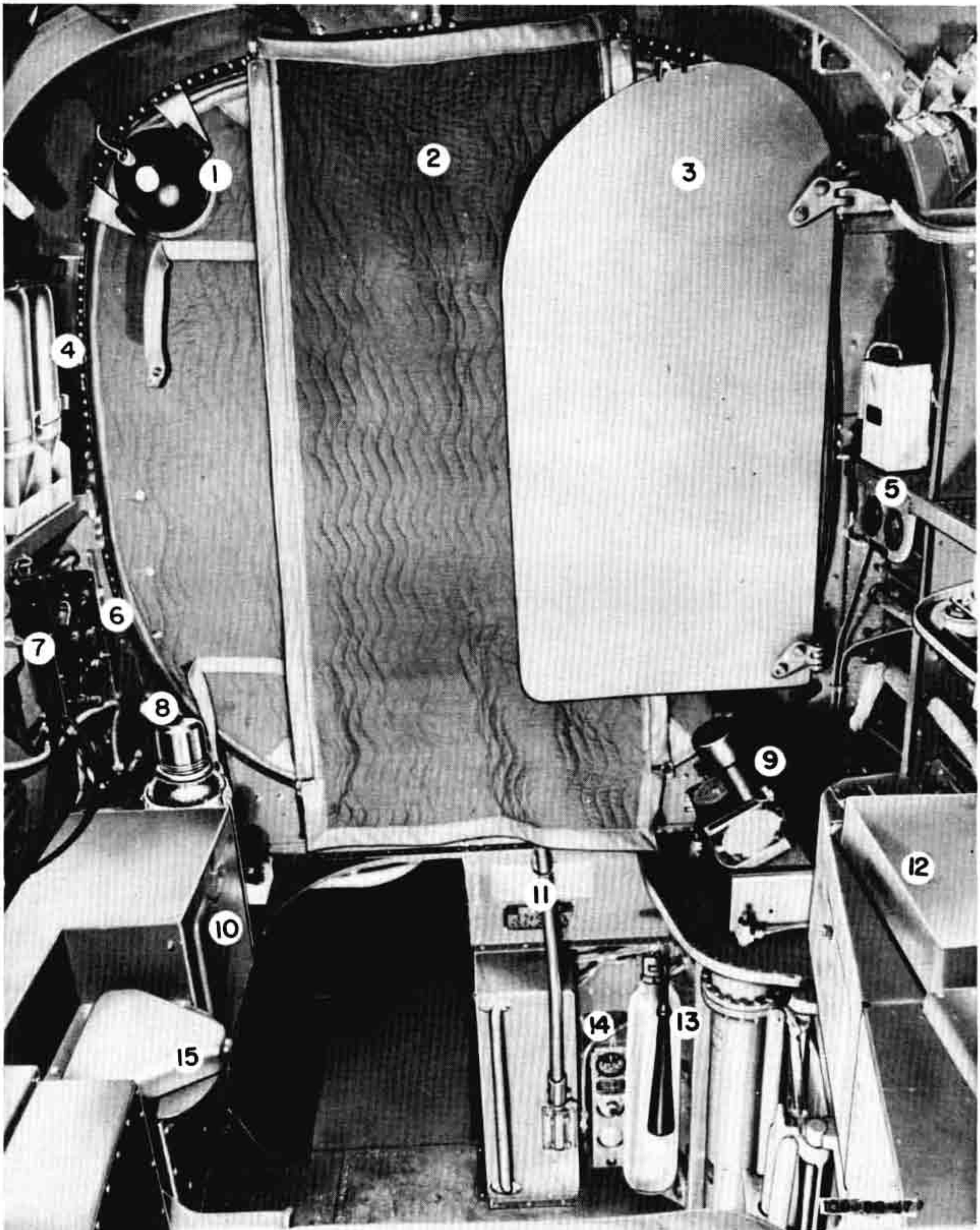


Figure 31—Navigator's Compartment—Forward View

NOMENCLATURE FOR FIGURE 31

1. Landing Gear Warning Horn
2. Heat Insulation Curtain
3. Movable Armor Plate
4. Drift Signals
5. Accumulator Pressure Gages
6. Radio Compass Control Box
7. Throat Microphone Switch
8. Thermos Bottle
9. Driftmeter
10. Sextant Stowage Box
11. Emergency Landing Gear Lowering Pump Handle
12. Computer Stowage Box
13. Fire Extinguisher
14. Air Brake Tank
15. Compass

g. DE-ICER AND ANTI-ICER.—The flight surface de-icer control is located at the left of the instrument panel. The propeller anti-icer control rheostat and carburetor de-icer control switch are on the pilot's switch panel. Some airplanes are equipped with a pilot's windshield de-icer system, which is controlled by a rheostat on the pilot's switch panel.

2. COPILOT.

a. COMMAND SET.

(1) DESCRIPTION.—The command set, SCR-274-N, consists of two transmitters (figure 29-11) and three receivers (figure 29-10) with independent control boxer for each group, an antenna switching relay, (figure 29-9) and the accessories for interconnection of the units. The group of command set units is in the upper aft right side of the nagivator's compartment. The control boxes are at the right of the copilot's seat (figure 29-3 and 4.)

(2) OPERATION.—The frequency range of the command set is as follows:

BC-457-A Transmitter	4000 to 5300 kc
BC-459-A Transmitter	7000 to 9100 kc
BC-453-A Receiver	190 to 550 kc
BC-454-A Receiver	3000 to 6000 kc
BC-455-A Receiver	6000 to 9100 kc

No spare coils are required for either the transmitters or the receivers.

(a) TRANSMITTER.—Turn "ON" transmitter power switch, select one of the two transmitters desired, and turn switch marked "TONE-CW-VOICE" to the desired position.

(b) RECEIVER.—The desired receiver is turned on or off by a switch located in the upper right-hand corner of the control box section used. This switch, in addition to having an "OFF" position, has two selective positions marked "CW" and "MCW," each of which is an "ON" position and indicates the type of signal to be received.

b. RANGE FILTER.—Two RC-32 range filters serve to separate voice-given weather reports from the beacon signal when they are being broadcast simultaneously on the same approximate frequency. A switch on each side of the pilot's compartment adjacent to the interphone jack box permits the copilot or pilot to select weather reports only, beacon signal only, or weather reports, and beacon signal. This is done by turning the switch to "VOICE," "RANGE," or "BOTH."

3. NAVIGATOR.

a. NAVIGATION EQUIPMENT.

(1) DRIFT METER (EARLY AIRPLANES).

(a) DESCRIPTION.—A type B-3 drift meter with a gyroscopically stabilized reticle is installed in the forward right-hand corner of the navigator's compartment.

NOTE

The electrically driven gyro must always be caged during take-off or landing, during turns when the incline is over 20 degrees from vertical, when not in use, and before switching off the current.

(b) OPERATION.

1. Turn on starting switch on gyro housing and allow gyro to gain speed for at least 3 minutes.

2. Uncage gyro and allow it to run uncaged for at least 10 minutes before attempting to take any readings.

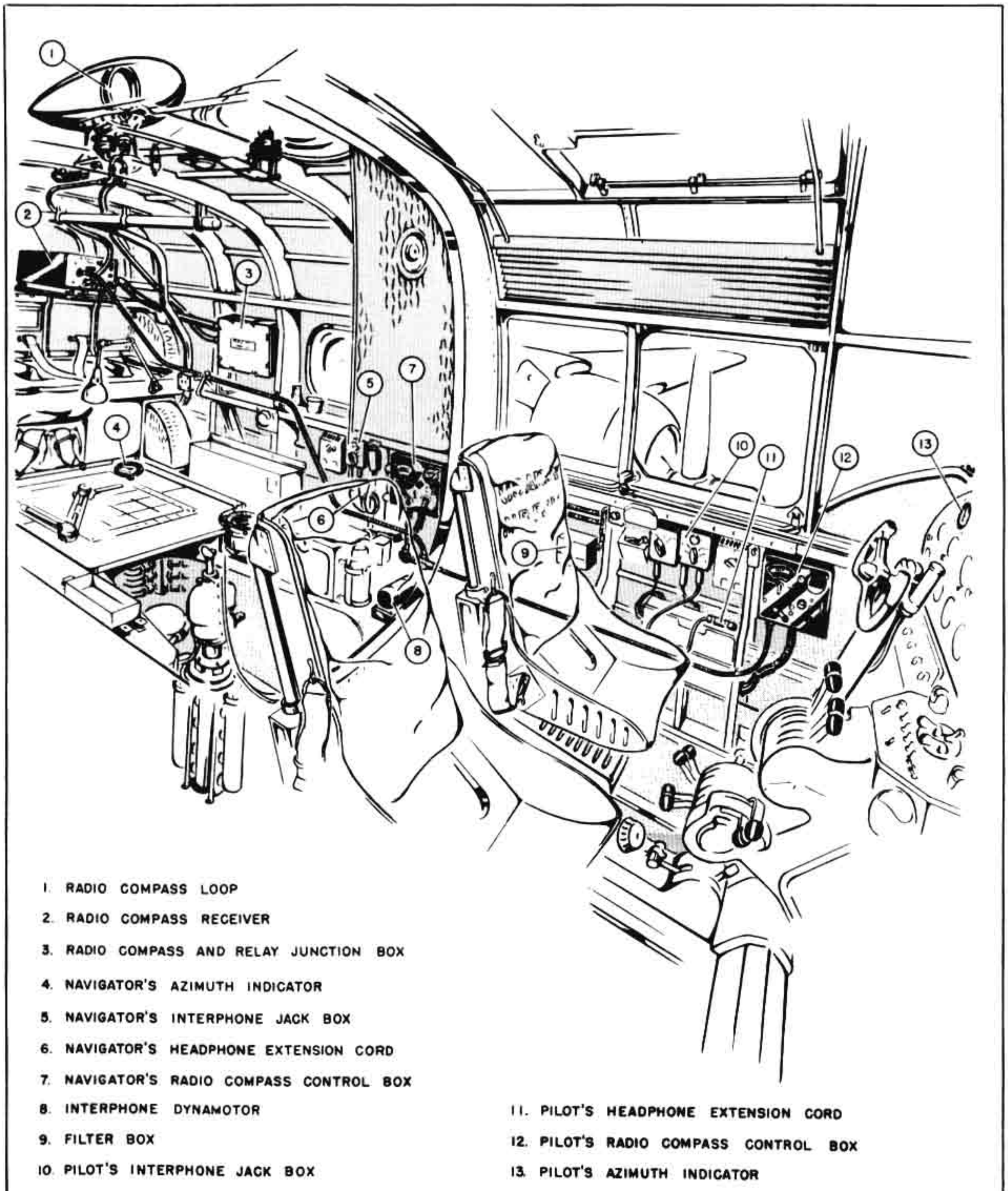
3. Turn reticle light rheostat knob clockwise until desired intensity of grid lines is obtained.

4. Set line of sight control to zero.

5. Rotate drift meter until drift lines are parallel to the apparent motion of ground objects and read drift on drift scale. Either the central or any of the side lines may be used.

(2) DRIFT METER (LATER AIRPLANES).

(a) DESCRIPTION.—A type B-5 drift meter (figure 31-9) is installed in the forward right-hand corner of the navigator's compartment. This drift meter is stowed with the reflecting mirror inside the fuselage and the drift meter port closed. Make certain that the drift meter is in the operating position before attempting to use it.



1. RADIO COMPASS LOOP
2. RADIO COMPASS RECEIVER
3. RADIO COMPASS AND RELAY JUNCTION BOX
4. NAVIGATOR'S AZIMUTH INDICATOR
5. NAVIGATOR'S INTERPHONE JACK BOX
6. NAVIGATOR'S HEADPHONE EXTENSION CORD
7. NAVIGATOR'S RADIO COMPASS CONTROL BOX
8. INTERPHONE DYNAMOTOR
9. FILTER BOX
10. PILOT'S INTERPHONE JACK BOX
11. PILOT'S HEADPHONE EXTENSION CORD
12. PILOT'S RADIO COMPASS CONTROL BOX
13. PILOT'S AZIMUTH INDICATOR

Figure 32—Radio Compass Equipment

(*b*) OPERATION.

1. Look through the eye lens and rotate the reticle control until the drift lines are parallel to the apparent line of motion of objects on the ground. When over land or water on which there are few prominent or readily identifiable objects, keep the eye fixed on the reticle and observe the general movement of the background without attempting to follow any one ground object. The pointer on the drift dial will then show the drift of the aircraft to the left (plus) or to the right (minus).

2. The drift meter may be operated by use of the pantograph pointer instead of the reticle lines. With the point of the needle visible in the eye lens and a pencil in the pantograph holder, follow, by means of the pantograph system, the movement of an object (on the ground) across the field of the eye lens. The pencil will leave a line on the ground glass. Then move the indicator knob of the reticle control until the parallel lines align themselves with the line drawn on the ground glass plate. The pointer on the drift scale will then indicate the drift to the left or right.

3. To determine ground speed, the altitude of the airplane must be known and the airplane must be kept in level flight while a reading is taken. Set the reticle lines of the drift meter by determining the existing drift of the aircraft. With a stop watch, check the time required for an object on the ground to cross the eye-lens field from one timing line to the other. Then locate the time in seconds on the dial of the computer and set reading against the height of the airplane on the height scale. The ground speed in miles per hour will be indicated by the black line on the dial marked "MPH," and the speed in knots by the red line marked "KNOTS."

(3) DRIFT SIGNALS.—Racks in the navigator's compartment accommodate 12 drift signals, which are released from the airplane through a chute in the floor of the navigator's compartment.

NOTE

Drop the drift signal through the chute in an inverted position to prevent accidental firing of the signal in the airplane.

(4) RADIO COMPASS.

(*a*) DESCRIPTION.—The radio compass, SCR-269-A, consists of a receiver (figure 32-2), two remote control boxes, two azimuth indicators (figures 32-4 and 13), a rotatable loop, a relay for shifting control, a terminal box, and accessories for interconnection of the units. The radio compass receiver is located on the left side of the forward entrance to the bomb bay crawl deck. A control box is mounted on the left side of the pilot's compartment and in the navigator's compartment forward and below the left window. The azimuth indicators are mounted on the pilot's instrument panel and the navigator's chart table. The loop is mounted on the upper forward part of the fuselage above the navigator's compartment. The radio compass is operable from either of the two control boxes, but not from both at the same time.

(*b*) OPERATION.

1. Establish control by depressing button marked "CONTROL" at the lower right-hand corner of the box. When control is established at the desired remote control unit, a green light will appear on the face of the control unit.

2. Turn on radio compass receiver by moving switch on remote control box to "COMP," "ANT," or "LOOP." With the switch turned to "COMP," both the rotatable loop and the fixed antenna are in use; in the position marked "ANT," only the fixed antenna is in use, and with the switch turned to "LOOP," only the rotatable loop is in use.

3. Select frequency band desired by rotating the band switch control to one of its three marked positions.

(5) CELESTIAL NAVIGATION EQUIPMENT.—Late airplanes are equipped with an astro-dome containing an astro-compass and an astrograph. Special lighting is provided for the chart table.

b. HEATING SYSTEM.

(1) STARTING HEATER.

(a) Have pilot close airflow control.

(*b*) Set heater control in "OFF."

(*c*) Ask pilot to maintain the left engine manifold pressure at approximately 27 inches Hg.

(*d*) Move heater control to "ON."

(*e*) After heater starts, adjust heater control and airflow control for desired heat.

(*f*) Adjust control on duct below left shelf.

NOTE

If heater does not start in 1 to 3 minutes (cold outside air temperatures may require a longer starting period), move heater control further toward full "ON" position. Moving the heater control back and forth may also aid the starting. If the heater still does not start, ask pilot to vary the manifold pressure and mixture setting. The heater will start and operate better on a lean mixture. In extremely cold weather, leave the airflow control closed at all times, regardless of altitude and air speed. If heater goes out at high manifold pressures, it may be restarted by reducing manifold pressure and repeating starting procedure. If heater continues to go out at high manifold pressures, try retarding the heater control toward the "OFF" position so as to decrease the flow through the heater.

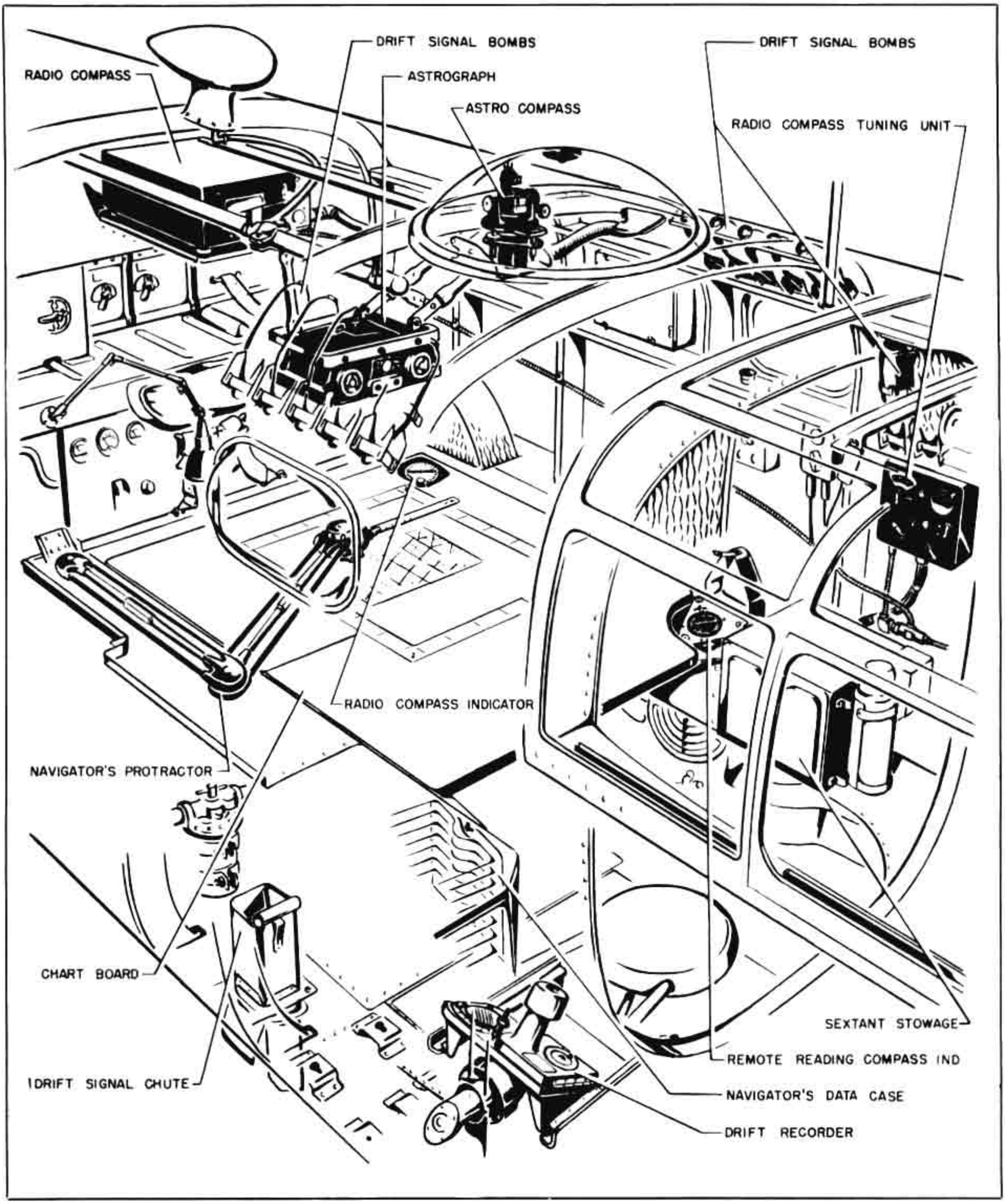


Figure 33—Celestial Navigation Equipment

Figure 34—Navigator's Control Panel

c. ELECTRICAL EQUIPMENT.

(1) GENERATOR CUT-OUT SWITCHES.—The generator cut-out switches are mounted on the navigator's fuse panel. These switches must be turned "ON" during engine run-up or while the airplane is in flight. This allows the reverse-current relay to cut the generator into the electrical load when the generator output reaches 26 to 27 volts. In an emergency or forced landing, turn the switches "OFF" to prevent damage to the generator and the discharging of the battery into the generator. This will also greatly minimize the possibility of fire in case of a crash landing.

NOTE

During one-engine operation or if one generator fails, it is important not to draw more than 200 amperes from the one generator still operating. If possible, keep the load below this figure to prevent the generator from overheating and eventually failing. In case of generator failure, the batteries are adequate only for a flight of short duration, and then only if they are in a properly charged condition and all electrically operated equipment not essential in flight is turned off so as to conserve battery power.

(2) GENERATOR AMETERS AND VOLTMETER.—During long flights, if the batteries have become fully charged and there is little load in the electrical system, the ameter readings for the generator may be low. This is a normal condition and does not indicate that the generator, regulator, or reverse-current relay is faulty. If the generator shows approximately normal voltage on the voltmeter of the generator control panel, the voltage regulator and generator are in working condition.

(3) INVERTER SWITCH.—An inverter switch is located on the navigator's fuse panel. On early airplanes a spare inverter is provided. As the switch controls the alternating current to various items, it is imperative that this switch be "ON" at all times except when testing or in an emergency. On most airplanes an inverter cutout switch on the navigator's fuse panel

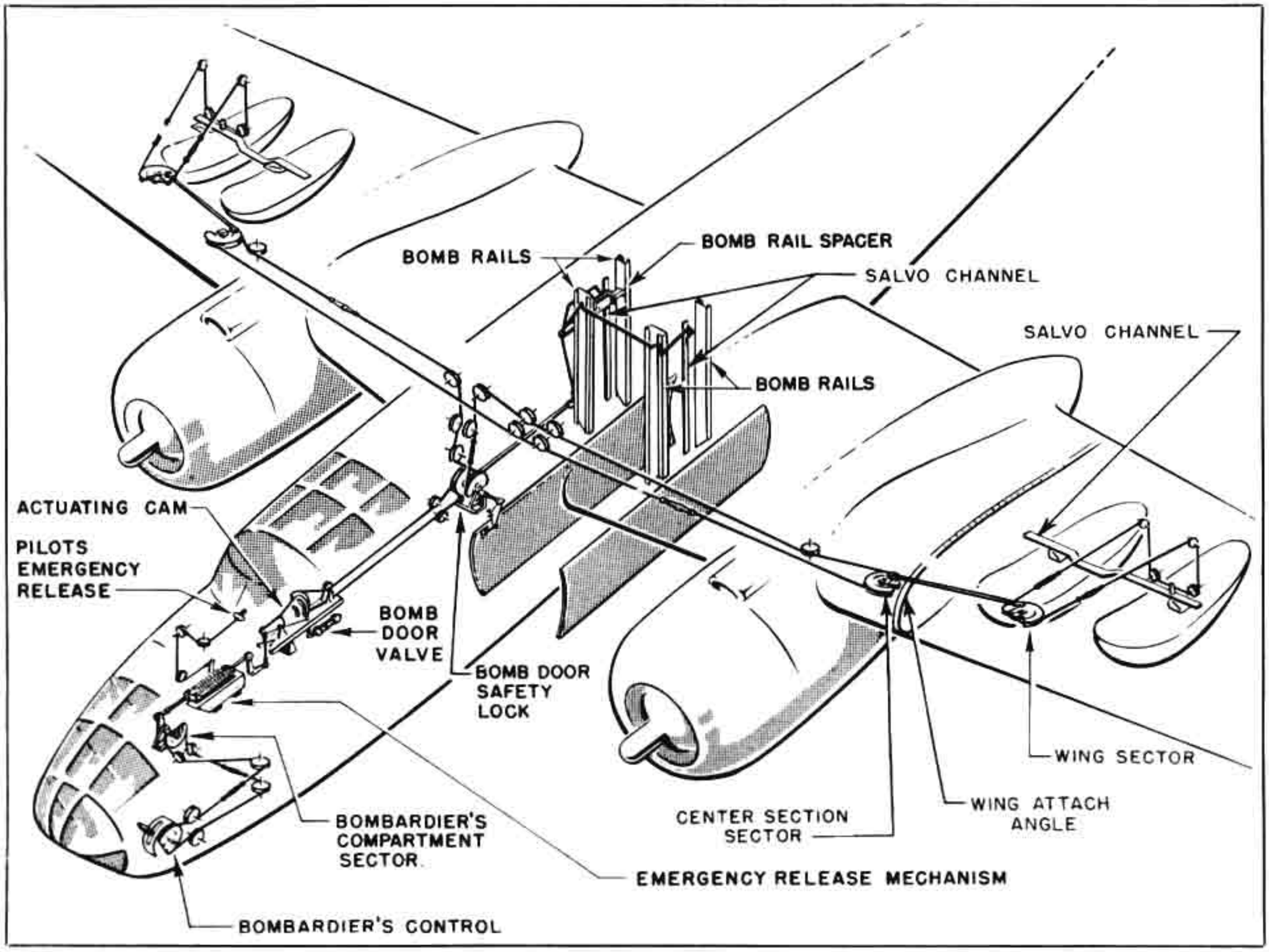


Figure 35—Bomb Rack Control System

allows the battery-disconnect switches to be "ON" without energizing the inverter; this arrangement provides for emergency or checking purposes.

4. BOMBARDIER.

a. BOMBING EQUIPMENT.

(1) DESCRIPTION.—The bomb control handle, on the left side of the bombardier's compartment, may be moved to lock the controls so that bombs cannot be released, to position the racks for a selective (electrical) release, or to salvo all bombs installed. A bomb control panel, on the bombardier's left, incorporates 12 fuselage, and on late airplanes 8 wing rack bomb station indicator lights and their "ON-OFF" switch. On late airplanes a bomb nose fusing switch and its indicator light are provided. A bomb interval control on the left side of the compartment provides either "TRAIN" or "SELECTIVE" release of bombs. A bomb release switch is on the lower left forward corner of the compartment. The bombsight is located in the nose section. Provisions are made for the installation of a glide bombing attachment.

(2) OPERATION.

(a) GENERAL.—The bomb control handle cannot be moved from one setting to another until the plunger knob on top of the handle is depressed. When moving the handle from "DOORS CLOSED" to "SEL," first move handle to "DOORS OPEN" and wait until bomb door signal light illuminates; then move handle to "SEL." To move bomb control handle from "SEL" to "SALVO," move handle toward "DOORS CLOSED" to clear the catch, pull antisalvo guard aside, and then move handle to "SALVO."

CAUTION

DO NOT force bomb control handle into any position.

(b) BOMB RACK SELECTOR SWITCH (LATER AIRPLANES). When this switch, on the bomb control panel, is in "NORMAL," the release sequence of the bombs is through the wing racks and then through the fuselage bomb stations. When the switch is placed in "ALTERNATE," the bomb release sequence is through the fuselage bomb stations only.

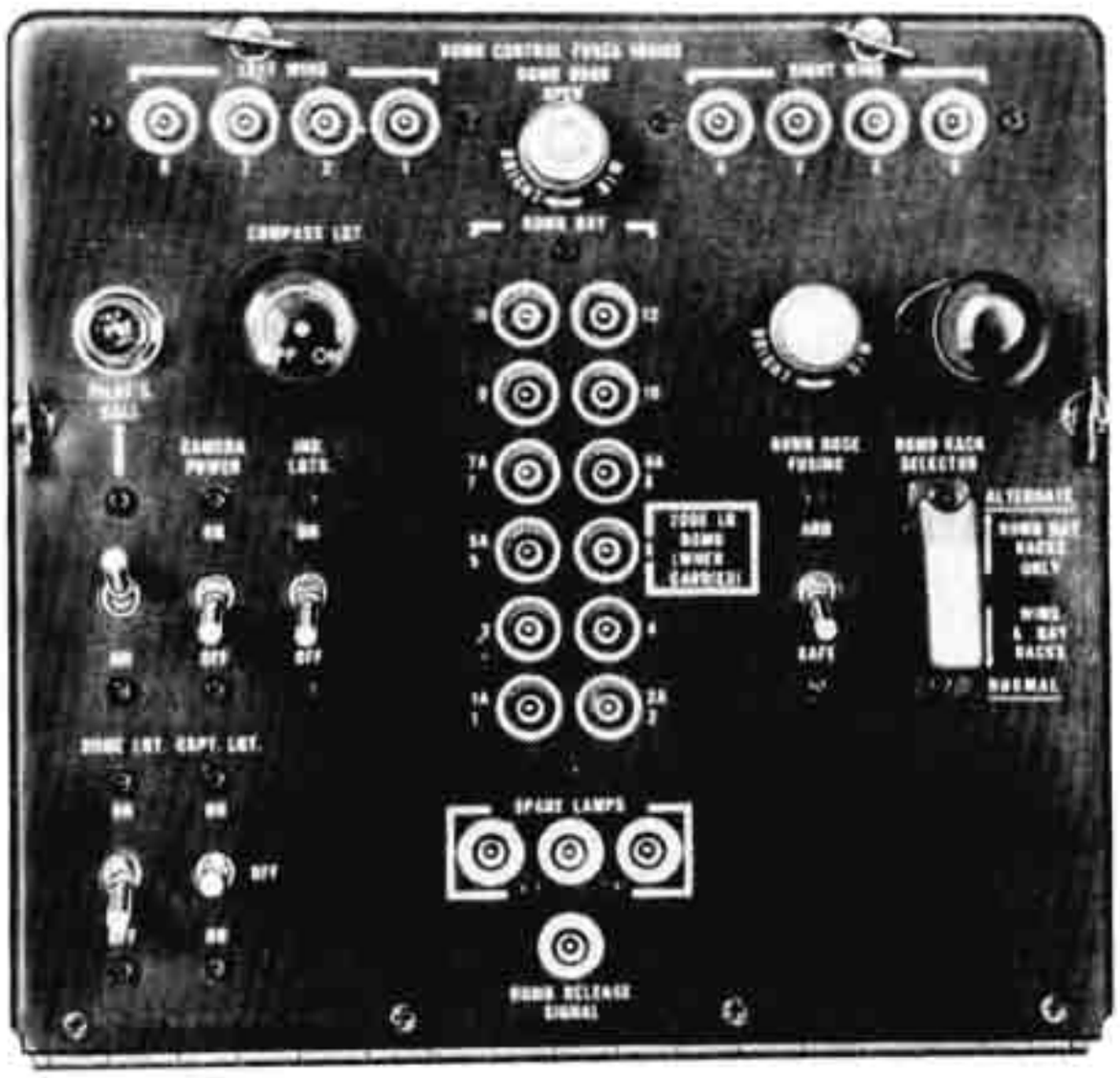


Figure 36—Bomb Control Panel

(c) INOPERATIVE POSITION OF CONTROLS.—When the bomb controls are not in operation, position them as follows:

1. Bomb control handle in "DOORS CLOSED" with antisalvo guard in place.

2. Bomb nose fusing switch "SAFE."

3. Train-selective switch in "TRAIN" with counter at "ZERO."

4. Bomb rack selector switch "NORMAL."

5. Indicator light switch "OFF."

6. Guard in place over bomb release switch.

(d) TRAIN RELEASE.

1. Set train - selective switch in "TRAIN."

2. Set interval selector dial at position which will give desired spacing of bombs at ground speed at which airplane is traveling.

3. At least 1 minute prior to operation of bomb interval control, place counter at setting corresponding to number of bombs to be released.

4. Move bomb control handle to "DOORS OPEN." When bomb door position indicator illuminates, move bomb control handle to "SEL."

5. Turn bomb nose fusing switch to "ARM" (if desired).

NOTE

When the switch is positioned at the "ARM" side, it affects only the nose arming units (the tail is armed at all times except when bomb control handle is in "SALVO" position).

6. Press bomb release. A momentary pressure on the bomb release switch will suffice to release total number of bombs for which counter is set. To stop a train of bombs before total number of bombs selected has been dropped, manually return counter to "ZERO" or switch bomb interval control to "SEL."

7. Move bomb control handle to "DOORS CLOSED."

8. Return bomb controls to their inoperative positions.

(e) SELECTIVE RELEASE.

1. Set train-selective switch in "SEL."

2. Move bomb control handle to "DOORS OPEN." When door position indicator light illuminates, move bomb control handle to "SEL."

3. Turn bomb nose fusing switch to "ARM" (if desired).

4. Press bomb release switch once for each bomb to be released.

5. Return bomb control handle to "DOORS CLOSED" position.

6. Return bomb controls to their inoperative position.

(f) SALVO RELEASE.—To release bombs in a salvo, hinge antisalvo guard upward and move bomb control handle to "SALVO." Should there be a hydraulic system failure, follow procedure outlined in *4 a.* (2) *(g)* following.

NOTE

If over enemy territory, place nose fusing switch in "ARM" so that all bombs will drop in a salvo armed. If over friendly territory, place nose fusing switch in "SAFE" so that all bombs will drop in a salvo unarmed.

(g) OPENING BOMB BAY DOORS WITH HAND CRANK.—If bomb control handle is moved to "DOORS OPEN" and bomb doors do not open (indicated by nonillumination of bomb door position indicator light), leave bomb door control handle in "DOORS OPEN" and instruct copilot to open doors with hand crank. When the bomb doors are open, move bomb control handle to either "SALVO" or "SEL," as desired.

CAUTION

Always have bomb racks checked after all bombs have been released, to make sure no bombs are hung up on the racks.

b. GUNNERY EQUIPMENT.

(1) .30-CALIBER FLEXIBLE NOSE GUN (EARLY AIRPLANES).

(a) DESCRIPTION.—The .30-caliber gun may be used in any one of the ball-and-socket mounts in the panels of the bombardier's compartment. Six

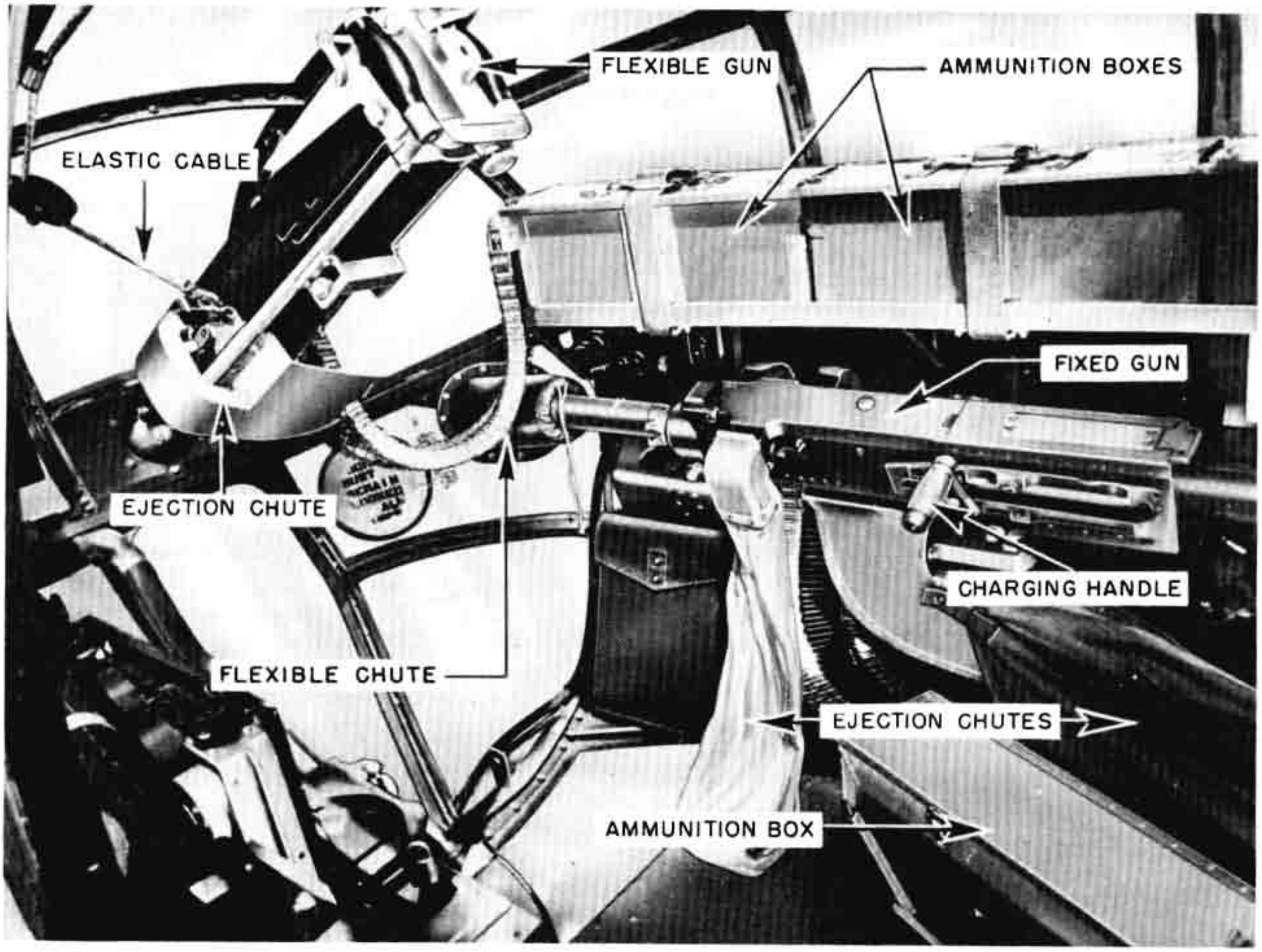


Figure 37—Gunnery Equipment—Bombardier's Compartment

ammunition boxes, each with a capacity of 100 rounds, are stowed at the right side of the compartment. The gun is stowed at the right side of the compartment.

(b) OPERATION.

1. Remove gun from stowage by releasing drawlatch and lifting gun from bracket and socket. Swing stowage bracket assembly aft and lock it in stowed position during combat operation.

2. Install gun in ball-and-socket mount by inserting barrel through the ball and then engaging the gun mount adapter lock.

3. Unroll the case and link ejection chutes.

4. Take a loaded ammunition box from its stowage rack and place it in the holder assembly attached to the gun. (Cartridges point in the direction the gun points.)

5. Load the gun. This is done by either inserting the double loop end and first cartridge into the feedway of the gun until cartridge holding pawl holds cartridge; or by raising gun cover and laying the double loop end and first cartridge in gun feedway with cartridge up against cartridge stop, engaging extractor with extracting ridge on the cartridge, and then closing cover. In the former case, charge the gun twice to place the cartridge in the chamber. In the latter case, only one charging action is needed to place the cartridge in the chamber. Charge the gun by pulling the charging handle back and then releasing it.

6. Fire gun by pressing trigger. The operation of the gun is fully automatic with the trigger depressed.

7. The firing zones are confined to certain limits by the gun mount adapter and the projecting inside rim of the socket. This prevents the gunner's hands and the front bead sight from striking against the compartment structure and the equipment in the compartment. In several positions, gun movement is obstructed and it is necessary for the gunner to become familiar with these positions to be able to avoid them in operation.

8. The gun is air-cooled. It may be fired with an initial maximum burst of 50 to 75 rounds.

This long burst will heat the barrel to the maximum permissible temperature, and after 1 minute delay, repeated firing at the rate of 20 rounds per minute will allow the barrel to cool sufficiently in approximately 15 minutes so that the long burst of 50 to 75 rounds may be repeated. If long bursts are not fired, 25 rounds per minute may be fired over long periods. Long bursts should be avoided as much as possible as they cause excessive gun barrel wear.

9. The only stoppages that can be relieved during flight are those which can be remedied by pulling back the charging bolt handle, or by removing a faulty cartridge from the chamber. If the gun fails to fire, see that the cover is latched, then pull the handle back, and release it quickly. This should eject the cartridge in the chamber and load the next cartridge. If the stoppage is still not remedied, lift the cover and see if a battered or thick-headed cartridge is held in the bolt. If so, remove it with a screw driver.

CAUTION

After any stoppage which appears to be caused by insufficient recoil, make certain that the bore is clear before continuing firing. A stoppage caused by incomplete ignition of the powder charge, might result in a bullet lodging in the bore. Should this happen, and another round is fired before the bore is cleared, the gun will be seriously damaged and the gunner might be injured.

10. Prior to landing, unload the gun by raising the gun cover and removing the cartridge belt from the gun feedway. Then pull the charging handle to the rear to completely eject the cartridge from the chamber. Inspect the T-slot and chamber to make certain the gun is unloaded, and close the cover. Press the trigger to relieve the tension on the firing-pin spring. The gun may then be stowed.

(2) .50-CALIBER FLEXIBLE NOSE GUN (LATER AIRPLANES).

(a) DESCRIPTION.—The flexible .50-caliber nose gun is mounted in a ball-and-socket mount directly above the bombsight window. Maneuverability of the gun is aided by two shock cords suspended from the enclosure frame and attached to the gun. Three 100-round ammunition boxes are located on the right side of the compartment. When the gun is not in use, the aft end may be swung upward and fastened to the stowage bracket on the enclosure frame.

(b) OPERATION.

1. Release gun from stowage bracket by pushing out plunger on aft end of recoil adapter.

2. Check gun for right-hand feed and proper loading.

3. Charge gun by pulling back and releasing charging handle.

4. Move the safety to firing position.

5. Sight through ring-and-bead sight.

6. Fire gun by pulling trigger.

7. After firing, safety gun, and stow it.

8. Unload gun before landing.

c. HEATING AND DEFROSTING.—Heat is admitted into the compartment by adjusting the Anemostat control at left side of compartment. Warm air is diverted to the bombsight window when the heating system is on. A flexible tube stowed on the left side of the compartment may be attached to a fitting on the defroster duct to divert warm air to the bombsight. On later airplanes a blower, controlled by a switch on the bomb control panel, furnishes ram air for the defroster system.

5. RADIO OPERATOR.

a. RADIO EQUIPMENT.

(1) DESCRIPTION.

(a) LIAISON TRANSMITTER AND RECEIVER.—The SCR-287-A liaison set includes a transmitter (figure 38-4) with seven interchangeable tuning units, a receiver (figure 38-8), telegraph key, dynamotor, frequency meter, antenna tuning unit, and the terminal or junction box; all these units are located in the radio operator's compartment. The liaison set is used for communication over comparatively long distances from ship-to-base, or ship-to-ground station, primarily for reporting ship position or flight progress. The transmitter identified as BC-375-D and the receiver identified as BC-348-H are located on the left side of the radio operator's compartment, immediately forward of the lower turret.

(b) IDENTIFICATION (LATER AIRPLANES).—The set consists of the receiver and transmitter unit, a control box, detonator switches, an inertia crash switch, and two indicator lamps. The transmitter-received unit is mounted immediately below the radio operator's seat. The control box is located below and aft of the liaison receiver. The indicator lamps and the inertia crash switch are mounted adjacent to the radio operator's folding table. The detonator buttons are on the right-hand instrument subpanel.

(2) OPERATION.

(a) LIAISON TRANSMITTER.—The following are general instructions for operation of the liaison transmitter:

1. Select tuning unit covering the desired frequency on which the transmitter is to operate. Set dials "B," "C," and "D" in accordance with calibration chart on tuning unit. Select type of emission by turning switch marked "TONE-CW-VOICE," and position filament switch to correspond. Turn "ON" transmitter master switch.

2. Select antenna by positioning antenna change-over switch. If trailing antenna is to be used, turn control knob on antenna reel box to "OUT."

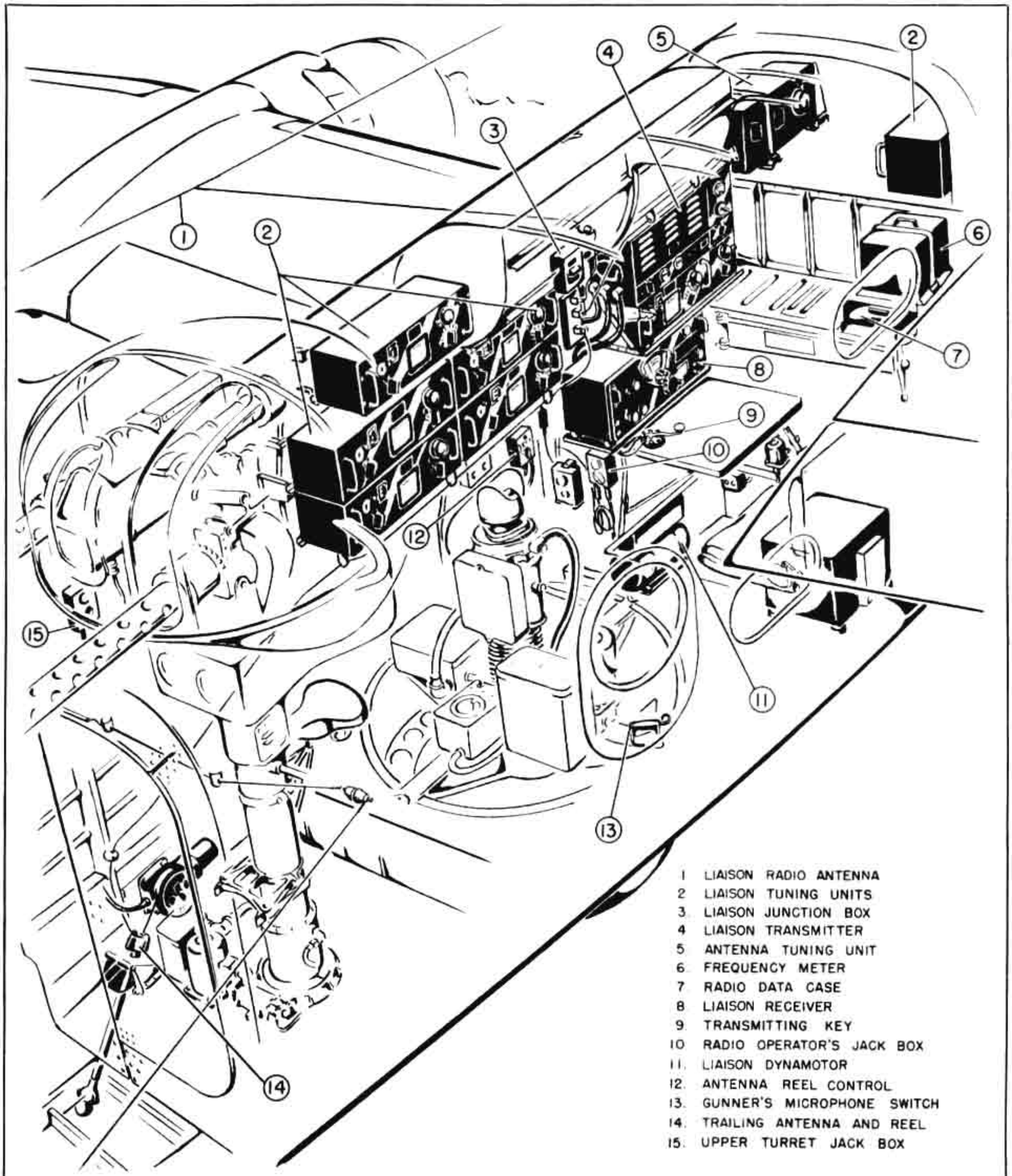
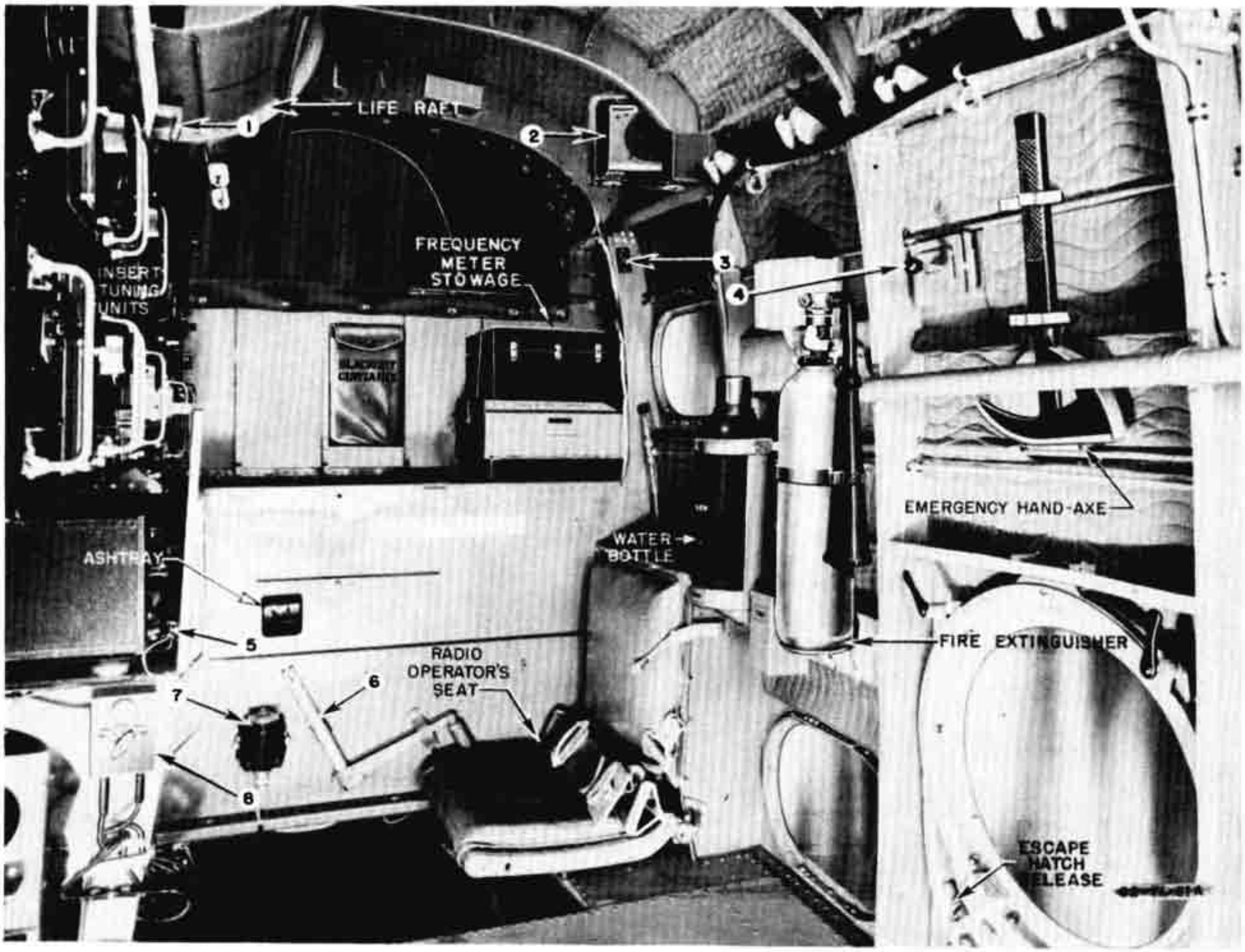


Figure 38—Liaison Radio Equipment



1. Life Raft Release Handle
2 Compass
3. Dome Light Switch
4. Ventilator
5. Transmitter Key
6. Wing Flap Handcrank
7. Inertia Crash Switch
8. Interphone Jack Box

Figure 39—Radio Operator's Compartment—Forward View

3. Close either the telegraph key or microphone button, depending upon type of emission selected. Tune dial "C" to maintain a resonant point, indicated by the milliammeter. Turn dial "M" until full antenna current is shown on antenna current meter. Retune dial "C" for resonance point.

NOTE

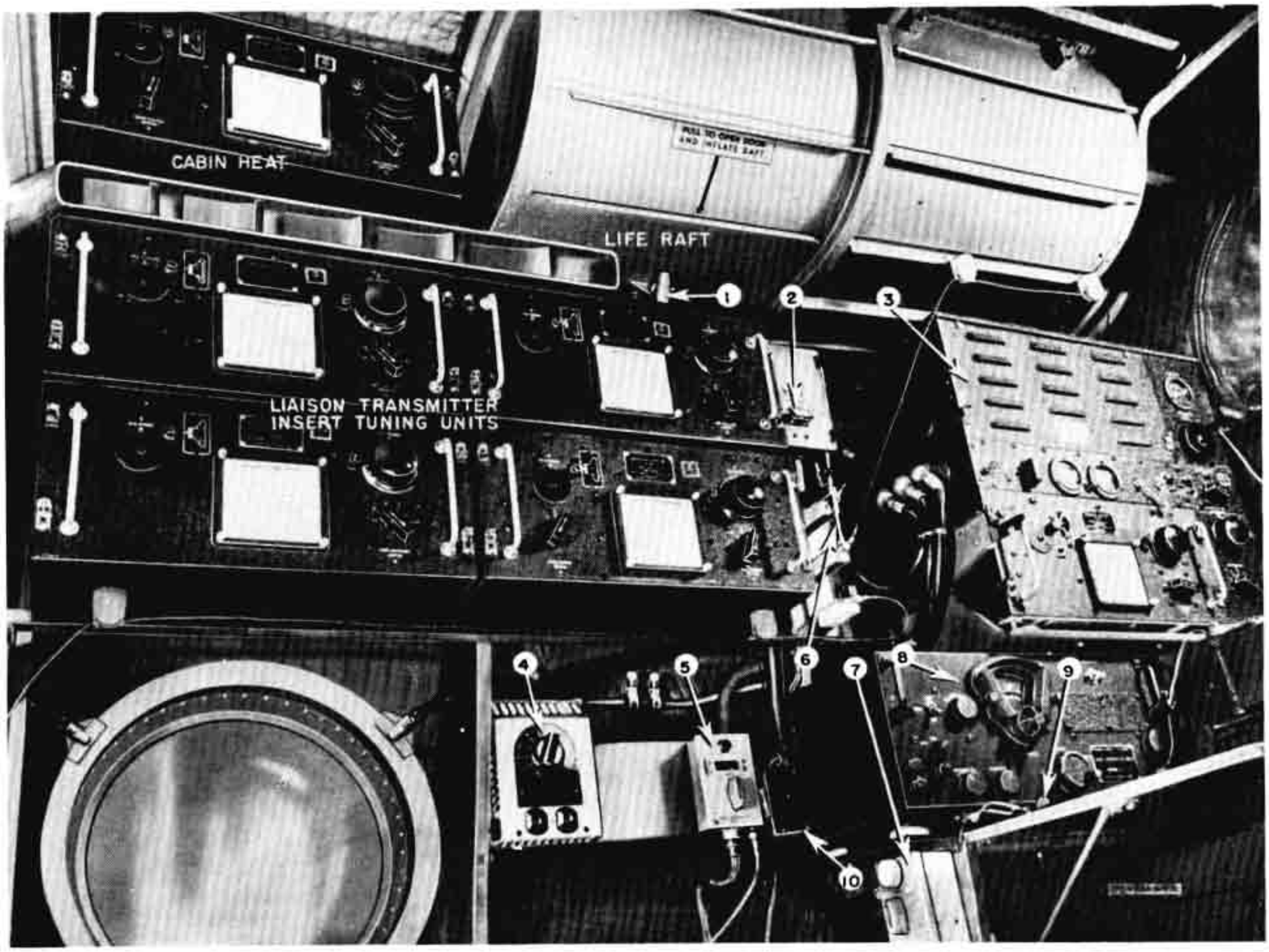
When operating transmitter, make certain that dial pointers on milliammeter and voltmeter do not exceed the red marks on dial scales.

(b) LIAISON RECEIVER.—Turn monitor switch, on lid of liaison set junction box, to "NORMAL." Turn on liaison receiver by means of switch marked "OFF," "MVC" (manual volume control), and "AVC" (automatic volume control). Tune or search with the switch turned to the "MVC" position; after the desired signal has been tuned in, move the switch to "AVC." Frequency band selection is accomplished by the "BAND SWITCH" knob on the face of the receiver case under the dial window. Dial calibrations corresponding to the band selected are revealed by the dial mask.

WARNING

Do not remove or replace tubes in any of the equipment while equipment is turned on.

(c) TRAILING ANTENNA CONTROL.—To extend the trailing antenna, turn the control knob to the right from "OFF" to "OUT"; to retract the antenna, turn the control knob from "OFF" to "IN." A three-digit visible counter indicates the number of



1. Life Raft Release Handle
2. Monitor Switches
3. Liaison Transmitter
4. Heated Clothing Rheostat
5. Trailing Antenna Reel Control Box
6. Antenna Change-over Switch
7. Interphone Jack Box
8. Liaison Receiver
9. Transmitting Key
10. Throat Microphone Switch

Figure 40—Radio Operator's Compartment—Left Side

turns made by the antenna in extending, and reverses during retraction. The zero point may be reset by means of a small knurled thumb wheel.

NOTE

An amber light above the counter will act as a warning if the trailing antenna is left in an extended position as the main landing gear starts to descend. Do not use the trailing antenna for transmitting while on the ground.

The approximate tuning ranges for the trailing antenna are as follows:

KC	*Length in Feet*	*Counter Reading*	*Length in Feet*	*Counter Reading*
	¼-WAVE		¾-WAVE	
2000	123	108		
3000	82	72		
4000	62	54		
5000	49	44	147	130
6000	41	36	123	108
7000	35	30	105	92
8000	31	28	93	82
9000	27	24	81	72
10,000	24	22	73	64

(d) IDENTIFICATION EQUIPMENT (LATER AIRPLANES).—The confidential nature of the identification equipment permits only basic instructions to be issued. Additional information may be obtained from the communications officer in charge. Place the radio set in operation by turning the "ON-OFF" switch to "ON." Allow 5 minutes for the set to warm up. To stop the equipment, turn "OFF" all switches.

WARNING

The destructor plug is to be inserted only when the airplane is ready to take off. Remove plug immediately after the airplane has landed.

b. LOWER TURRET.

(1) DESCRIPTION.—The lower turret, mounting two .50-caliber guns and a periscopic-type gun sight, is electrically powered and, on later airplanes, is Amplidyne controlled. A 390-round ammunition box is provided for each gun.

(2) OPERATION.

WARNING

Do not operate turret without adequate power supply. If the supply voltage at the turret drops below 20 volts, damage to the turret or the airplane may result.

(a) PREPARATION FOR NORMAL OPERATION.—Lower padded knee support and adjust chest support. Turn hydraulic shut-off valve counterclockwise to the open position, and adjust the sight eyepiece to focus by pulling up on the knurled collar below the sight cushion, and screwing eyepiece out or in until objects which are farther out than 40 feet come into clear focus. Then push down collar and engage it in nearest locking notch.

(b) EXTENSION TO COMBAT POSITION.

1. Before extension, make sure that turret index bolt (located at the aft side of the center column below the brush box) is securely locked in by the index plate spring and is flush with outer surface of the center column. If bolt is released, it may be pulled back in by depressing the retract lever and manually rotating turret slightly so that the guns are pointing directly aft. To rotate turret by hand, remove a section of turret windshield and grasp the turret housing hanger arm.

2. Disengage retract lever lock and make sure that lever is to the left (as viewed by operator) against its stop.

3. Turn on both battery-disconnect switches.

NOTE

Ground operation should be kept to a minimum unless an external power supply, such as a ground generator, is used. If the airplane batteries or auxiliary batteries are to be used for ground operation, first test them to ensure they are fully charged. To avoid serious damage to the turret or airplane, the turret operation must be stopped immediately upon indication that the batteries are running down.

4. Turn on turret main power switch, located on the forward side of the resistor box. On earlier airplanes the switch is on the outboard side of the controller box.

5. Grasp either control handle and depress safety switch on outboard side of handle.

WARNING

Do not depress the high-speed button when approaching the index position during extension. High speed may be used after indexing.

6. Turn control handles counterclockwise about their vertical axis a few degrees from neutral for slow speed and maximum rotation for normal full speed. For high-speed operation, depress high-speed switch button on upper end of either control handle. Neutral position of the control handles is halfway between the stops. The handles will automatically return to their neutral position when released.

CAUTION

As the turret approaches the fully extended position, use slow speed until the index bolt automatically engages and the turret starts to rotate counterclockwise. Avoid contact with the trigger firing switches on the control handles. The guns can be fired as soon as extended position is reached.

(c) CHARGING GUNS.

1. To charge guns ready for combat or to remove a faulty cartridge, depress the control valve knob with the knob rotated clockwise against its stop. After depression, the knob is automatically kicked back at the end of the charging stroke, positioning the valve for the next charging stroke.

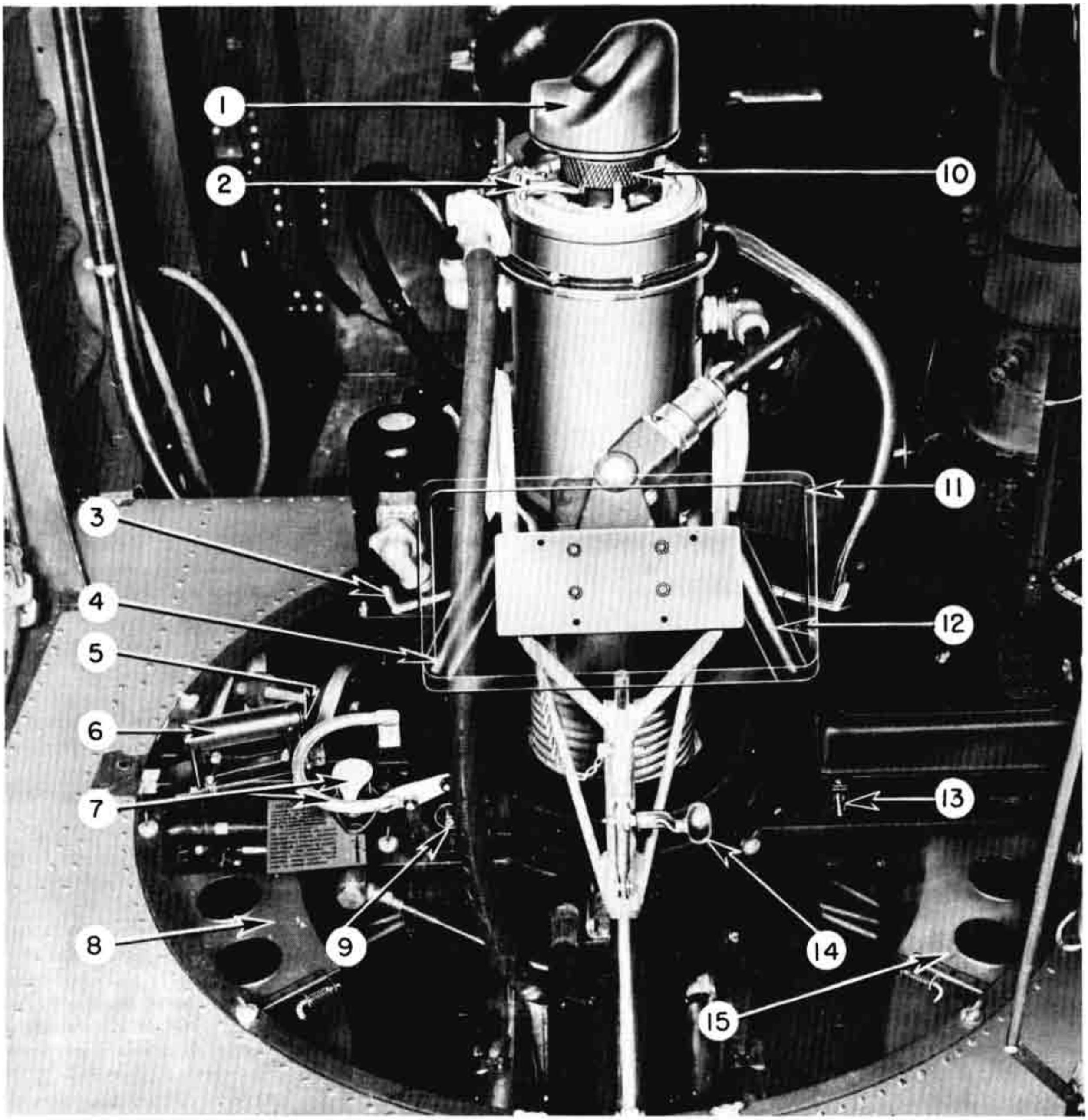
2. To charge the guns and hold the bolt back in safety, depress the control valve knob with the knob rotated counterclockwise against its stop. When ready to release the bolt for combat, rotate the knob clockwise completely against its stop.

3. Do not operate turret for long periods with guns in safety position, as this will cause excessive wear on gland seals within the turret.

4. Do not permit control valve knob to stay in depressed position longer than the few seconds necessary to charge guns ready for combat or to move the gun bolts to the safety position.

(d) COMBAT OPERATION.—With turret extended to the combat position, operate the turret and guns as follows:

1. Take a kneeling position with chest on chest support, eye on sight eye cushion, and both hands



1. Gun Sight Eye Cushion
2. Retract Lever
3. Safety Switch
4. Left Control Handle
5. Interphone Switch
6. Left Hand Steady Grip
7. Gun Charger Knob and Guard
8. Left Gun Ammunition Box
9. Azimuth Shifter Shaft
10. Gun Sight Focus Adjustment
11. Gunner's Chest Support
12. Right Control Handle
13. Main Power Switch on Resistor Box
14. Manual Handcrank Stowed
15. Right Gun Ammunition Box

Figure 41—Lower Turret

either on the master control handles or the right hand on the right control handle and the left hand on the steady grip.

2. With the master control handles in their normal neutral position, grip the handles to depress the safety switch on the outboard side of the handles.

NOTE

Do not depress trigger firing switch on the front of either handle as the guns can be fired as soon as the turret main power switch is turned on.

3. To rotate turret in azimuth, turn control handles about their vertical axis. The guns will move in the same relative direction as the handles, at a speed proportional to the degree of rotation of the control handles from their neutral position. For high-speed rotation of the turret, depress either high-speed switch button on the upper end of the control handles with the thumb. The speed of turret rotation with the high-speed switch button depressed is proportional to the degree of rotation of the control handles from their neutral position. The turret may be rotated continuously (360 degrees) in azimuth provided the guns are lowered sufficiently to clear the forward fuselage; if they are not, the rotation of the turret will stop when the guns approach the sides of the fuselage.

4. The swing of the guns in elevation follows the up and down swing of the control handles. The guns will move in elevation in the same relative direction as the handles, at a speed proportional to the degree of displacement of the control handles from their neutral position. For high-speed elevation of the guns, depress either high-speed switch button on the upper end of the control handles with the thumb. The speed of gun elevation with the high-speed switch button depressed is proportional to the degree of rotation of the control handles from their neutral position. The guns swing from a few degrees above horizontal to almost straight down, except in the forward area.

5. Looking through the sight, train guns on target by means of master control handles. The dot in the center of the reference circle indicates the point on which the guns are trained.

6. To fire guns, depress trigger firing switch on either control handle.

7. The microphone switch button is located in the end of the steady grip.

(e) RETRACTION TO STOWED POSITION.

1. Elevate guns to their upper limit, rotate turret until guns are pointing slightly to the left of straight aft (as viewed by operator), and then depress and lock the retract lever. Depressing the retract lever stops the rotation of the turret.

WARNING

Do not depress high-speed button when approaching the index position during retraction. High speed may be used after indexing.

2. Slowly lower guns until they lock in their stowage position, which is slightly (2 to 6 degrees) below horizontal. Gun elevation control is now inoperative.

3. Rotate turret clockwise at very slow speed by turning control handles a few degrees to the right of neutral. The turret will rotate until guns are pointing straight aft; then it will index and start to retract.

4. The turret may be retracted at any desired speed after retraction has started. Retraction will stop automatically when turret reaches the fully stowed position.

c. AFT COMPARTMENT HEATER (LATER AIRPLANES).

(1) STARTING HEATER.

(a) Ask pilot to turn "ON" master cabin heater switch and to maintain a manifold pressure of approximately 27 inch Hg in the right engine.

(b) Turn "ON" heater control. The fan at bottom of heater will also start.

(c) Adjust heater control to obtain desired amount of heat.

(d) To divert warm air to defroster tube, turn butterfly valve at base of tube.

NOTE

If heater fails to start, or goes out at high manifold presures, refer to paragraph 3. *b.* of thissection for information concerning restarting.

d. SIGNAL LIGHT.—The type C-3A sealed-beam, quick-signaling lamp is stowed in a small case in the aft part of the radio compartment. The lamp is provided with four filters for various signaling operations; red, green, amber, and neutral grey. The grey filter, for night signalling, cuts the light to approximately 10 percent of its original intensity. Plug the lamp into the 24-volt outlet of the heated clothing rheostat. The lamp is controlled by a trigger switch on the handle and is aimed by means of sights at the top of the reflector.

6. UPPER TURRET GUNNER.

a. UPPER TURRET.

(1) DESCRIPTION.—The upper turret is electrically powered and, on later airplanes, is Amplidyne controlled. The turret carries two flexibly mounted .50-caliber guns, and a 400-round ammunition box for each gun. On later airplanes, the turret has a type N-6A optical gun sight.

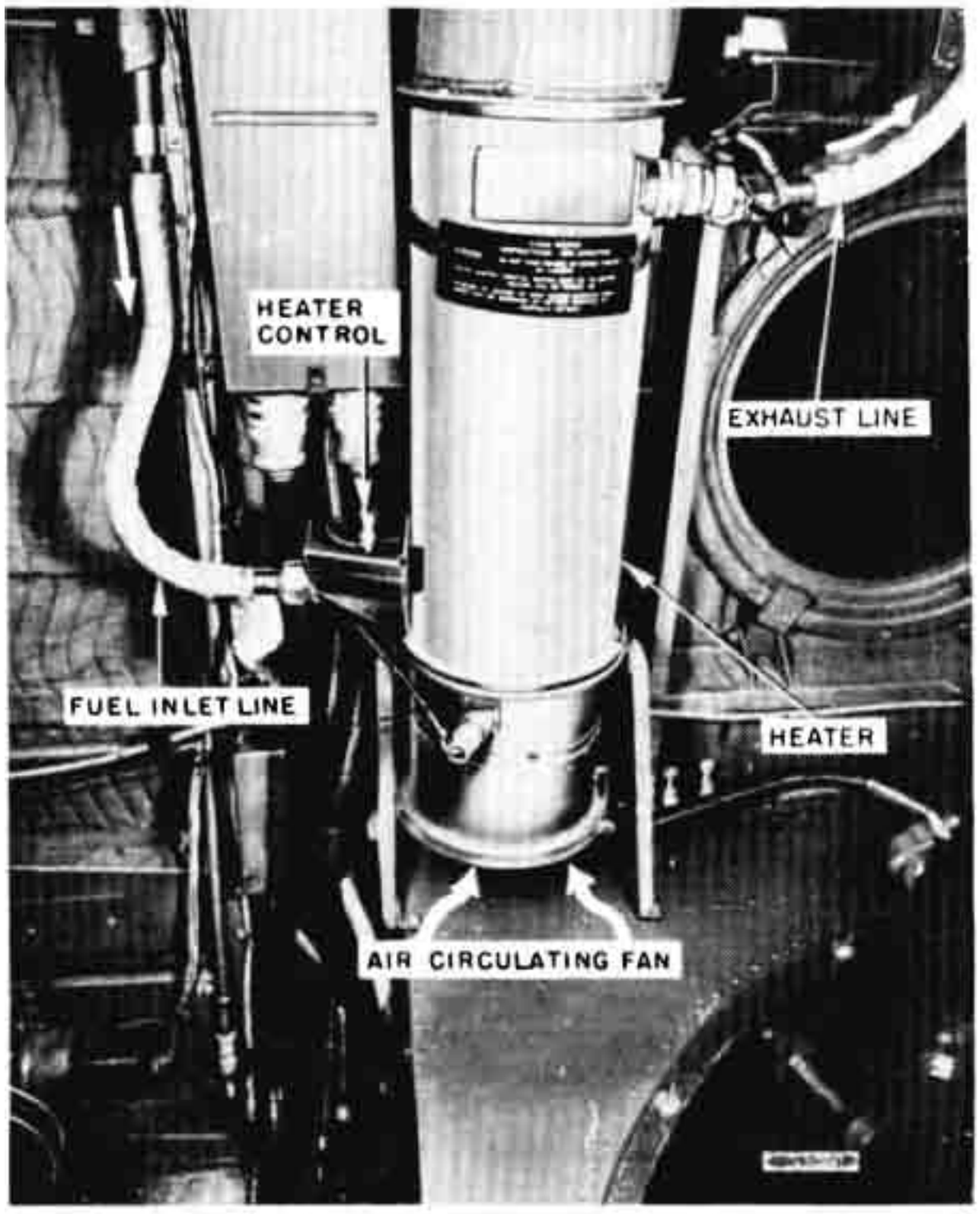


Figure 42—Aft Compartment Heater

(2) OPERATION.

WARNING

Do not operate the turret without an adequate power supply. If the voltage supply at the turret drops below 20 volts, serious damage to the turret or to the airplane may result. When the turret is operated on the ground, the airplane engines should be running, or an external power supply providing a constant 28-volt supply should be used. Operation of the turret with the airplane batteries should be kept to an absolute minimum.

(a) PREPARING TURRET.

1. Adjust footrests and seat.

2. On turrets equipped with a telescopic sight, adjust sight by loosening lock nut on eyepiece and rotating eyepiece until objects farther out than 28 feet come into clear focus. Tighten lock nut.

3. Before entering turret, turn on turret main power switch (and heated clothing and extension light switch, if necessary). On turrets equipped with the type N-6A reflector-type sight, the heated clothing and extension light switch must be turned on before the gun sight rheostat will operate.

4. Take position in the turret by unlatching riding seat, stepping on footrests, and then pulling seat into place. DO NOT step on azimuth motor, compensator, brush box, or electrical conduits when getting in or out of the turret.

5. To heat the clothing, connect plug of heated clothing wire to socket in rheostat below right control handle. Turn knob clockwise for desired heat.

6. Plug in microphone and head-set circuits and turn jack box knob to desired communication position.

(b) CHARGING GUNS. — On later airplanes, to charge a gun or remove a faulty cartridge during firing, raise the respective footrest with the toe until footrest latches; then press footrest down sharply to its normal position. On earlier airplanes, depress the lower button on the left side of the center column until gun chargers have moved gun bolts to their rear position. Releasing buttons will release the bolts charging the guns.

(c) COMBAT OPERATION.

1. Grip master control handles with both hands, depressing safety switches on the side of each handle.

NOTE

DO NOT depress trigger firing switch on front of control handles as the guns are operative as soon as the main power switch is turned on.

2. To rotate turrets in azimuth, turn control handles about their vertical axis. The guns will move in the same relative direction as the handles at a

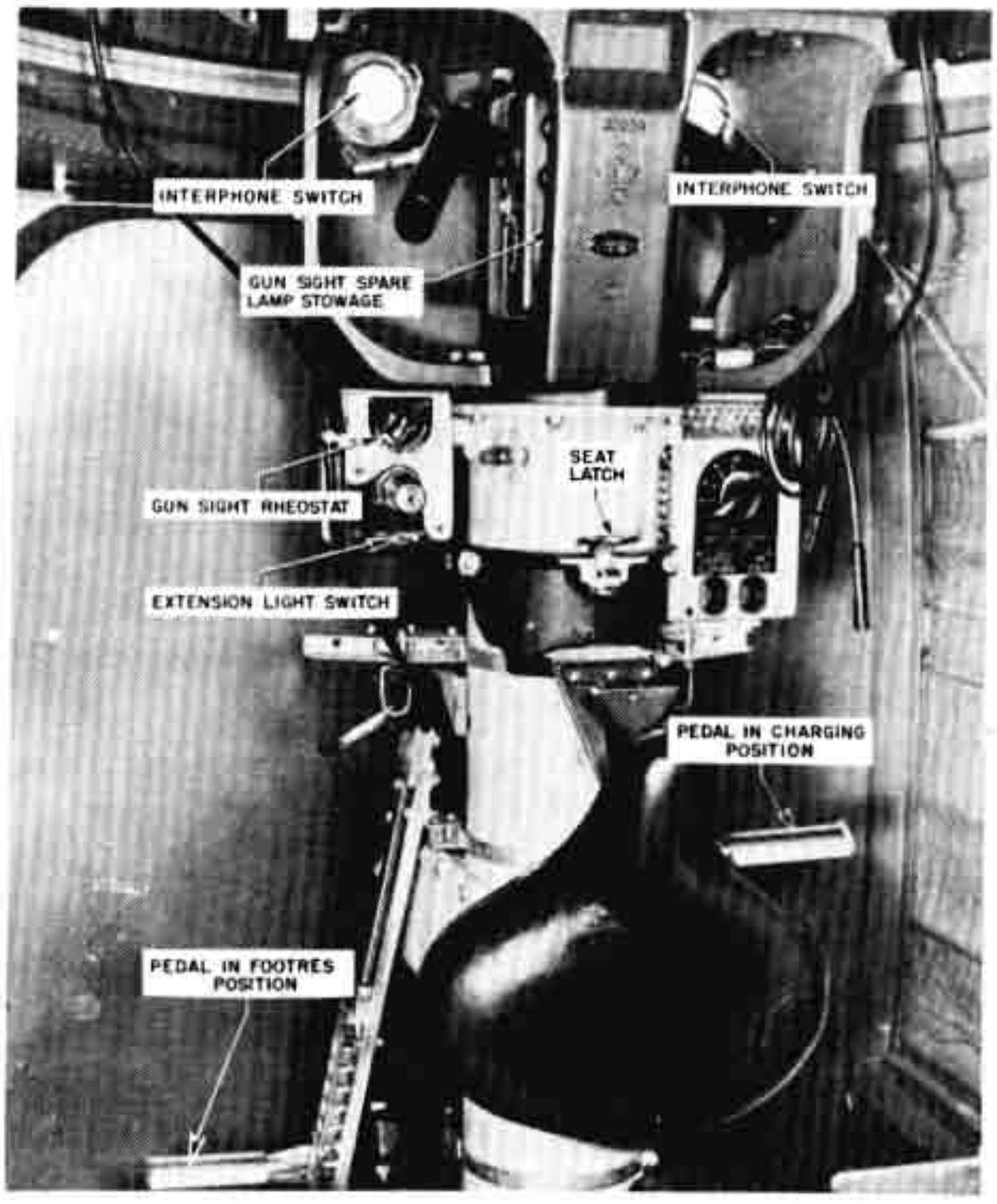


Figure 43—Upper Turret

speed proportionate to the degree of control handle rotation from the neutral position. For high-speed rotation of the turret, depress either high-speed switch button on the upper end of either control handle with the thumb. The speed of turret rotation with high-speed switch button depressed is proportional to the degree of rotation of the control handles from their neutral position. The turret may be rotated continuously in azimuth provided the guns are elevated sufficiently to clear the fuselage forward of the turret; if they are not, the turret will stop when the guns are at the sides of the fulesage.

3. The swing of the guns in elevation follows the up and down swing of the control handles. The guns will move in elevation in the same relative direction as the handles at a speed proportional to the degree of movement of the control handles from their neutral position. For high-speed elevation of guns, depress either high-speed switch button on upper end of control handles. The speed of gun elevation with high-speed switch button depressed is proportional to the degree of rotation of control handles from their neutral position. The guns swing from horizontal to almost straight up, except in the forward area over the fuselage.

4. Looking through the sight, train guns on target by means of master control handles. The dot in the center of the reference circle indicates the point on which the guns are trained.

5. To fire guns, depress trigger firing switch on front of either control handle.

6. The microphone switch buttons are located above and forward of the control handles.

7. When the turret is not in use, return guns to a horizontal straight aft position and turn off turret main power switch on resistor box at left side of fuselage adjacent to upper turret.

b. PHOTOGRAPHIC EQUIPMENT.

(1) DESCRIPTION.

(a) GENERAL.—The photography station is in the fuselage rear section. Vertical photographs are made through a camera opening in the fuselage floor. A vertical viewfinder mounting plate and opening are provided in the fuselage floor just aft the camera opening. A window at each side of the fuselage provides for taking oblique photographs.

(b) CAMERA SUPPORT.—The camera support is located above the camera opening and is mounted on four spring-loaded support tubes. The support lowers to the operating position.

(c) CAMERA POWER AND CONTROL PROVISIONS.—The camera power junction box is on the left side of the compartment, convenient to the operator. The panel of the box contains a camera power socket, an intervalometer socket, a camera heater socket, and a camera power switch. A vacuum valve, a suction gage, and a regulator to control the vacuum pressure to the camera back are mounted on the left of the box. Suction holds the film flat to the camera back. When the intervalometer is used, it is placed on a bracket mounted to the right of the junction box. The bracket will accommodate either the type B-3 or B-4 intervalometer. The intervalometer operates the camera at whatever time interval is set on its dial, and flashes a warning light 3 seconds before each exposure so that the operator will have time to level the camera.

(d) CAMERA MOUNT.—A camera mount for the particular camera to be used may be installed on the camera support. Two accessory camera brackets may be attached to the regular camera support assembly to accommodate K-17 cameras with 6-inch lens cones, and T-5 tactical mapping cameras. These brackets are stowed by means of four wing nuts, to the right side of the camera operator's compartment, forward and above the camera support assembly. A bracket at the operator's right provides stowage for a K-20 hand-held camera.

(2) OPERATION.—Since photographic section personnel normally install and operate all photographic equipment used on B-25 Series Airplanes, only the instructions necessary for the operation of the photographic installations permanently attached to the airplane are included.

(a) CAMERA OPENING COVER.—The camera opening cover must be removed before camera is lowered to operating position. To remove cover, loosen knurled nut, and hinge it down, then pull up cover. To replace cover, reverse the above procedure, making sure that cover is positioned correctly.

(b) CAMERA SUPPORT.

1. To lower camera support, press red safety catch plunger on top of lock control handle, located at left rear corner of the support, and turn handle clockwise. Push support down, overcoming the spring load of the support tubes, until it is in the operating position; then turn lock control handle counterclockwise to secure support in operating position.

2. To return support to up position, reverse the above procedure, making sure that the support rises slowly to avoid jarring the camera.

WARNING

Do not raise camera support from operating position to up position when inner door of the rear entrance hatch is in its stowed position, as this door interferes with the travel of the camera support, and damage to both may result.

(c) CAMERA MOUNT.—Position mount so that the bolts beneath the corners of the mount will go into the keyhole slots provided for them at the top of the camera support frame. Push mount forward to lock it in position. To remove mount, depress spring-loaded catch lock just aft of each of the two rear keyhole slots, slide mount back, and lift it off the frame. The mount

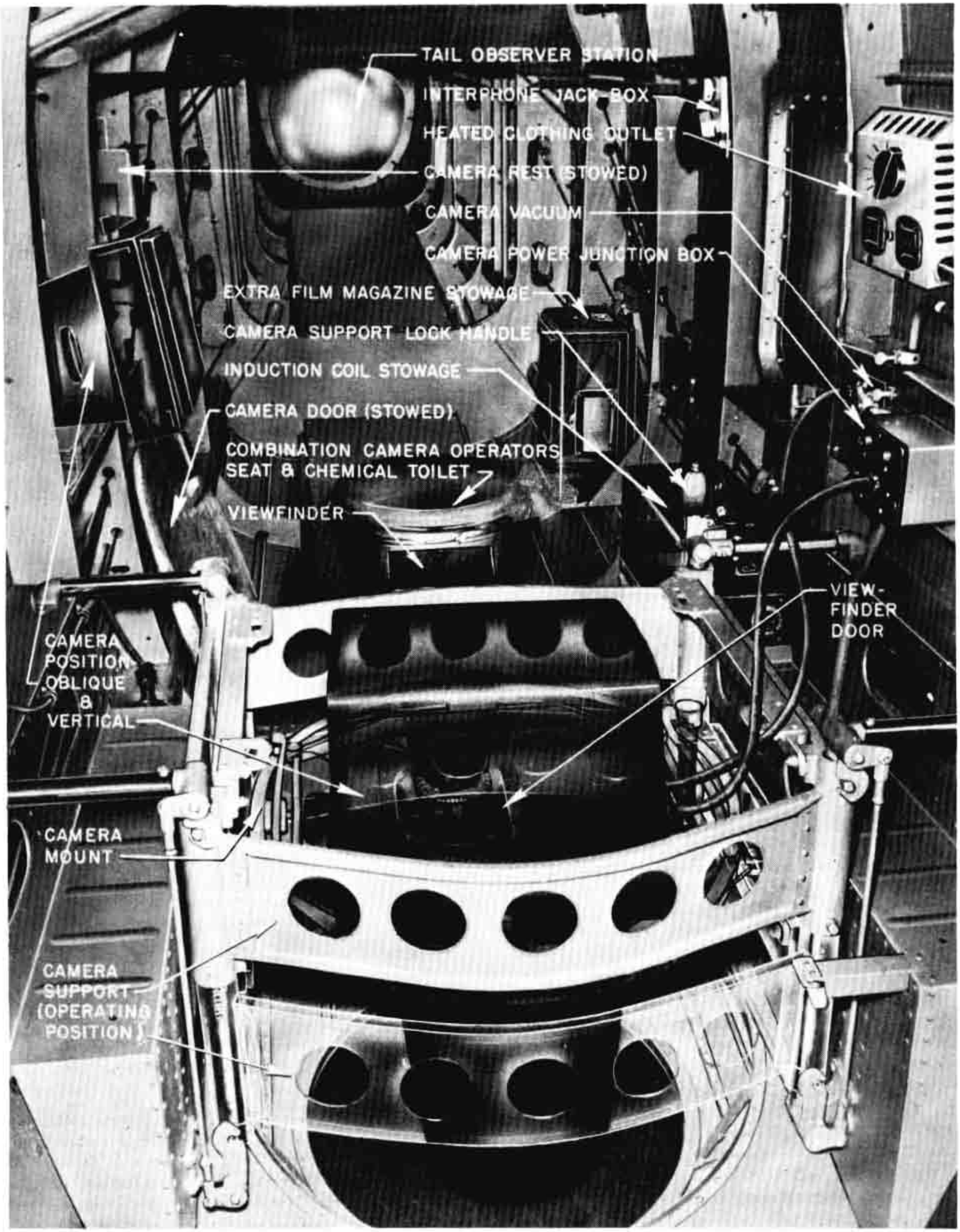


Figure 44—Photography Station

acts as a gimbal ring for leveling the camera during flight. The camera is oriented by means of a horizontal vernier scale on the mount.

(d) VIEWFINDER.—To install viewfinder, insert the bolts projecting from the bottom of the viewfinder into the keyhole slots provided in the viewfinder lock plate, and turn viewfinder clockwise to locked position. To remove viewfinder, reverse the procedure.

(e) VIEWFINDER DOOR.—To open viewfinder door, push down on door handle and turn it 180 degrees in either direction. At that point a spring in the door hinge will raise the door slightly and lock it in the "OPEN" position.

(f) OBLIQUE PHOTOGRAPHY.—To make oblique photographs through either side window proceed as follows:

1. Open window to be used. Pull up on the T-handle at the bottom of window, swing window inboard and up, and fasten the T-handle to hook on compartment ceiling.

CAUTION

To prevent injury to personnel, stow the hooks in ceiling clips when not in use.

2. Remove the camera rest from its stowage bracket, and install it on the window sill by means of the attached Dzus fasteners.

3. Attach the proper fittings to the camera, and position it on the camera rest.

(g) POTOELECTRIC TRIIPER. — When using the K-19 nightphotography camera, install a photoelectric shutter tripping unit in the viewfinder opening. Since the lower part of the unit projects beyond the fuselage, it is necessary to open the viewfinder door before installing the unit. Installation and removal are the same as for the viewfinder. The unit must be oriented so that the photo-cell opening faces aft. In operation, flash bombs are dropped from the airplane to provide sufficient light for the exposure. The photoelectric unit is energized by the light flash and trips the camera shutter at the peak of the illumination.

7. OXYGEN SYSTEM (EARLY AIRPLANES).

a. DESCRIPTION.

(1) GENERAL.—The oxygen system is of the low-pressure type, operating at an average starting pressure of 365 pounds per square inch.

(2) CYLINDERS.—Three G-1 low-pressure oxygen cylinders are installed in each nacelle, two at the front and one at the rear.

(3) REGULATORS.—The location of the eight A-9A low-pressure regulators is shown in figure 45. A pressure gage in each regulator indicates the pressure of the entire system.

(4) MASKS.—Type A-8 oxygen masks are to be used with this system. This is an oral-nasal mask which permits breathing through either the mouth or the nose and requires no adjustment for altitude.

b. OPERATION.

(1) Slip hose from oxygen mask over outlet tube on regulator. The outlet tube of the upper turret gunner's regulator is located on the upper turret support column.

(2) Adjust oxygen flow by turning knob on regulator. The dial on the face of the indicator shows oxygen flow in thousands of feet altitude.

(3) The small valve at the bottom of the rebreather bag on the oxygen system is used to drain off any water which collects in the bag.

8. OXYGEN SYSTEM (LATER AIRPLANES).

a. DESCRIPTION.

(1) Two portable low-pressure oxygen units are stowed behind the pilot's seat, and another is located in the forward left corner of the navigator's compartment.

(2) CYLINDER.—A type F-1 low-pressure oxygen cylinder of the externally reinforced type is used. The other parts of the unit are mounted on the cylinder.

(3) FILLER VALVE.—A filler valve provides a means of filling the unit, permitting the oxygen to enter the system but preventing the flow from reversing. The valve prevents oxygen from escaping through the filler opening under a pressure range of from 10 to 450 pounds per square inch.

(4) REGULATOR.—A type AN-R-5 demand regulator automatically controls the flow and dilution of the oxygen. As the user inhales, a diaphragm collapses and opens a valve which permits oxygen to flow through the regulator, where it mixes with free air in an amount governed by a belows-type valve in accordance with the barometic pressure. The oxygen is thus diluted by free air, in inverse proportion to the altitude, in order to conserve the supply. A control enables the user to close the air intake port and render the automatic mixing mechanism inoperative; pure oxygen then flows to the mask as required by the inhalabtion. An emergency valve on the unit allows the oxygen to bypass the regulator; the valve is controlled by a red knob. The type A-12 regulator which may also be used is similar in design to the AN-R-5, and contains all of the above-mentioned features.

(5) PRESSURE GAGE.—A gage indicates the oxygen supply by denoting the pressure within the cylinder. The dial is calibrated to show pounds per square inch pressure in 50-pound graduations from 0 to 500.

(6) MASK TUBE.—Low-pressure tube assembly conducts the oxygen mixture from the regulator to the mask intake tube. The mask end is provided with a jaw-type stowage clamp. The other end is clamped to the regulator adjustable elbow.

(7) MASK.—The portable unit is designed for use with A-9, A-10, or A-10-A type oxygen masks. A correctly fitted mask of the proper type is extremely important.

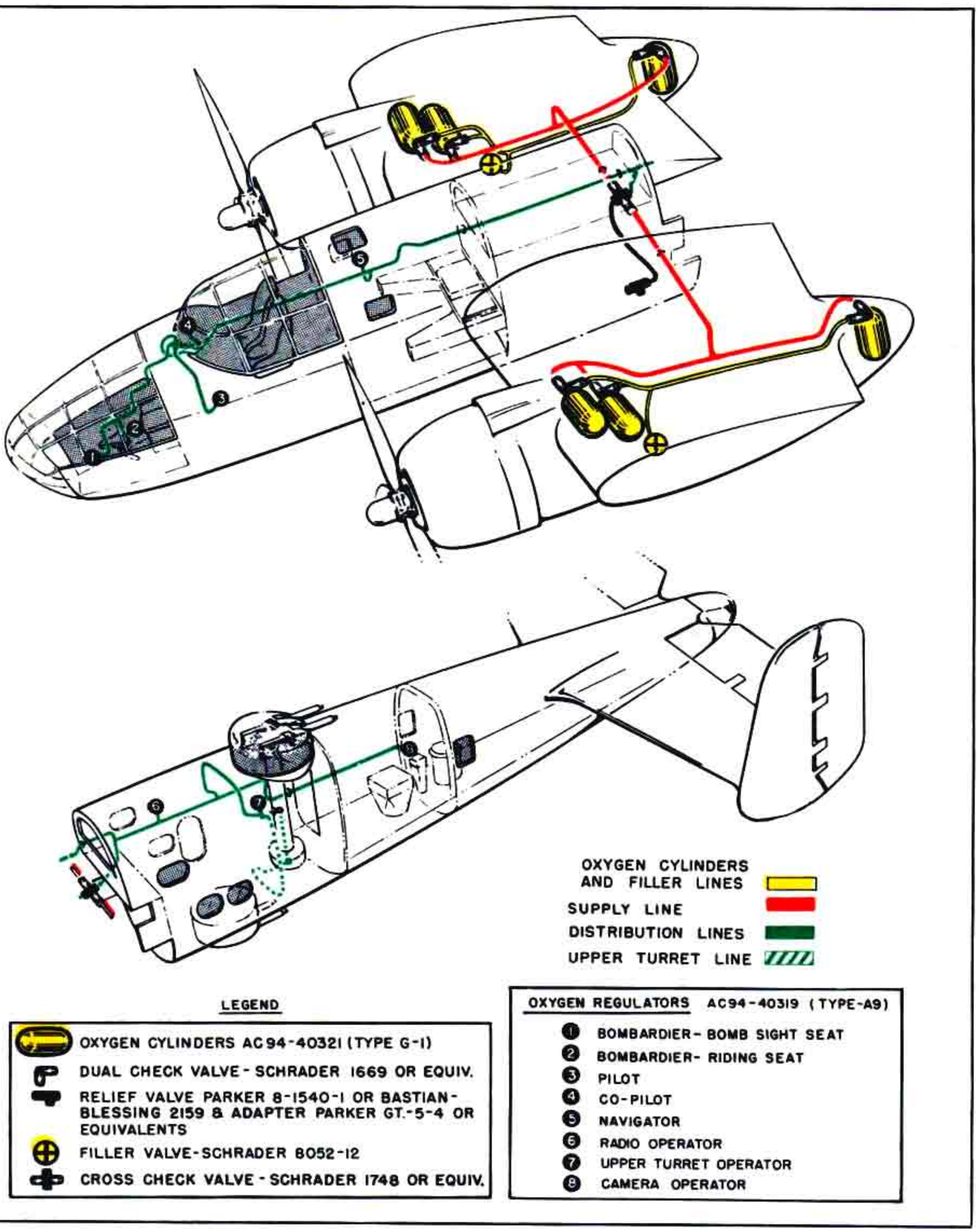


Figure 45—Oxygen System

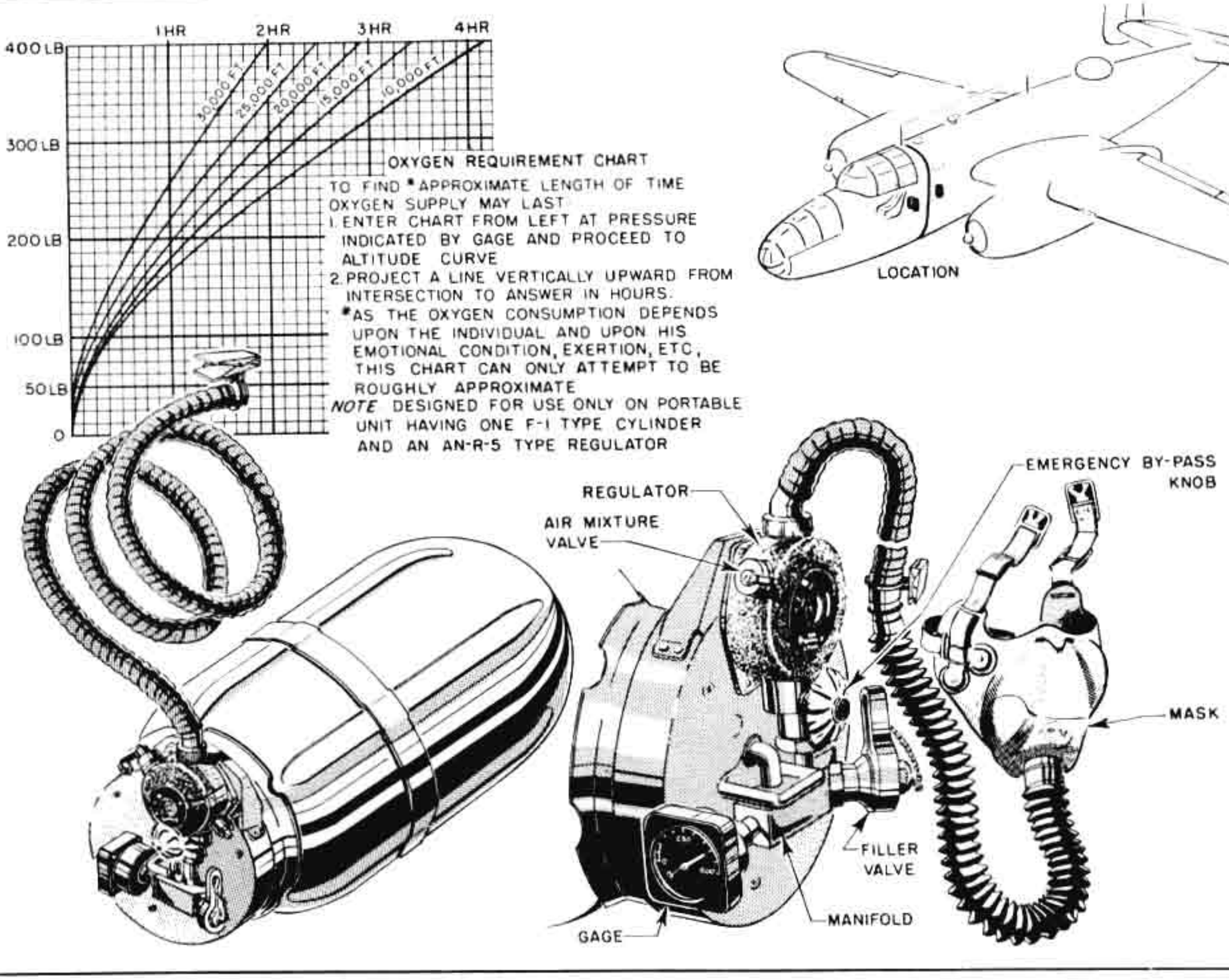


Figure 46—Portable Oxygen Unit

b. OPERATING INSTRUCTIONS.—Normal operation of the portable oxygen system is automatic. If the mask is correctly fitted and the system is tight and in proper condition, the user's breathing will set the system in operation and release the right mixture of oxygen for the altitude at which the unit is being operated. If the mixture valve does not function properly, it may be turned "OFF" by turning the thumb lever on the regulator. This will allow pure oxygen to flow to the mask as required by the inhalation of the user. If failure of other parts of the regulator is suspected, the entire regulator mechanism may be bypassed by turning the red emergency knob in a counterclockwise direction. However, for normal operation, the automatic mixture valve must be turned "ON" and the emergency bypass knob turned "OFF" to conserve the oxygen supply.

WARNING

Before taking off, flying personnel should make sure that sufficient oxygen is provided for the projected flight and that the masks are of the correct type and fit. It is also important that the entire system be free from oil and grease at all times. If oil or grease comes in contact with any part of the equipment, it should be wiped off immediately. Failure to do this may result in an explosion.

9. MISCELLANEOUS EQUIPMENT.

a. INTERPHONE EQUIPMENT.

(1) DESCRIPTION.—The interphone equipment, RC-36, includes an amplifier, a dynamotor, one jack box for each interphone station, and one microphone (throat type) for each crew member. Some airplanes carry one low impedance head set for each crew mmber. A low impedance adapter is installed at each interphone station. The pilot's interphone jack box is mounted on the left side of the pilot's compartment just aft the instrument panel. The copilot's jack box is located on the right side of the pilot's compartment, below the window. The navigator's jack box is on the left side of the navigator's compartment, below the window. The bombardier's jack box is on the

right side of the bombardier's compartment. The radio operator's jack box is mounted below and aft the liaison receiver. The upper turret operator's jack box is on the left side of the airplane, below the upper longeron. The camera operator's jack box is installed at the left side of the camera. The tail observer's jack box is located in the tail section. The radio operator must be able to use the interphone system from two positions, since he also operates the lower turret guns. For his use while operating the liaison equipment, a microphone switch cord is provided, and a jack box is located immediately aft the liaison receiver. While he is acting as lower turret gunner, his throat microphone is connected to the jack box by extension cables which incorporate a push-button switch located in the left-hand steady handle of the turret. At the upper turret gunner's station, a four-conductor shielded cable connects to plugs at the jack box and extends downward to a plug on the upper turret junction box. The microphone and head set circuits are carried from slip rings in the base of the turret up through the column to a press-to-talk push-button switch on the right side of the turret. The gunner's throat microphone extension cord and head set extension cord connect to a terminal block located within the turret mechanism housing.

(2) OPERATION.—The interphone jack box has five selective positions marked on the face of the box. Each position is used as follows:

(a) Position 1 marked "COMP." In this position the audio output of the radio compass only will be heard.

(b) Position 2 marked "LIAISON." In this position the receiver output will be heard; however, voice input over the liaison transmitter can be made from only three interphone stations (one on each side of the pilot's compartment and one in radio compartment). The remaining interphone stations are not wired to provide voice modulation of the liaison transmitter.

(c) Position 3 marked "COMMAND." In this position the command receiver output and sidetone of the command transmitter will be heard, and the microphone push-to-talk switch operates the command transmit-receiver relays. The microphone will modulate the command transmitter when the push-to-talk switch is closed and the transmitter control box is in the "VOICE" position.

NOTE

In the above three positions, a limited control over the volume can be had by turning the increase-output knob.

(d) Position 4 marked "INTER." All jack boxes turned to this position provide an intercommunication system between crew members. The microphone is connected to the input of the interphone amplifier and the headphones to the output of the same amplifier. The volume control is not effective in this position.

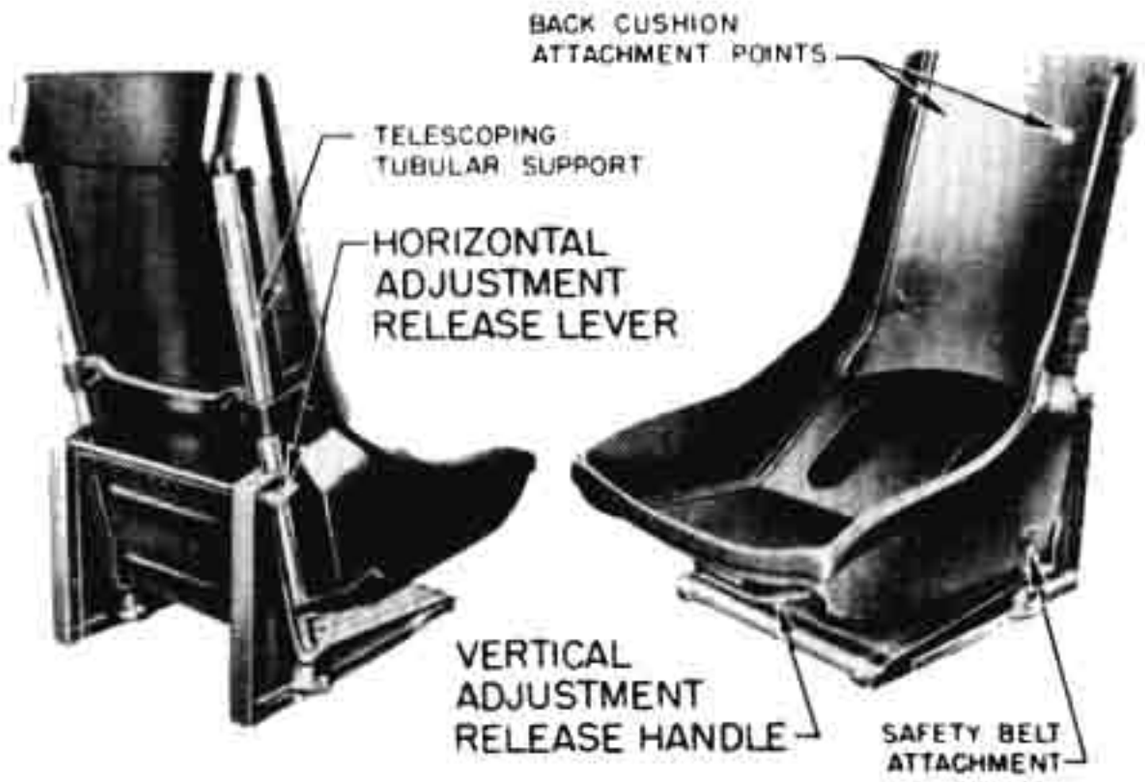


Figure 47—Pilot's Seat

(e) Position 5 marked "CALL." This is an emergency call position in which all positions of all jack boxes are placed in parallel across the output of the interphone amplifier. Should an emergency arise in which a crew member wishes to call an interphone station in use, he may do so by switching his jack box to the "CALL" position. The microphone is connected to the input of the interphone amplifier. This position is effective at all interphone stations. The handle must be held in the "CALL" position as it is spring-loaded to return to the "INTER" position.

b. SEATS.—The pilot's and copilot's seats are conventional and may be adjusted both horizontally and vertically. The bombardier is provided with an adjustable motorcycle-type bomb sight seat and a folding riding seat. The bombsight seat is removable and may be stowed by means of bracket and strap provided at right side of riding seat. The navigator has a folding stool for chart-board work and the chart board, when folded back, becomes the navigator's riding seat. Retractable footrests are provided for use in conjunction with the navigator's riding seat. A folding seat is also used by the radio operator and tow target operator. Seats and rests are a part of the gun turrets.

c. SAFETY BELT.—Each seat, except bombsight and camera operator's seat and navigator's chart-board stool, is provided with a safety belt. On later airplanes, a safety belt is provided on the camera operator's seat.

d. LAVATORY EQUIPMENT.—The chemical toilet is an integral part of the camera operator's seat, located in the rear of the fuselage. On later airplanes the chemical toilet has been removed. The relief tube for the bombardier, pilot, copilot, and navigator is located on the right side of the navigator's riding seat. The relief tube for the crew members aft of the bomb bay is below the radio operator's table.

e. DRINKING WATER CONTAINERS.—A drinking water container and a cup holder are at the left

side of the navigator's compartment and at the right side of the radio operator's compartment.

f. BLACKOUT CURTAINS.—On late airplanes, waterproofed, olive-drab blackout curtains are provided as follows: one for each of the two windows in the navigator's compartment; one for the navigator's astro dome; one for each of the windows in the radio compartment. The curtains are readily attachable or detachable by means of snap fasteners around the edges.

g. TOW TARGET.—Provisions are made in the bomb bay for the installation of tow target equipment.

h. HEATED CLOTHING.

(1) DESCRIPTION.—Heated clothing outlets are provided for the connection of electrically heated clothing to the airplane's electrical system. A type Q-1A rheostat is installed at each crew station. The rheostat dial is graduated in 25 heat control divisions, the lowest of which is used to turn the power "OFF." Clothing designed for operation on 24 volts carries plugs which permit connection only to the proper systems. Clothing suitable for use with these airplanes is blue in color. The external extension wires are brown.

(2) OPERATION.—Plug the flying suit into the "HEATED CLOTHING" outlet of the rheostat unit, and place the dial at the lowest setting required for comfort. Avoid "riding hot," as perspiration caused by excessive heat at medium outside temperatures produces a chilling effect when lower temperatures are reached. The proper amount of energy is being used when the wearer is not conscious of external heat, with the possible exception of the abdomen and the back of the hands.

APPENDIX I

GLOSSARY OF NOMENCLATURE

(U. S. A.-BRITISH)

American Terminology	*British Terminology*
1. GLOSSARY.	
1. Accumulator	Pressure Reservoir
2. Air Filter	Air Cleaner
3. Airfoil	Aerofoil
4. Airplane	Aeroplane
5. Antenna	Aerial
6. Battery	Accumulator
7. Carburetor	Carburettor
8. Cockpit Enclosure	Cockpit Hood
9. Control Stick	Control Column
10. Empennage	Tail Unit
11. Engine (Power Plant)	Aero-Engine
12. Fire Wall	Fireproof Bulkhead
13. Horizontal Stabilizer	Tail Plane
14. Indicated Air Speed	Air-Speed-Indicator Reading
15. Land	Alight
16. Landing Gear	Undercarriage
17. Left	Port
18. Left Wing	Port Main Plane
19. Lines	Pipes
20. Manifold Pressure	Boost
21. Mooring Rings	Picketing Rings
22. Radio	Wireless
23. Radio Mast	Rod Aerial
24. Right	Starboard
25. Right Wing	Starboard Main Plane
26. Shock Strut	Oleo Leg
27. Signal Flares	Signal Star
28. Surface Control Lock	Locking Gear
29. Surface Controls	Flying Controls
30. Vertical Stabilizer	Fin
31. Windshield	Windscreen
32. Wing	Main Plane
33. Wing Tips	Plane Tips

2. CONVERSION TABLES.

The following general table of conversions may be used where calculations are necessary:

Multiply	*By*	*To Obtain*
U.S. Gallons (gal.)	0.833	(Imp. gal.) Imperial Gallons
U.S. Gallons	3.785	(l) Liters
Miles per hour (MPH)	1.609	(KmPH) Kilometers per Hour
Miles per hour	0.8684	Knots
Miles	1.609	(km) Kilometers
Miles	0.8684	Nautical Miles
Feet (ft)	0.3048	(m) Meters
Inches (in.)	2.54	(cm) Centimeters
Pounds (lb)	0.4536	(kg) Kilograms
Pounds per sq in. (lbs/sq in.)	0.0703	(kg/sq. cm) Kilograms per Square Centimeter
Inches of Mercury (in. Hg)	2.54	(cm Hg) Centimeters of Mercury
Horsepower (HP)	1.014	(MHP) Metric Horsepower
Degrees Centigrade (°C)+17.8	1.8	(°F) Degrees Fahrenheit

APPENDIX II
FLIGHT OPERATING CHARTS

1. FLIGHT PLANNING.

NOTE

Performance charts will be found on the aft side of the pilot's and copilot's armor plate.

The following outline may be used as a guide to assist personnel in the use of the FLIGHT OPERATION INSTRUCTION CHART for flight planning purposes.

a. If the flight plan calls for a continuous flight where the desired cruising power and air speed are reasonably constant after take-off and climb to 5000 feet, the fuel required and flight time may be computed as a "single section flight."

(1) Within the limits of the airplane, the fuel required and flying time for a given mission depend largely upon the speed desired. With all other factors remaining equal in an airplane, speed is obtained at a sacrifice of range, and range is obtained at a sacrifice of speed. The speed is usually determined after considering the urgency of the flight plotted against the range required. The time of take-off is adjusted so as to have the flight arrive at its destination at the predetermined time.

(2) Select the FLIGHT OPERATION INSTRUCTION CHART for the gross weight to be used at take-off. Locate the largest figure entered under gph (gallons per hour) in the column which is applicable to the flight on the lower half of the chart. Multiply this figure by the number or fraction of hours desired for reserve fuel. Add the resulting figure to the number of gallons set forth in footnote No. 1, and subtract the total from the amount of fuel in the airplane prior to starting of engine. The figure obtained as a result of this computation will represent the amount of gasoline available and applicable for flight planning purposes on the RANGE IN AIR MILES section of the FLIGHT OPERATION INSTRUCTION CHART.

(3) Select a figure in the fuel column equal to, or the next entry less than, the available amount of fuel in the airplane, as determined in paragraph 1. *a.* (2) preceding. Move horizontally to the right or left and select a figure equal to, or the next entry greater than, the air miles (with no wind) to be flown. Operating values contained in the column number in which this figure appears represent the highest cruising speed possible *at the range desired;* however, the airplane may be operated in accordance with values contained under OPERATING DATA in *any* column of a higher number, with the flight plan being completed at a sacrifice of speed but at an increase in fuel economy.

(4) Using the same column number selected by applications of instructions contained in paragraph 1. *a.* (3) preceding, determine the true air speed in the lower section of the chart under the subtitle OPERATING DATA. Divide the TAS into air miles to be flown and obtain the calculated flight duration in minutes, which can then be converted into hours and minutes and deducted from the desired arrival time at destination in order to obtain the take-off time (without consideration for wind). To allow for wind, use the above TAS as ground speed and calculate a new corrected ground speed with the aid of a flight calculator or by a navigator's triangle of velocities.

(5) The airplane and engine operating values listed below OPERATING DATA in any single numbered column are calculated to give constant miles per gallon at any altitude listed. Therefore, the airplane may be operated at any altitude and at the corresponding set of values given, so long as they are in the same column listing the range desired.

CAUTION

Ranges listed in column I are shown for the altitude which gives the least miles per gallon. The engine and airplane operating data listed under OPERATING DATA will give constant miles per gallon if operation is consistent with values set opposite the listed altitudes.

(6) The flight plan may be readily changed at any time en route, and the chart will show the balance of range at various cruising powers by following the INSTRUCTIONS FOR USING CHART printed on each page.

(7) Multiple charts are provided to give accurate data for operation at different gross weights, different external loads, and/or different combinations of engine use, such as single-engine operation. Extreme caution should be exercised to assure selection of the correct chart applicable to the specific operating condition.

b. If the original flight plan calls for a mission requiring changes in power, speed, gross load, or external load, in accordance with the titles shown at the top of each chart provided, the total flight should be broken down into a series of individual short flights, each computed as outlined in paragraph 1. *a.* in its entirety, and then added together to make up the total flight and its requirements.

SPEC. AN-M-8 Dec. 10, 1942 FORM ASC-510

AIRPLANE MODELS

B-25C & B-25D

NO EXTERNAL LOAD

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODELS

R-2600-13 OR

R-2600-29

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND MPH		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.	
			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.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
36,000	0		4600	5700	5200	6400	6700	8100	5300	6300	6000	7200	7600	9200	8000	9000	9000	10,500	11,500	13,000
36,000	20		3200	4000	3400	4300	4500	5600	3500	4300	4000	5000	5400	6600	5300	6100	6300	7,300	7,800	9,000
36,000	40		2000	2700	2100	2800	2800	3700	2100	2900	2600	3400	3500	4600	3900	4000	4200	5,000	5,100	6,100
32,000	0		3300	4200	3700	4700	4700	5900	3700	4600	4000	5000	5300	6600	5600	6300	5900	6,900	6,200	8,500
32,000	20		2200	2900	2500	3300	3200	4200	2500	3200	2800	3600	3400	4400	3700	4300	4000	4,900	5,000	6,000
32,000	40		1400	2000	1600	2300	2000	2800	1700	2200	1800	2400	2100	2900	2300	2800	2700	3,300	3,900	4,700
28,000	0		2300	3000	2500	3300	3000	4000	2500	3300	2700	3500	3200	4200	3500	4200	3700	4,500	4,800	5,800
28,000	20		1600	2200	1700	2400	2100	2900	1700	2400	1800	2500	2100	3000	2300	2900	2500	3,100	3,300	4,200
28,000	40		1000	1500	1100	1600	1300	2000	1100	1600	1200	1800	1400	2100	1500	2000	1800	2,100	2,000	2,800

NOTE: INCREASE DISTANCE 5 % FOR EACH 10°C ABOVE 0°C I 5 % FOR EACH 20°F ABOVE 32°FI

ENGINE LIMITS FOR TAKE-OFF 2600 RPM & 44.0 IN. HG

CLIMB DATA

COMBAT MISSIONS USE 2400 RPM & (LOW) -38 (HI) -41 IN. HG

FERRY MISSIONS USE 2100 RPM & 31 IN. HG

GROSS WEIGHT IN LBS.	TYPE OF CLIMB	S. L. TO 3000 FT. ALT.				6000 FT. ALT.				9000 FT. ALT.				12,000 FT. ALT.				15,000 FT. ALT.				BLOWER CHANGE
		BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U. S.	BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U. S.	BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.	BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.	
36,000	COMBAT	155		1010	3.0	155		930	6.0	85	155		690	9.5	105	155		610	14.5	130	150		440	20.0	165	10,000
	FERRY	155		450	6.5	155		420	13.5	95	155		330	21.0	125	155		170	33.0	165	150		70	59.0	250	13,000
32,000	COMBAT	155		1300	2.3	155		1220	4.6	75	155		960	7.5	90	155		870	10.5	110	150		710	14.5	130	10,000
	FERRY	155		680	4.5	155		650	9.0	80	155		550	13.5	100	155		380	20.0	120	150		290	30.0	150	13,000
28,000	COMBAT	155		1660	1.8	155		1570	3.6	70	155		1280	5.7	80	155		1190	8.5	95	150		1020	11.0	110	10,000
	FERRY	155		960	3.1	155		930	6.3	70	155		810	9.5	85	155		620	14.0	100	150		520	19.5	120	13,000

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

LANDING DISTANCE (IN FEET)

GROSS WEIGHT IN LBS.	BEST I. A. S. APPROACH MPH		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.	
			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.	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
34,000	120		3900	1900	4100	2100	4400	2300	4200	2200	4400	2400	4800	2600	8300	7900	10,200	8700	11,100	8800
31,000	120		3600	1700	3800	1900	4100	2100	3900	2000	4100	2200	4400	2400	8700	6800	9,400	7500	10,200	8200
25,000	110		3100	1400	3300	1500	3500	1700	3000	1600	3500	1800	3800	1900	7200	5600	7,800	6000	8,400	6600

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

REMARKS

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

NEW FIGURES HAVE NOT BEEN FLIGHT CHECKED.

Figure 48—Take-Off, Climb, and Landing Chart—No External Load

SPEC. AN-H-8 Dec. 18, 1943 FORM ASC-310

AIRPLANE MODELS

B-25C & B-25D

WITH TORPEDO OR 8 WING BOMBS

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODELS

R-2600-13 OR

R-2600-29

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND MPH		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.	
			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.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.*
36,000	0		4600	5700	5200	6400	6700	8100	5300	6300	6000	7200	7600	9200	8000	9000	9300	10,500	11,500	13,000
36,000	20		3200	4000	3400	4300	4500	5600	3500	4300	4000	5000	5400	6600	5300	6100	6300	7,300	7,800	9,000
36,000	40		2000	2700	2100	2800	2800	3700	2100	2900	2600	3400	3500	4600	3400	4000	4200	5,000	5,100	6,100
32,000	0		3300	4200	3700	4700	4700	5900	3700	4600	4000	5000	5300	6600	5500	6300	5900	6,800	6,200	9,500
32,000	20		2200	2900	2500	3300	3200	4200	2500	3200	2800	3600	3400	4400	3700	4300	4000	4,800	5,800	6,800
32,000	40		1400	2000	1600	2300	2000	2800	1700	2200	1800	2400	2100	2900	2300	2800	2700	3,300	3,800	4,700
28,000	0		2300	3000	2500	3300	3000	4000	2500	3300	2700	3500	3200	4200	3500	4200	3700	4,500	4,800	5,800
28,000	20		1600	2200	1700	2400	2100	2900	1700	2400	1800	2500	2100	3000	2300	2900	2500	3,100	3,300	4,200
28,000	40		1000	1500	1100	1600	1300	2000	1100	1600	1200	1800	1400	2100	1500	2000	1600	2,100	2,000	2,600

NOTE: INCREASE DISTANCE 5 % FOR EACH 10°C ABOVE 0°C (5 % FOR EACH 20°F ABOVE 32°F)

ENGINE LIMITS FOR TAKE-OFF 2600 RPM & 44.0 IN. HG

CLIMB DATA

COMBAT MISSIONS USE 2400 RPM & (LOW) -38 (HI) -81 IN. HG

FERRY MISSIONS USE 2100 RPM & 31 IN. HG

GROSS WEIGHT IN LBS.	TYPE OF CLIMB	S. L. TO 3000 FT. ALT.				6000 FT. ALT.				9000 FT. ALT.				12,000 FT. ALT.				15,000 FT. ALT.				BLOWER CHANGE
		BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.		BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.		BEST I.A.S. MPH		FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.		
36,000	COMBAT	155		920	3.2	155		830	6.5	85		155		600	11.0	110		155		500	16.5	140		150		350	23.0	180		10,000
	FERRY	155		380	7.5	155		330	16.0	105		155		230	26.0	140		155		70	47.0	210								13,000
32,000	COMBAT	155		1200	2.5	155		1110	5.0	80		155		850	8.0	95		155		750	12.0	120		150		600	16.5	150		10,000
	FERRY	155		580	5.0	155		540	10.5	85		155		430	16.5	110		155		260	25.0	140		150		170	40.0	190		13,000
28,000	COMBAT	155		1530	1.9	155		1440	3.9	70		155		1150	6.3	85		155		1050	9.0	100		150		880	12.0	120		10,000
	FERRY	155		840	3.5	155		800	7.0	75		155		680	11.0	90		155		490	16.0	110		150		390	23.0	130		13,000

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

LANDING DISTANCE (IN FEET)

GROSS WEIGHT IN LBS.	BEST I. A. S. APPROACH MPH		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.	
			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.	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
34,000	120		3900	1900	4100	2100	4400	2300	4200	2200	4400	2400	4800	2600	9300	7400	10,200	8200	11,100	8900
31,000	120		3600	1700	3800	1900	4100	2100	3900	2000	4100	2200	4400	2400	8700	6800	9,400	7500	10,200	8200
25,000	110		3100	1400	3300	1500	3500	1700	3000	1600	3500	1800	3800	1900	7200	5500	7,800	6000	8,400	6600

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

REMARKS

LEGEND
I.A.S.: Indicated Air Speed
M.P.H.: Miles Per Hour
S.L.: Sea Level
U.S.: U. S. Gallons
IMP.: Imperial Gallons
NOTE: All Distances are Average
RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

Figure 49—Take-Off, Climb, and Landing Chart—Torpedo or Eight Wing Bombs

SPEC. AN-N-8 Dec. 15, 1942 FORM ASC-510

AIRPLANE MODELS

B-25C & B-25D

WITH TORPEDO AND 8 WING BOMBS

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODELS

R-2600-13 OR

R-2600-29

TAKE-OFF DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	HEAD WIND MPH		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.	
			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.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.	GROUND RUN	TO CLEAR 50' OBJ.
36,000	0		4600	5700	5200	6400	6700	8100	5300	6300	6000	7200	7600	9200	8000	9000	9300	10,500	11,500	13,000
36,000	20		3200	4000	3400	4300	4500	5600	3500	4300	4000	5000	5400	6600	5300	6100	6300	7,300	7,800	9,000
36,000	40		2000	2700	2100	2800	2800	3700	2100	2900	2600	3400	3500	4600	3400	4000	4200	5,000	5,100	6,100
32,000	0		3300	4200	3700	4700	4700	5900	3700	4600	4000	5000	5300	6600	5500	6300	5900	6,800	8,200	9,500
32,000	20		2200	2900	2500	3300	3200	4200	2500	3200	2800	3600	3400	4400	3700	4300	4000	4,800	5,800	6,800
32,000	40		1400	2000	1600	2300	2000	2800	1700	2200	1800	2400	2100	2900	2300	2800	2700	3,300	3,900	4,700
28,000	0		2300	3000	2500	3300	3000	4000	2500	3300	2700	3500	3200	4200	3500	4200	3700	4,500	4,800	5,800
28,000	20		1600	2200	1700	2400	2100	2900	1700	2400	1800	2500	2100	3000	2300	2900	2500	3,100	3,300	4,200
28,000	40		1000	1500	1100	1600	1300	2000	1100	1600	1200	1800	1400	2100	1500	2000	1600	2,100	2,000	2,600

NOTE: INCREASE DISTANCE 5% FOR EACH 10°C ABOVE 0°C (5% FOR EACH 20°F ABOVE 32°F)

ENGINE LIMITS FOR TAKE-OFF 2600 RPM & 44.0 IN. HG

CLIMB DATA

COMBAT MISSIONS USE 2400 RPM & (LOW) -38 (HI) -41 IN. HG

FERRY MISSIONS USE 2100 RPM & 31 IN. HG

GROSS WEIGHT IN LBS.	TYPE OF CLIMB	S. L. TO 3000 FT. ALT.				6000 FT. ALT.				9000 FT. ALT.				12,000 FT. ALT.				15,000 FT. ALT.				BLOWER CHANGE
		BEST I.A.S. MPH	FT/MIN	TIME FROM S. L.		BEST I.A.S. MPH	FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U. S.	BEST I.A.S. MPH	FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U. S.	BEST I.A.S. MPH	FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.	BEST I.A.S. MPH	FT/MIN	TIME FROM S. L.	FUEL FROM S.L. U.S.	
36,000	COMBAT	155	830	3.5		155	740	7.5	90	155	500	12.0	120	155	400	19.0	160	150	280	28.0	210	10,000
	FERRY	155	280	9.5		155	230	21.0	125	155	130	36.0	180									13,000
32,000	COMBAT	155	1090	2.7		155	1000	5.5	80	155	730	9.0	100	155	630	13.5	125	150	480	19.0	160	10,000
	FERRY	155	470	6.1		155	430	12.5	95	155	320	20.5	120	155	140	34.0	170	150	50	67.0	280	13,000
28,000	COMBAT	155	1410	2.1		155	1310	4.3	75	155	1010	7.0	90	155	910	10.0	110	150	750	14.0	130	10,000
	FERRY	155	720	4.1		155	670	8.4	80	155	550	13.0	100	155	350	20.0	120	150	260	30.0	150	13,000

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

LANDING DISTANCE (IN FEET)

GROSS WEIGHT IN LBS.	BEST I. A. S. APPROACH MPH	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.	
		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.	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
34,000	120	3900	1900	4100	2100	4400	2300	4200	2200	4400	2400	4800	2600	9300	7400	10,200	8200	11,100	8900
31,000	120	3600	1700	3800	1900	4100	2100	3900	2000	4100	2200	4400	2400	8700	6800	9,400	7500	10,200	8200
25,000	110	3100	1400	3300	1500	3500	1700	3000	1600	3500	1800	3800	1900	7200	5500	7,800	6000	8,400	6600

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

REMARKS

LEGEND
I.A.S.: Indicated Air Speed
M.P.H.: Miles Per Hour
S.L.: Sea Level
U.S.: U. S. Gallons
IMP.: Imperial Gallons
NOTE: All Distances are Average
RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

Figure 50—Take-Off, Climb, and Landing Chart—Torpedo and Eight Wing Bombs

MODEL(S)

B-25C & B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 35,000 TO 32,000 POUNDS

EXTERNAL LOAD ITEMS

NONE

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		974	① 84 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						974		
750	*650*	890	970	*840*	1120	*970*	1350	*1170*	890	1510	*1320*
670	*580*	800	870	*760*	1010	*870*	1220	*1050*	800	1360	*1180*
590	*510*	700	760	*660*	880	*750*	1060	*920*	700	1190	*1040*
500	*440*	600	650	*570*	750	*650*	910	*790*	600	1030	*890*
420	*360*	500	540	*470*	630	*540*	760	*660*	500	860	*750*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	215	F.R.	F.T.	340	275	15000	2150	205	F.R.	34	250	260	2250	190	F.R.	F.T.	205	245	2100	180	C.L.	F.T.	145	230	15000						
2400	230	F.R.	F.T.	305	275	10000	2250	220	F.R.	F.T.	250	260	2100	210	F.R.	30	205	245	2050	200	C.L.	29	155	235	10000	2000	180	C.L.	28	135	215
2400	250	F.R.	38	340	275	5000	2150	225	F.R.	33	240	250	2050	210	F.R.	31	195	230	2050	205	C.L.	30	150	225	5000	1900	175	C.L.	28	120	195
2400	250	F.R.	38	315	255	S. L.	2150	230	F.R.	34	225	235	2050	210	F.R.	31	180	215	2000	205	C.L.	30	145	210	S. L.	1700	175	C.L.	29	110	175

NOTES

① ALLOW 84 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 34,000 LB. GROSS WT. WITH 890 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 84 GAL.) TO FLY 1250 STAT. AIRMILES AT 10,000 FT. ALT. MAINTAIN 2050 RPM AND 200 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 51—Flight Operation Instruction Chart—No External Load—35,000 to 32,000 Pounds

MODEL(S)

B-25C & B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT ORERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 33,000 TO 30,000 POUNDS

EXTERNAL LOAD ITEMS

NONE

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		1524	① 74 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT				①		1524		
1230	*1070*	1450	1660	*1440*	1960	*1700*	2280	*1980*	1450	2500	*2180*
1110	*960*	1300	1480	*1290*	1750	*1520*	2040	*1770*	1300	2250	*1950*
1020	*880*	1200	1370	*1190*	1620	*1410*	1890	*1640*	1200	2080	*1800*
930	*810*	1100	1260	*1090*	1480	*1290*	1730	*1500*	1100	1910	*1650*
850	*740*	1000	1140	*990*	1350	*1170*	1570	*1360*	1000	1730	*1500*
760	*660*	900	1030	*890*	1210	*1050*	1420	*1230*	900	1560	*1350*
680	*590*	800	910	*790*	1080	*930*	1260	*1090*	800	1380	*1200*
590	*510*	700	800	*690*	940	*820*	1100	*950*	700	1210	*1050*
510	*440*	600	680	*590*	810	*700*	940	*820*	600	1040	*900*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	185	F.R.	F.T.	260	255	20000	2250	180	F.R.	F.T.	215	250	2050	165	F.R.	F.T.	175	225							20000						
2400	220	F.R.	F.T.	340	280	15000	2150	205	F.R.	34	240	265	2200	195	F.R.	F.T.	190	250	2100	185	C.L.	F.T.	145	235	15000						
2400	235	F.R.	F.T.	305	275	10000	2200	225	F.R.	32	240	265	2050	205	F.R.	29	190	245	2050	200	C.L.	29	155	240	10000	1950	180	C.L.	27	125	215
2400	250	F.R.	38	340	280	5000	2100	225	F.R.	32	220	245	2050	210	F.R.	30	185	230	2000	205	C.L.	30	145	225	5000	1850	180	C.L.	28	115	195
2400	255	F.R.	38	315	260	S. L.	2100	225	F.R.	33	210	230	2050	210	F.R.	31	175	215	2000	205	C.L.	30	135	210	S. L.	1650	180	C.L.	29	105	180

NOTES

① ALLOW 74 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY

EXAMPLE

AT 32,000 LB. GROSS WT. WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 74 GAL.) TO FLY 1350 STAT. AIRMILES AT 10,000 FT. ALT. MAINTAIN 2050 RPM AND 200 MPH IND. AIRSPEED WITH MIXTURE SET Cruising Lean.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 52—Flight Operation Instruction Chart—No External Load—33,000 to 30,000 Pounds

MODEL(S)
B-25C & B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 30,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS

NONE

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		974	① 74 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						974		
750	640	900	940	820	1140	990	1470	1280	900	1680	1460
660	570	800	840	730	1010	880	1310	1140	800	1500	1300
580	500	700	730	630	890	770	1150	990	700	1310	1130
500	430	600	630	540	760	660	980	850	600	1120	970
410	360	500	520	450	630	550	820	710	500	930	810
330	290	400	420	360	510	440	650	570	400	750	650
250	210	300	310	270	380	330	490	420	300	560	480
160	140	200	210	180	250	220	330	280	200	370	320
80	70	100	100	90	120	110	160	140	100	180	160

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
2400	195	F.R.	F.T.	260	270	20000	2300	185	F.R.	F.T.	240	260	2150	180	F.R.	F.T.	200	250	1950	160	C.L.	F.T.	140	225	20000						
2400	225	F.R.	F.T.	340	285	15000	2200	215	F.R.	35	260	275	2250	205	F.R.	F.T.	205	260	2100	190	C.L.	F.T.	145	245	15000						
2400	240	F.R.	F.T.	305	280	10000	2250	230	F.R.	F.T.	260	275	2100	220	F.R.	30	205	260	2050	205	C.L.	29	145	240	10000	1850	175	C.L.	26	110	210
2400	255	F.R.	38	340	280	5000	2200	235	F.R.	33	250	260	2050	220	F.R.	31	190	240	2000	205	C.L.	29	135	225	5000	1700	175	C.L.	27	100	190
2400	255	F.R.	38	315	260	S. L.	2150	235	F.R.	34	230	240	2050	220	F.R.	31	175	225	1950	205	C.L.	29	125	210	S. L.	1500	170	C.L.	29	90	170

NOTES

① ALLOW 74 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY

EXAMPLE

AT 29,000 LB. GROSS WT. WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 74 GAL.) TO FLY 1400 STAT. AIRMILES AT 10,000 FT. ALT. MAINTAIN 2050 RPM AND 205 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 53—Flight Operation Instruction Chart—No External Load—30,000 to 26,000 Pounds

MODEL(S)

B-25C & B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 33,000 TO 30,000 POUNDS

EXTERNAL LOAD ITEMS

1 TORPEDO

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		1189	① 89 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						1189		
880	*760*	1100	1100	*950*	1310	*1140*	1580	*1370*	1100	1760	*1530*
800	*690*	1000	1000	*870*	1190	*1040*	1430	*1240*	1000	1600	*1390*
720	*620*	900	900	*780*	1070	*930*	1290	*1120*	900	1440	*1250*
640	*550*	800	800	*690*	950	*830*	1150	*990*	800	1280	*1110*
560	*480*	700	700	*600*	840	*720*	1000	*870*	700	1120	*970*
480	*410*	600	600	*520*	710	*620*	860	*740*	600	960	*840*

MAXIMUM CONTINUOUS						ALT. Feet	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT. Feet	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	205	F.R.	F.T.	340	260	15000	2200	195	F.R.	F.T.	265	250	2300	185	F.R.	F.T.	210	235	2100	170	C.L.	F.T.	145	215	15000						
2400	220	F.R.	F.T.	305	260	10000	2300	215	F.R.	F.T.	270	255	2100	195	F.R.	30	200	235	2050	190	C.L.	29	155	225	10000	2000	170	C.L.	27	130	200
2400	235	F.R.	38	340	260	5000	2200	220	F.R.	33	250	240	2050	200	F.R.	31	190	220	2000	195	C.L.	31	155	215	5000	1950	165	C.L.	28	125	185
2400	235	F.R.	38	315	240	S. L.	2150	220	F.R.	34	235	225	2050	200	F.R.	31	180	205	2000	195	C.L.	31	140	200	S. L.	1650	160	C.L.	29	105	165

NOTES

① ALLOW 89 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 32,000 LB. GROSS WT. WITH 1100 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 89 GAL.) TO FLY 1500 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 195 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 54—Flight Operation Instruction Chart—1 Torpedo—33,000 to 30,000 Pounds

MODEL(S)
B-25C & B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 30,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS
1 TORPEDO

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		670	① 70 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT					③	670		
470	410	600	600	520	720	620	900	780	600	1020	880
390	340	500	500	430	600	520	750	650	500	850	740
310	270	400	400	340	480	410	600	520	400	680	590
230	200	300	300	260	360	310	450	390	300	510	440
150	130	200	200	170	240	210	300	260	200	340	290
80	70	100	100	80	120	100	150	130	100	170	140

MAXIMUM CONTINUOUS						ALT. Feet	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT. Feet	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	210	F.R.	F.T.	340	265	15000	2200	200	F.R.	F.T.	255	255	2250	190	F.R.	F.T.	205	245	2100	180	C.L.	F.T.	150	230	15000						
2400	255	F.R.	F.T.	305	265	10000	2250	215	F.R.	F.T.	255	255	2100	200	F.R.	30	200	240	2050	195	C.L.	29	155	230	10000	1850	160	C.L.	26	115	190
2400	240	F.R.	38	340	265	5000	2150	220	F.R.	33	245	245	2050	205	F.R.	31	185	225	2000	195	C.L.	30	145	215	5000	1750	160	C.L.	27	105	175
2400	240	F.R.	38	315	250	S. L.	2150	220	F.R.	34	225	225	2050	205	F.R.	31	175	210	2000	195	C.L.	30	135	200	S. L.	1550	160	C.L.	29	95	160

NOTES

③ ALLOW 70 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY

EXAMPLE

AT 28,000 LB. GROSS WT. WITH 600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 70 GAL.) TO FLY 800 STAT. AIRMILES AT 5,000 FT. ALT. MAINTAIN 2,000 RPM AND 195 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 55—Flight Operation Instruction Chart—1 Torpedo—30,000 to 26,000 Pounds

MODEL(S)
B-25C AND B-25D

FLIGHT OPERATION INSTRUCTION CHART

EXTERNAL LOAD ITEMS
8 WING BOMBS OR
6 DEPTH CHARGES

ENGINE(S): R-2600-13 OR R-2600-29

CHART WEIGHT LIMITS: 36,000 TO 33,000 POUNDS

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		974	① 94 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						974		
680	*590*	880	830	*720*	1010	*880*			880	1250	*1080*
610	*530*	800	760	*660*	920	*800*			800	1130	*980*
540	*460*	700	660	*570*	800	*700*			700	990	*860*
460	*400*	600	570	*490*	690	*600*			600	850	*740*
380	*330*	500	470	*410*	570	*500*			500	710	*610*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	200	F.R.	F.T.	340	255	15000	2200	190	F.R.	34	250	240	2200	170	F.R.	F.T.	190	215							15000						
2400	215	F.R.	F.T.	305	255	10000	2250	210	F.R.	F.T.	260	250	2100	190	F.R.	30	195	225							10000	2050	175	C.L.	29	150	210
2400	235	F.R.	38	340	255	5000	2200	215	F.R.	33	250	235	2050	190	F.R.	31	185	210							5000	2000	175	C.L.	29	135	190
2400	235	F.R.	38	315	240	S. L.	2150	220	F.R.	34	240	225	2050	195	F.R.	31	175	200							S. L.	1900	170	C.L.	29	125	175

NOTES

① ALLOW 94 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 36,000 LB. GROSS WT. WITH 880 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 94 GAL.) TO FLY 1100 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 175 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 56—Flight Operation Instruction Chart—8 Wing Bombs—36,000 to 33,000 Pounds

MODEL(S)
B-25C AND B-25D

FLIGHT OPERATION INSTRUCTION CHART

EXTERNAL LOAD ITEMS
8 WING BOMBS OR
6 DEPTH CHARGES

ENGINE(S): R-2600-13 OR R-2600-29

CHART WEIGHT LIMITS: 33,000 TO 30,000 POUNDS

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		1189	① 89 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						1189		
880	*760*	1100	1100	*950*	1310	*1140*	1580	*1370*	1100	1760	*1530*
800	*690*	1000	1000	*870*	1190	*1040*	1430	*1240*	1000	1600	*1390*
720	*620*	900	900	*780*	1070	*930*	1290	*1120*	900	1440	*1250*
640	*550*	800	800	*690*	950	*830*	1150	*990*	800	1280	*1110*
560 480	*480* *410*	700 600	700 600	*600* *520*	840 710	*720* *620*	1000 860	*870* *740*	700 600	1120 960	*970* *840*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	205	F.R.	F.T.	340	260	15000	2200	195	F R.	F.T.	265	250	2300	185	F.R.	F.T.	210	235	2100	170	C.L.	F.T.	145	215	15000						
2400	220	F.R.	F.T.	305	260	10000	2300	215	F.R.	F.T.	270	255	2100	195	F.R.	30	200	235	2050	190	C.L.	29	155	225	10000	2000	170	C.L.	27	130	200
2400	235	F.R.	38	340	260	5000	2200	220	F.R.	33	250	240	2050	200	F.R.	31	190	220	2000	195	C.L.	31	155	215	5000	1950	165	C.L.	28	125	185
2400	235	F.R.	38	315	240	S. L.	2150	220	F.R.	34	235	225	2050	200	F.R.	31	180	205	2000	195	C.L.	31	140	200	S. L.	1650	160	C.L.	29	105	165

NOTES

① ALLOW 89 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 32,000 LB. GROSS WT. WITH 1100 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 89 GAL.) TO FLY 1500 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 195 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 57—Flight Operation Instruction Chart—8 Wing Bombs—33,000 to 30,000 Pounds

MODEL(S)
B-25C AND B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 30,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS
8 WING BOMBS OR
6 DEPTH CHARGES

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		670	① 70 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						670		
470	410	600	600	520	720	620	900	780	600	1020	880
390	340	500	500	430	600	520	750	650	500	850	740
310	270	400	400	340	480	410	600	520	400	680	590
230	200	300	300	260	360	310	450	390	300	510	440
150	130	200	200	170	240	210	300	260	200	340	290
80	70	100	100	80	120	100	150	130	100	170	140

MAXIMUM CONTINUOUS						ALT. Feet	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT. Feet	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	210	F.R.	F.T.	340	265	15000	2200	200	F.R.	F.T.	255	255	2250	190	F.R.	F.T.	205	245	2100	180	C.L.	F.T.	150	230	15000						
2400	225	F.R.	F.T.	305	265	10000	2250	215	F.R.	F.T.	255	255	2100	200	F.R.	30	200	240	2050	195	C.L.	29	155	230	10000	1850	160	C.L.	26	115	190
2400	240	F.R.	38	340	265	5000	2150	220	F.R.	33	245	245	2050	205	F.R.	31	185	225	2000	195	C.L.	30	145	215	5000	1750	160	C.L.	27	105	175
2400	240	F.R.	38	315	250	S. L.	2150	220	F.R.	34	225	225	2050	205	F.R.	31	175	210	2000	195	C.L.	30	135	200	S. L.	1550	160	C.L.	29	95	165

NOTES

① ALLOW 70 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 28,000 LB. GROSS WT. WITH 600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 70 GAL.) TO FLY 800 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 195 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 58—Flight Operation Instruction Chart—8 Wing Bombs—30,000 to 26,000 Pounds

MODEL(S)

B-25C AND B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 35,000 TO 33,000 POUNDS

EXTERNAL LOAD ITEMS

1 TORPEDO AND 8 WING BOMBS OR
1 TORPEDO AND 6 DEPTH CHARGES

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		1189	① 99 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						1189		
780	*680*	1090	1000	*870*	1200	*1040*			1090	1440	*1250*
720 650	*620* *560*	1000 900	920 830	*790* *710*	1100 990	*950* *860*			1000 900	1320 1190	*1140* *1030*
570	*500*	800	730	*640*	880	*760*			800	1050	*910*
500	*430*	700	640	*560*	770	*670*			700	920	*800*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	190	F.R.	F.T.	340	240	15000	2150	175	F.R.	34	240	225	2200	160	F.R.	F.T.	190	205							15000						
2400	205	F.R.	F.T.	305	245	10000	2250	200	F.R.	F.T.	250	235	2050	175	F.R.	29	190	210							10000	2050	170	C.L.	29	155	205
2400	225	F.R.	38	340	245	5000	2150	205	F.R.	33	245	225	2050	180	F.R.	30	185	200							5000	2000	170	C.L.	29	145	190
2400	225	F.R.	38	315	230	S. L.	2150	205	F.R.	34	230	210	2050	185	F.R.	31	175	190							S. L.	2000	170	C.L.	29	130	175

NOTES

① ALLOW 99 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 35,000 LB. GROSS WT. WITH 1090 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 99 GAL.) TO FLY 1300 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 170 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 59—Flight Operation Instruction Chart—Torpedo and 8 Wing Bombs—35,000 to 33,000 Pounds

MODEL(S)
B-25C AND B-25D

FLIGHT OPERATION INSTRUCTION CHART

EXTERNAL LOAD ITEMS
1 TORPEDO AND 8 WING BOMBS OR
1 TORPEDO AND 6 DEPTH CHARGES

ENGINE(S): R-2600-13 OR R-2600-29

CHART WEIGHT LIMITS: 33,000 TO 30,000 POUNDS

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		974	① 94 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						974		
650	*560*	880	830	*720*	990	*860*			880	1230	*1070*
590 520	*510* *450*	800 700	760 660	*660* *570*	900 790	*780* *680*			800 700	1120 980	*970* *850*
440	*380*	600	570	*490*	680	*590*			600	840	*730*
370 290	*320* *250*	500 400	470 380	*410* *330*	560 450	*490* *390*			500 400	700 560	*600* *480*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	190	F.R.	F.T.	340	245	15000	2150	180	F.R.	34	245	230	2200	165	F.R.	F.T.	190	215							15000						
2400	205	F.R.	F.T.	305	245	10000	2250	200	F.R.	F.T.	250	235	2050	180	F.R.	30	190	215							10000	2000	165	C.L.	28	145	195
2400	225	F.R.	38	340	245	5000	2150	205	F.R.	33	235	225	2050	185	F.R.	31	185	205							5000	2000	165	C.L.	28	130	180
2400	225	F.R.	38	315	230	S. L.	2100	205	F.R.	34	220	210	2050	190	F.R.	31	175	195							S. L.	1850	165	C.L.	29	120	170

NOTES

① ALLOW 94 GAL. FOR WARM-UP, TAXE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 33,000 LB. GROSS WT. WITH 880 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 94 GAL.) TO FLY 1100 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2000 RPM AND 165 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 60—Flight Operation Instruction Chart—Torpedo and 8 Wing Bombs—33,000 to 30,000 Pounds

MODEL(S)

B-25C AND B-25D

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 30,000 TO 26,000 POUNDS

EXTERNAL LOAD ITEMS

1 TORPEDO AND 8 WING BOMBS OR

1 TORPEDO AND 8 DEPTH CHARGES

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		670	① 80 GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ①						670		
440	*380*	590	560	*490*	670	*580*	810	*700*	590	900	*790*
370	*320*	500	480	*410*	560	*490*	680	*590*	500	770	*660*
300	*260*	400	380	*330*	450	*390*	550	*470*	400	610	*530*
220	*190*	300	280	*250*	340	*290*	410	*350*	300	460	*400*
150	*130*	200	190	*160*	220	*190*	270	*240*	200	310	*260*
70	*60*	100	90	*80*	110	*100*	130	*120*	100	150	*130*

MAXIMUM CONTINUOUS						ALT.	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT.	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	Feet	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
2400	200	F.R.	F.T.	340	255	15000	2150	185	F.R.	34	240	235	2300	180	F.R.	F.T.	210	230	2100	170	C.L.	F.T.	150	215	15000						
2400	210	F.R.	F.T.	305	250	10000	2250	205	F.R.	F.T.	255	240	2100	190	F.R.	30	205	230	2050	185	C.L.	29	155	220	10000	2000	165	C.L.	27	130	195
2400	225	F.R.	38	340	250	5000	2150	210	F.R.	33	240	230	2050	195	F.R.	31	190	215	2050	190	C.L.	30	150	210	5000	1900	165	C.L.	28	120	185
2400	230	F.R.	38	315	235	S. L.	2150	210	F.R.	34	225	215	2050	195	F.R.	31	180	200	2000	190	C.L.	31	145	195	S. L.	1700	165	C.L.	29	110	170

NOTES

① ALLOW 80 GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

HIGH BLOWER ABOVE HEAVY LINE ONLY.

EXAMPLE

AT 30,000 LB. GROSS WT. WITH 590 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 80 GAL.) TO FLY 750 STAT. AIRMILES AT 5000 FT. ALT. MAINTAIN 2050 RPM AND 190 MPH IND. AIRSPEED WITH MIXTURE SET CRUISING LEAN.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 61—Flight Operation Instruction Chart—Torpedo and 8 Wing Bombs—30,000 to 26,000 Pounds

MODEL(S)
B-25C & B-25D
SINGLE ENGINE OPERATION

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 29,000 TO 27,000 POUNDS

EXTERNAL LOAD ITEMS

NONE

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruisng only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			○ GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ○								
1200	1040	1100	1320	1140							
1090 980	940 850	1000 900	1200 1080	1040 930							
870 760	750 660	800 700	960 840	830 730							
650 540	560 470	600 500	720 600	620 520							

MAXIMUM CONTINUOUS						ALT. Feet	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT. Feet	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
						15000																			15000						
						10000																			10000						
2400	165	F.R.	38	170	180	5000																			5000						
2400	170	F.R.	38	160	170	S. L.	2200	145	F.R.	35	125	150													S. L.						

SINGLE ENGINE OPERATION

NOTES

○ ALLOW GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

EXAMPLE

AT 29,000 LB GROSS WT. WITH 1000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 0 GAL.) TO FLY 1150 STAT. AIRMILES AT S. L. FT. ALT. MAINTAIN 2200 RPM AND 145 MPH IND. AIRSPEED WITH MIXTURE SET FULL RICH.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

Figure 62—Flight Operation Instruction Chart—Single-Engine Operation—No External Load—29,000 to 27,000 Pounds

MODEL(S)
B-25C & B-25D
SINGLE ENGINE OPERATION

ENGINE(S): R-2600-13 OR R-2600-29

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 27,000 TO 25,000 POUNDS

EXTERNAL LOAD ITEMS

NONE

LIMITS	R. P. M.	M. P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	TOTAL G. P. H.
WAR MAX.						
MILITARY POWER	2600	41.5 44	LOW HIGH	FULL RICH	5 MIN.	215
NORMAL RATED	2400	37.5 41	LOW HIGH	FULL RICH	CONT.	180 190

INSTRUCTIONS FOR USING CHART: Select figure in FUEL column equal to or less than amount of fuel to be used for cruising. Move horizontally to left or right and select RANGE value equal to or greater than the statute or nautical air miles to be flown. Vertically below and opposite desired cruising altitude (ALT.) read optimum R. P. M., I. A. S. and MIXTURE setting required.

NOTES: Column I is for emergency high speed cruising only. Columns II, III, IV and V give progressive increase in range at a sacrifice in speed. Manifold pressure (M. P.), gallons per hour (G. P. H.) and true airspeed (T. A. S.) are approximate values for reference. For efficiency maintain indicated airspeed (I. A. S.) hourly. Adjust RPM slightly if necessary to avoid exceeding manifold pressure more than 3 in. Hg.

I		FUEL	II		III		IV		FUEL	V	
RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES		RANGE IN AIR MILES		RANGE IN AIR MILES		U. S.	RANGE IN AIR MILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			○ GAL. ALLOWANCE NOT AVAILABLE IN FLIGHT ○								
890	*770*	800	970	*840*	1090	*940*					
780	*680*	700	850	*740*	950	*820*					
670	*580*	600	730	*630*	810	*700*					
560	*480*	500	610	*530*	680	*590*					
450	*390*	400	490	*420*	540	*470*					
330	*290*	300	360	*310*	400	*350*					
220	*190*	200	240	*210*	270	*230*					
110	*90*	100	120	*100*	130	*110*					

MAXIMUM CONTINUOUS						ALT. Feet	OPERATING DATA						OPERATING DATA						OPERATING DATA						ALT. Feet	MAXIMUM RANGE					
R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.	R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.		R. P. M.	I. A. S. M.P.H.	MIX-TURE	M. P. In. Hg.	G. P. H.	T. A. S.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
						15000																			15000						
2400	150	F.R.	F.T.	150	175	10000	2300	145	F.R.	F.T.	140	170													10000						
2400	170	F.R.	38	170	190	5000	2250	160	F.R.	35	145	175													5000						
2400	175	F.R.	38	160	180	S. L.	2250	165	F.R.	36	140	170	2100	145	F.R.	33	110	150							S. L.						

NOTES

○ ALLOW GAL. FOR WARM-UP, TAKE-OFF & INITIAL CLIMB PLUS ALLOWANCE FOR WIND, RESERVE & COMBAT AS REQ'D.

EXAMPLE

AT 27,000 LB. GROSS WT. WITH 700 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 0 GAL.) TO FLY 900 STAT. AIRMILES AT S. L. FT. ALT. MAINTAIN 2100 RPM AND 145 MPH IND. AIRSPEED WITH MIXTURE SET FULL RICH.

LEGEND

I. A. S.: INDICATED AIRSPEED
M. P.: MANIFOLD PRESSURE
G. P. H.: U. S. GAL. PER HOUR
T. A. S.: TRUE AIRSPEED
S. L.: SEA LEVEL
F. T.: FULL THROTTLE
F. R.: FULL RICH
A. R.: AUTO-RICH
A. L.: AUTO-LEAN
C. L.: CRUISING LEAN

SINGLE ENGINE OPERATION

Figure 63—Flight Operation Instruction Chart—Single-Engine Operation—No External Load—27,000 to 25,000 Pounds

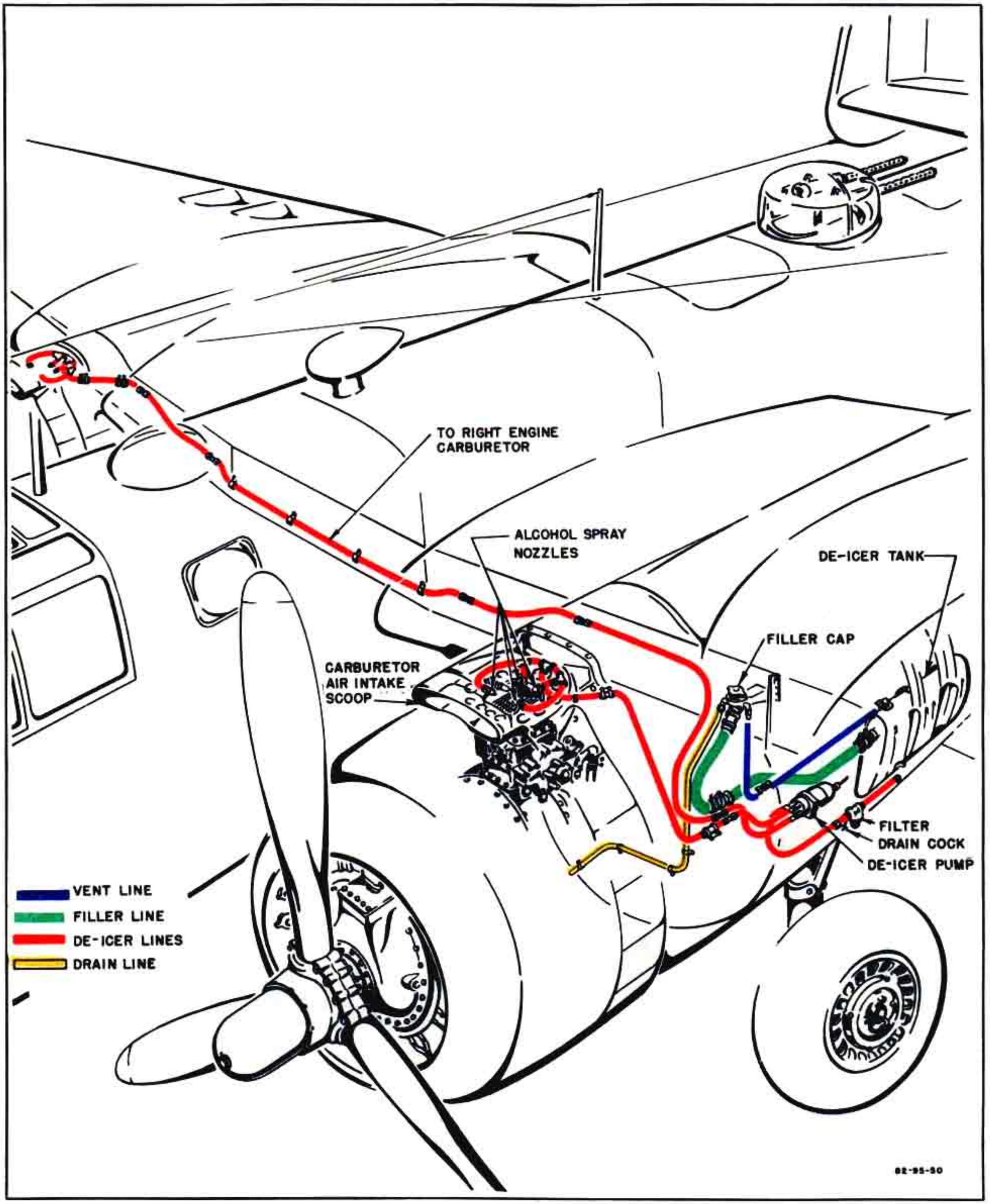


Figure 64—Carburetor De-icer System

APPENDIX III
COLD WEATHER PROVISIONS

1. DESCRIPTION.

a. GENERAL.—The cold weather installations on this airplane are described below, with instructions for their use in the sequence they will be needed.

b. OIL DILUTION SYSTEM.—The oil dilution system draws engine fuel from the carburetor and introduces it into the oil system at the oil Y-drain fitting, where it mixes with the oil. This action lowers the viscosity of the oil and facilitates engine starting in cold weather. Each engine has an independent oil dilution system controlled by a single switch on the pilot's switch panel. On late B-25D Airplanes there is a control switch for each system, permitting selective or simultaneous dilution of the oil in each engine. Satisfactory dilution of the oil in the propeller feathering lines on each engine is obtained by feathering the propeller through at least one complete cycle.

c. CARBURETOR HEAT.—The carburetor heat system consists of a cold-air door and a warm-air door interconnected by linkage and controlled from the pilot's control pedestal. The control has two positions: "NORMAL" and "ICING." In the "NORMAL" position the cold-air door is open and the warm-air door is closed. In the "ICING" position the cold-air door is closed and the warm-air door is open to admit warm air from behind the engine cylinders.

d. CARBURETOR DE-ICER SYSTEM.—Some airplanes are equipped with an alcohol spray system to de-ice the carburetors. The operation of this system is controlled by a momentary contract switch on the pilot's switch panel. The system will operate only as long as the switch is held manually in the "ON" position.

e. CARBURETOR AIR THERMOMETERS.—Late airplanes are equipped with a dual-dial carburetor air temperature indicator, mounted on the instrument panel, to indicate icing possibilities in the carburetors. A resistance bulb in each carburetor air scoop is connected electrically to the indicator and transmits the temperature of the air entering the carburetor to the indicator.

f. PROPELLER ANTI-ICER SYSTEM.—The propeller anti-icer system consists of an alcohol fluid tank, electric pump, propeller anti-icer slinger rings, and leading edge feed shoes. The system distributes alcohol along the leading edges of the propeller blades to prevent the adhesion or accumulation of ice on the propellers. The system is operated by a rheostat control on the pilot's switch panel.

g. BOMBSIGHT WINDOW ANTI-ICER SYSTEM. On some airplanes an alcohol spray is utilized to keep ice from forming on the bombsight window. A rheostat control for the anti-icer spray is on the bombardier's switch panel. On late B-25D Airplanes the bombsight window anti-icer system is replaced by a Raymond de-icer panel.

h. WINDSHIELD WIPER.—A windshield wiper is installed on the bombsight window on later airplanes. The control is at the forward left side of the bombardier's compartment.

i. PROPANE PRIMING.—A propane priming connection is provided on some airplanes. To gain access to this connection, open the ground heating door on the bottom of the engine accessory compartment.

j. COVERS.—The following covers are furnished with the airplane:

Engine covers
Front section covers
Turret covers
Tail cone covers

Engine covers are equipped with ground heater sleeves. The front sleeve directs warm air to the propeller reduction gear housing and the propeller dome. The rear sleeve directs warm air into the engine accessory compartment and on some airplanes, heats the battery. Sleeves on the front section cover direct air into the bombardier's and pilot's compartments.

k. OIL IMMERSION HEATER.—Some airplanes have provisions for installing an oil immersion heater in each oil sump. A plug in each nacelle is used to supply electricity to the heater element.

l. SNOW AND ICE TIRES.—Snow and ice tires will be installed at jump-off points on airplanes assigned to cold weather operation by the Army Air Force. These tires have metal cleats to assure traction when the airplane is operating from snow or ice-covered flying fields. This type of tire should not be used on the nose wheel.

m. DE-ICER PANELS.—Raymond type de-icer panels are installed on the windshields and bombsight window of late B-25D Airplanes. These panels serve to retain the warm air from the defroster ducts and thus keep the important glass areas free from frost, fog, and ice. When not installed, the panels are stowed as loose equipment.

n. CLEAR VISION PANEL.—A clear vision panel is installed in the pilot's windshield on late airplanes. The panel is opened for better vision while flying in snow, rain, or sleet.

o. WING DE-ICERS.—The flight surface de-icer system consists of inflatable rubber shoes on the leading edges of the wings and empennage, inflated from the pressure side of two engine-driven vacuum pumps. During flight, when the system is not in operation, vacuum

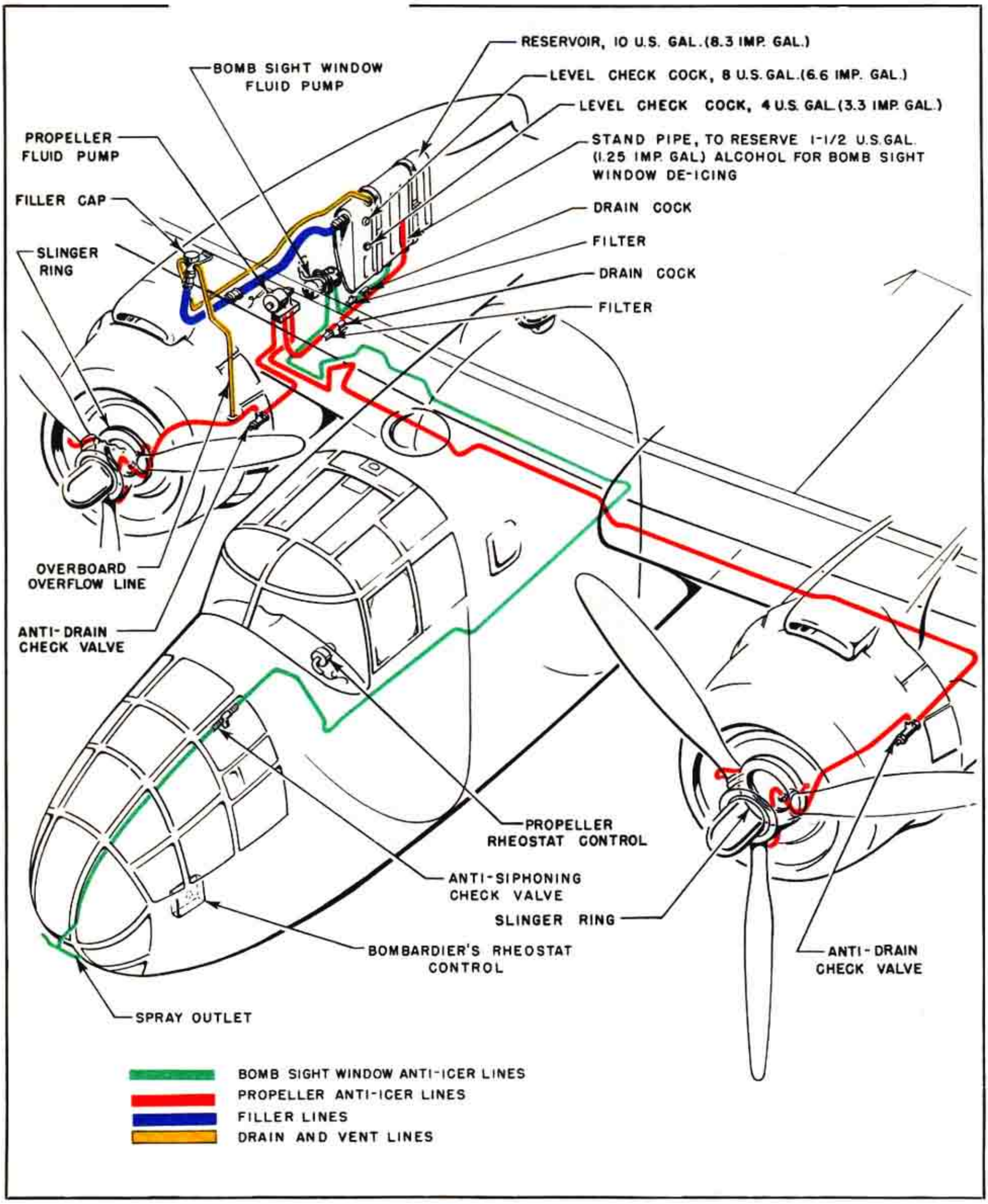


Figure 65—Propeller and Bomb Sight Window Anti-icer System

pump suction prevents negative air pressure on the airfoils from raising the de-icer shoes.

2. OPERATION.

a. STARTING ENGINE.—A normal start should be made by following the procedure listed on pilot's check list. Below are supplementary instructions to be followed if any difficulty is encountered when starting the engine.

(1) Turn the engine over several revolutions by hand before engaging the starter. Considerable priming is necessary to ensure a successful start in cold weather. Prime the engine by pushing the primer switch to "ON" for 1 second and "OFF" for 2 seconds. Repeat this procedure while energizing, and while the engine is being turned over by the starter, operate the primer switch until regularity of firing results.

(2) If the engine fails to start, moisture on the spark plugs may be the cause. Remove at least one plug from each cylinder and warm the plugs to dry the points. Make another attempt to start the engine immediately after replacing the plugs.

(3) In starting each engine, a normal start should be made without regard to the oil dilution system. After starting engine, if a heavy viscous oil is indicated by oil pressure that is too high, or by oil pressure that fluctuates or falls back when the engine rpm is increased, the dilution switch may be pushed "ON" to dilute the oil and correct this condition. This method should be used only if time and extreme temperature conditions do not permit normal engine warm-up.

NOTE

Overdilution is likely to result under these conditions because of low oil flow and a cold engine which holds back evaporation.

(4) If dilution is used during warm-up, close observation of the oil pressure will be necessary during the time of dilution and through the remainder of the warm-up and take-off to determine whether or not the oil has been overdiluted, resulting in low oil pressure.

(5) Do not run the engines at more than 1200 rpm until the oil has reached a temperature of 20° C (68° F).

(6) Ordinarily the carburetor air control handles will be in the "NORMAL" position. However, during extended ground operation under icing conditions and before take-off, place the control handles in the "ICING" position until the ice has been eliminated from the induction system.

(7) If necessary, use carburetor heat to keep engine running smoothly in extremely cold weather.

b. TAKE-OFF.

(1) Do not take off with snow, ice, or frost on the wings. Even loose snow cannot be depended upon to blow off, and only a thin layer is necessary to cause loss of lift and very treacherous stalling characteristics. Under some conditions, it may be necessary to taxi out to the take-off position before removing the protective covers from the flight surfaces, since frost formation can be very rapid.

(2) If deep, heavy snow interferes with the take-off run, but does not prevent the airplane from being taxied, move slowly up and down the take-off course several times to pack down the snow on the runway before attempting the actual take-off.

(3) When taking off or landing on a narrow strip of clear ice, cross-winds are particularly dangerous because of poor maneuverability caused by lack of traction. If the wind is gusty, the airplane may be blown completely off the ice before control can be regained.

(4) Normally the carburetor air controls should not be used during take-off. Under icing conditions, the controls are placed in the "ICING" position prior to take-off to ensure that all ice is eliminated from the induction system. However, immediately after take-off when power is reduced, the carburetor controls may be placed in the position desired.

(5) Make certain that cabin heaters are "OFF" before attempting take-off.

c. FLIGHT.

(1) After taking off from snow or slush-covered fields, operate the landing gear and flaps through several cycles to ensure against the gear and flaps freezing in the up position.

(2) Turn "ON" the pitot tube heater. This should not be done when the airplane is on the ground, as there is insufficient cooling in the pitot head.

(3) If ice starts to form on the propellers, turn anti-icer rheostat control to "NORMAL." By adjusting the control to various positions, the amount of anti-icer fluid being delivered to the propellers by the pump may be varied.

(4) If ice starts to form on the leading edges of the wing and empennage, turn surface de-icer control handle on left side of pliot's compartment to "ON."

CAUTION

Do not operate de-icer during landing or take-off. Do not operate de-icer system at speeds above 230 mph indicated.

NOTE

On late airplanes an emergency shut-off valve is located near the distributor valve in the navigator's compartment. This valve may be utilized to prevent loss of instrument readings in the event of de-icer system failure.

(5) When icing of the carburetor is detected by a gradual loss of rpm and manifold pressure, without changing the throttle position or attitude of flight, place carburetor air control handles in the "ICING" position.

(6) On airplanes equipped with carburetor de-icer systems, if the ice cannot be eliminated by use of carburetor heat, hold carburetor de-icer switch "ON" for periods of from 20 to 60 seconds, or the minimum

time necessary to remove the existing ice, as shown by a return to normal rpm and manifold pressure.

(7) Carburetor icing is less likely to occur under extreme conditions of cold than when free air temperature is between -7 and 16 C (19° and 61°F). It is good practice to place the carburetor air controls in the "ICING" position for 1 to 2 minutes every ½ hour during flight to preclude the possibility of carburetor icing.

(8) Increase propeller speed by approximately 200 rpm every ½ hour to assure continued governing at extremely low temperatures. Return to the desired cruising rpm as soon as the tachometer shows that the governor is functioning.

(9) Stay on a prearranged flight course as closely as possible so that searchers will be able to find you if you are forced down. Except in extreme emergency, it is better to land or crash land than to bail out.

d. LANDING.—Temperature inversions are common in winter and the ground air may be 15 to 30 C (27° to 54 F) colder than that at altitude. Therefore, care must be taken to avoid excessive cooling when letting down. Lower the landing gear and use flaps to reduce air speed while descending. Retain considerable power, and if possible, maintain the oil temperature above 20 C (68 F) and the head temperature above 150 C (302 F). Lower readings than these may result in the engines cutting out or the failure of the engines to respond when the throttles are advanced.

e. AFTER LANDING.

(1) OIL DILUTION.—To obtain sufficient dilution of the oil to facilitate starting, the engine should be allowed to cool, either by idling or stopping after flight, before dilution is begun. This will prevent rapid evaporation of the gasoline and ensure that the viscosity of the oil has been reduced sufficiently. In most cases it will be found that the engines have cooled sufficiently for dilution by the time the airplane reaches the flight line. Dilute the engines at 1000 rpm for the time indicated below, consistent with the lowest expected air temperature:

Temperature	*Time-Minutes*		*Max Allowed Temp*	
	B-25D-30 B-25D-35	*All Others*	*Cyl Head*	*Oil*
-6 to -18 C (+20 to 0 F)	3	6	150 C (302 F)	50 C (122 F)
-18 to -29 C (0 to -20 F)	5	10	145 C (243 F)	45 C (113 F)
-29 to -40 C (-20 to -40 F)	7	14	140 C (284 F)	40 C (104 F)
-40 to -51 C (-40 to -60 F)	11	21	140 C (284 F)	40 C (104 F)

At the completion of the above dilution period, run both engines up to 1700 rpm, continuing dilution, and with propeller in full "INCREASE RPM," feather and unfeather each propeller through one complete cycle. Then operate each propeller governor through one complete cycle. Release dilution switch and decrease engine speed. Stop engines and install engine covers.

NOTE

If temperatures approach limits during 1000 rpm dilution, shut down for 10 to 15 minutes to cool engine; then start engine and finish dilution procedure.

3. PERSONAL CONSIDERATIONS.

a. GENERAL.—Personnel undertaking Arctic operations should exercise care in preparing the person for flight or ground activities. Failure to comply with the instructions below may result in physical discomfort or serious injury to the persons involved. Follow the instructions and you will find Arctic operations more pleasant.

b. SWEATING.—Sweating is always dangerous in sub-zero temperatures. If your feet or other parts of your body perspire, make sure that your clothing and body are absolutely dry before you go outside in severe weather conditions. Ice will form in the clothing, and damp portions of the body will freeze almost immediately.

c. CLOTHING.—Suitable and adequate clothing should be worn at all times. The greatest danger from freezing is in the spring when the sun shines brightly and the temperature warms up to 15 F (-10 C) or 25 F (-4 C) during the day, as personnel is then tempted to go out wearing less clothing than usual. At sundown the temperature will drop rapidly, although many hours of daylight may be left. During the night the temperature may drop as low as -50 F (-46 C).

d. FACE MASKS.—In extreme temperatures, face masks should be worn.

e. OVEREXERTION.—When the temperature is -25 F (-32 C) or below, there is danger of freezing the lungs through deep breathing following overexertion. If you unknowingly overexert and start gasping large breaths of air, put your head down and breathe from inside your clothing until the heavy breathing stops.

f. SHELTER.—Light tent shelters or heated nose hangars must be provided to enable maintenance crews to work efficiently with tools and equipment.

g. INSULATING TOOLS.—Metal tools may be insulated against cold by wrapping the handles with a light cord.

h. GASOLINE SPILLAGE.—Gasoline spilled on the hands or clothing in sub-zero weather has an effect similar to that of liquid air; it will freeze flesh in a few seconds after contact.

i. FORCED LANDING.—In case of a forced landing. personnel is directed to remain in the vicinity of the aircraft in order to conserve energy and to simplify rescue, as it is impossible to traverse normal Arctic terrain except under the most favorable circumstances.

j. SERVICING.—All personnel in any way concerned with servicing the airplane in very cold weather should keep these basic cautions firmly in mind:

(1) Tools or other metal articles should not be grasped with the bare hands during sub-zero weather, as the skin will freeze to the article or surface and result in a painful tearing of the flesh.

(2) When making emergency repairs or when replacing equipment in very cold weather, extreme care should be taken to avoid placing too great a tension upon nuts, bolts, cables, etc., as these will expand upon warming and might freeze or snap.

(3) Small parts dropped into snow are very difficult to find, and personnel should be careful to avoid loss of essential parts.

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