AN 01-40NU-1

HANDBOOK

FLIGHT OPERATING INSTRUCTIONS

USAF SERIES

C-54G

NAVY MODEL

R5D-5

AIRCRAFT

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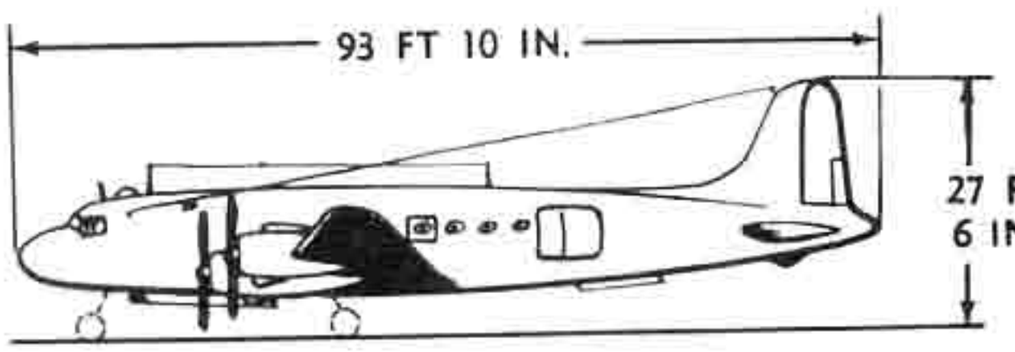


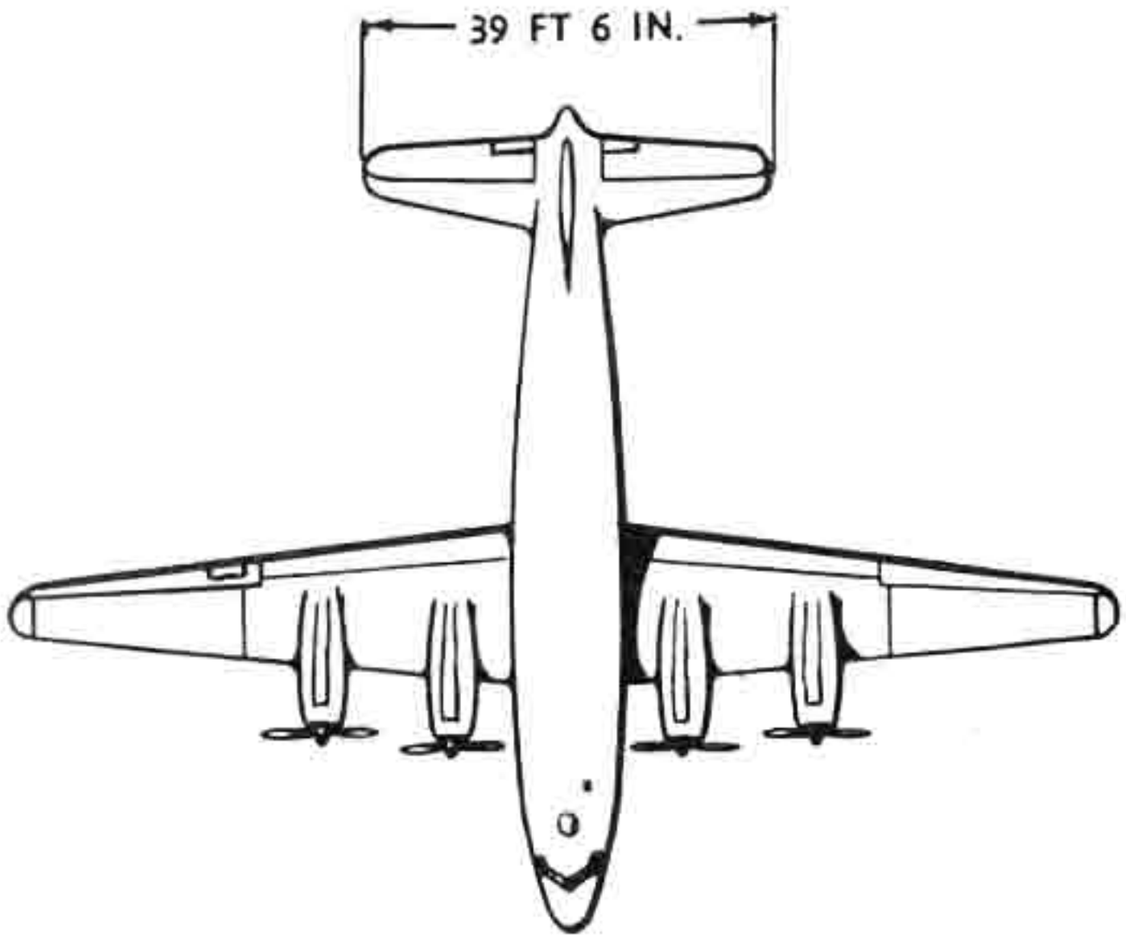


Figure 1 — Complete Airplane

IMPORTANT

If maximum benefits are to be gained from this handbook, it is imperative that this page be read carefully.

FOREWORD

This official publication has been prepared by the contractor for use by flight crews. Read the entire handbook for a complete familiarization of the aircraft models covered and use it as a reference manual to answer specific questions. The handbook is kept current by frequent revisions. However, since the incorporation of revision data takes time it is imperative that the flight crews stay abreast of the short technical orders of the AN 01-40NU series which frequently cover critical flight restrictions or new operating techniques which have not as yet been incorporated in the handbook.

The handbook is divided into six sections and appendices, as follows:

SECTION I, DESCRIPTION.

The function of this section is to describe the airplane, its equipment, systems, and controls which are essential to flight and which will be needed for one complete non-combat mission in good weather at medium altitude. All emergency equipment which is not part of the auxiliary equipment and all miscellaneous equipment is also covered in this section.

SECTION II, PILOT'S OPERATING INSTRUCTIONS.

This section contains the steps of procedure to be accomplished from the time the airplane is approached by the flight crew until it is left parked on the ramp after accomplishing one complete non-combat mission in good weather at medium altitude.

SECTION III, FLIGHT OPERATION DATA.

This section includes an airspeed and altimeter correction table, a power plant chart and the instrument range markings for the airplane.

SECTION IV, EMERGENCY OPERATING INSTRUCTIONS.

This section clearly and concisely describes the procedure to be followed in meeting any emergency (except those in connection with the auxiliary equipment) that could reasonably be expected to be encountered.

SECTION V, OPERATIONAL EQUIPMENT.

This section includes the description, normal operation and emergency operation of all equipment not directly contributing to flight, but which enables the airplane to perform certain specialized functions. Included in this category are such items of equipment as: heating and ventilating equipment, oxygen system, communications equipment, ice eliminating equipment, and navigation equipment.

SECTION VI, EXTREME WEATHER OPERATION.

The function of this section is to set forth the proper techniques and procedures to be employed under conditions of cold weather operation. This section provides information supplemental to Section II.

APPENDIX I, FLIGHT DATA.

This appendix contains all operating data charts necessary for pre-flight and in-flight mission planning and includes explanatory text on the use of the data presented.

APPENDIX II, ENGINEERING DATA.

This appendix contains a characteristic speed chart for the airplane and a speed and load factor chart with a discussion on the use of this chart.

Section I

DESCRIPTION

1. GENERAL.

a. DESCRIPTION.—The C-54G airplane, designed as a long range troop or cargo transport, is a four-engine, low-wing, monoplane with tricycle landing gear. It has a maximum gross take-off weight of 73,000 pounds.

The airplane may be used as a troop transport, with accommodations for 49 troops; as a cargo transport; or as an ambulance plane carrying 36 litters. External ordnance may be carried, and a glider tow is installed in the tail cone.

b. PERSONNEL. – The airplane carries a normal flight crew of five: pilot, co-pilot, flight engineer, navigator, and radio operator. Movement of personnel is unrestricted throughout the airplane.

2. FLIGHT CONTROLS.

a. GENERAL.—The dual flight controls are conventional. Aileron and elevator trim tab control wheels are mounted on each side of the control pedestal. The rudder trim tab control wheel is mounted in the "V" of the windshield.

b. WING FLAPS. – The hydraulically - actuated wing flaps are controlled by a handle on the lower aft face of the control pedestal. The position of the flaps is shown by an indicator on the main instrument panel. A cable system interconnects the actuating struts of the two flaps and insures positive synchronization.

c. FLIGHT CONTROL LOCKS.—The rudder, elevator, and aileron control systems are provided with cable-operated mechanical gust locks. A lever in the floor of the flight compartment to the right of the pilot's seat operates the gust lock system and secures the controls in the neutral position. The lever is held in the locked position by inserting a pin which is attached to a red warning tape wound on a reel in the ceiling to the left of the upper instrument panel.

3. LANDING GEAR.

a. MAIN GEAR. – The hydraulically-operated, retractable landing gear is controlled by a lever on the lower aft face of the control pedestal. A control handle for the operation of the landing gear emergency extension valve is mounted on the right side of the control pedestal.

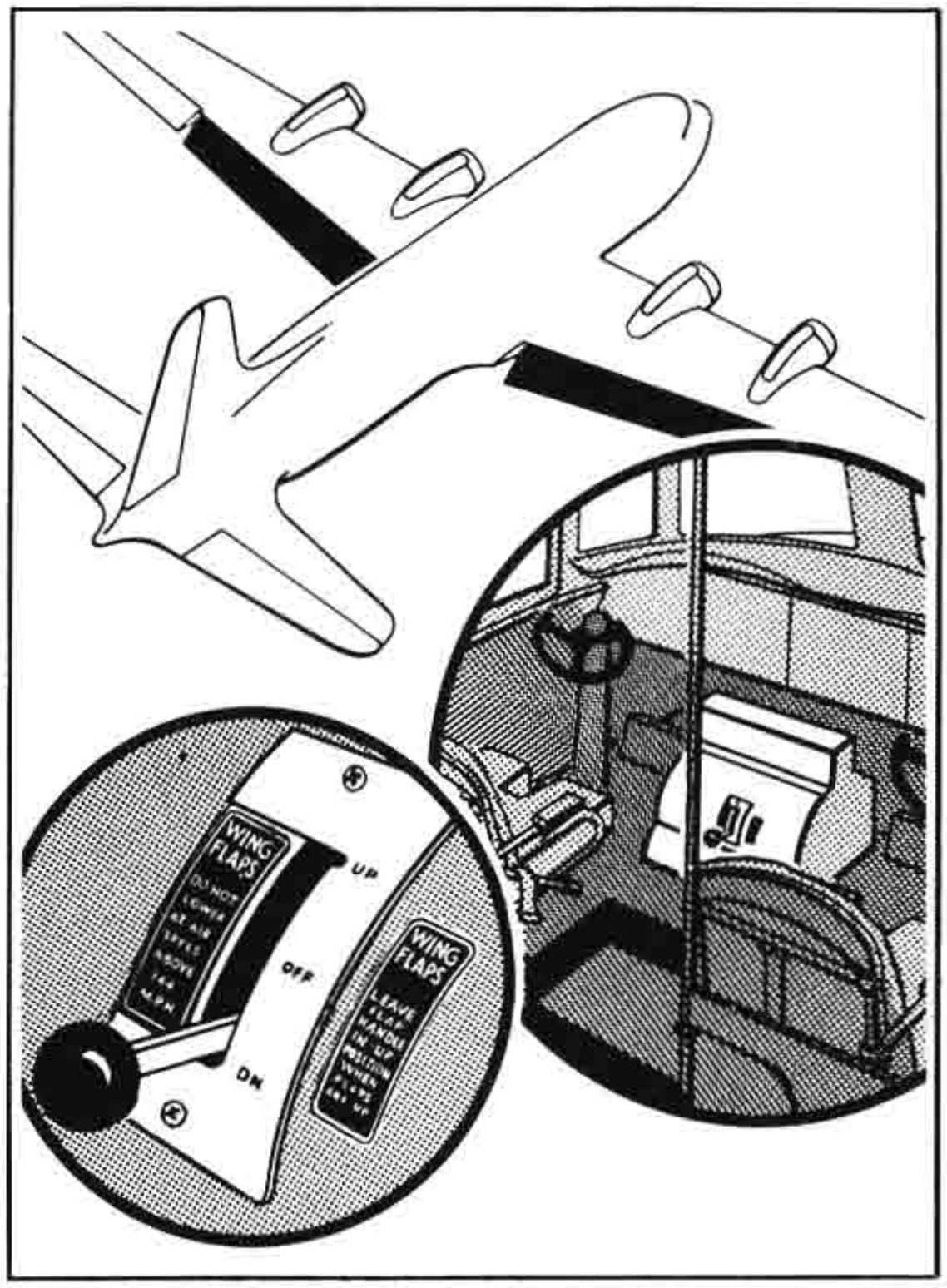


Figure 2 – Wing Flap Controls

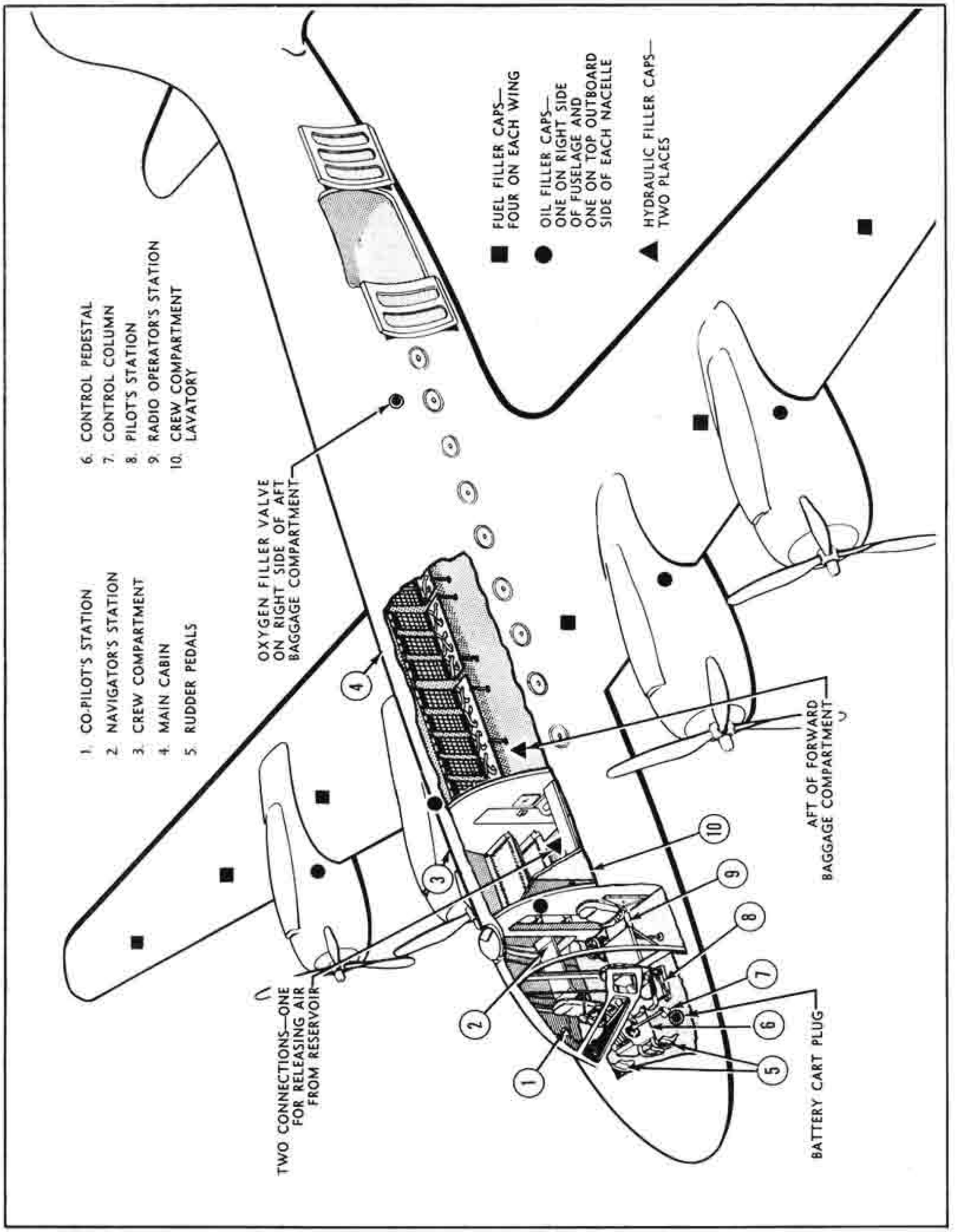
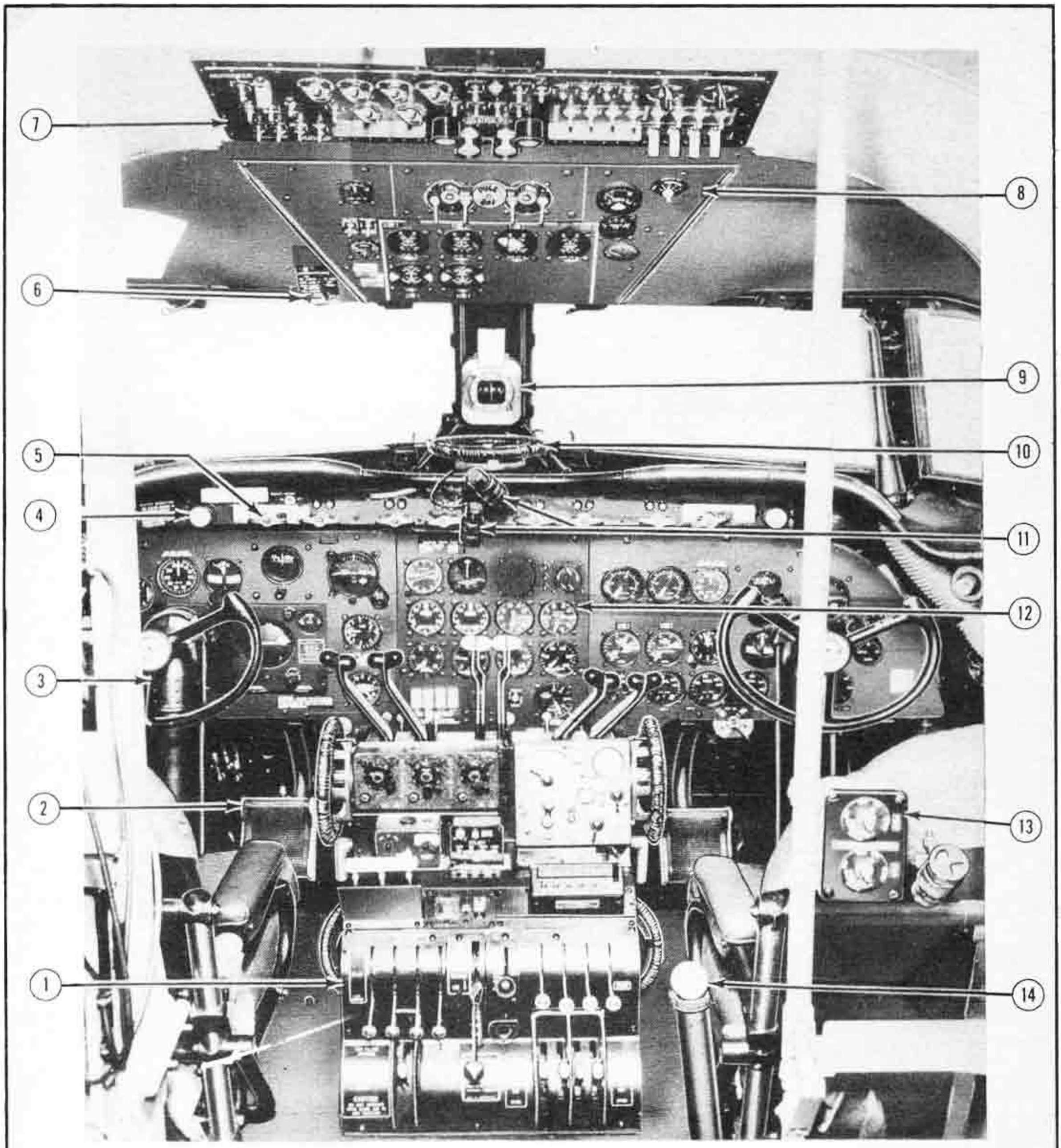
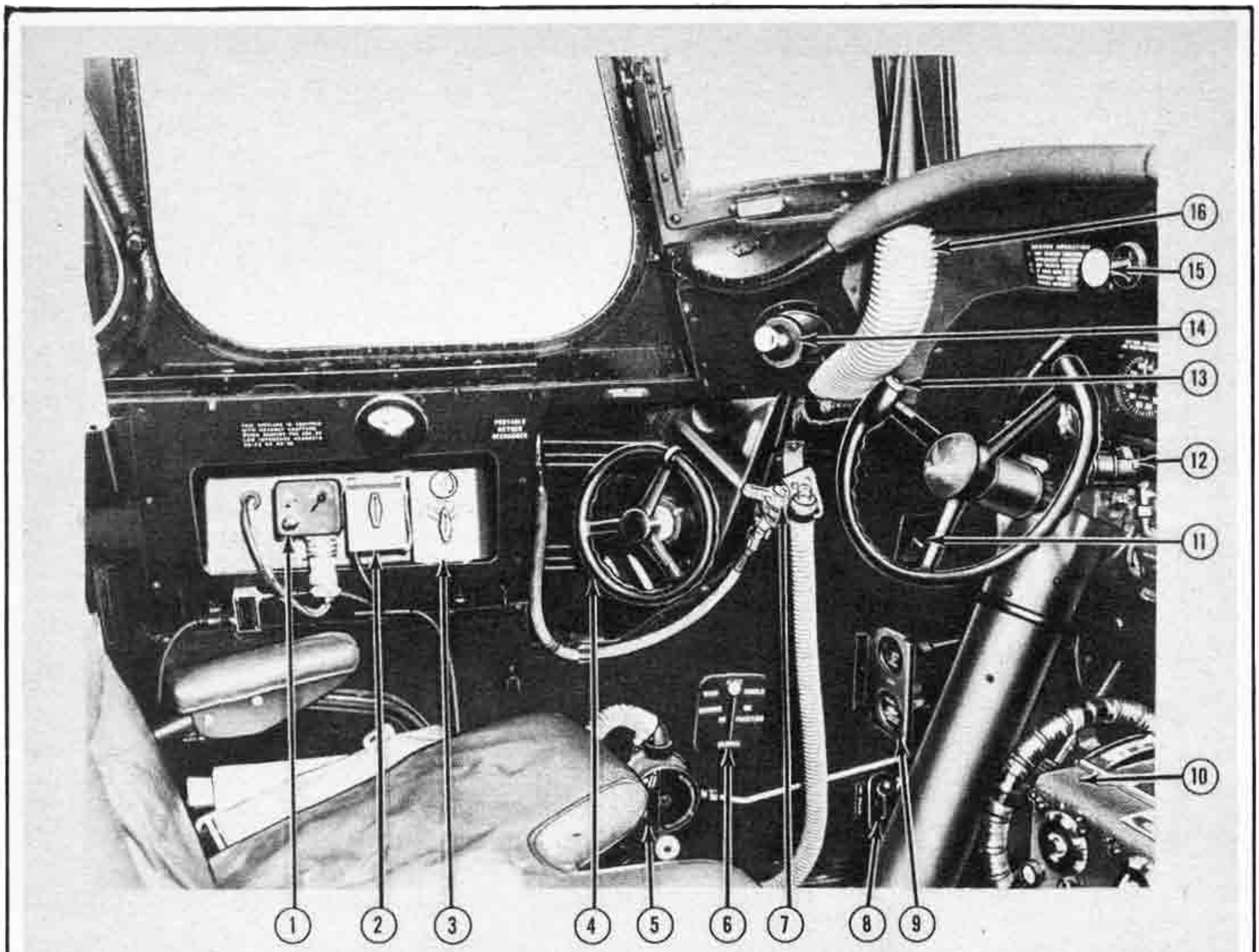


Figure 3 — Fuselage Contents and Arrangement



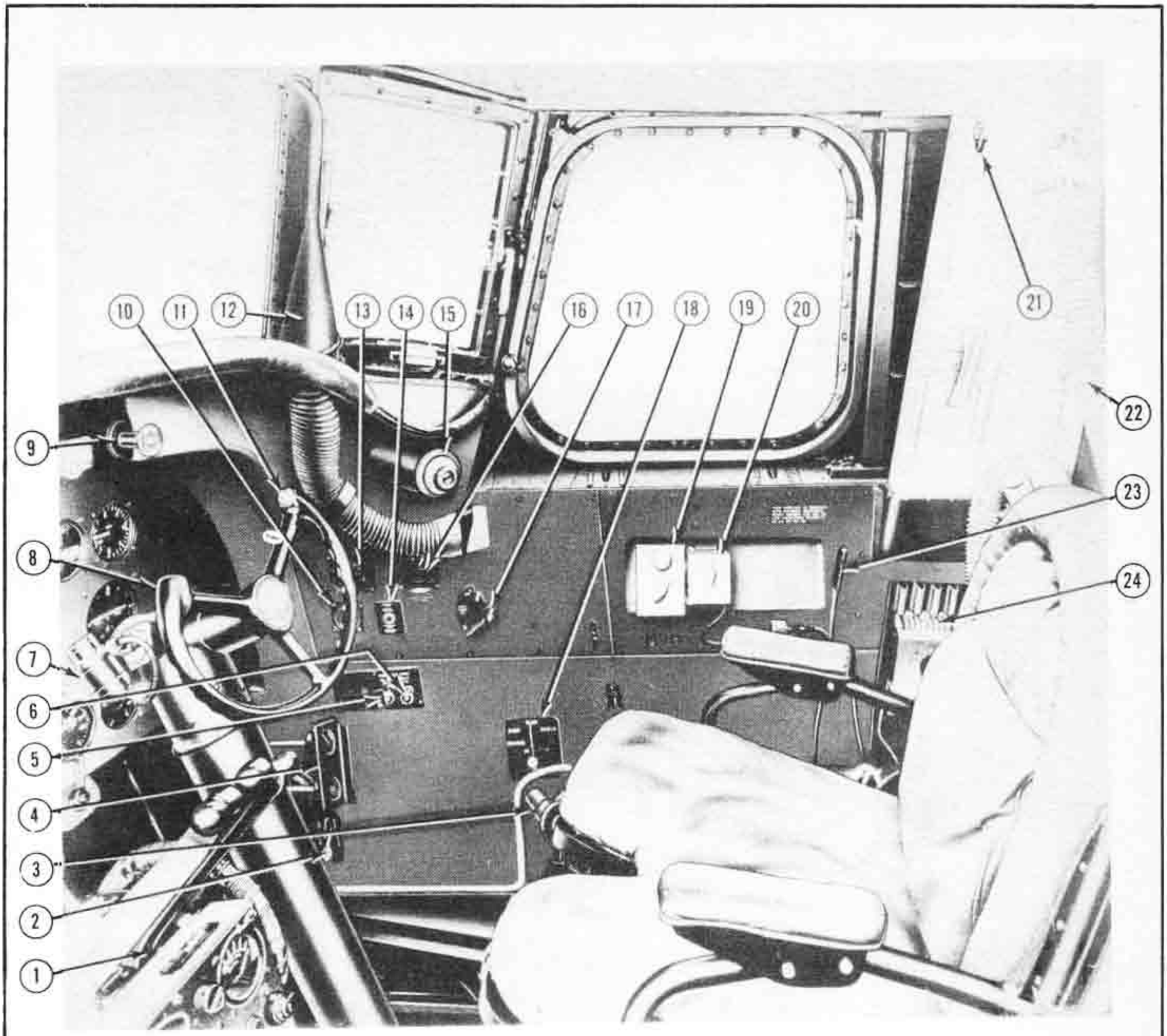
1. CONTROL PEDESTAL
2. RUDDER PEDAL
3. CONTROL COLUMN AND WHEEL
4. EMERGENCY AIR BRAKE CONTROL
5. FIRE EXTINGUISHER CONTROL
6. GUST LOCK TAPE AND PIN
7. ELECTRICAL CONTROL PANEL
8. UPPER INSTRUMENT PANEL
9. MAGNETIC COMPASS
10. RUDDER TRIM TAB CONTROL
11. SPOTLIGHTS
12. MAIN INSTRUMENT PANEL
13. NAVIGATOR'S INSTRUMENT LIGHTS CONTROL BOX
14. HYDRAULIC HAND PUMP

Figure 4 — Pilots' Compartment — Looking Forward



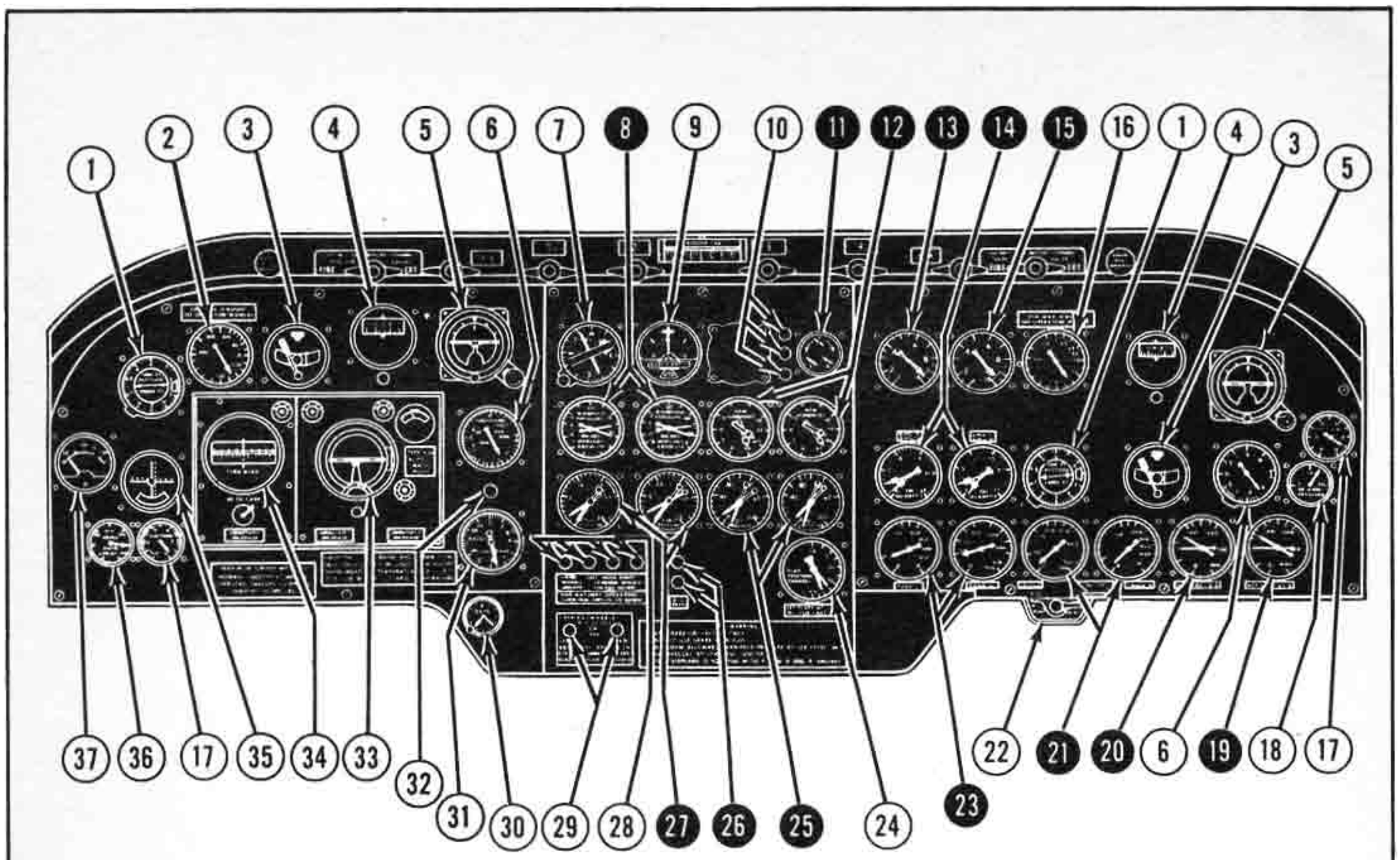
1. GLIDE PATH AND LOCALIZER CONTROL BOX
2. FILTER SWITCH BOX
3. INTERPHONE JACK BOX
4. NOSE WHEEL STEERING CONTROL
5. OXYGEN REGULATOR
6. WINDSHIELD DEFROSTER CONTROL
7. PORTABLE OXYGEN RECHARGER
8. PILOT'S FOOT WARMER CONTROL
9. OXYGEN INDICATOR PANEL
10. CONTROL PEDESTAL
11. STATIC PRESSURE SELECTOR VALVE
12. INSTRUMENT SPOTLIGHT
13. INSTRUMENT LIGHT MOMENTARY SWITCH
14. COLD AIR INLET VALVE
15. EMERGENCY AIR BRAKE CONTROL
16. WINDSHIELD DEFROSTER DUCT

Figure 5 — Pilots' Compartment — Left Side



1. CONTROL PEDESTAL
2. CO-PILOT'S FOOT WARMER CONTROL
3. OXYGEN REGULATOR
4. OXYGEN INDICATOR PANEL
5. WINDSHIELD WIPER CONTROL
6. WINDSHIELD ANTI-ICING FLUID CONTROL
7. INSTRUMENT LIGHT
8. CONTROL WHEEL AND COLUMN
9. EMERGENCY AIR BRAKE
10. EMERGENCY AIR BRAKE PRESSURE GAUGE
11. INSTRUMENT LIGHT MOMENTARY SWITCH
12. WINDSHIELD DEFROSTER
13. HYDRAULIC PRESSURE GAUGE
14. STATIC PRESSURE SELECTOR VALVE
15. COLD AIR INLET VALVE
16. BRAKE HYDRAULIC PRESSURE GAUGE
17. AUTO PILOT OIL SHUT-OFF VALVE
18. WINDSHIELD DE-ICER CONTROL
19. INTERPHONE JACK BOX
20. FILTER SWITCH BOX
21. HEADSET HOOK
22. FLEXIBLE HEAT AND VENT DUCT
23. HEADSET EXTENSION CORD
24. SUIT HEATER RHEOSTAT

Figure 6 — Pilots' Compartment — Right Side



1. ALTIMETER
2. AIRSPEED INDICATOR
3. TURN AND BANK INDICATOR
4. DIRECTIONAL GYRO
5. GYRO HORIZON
6. RATE-OF-CLIMB INDICATOR
7. MAGNETIC COMPASS REMOTE INDICATOR
8. MANIFOLD PRESSURE GAUGES
9. LEFT-RIGHT INDICATOR (MANUAL COMPASS)
10. AN/APN-1 INDICATOR LIGHTS (PROVISIONS ONLY)
11. ENGINE SYNCHROSCOPE INDICATOR
12. TACHOMETERS
13. FUEL FLOW METER (ENGINES 1 & 2)
14. OIL QUANTITY INDICATORS
15. FUEL FLOW METER (ENGINES 3 & 4)
16. AIRSPEED INDICATOR
17. VACUUM GAUGE
18. DE-ICER PRESSURE GAUGE
19. FUEL QUANTITY INDICATOR (AUXILIARY TANKS 2 & 3)
20. FUEL QUANTITY INDICATOR (AUXILIARY TANKS 1 & 4)
21. FUEL QUANTITY INDICATORS (MAIN TANKS 3 & 4)
22. VACUUM SELECTOR VALVE
23. FUEL QUANTITY INDICATORS (MAIN TANKS 1 & 2)
24. WING FLAP POSITION INDICATOR
25. OIL PRESSURE INDICATORS
26. OIL PRESSURE WARNING LIGHTS
27. FUEL PRESSURE INDICATORS
28. LANDING GEAR POSITION INDICATOR LIGHTS
29. LANDING GEAR WARNING LIGHT TEST SWITCHES
30. CLOCK
31. RADIO COMPASS
32. MARKER BEACON LIGHT
33. AUTO PILOT GYRO HORIZON
34. TURN GYRO
35. GLIDE PATH AND LOCALIZER
36. AUTO PILOT OIL PRESSURE GAUGE
37. PILOT'S HEATER TEMPERATURE GAUGE

Figure 7 — Main Instrument Panel

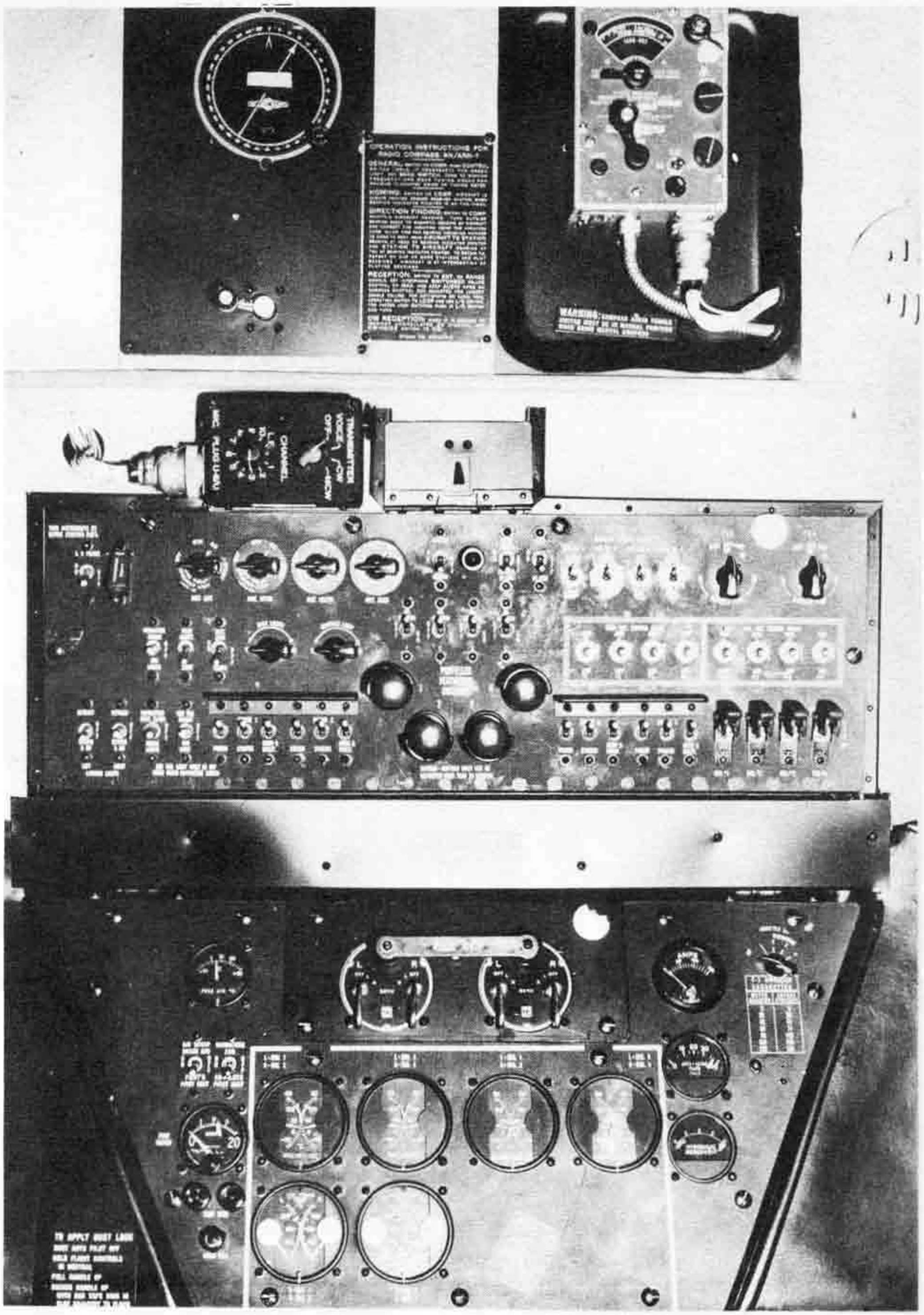


Figure 8 — Electrical Control Panel, Upper Instrument Panel, and Radio Compass Controls

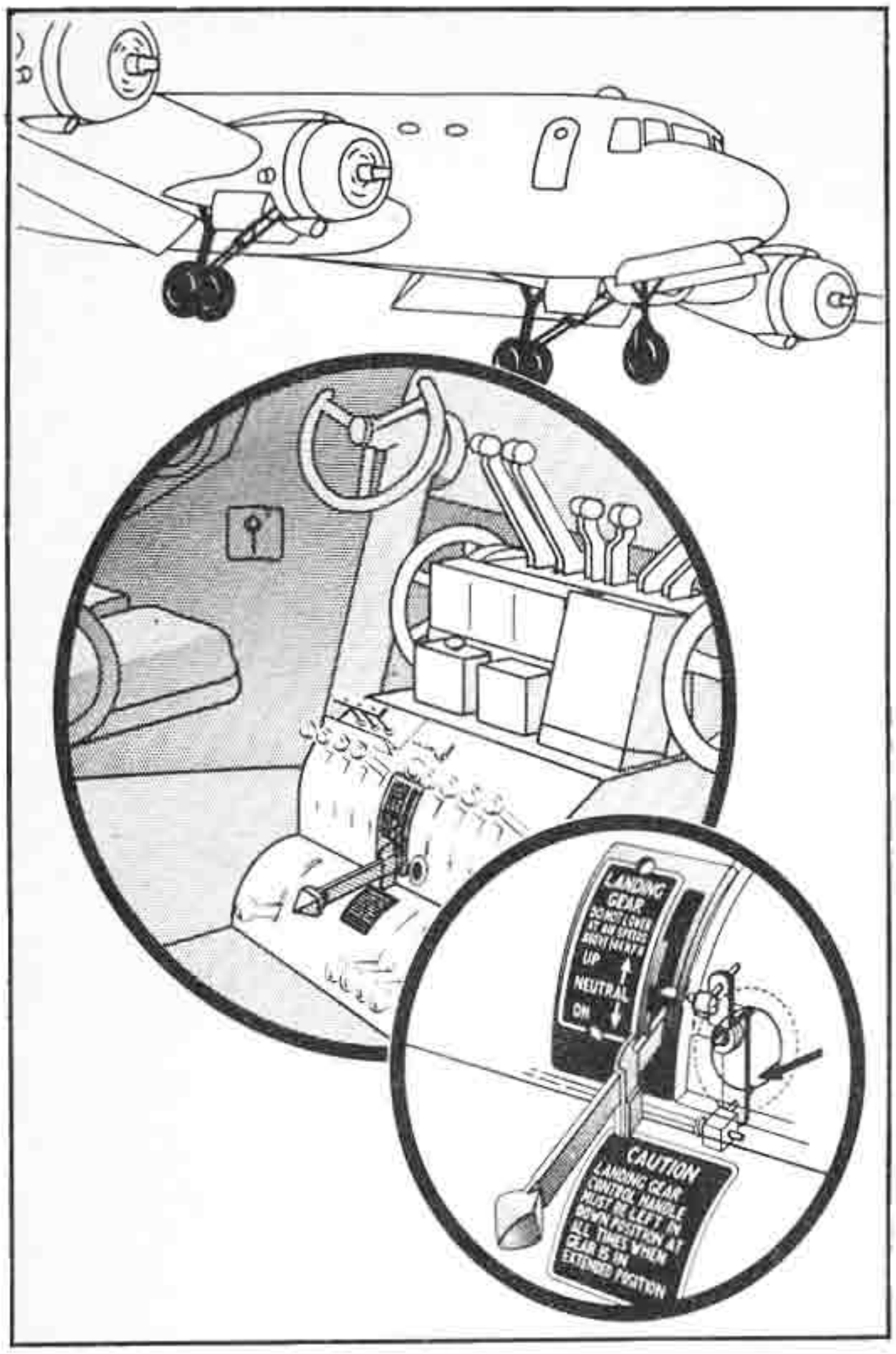


Figure 9 — Landing Gear Control

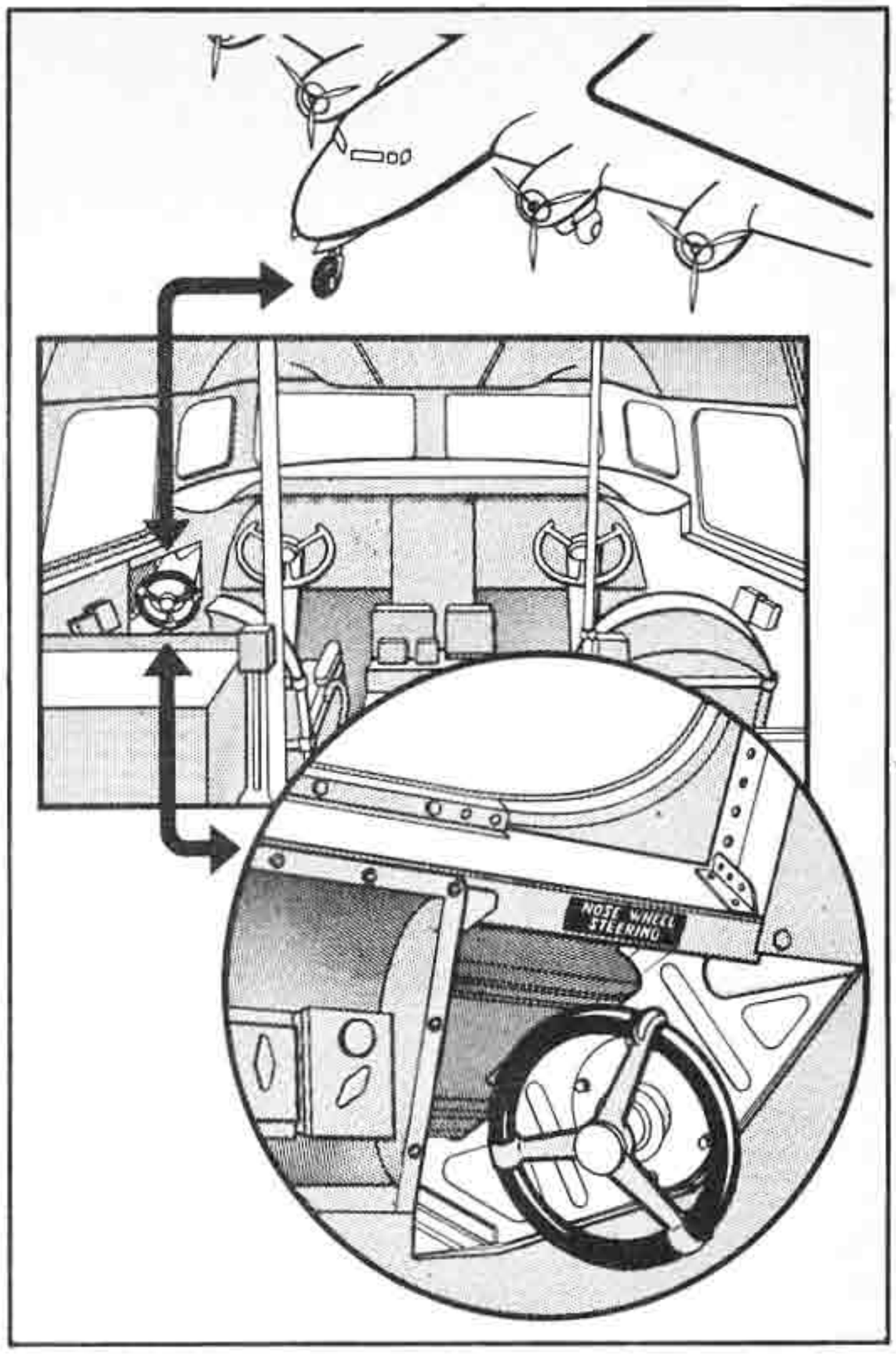


Figure 10 — Nose Wheel Steering Control

b. NOSE GEAR.—The nose wheel is steerable and is controlled by a wheel located on the left forward wall of the flight compartment adjacent to the pilot's seat.

c. BRAKES.—The main landing gear brakes are hydraulically actuated by toe pressure applied to the top of the rudder pedals. The parking brake control handle is located on the left side of the control pedestal. There is an emergency air brake control handle at each end of the main instrument panel, just under the glare-shield. Gauges on the panel to the right of the co-pilot's seat indicate the hydraulic pressure in the brake pressure accumulator and the air pressure in the emergency air brake air bottle.

d. LANDING GEAR SAFETY DEVICES.—Ground locks are provided to be installed in the landing gear linkage when the airplane is on the ground. A solenoid, mounted in the control pedestal adjacent to the landing gear control lever, prevents the lever being moved from the "DOWN" notch to the "NEUTRAL" notch while the airplane is on the ground with landing gear struts normally compressed. Should the solenoid pin stick, or fail to release when the airplane has left the ground, it may be manually released through the finger hole in the pedestal cover plate to the right of the control handle. There is a metal spring latch attached next to the landing gear control handle which retains the handle in the "DOWN" position. It is necessary to move this latch aside by hand before the handle can be moved up.

e. LANDING GEAR WARNING SYSTEM.—The position of the landing gear is indicated by three green lights and one red light on the main instrument panel. The three green indicator lights are on when the gear is down and locked in the safe landing position. The red warning light will glow when the gear is in any intermediate position. No lights glow when the gear is up and latched.

Note

The green lights will not light when the gear is down unless the landing gear control handle is in the full "DOWN" notched position. Lights may be tested by test switches adjacent to the lights.

A warning horn, located above the upper electrical panel, is connected to the throttle switches and to the UP and DOWN switches on the landing gear. When

all units of the landing gear are fully retracted in flight, the red warning light and the warning horn normally remain off. However, if one or more throttles are retarded beyond minimum cruise, and all of the gears are not locked down, the warning horn will sound and the red warning light will come on.

4. HYDRAULIC SYSTEM.

a. GENERAL.—The hydraulic system consists of the equipment necessary for the operation of the brakes, wing flaps, landing gear, cowl flaps, carburetor air filter doors, windshield wipers, and nose wheel steering mechanism. Pressure for the main hydraulic system is supplied by two engine-driven pumps, one mounted on engine No. 2 and one mounted on engine No. 3. Pressure is maintained at 2600 to 3050 psi by a pressure regulator. The automatic pilot is operated by a separate hydraulic system, pressure being supplied by an additional engine-driven pump on engine No. 2.

b. GAUGES.—The main system hydraulic pressure gauge is located on the right forward side of the pilots' compartment adjacent to the co-pilot's seat, and the remote indicating hydraulic reservoir quantity gauge is mounted on the right side of the upper instrument panel. The hydraulic brake system pressure accumulator has a separate pressure gauge which is mounted adjacent to the main system hydraulic pressure gauge.

c. HYDRAULIC HAND PUMP.—The hydraulic hand pump, located to the left of the co-pilot's seat, is an auxiliary pump which furnishes hydraulic pressure in the event of partial hydraulic system failure, or when the engine-driven pumps are not operating. The handle of this pump incorporates a swivel which allows the pump handle to be rotated into a position where it is easily accessible from the co-pilot's seat. The hand pump may be used to operate all units directly or it may be used to charge the pressure accumulator, depending on the position of the hand pump selector valve which is located on the floor adjacent to the hand pump handle.

d. SYSTEM BY-PASS VALVE. — The system by-pass valve is controlled by a handle on the floor near the base of the control pedestal. This valve, when opened, allows hydraulic fluid to be pumped directly from the engine pumps to the reservoir, by-passing the pressure regulator. The purpose of the valve is to save wear on the pressure regulator and engine pumps during cruising flight when it is not necessary to operate any of the hydraulic units.

5. ELECTRICAL SYSTEM.

a. GENERAL. — Most of the airplane's electrical equipment is powered by 24-volt direct current through a single-wire, ground-return type system. The capacity of each of the four generators is above that required for normal flying and in case of emergency, with all nonessential electrical equipment off, the electrical equipment essential for flight will operate on one generator only. The batteries are adequate to keep

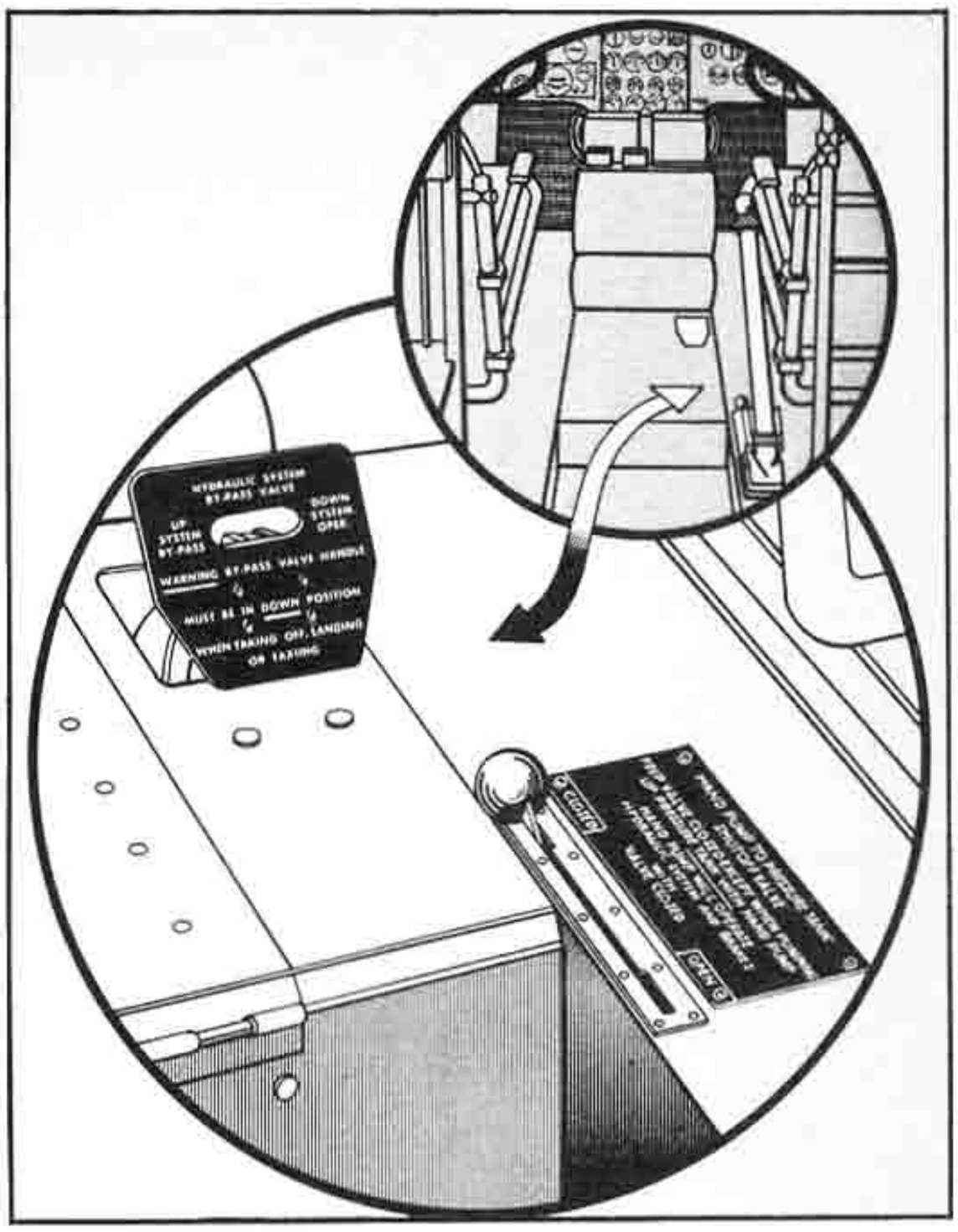


Figure 11 — Hand Pump Selector and System By-Pass Valve

the electrical system functioning for a short period if all load not essential to flight is turned off. The four guarded generator switches are located on the upper electrical panel. The 24-volt battery system consists of two 12-volt batteries connected in series. The master battery switch is located on the electrical control panel in the pilots' compartment.

b. INVERTERS.—There are two inverters, with provisions for a third. In all installations one inverter supplies power to the long range navigation radio equipment only, and is controlled separately by the "APN-9 ON-OFF" switch mounted on the forward edge of the aisle partition just aft of the navigator's stool location.

There is an inverter selector switch on the heater control panel. This switch is connected into the instrument inverter circuit. In standard installations there is only one instrument inverter and the selector switch is safety wired in the "NORMAL INVERTER" position. If a third inverter is installed, it is an alternate inverter for the instrument system. In this case, the safety wire is removed from the inverter selector switch on the heater control panel and the switch may be used to select either instrument inverter. The master control switch for the instrument inverter is the "AC POWER" switch on the upper electrical panel.

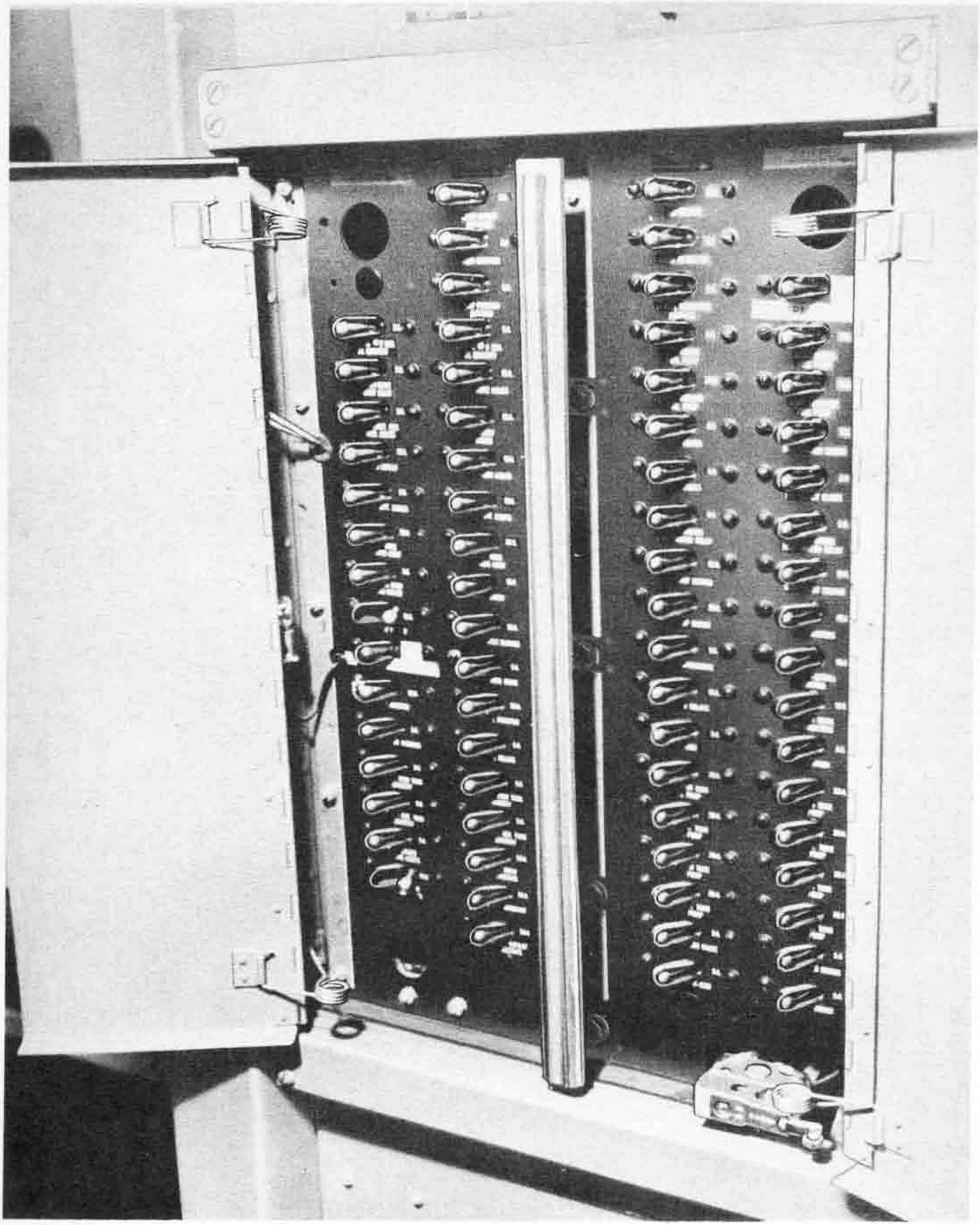
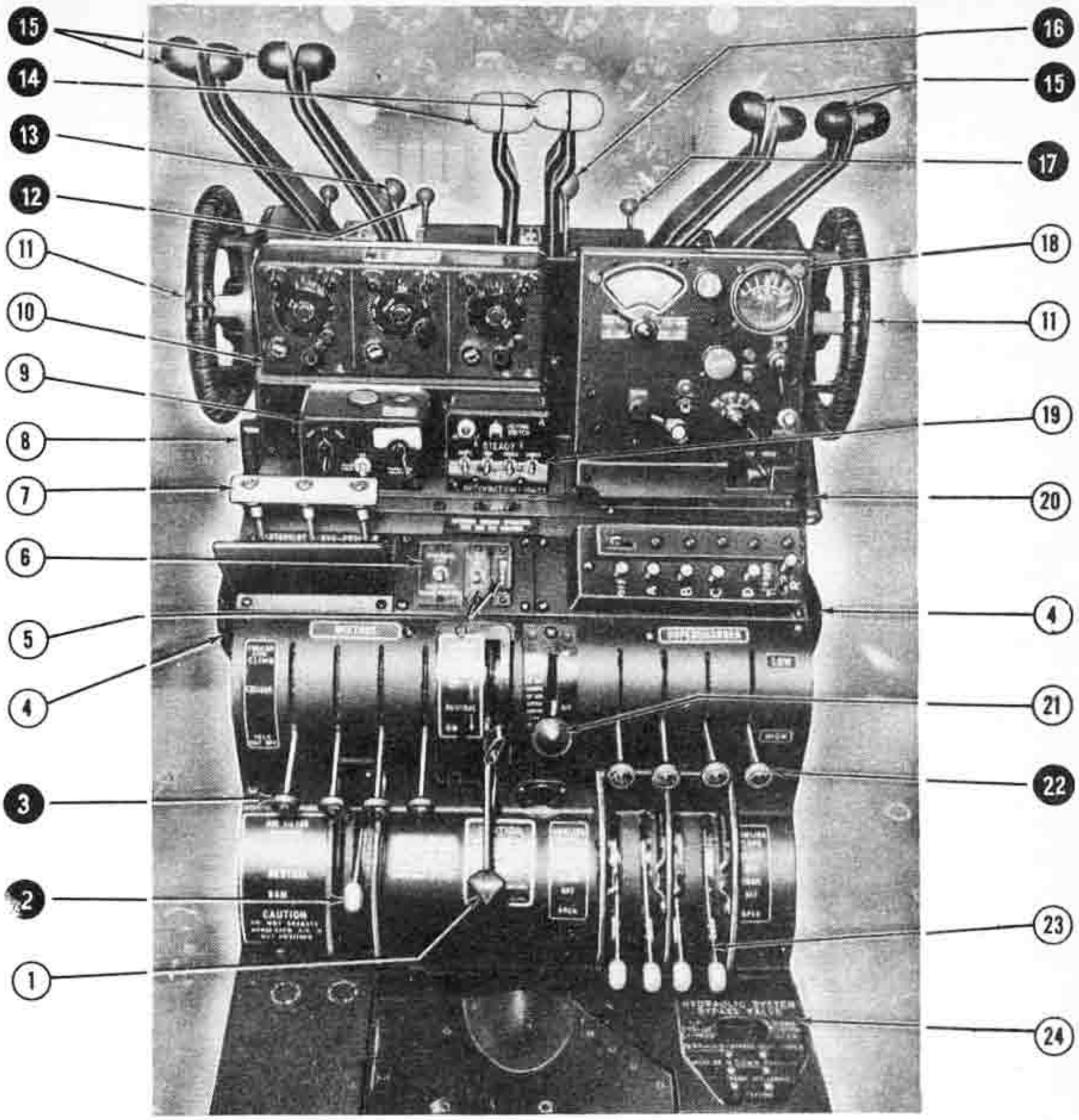


Figure 12 — Circuit Breaker Panel



1. LANDING GEAR CONTROL
2. CARBURETOR AIR FILTER CONTROL
3. MIXTURE CONTROLS
4. AILERON TRIM TAB CONTROL
5. IDENTIFICATION RADIO CONTROL SWITCHES
6. COMMAND RADIO TRANSFER CONTROL SWITCH
7. AUTOMATIC PILOT SERVO UNIT CONTROL
8. PARKING BRAKE CONTROL
9. SCR-274-N TRANSMITTER CONTROL BOX
10. SCR-274-N RECEIVER CONTROL BOX
11. ELEVATOR TRIM TAB CONTROL
12. TANK SELECTOR CONTROLS
13. THROTTLE FRICTION LOCK
14. PROPELLER CONTROLS
15. THROTTLE CONTROLS
16. PROPELLER FRICTION LOCK
17. CROSS-FEED CONTROL
18. AN/ARN-7 COMPASS CONTROL BOX
19. RECOGNITION LIGHTS
20. LANDING GEAR EMERGENCY EXTENSION CONTROL
21. WING FLAP CONTROL
22. SUPERCHARGER CONTROLS
23. COWL FLAP CONTROLS
24. HYDRAULIC SYSTEM BY-PASS VALVE

Figure 13 — Control Pedestal

c. UPPER ELECTRICAL PANEL.—The main electrical control panel is located on the ceiling of the pilots' compartment directly above the upper instrument panel.

d. CIRCUIT BREAKERS AND SPARE LAMPS.

(1) All 1-ampere to 50-ampere circuits are protected by circuit breakers. The switch-type circuit breakers are located on the face of the main junction box. Circuit breakers for the radio equipment and for the interphone system are located under the radio operator's table.

(2) Spare lamps are provided in a box located directly above the main circuit breaker panel.

e. LANDING LIGHTS.—The landing lights are extended and retracted electrically and are controlled by switches on the electrical control panel. The lights go on automatically when extended.

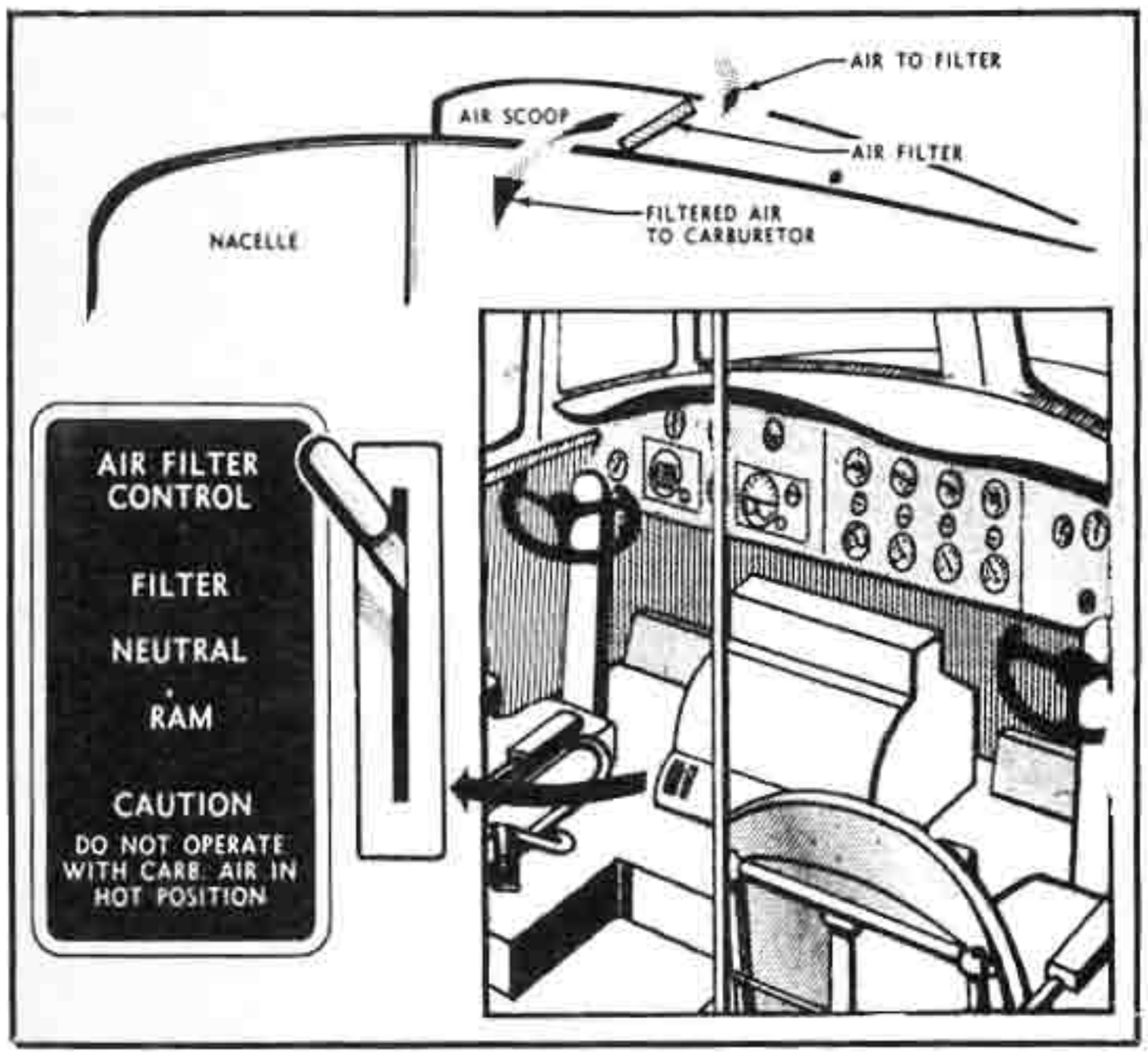


Figure 14 — Carburetor Air Filter Control

6. POWER PLANT CONTROLS.

a. ENGINES.—The airplane is powered by four Pratt & Whitney Twin Wasp engines, Models R-2000-9 and -4. The engines are equipped with two-speed superchargers and Bendix Stromberg Injection Carburetors, and are provided with full feathering Hamilton Standard Hydromatic propellers.

b. FUEL AND OIL SPECIFICATIONS.

(1) FUEL: Specification: MIL-F-5572
Grade: 100/130

(2) OIL: Specification: MIL-O-6082
Grade: 1100

c. THROTTLE CONTROLS. — Dual throttle controls *(see figure 13-15)* are located at the top of the control pedestal. A single friction lock control adjacent to the pilot's set of throttles, locks all throttles when applied.

d. MIXTURE CONTROLS — The four mixture controls *(see figure 13-3)* are located on the aft face of the control pedestal and are accessible to the pilot, co-pilot, or flight engineer. The controls notch into "IDLE CUT-OFF," "CRUISE," (auto-lean), and "TAKE-OFF AND CLIMB," (auto-rich).

e. PROPELLER RPM CONTROLS.—The propeller controls *(see figure 13-14)* are located at the top of the control pedestal between the two sets of throttle controls. A single control locks all four propeller control levers when applied. The controls are conventional in operation.

f. SUPERCHARGER CONTROLS. — Each engine incorportes a two-speed single-stage supercharger. The controls *(see figure 13-22)* are located on the right aft face of the control pedestal. The levers notch into their quadrants in either the "HIGH" or "LOW" position.

g. CARBURETOR AIR TEMPERATURE CONTROLS.—Carburetor air temperature control levers are located at the top center of the control pedestal, forward of the propeller control levers. The quadrants are notched to hold the levers in any position in which they are placed.

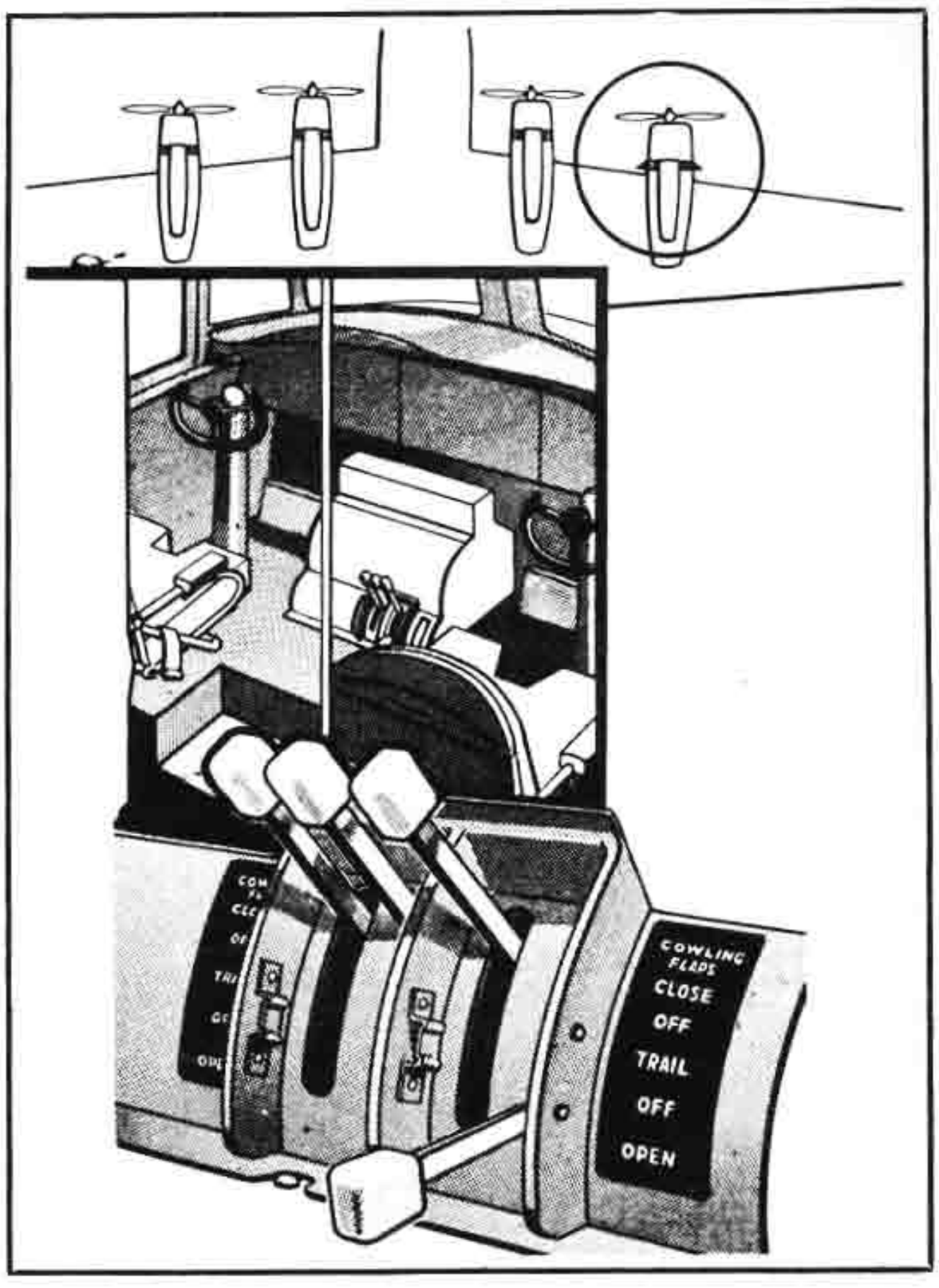


Figure 15 — Cowl Flap Control

h. CARBURETOR AIR FILTER CONTROL.—One carburetor air filter hydraulic control *(see figure 13-2)* for all four carburetor air filters is located on the lower aft face of the control pedestal. The control lever notches into three positions: "FILTER," "NEUTRAL," and "RAM."

i. COWL FLAP CONTROLS.—Cowl flaps for each engine are separately controlled by handles *(see figure 13-23)* located on the lower aft face of the control pedestal. Each control has five positions: "CLOSE," "OFF," "TRAIL," "OFF," and "OPEN." In the "TRAIL" position the cowl flaps are stabilized by equal air pressure on both sides of the flaps.

7. FUEL SYSTEM CONTROLS.

a. GENERAL.—The fuel system *(see figure 16)* consists of six integral tanks and two rubber fuel cells in the wings, an engine-driven fuel pump on each engine, a centrifugal electric booster pump on each tank, and four selector valves and two cross-feed valves to direct the flow of fuel from the tanks to the engines. Each engine is directly connected, through a selector valve, to its main or auxiliary tank.

b. WING FUEL TANKS.—The six integral and two collapsible "stub" tanks in this system *(see figure 16)* have a total capacity of 3540 US gallons.

FUEL QUANTITY DATA (GALS.)

Tanks	*No.*	*Usable Fuel (ea.)*	*Expans'n Space (ea.)*	*Unusu'ble Fuel Level Flgt. (ea.)*	*Total Vol. (ea.)*
MAIN (Nos. 1 & 4)	2	500	10	6.2	516.2
AUX. (Nos. 1 & 4)	2	420	15	1.3	436.3
MAIN (Nos. 2 & 3)	2	490	15	2.3	507.3
AUX. (Nos. 2 & 3)	2	360	12	3.0	375.0

The No. 2 and No. 3 auxiliary tanks are the rubber fuel cells, or "stub" tanks. Fuel quantity gauges for all tanks and a fuel flowmeter for each engine are located on the main instrument panel.

c. FUSELAGE FUEL TANKS.—Tubing and wiring provisions only are made for the installation of fuselage tanks.

d. SELECTOR VALVES.—Four levers on the control pedestal operate the four three-position selector valves. Each lever has the following positions: "OFF," "MAIN TANK ON," and "AUX TANK ON."

e. CROSS-FEED VALVES.—Various tank-to-engine combinations may be obtained by use of the two cross-feed levers on the control pedestal which operate the two three-position cross-feed valves. The left cross-feed control lever has positions of "OFF," "CROSS-FEED BETWEEN 1 AND 2," and "ALL ENGINES TO CROSS-FEED." The right cross-feed lever has similar positions for engines No. 3 and 4.

f. ELECTRIC FUEL BOOSTER PUMPS.—The eight electrically-driven booster pumps (one for each wing tank) are individually controlled by eight three-position switches on the electrical control panel. Each switch has an "OFF," "LOW," and "HIGH" position.

8. OIL SYSTEM.

a. TANKS.—Oil *(see figure 17)* is supplied to the engines from four independent nacelle oil tanks. Each tank has a capacity of approximately 22 US gallons. A fuselage oil tank with a capacity of approximately 50 US gallons is located in the crew compartment beneath the lower bunk. Oil may be transferred from the fuselage tank to any nacelle tank during flight.

b. OIL TRANSFER SYSTEM.—When the oil quantity gauges on the main instrument panel indicate that a nacelle tank is approximately half full, oil may be transferred from the fuselage tank to replenish the nacelle tank. A four-way selector valve is mounted near the floor on the aft right wall of the crew compartment. A momentary contact switch, for operating the oil transfer pump, and a circuit breaker reset switch are located near the selector valve. A quantity gauge is located on the side of the fuselage oil tank.

c. OIL DILUTION.—Engine oil dilution is provided for each engine. The oil dilution solenoids are individually controlled by switches on the upper electrical control panel. The propeller feathering oil is diluted by feathering and unfeathering the propeller during the engine oil dilution cycle.

d. TEMPERATURE AND PRESSURE GAUGES.—Oil temperature gauges are located on the upper instrument panel. Oil pressure gauges are located on the main instrument panel.

e. COIL COOLING.—No manual control of the oil cooling system is provided. Each engine is equipped with an oil cooler incorporating an automatically-operated door.

9. GLIDER TOW RELEASE CONTROL.

The glider tow release is a red T-shaped handle located under the hinged metal door in the floor directly aft of the control pedestal. Pulling up on this handle operates the release mechanism in the tail cone of the airplane.

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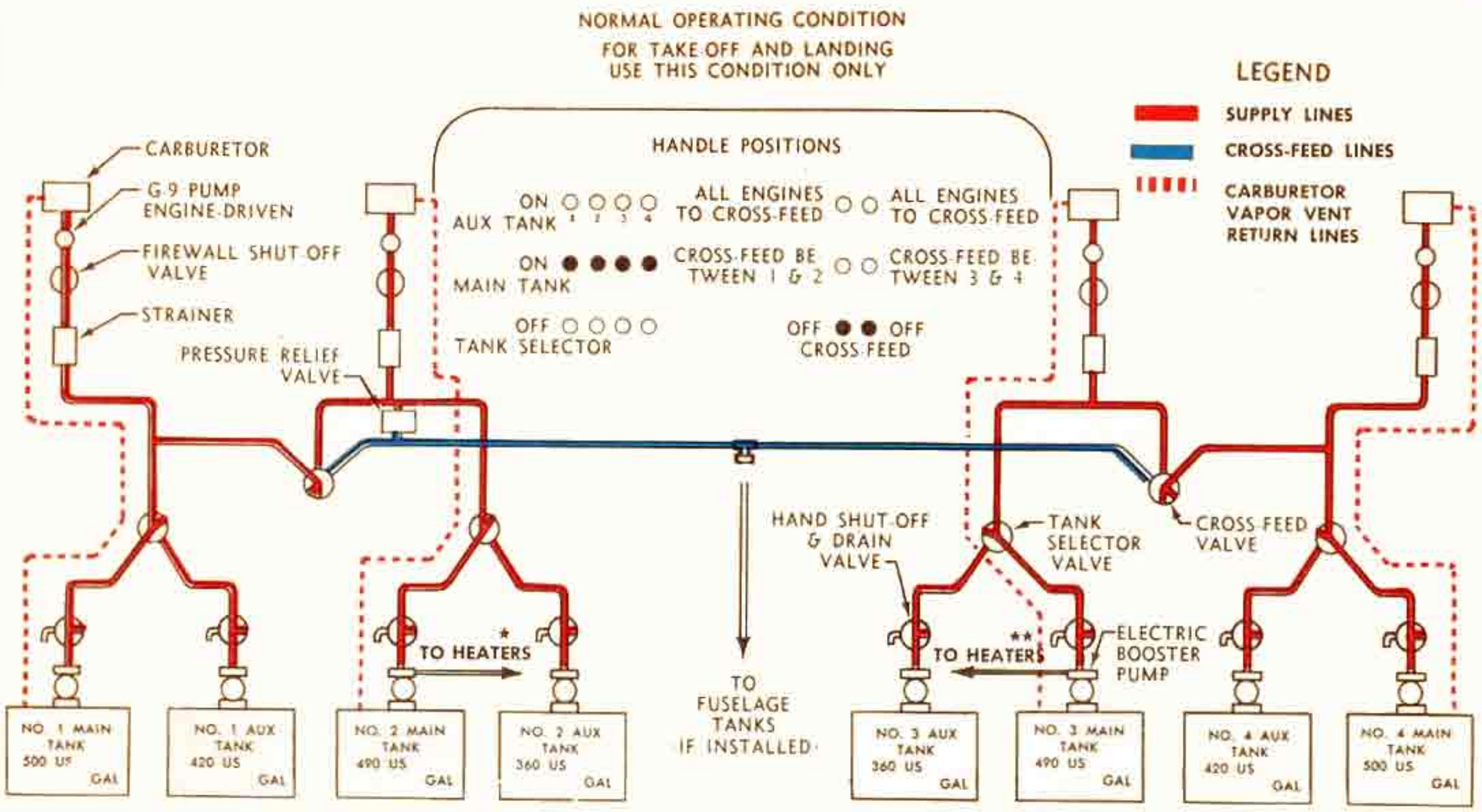
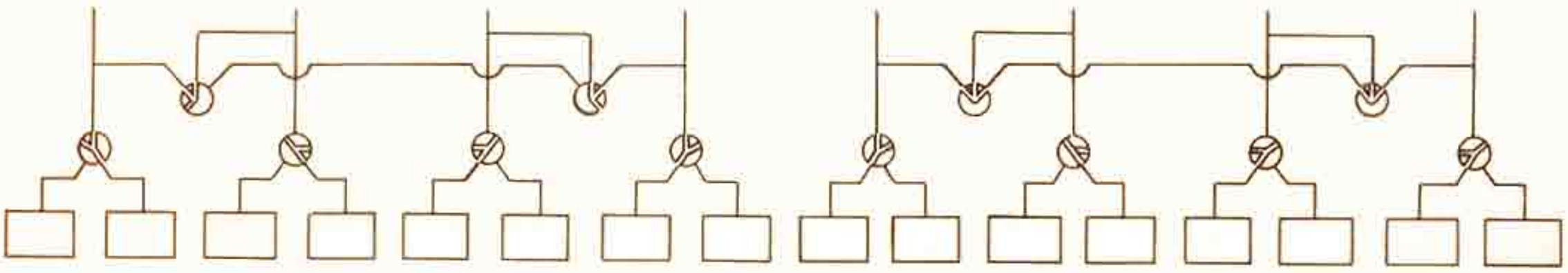


OUTBOARD AUXILIARIES TO TWO ENGINES
HANDLE POSITIONS

ON AUX TANK 1 2 3 4 ● ○ ○ ●
ALL ENGINES TO CROSS-FEED ○ ○ ALL ENGINES TO CROSS-FEED
ON MAIN TANK ○ ○ ○ ○
CROSS-FEED BE TWEEN 1 & 2 ● ● CROSS-FEED BE TWEEN 3 & 4
OFF TANK SELECTOR ○ ● ● ○
OFF ○ ○ OFF CROSS-FEED

NO. 1 MAIN TANK TO ALL ENGINES
HANDLE POSITIONS

ON AUX TANK 1 2 3 4 ○ ○ ○ ○
ALL ENGINES TO CROSS-FEED ● ● ALL ENGINES TO CROSS-FEED
ON MAIN TANK ● ○ ○ ○
CROSS-FEED BE TWEEN 1 & 2 ○ ○ CROSS-FEED BE TWEEN 3 & 4
OFF TANK SELECTOR ○ ● ● ●
OFF ○ ○ OFF CROSS-FEED



CAUTION

1. TO AVOID POSSIBILITY OF AIR ENTERING ENTIRE SYSTEM, TANK SELECTORS AND CROSS FEED VALVES MUST BE OFF EXCEPT WHEN FLOW IS EXPECTED THROUGH THEM
2. OPEN VALVES TO A NEW SOURCE OF SUPPLY BEFORE CLOSING OFF OLD SOURCE

TOTAL CAPACITY 3540 US GALLONS

NOTES:

1. ELECTRIC BOOSTER PUMP MUST BE IN HIGH SPEED FOR TAKE-OFF AND LANDING
2. ELECTRIC BOOSTER PUMP TO BE USED FOR STARTING, TAKE-OFF, LANDING, HIGH ALTITUDE, AND EMERGENCY
3. CHECK THE OPERATION OF EACH ENGINE ON ITS MAIN AND AUXILIARY TANKS BEFORE TAKE-OFF
4. HAND SHUT-OFF AND DRAIN VALVE TO BE LOCK-WIRED OPEN, EXCEPT DURING GROUND SERVICING
5. SEQUENCE OF USE OF FUEL SUPPLY
   - A TAKE-OFF IN NORMAL OPERATING CONDITION ONLY
   - B USE WING AUXILIARY TANK SUPPLY
   - C LAND IN NORMAL OPERATING CONDITION ONLY

FUSELAGE TANKS (IF INSTALLED)

1. FUSELAGE TANKS TO BE EMPTIED BEFORE WING TANKS
2. FINAL RUNOUT OF FUSELAGE TANKS TO BE TO TWO ENGINES ON ONE SIDE OF AIRPLANE ONLY

6. FUEL MAY RETURN FROM THE CARBURETORS TO THE MAIN TANKS THROUGH THE VAPOR VENT RETURN LINES IN VARYING AMOUNTS
7. *FUEL TO HEATERS IN AIRPLANES C-54G-1-DO, AND SUBSEQUENT
8. **FUEL TO HEATERS IN AIRPLANES C-54G-1-DC ONLY

Figure 16 — Fuel System

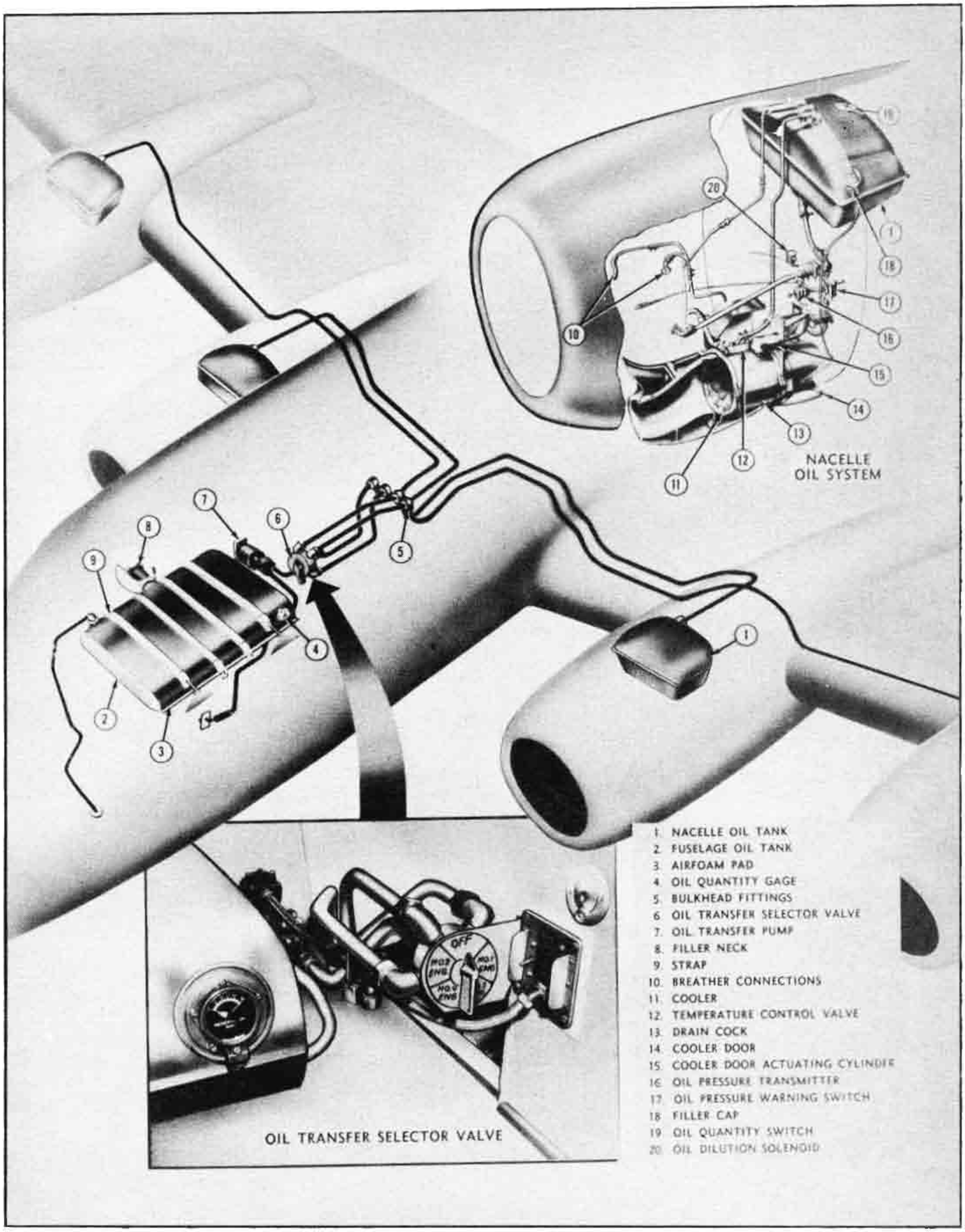


Figure 17 — Oil System

10. AUXILIARY POWER PLANT.

a. GENERAL.—The auxiliary power plant is located in the rear cargo compartment. It provides an independent source of additional electric power; the power plant will automatically supply, at constant speed, an electrical output of zero to five kilowatts (0 to 175 amperes at 28.5 volts). The unit has its own air cooling system, fuel and oil supply, and controls. It is not supercharged; above 10,000 feet its maximum amperage output decreases as altitude increases.

b. CONTROLS.

(1) The ignition switch located on the unit controls the single magneto.

(2) THROTTLE CONTROL LEVER.—The throttle has three positions: "CHOKE," this position is used for starting at temperatures below 50 F; "IDLE," when the lever is moved to the left of this position it controls the choke and when moved to the right it controls the speed; "RUN," this position is the normal operating position for delivering power, do not place throttle in this position until the engine has warmed up by running 5 to 15 minutes at the "IDLE" position.

(3) STARTER SWITCHES.—The auxiliary power plant generator serves a dual purpose of being a starter and a generator and is controlled by three switches on the auxiliary power plant electrical panel. Two of the three switches are interconnected. The two interconnected switches are spring-loaded to the on position. All switches have a "START" position, in this position for the two interconnected switches, the polarity of the generator is reversed causing it to function as a starter, the other switch supplies power from the airplane batteries. After starting these switches are in the "RUN" position to produce generator functioning and place generator on the line after engine is warmed up.

(4) EQUALIZER SWITCH.—The equalizer switch is turned "ON" after the generator is on the line to equalize voltage with that of the engine driven generators. The switch must be in the "OFF" position for starting.

c. INDICATORS.

(1) LOADMETER.—A loadmeter is installed on the APP electrical panel.

(2) VOLTMETER.—A voltmeter is also installed on the APP electrical panel.

Section II
PILOT'S OPERATING INSTRUCTIONS

1. FLIGHT RESTRICTIONS.

a. MANEUVERS PROHIBITED. — Acrobatics and power on stalls are prohibited. This airplane is restricted to normal level flight maneuvers.

b. FLIGHT LIMITATIONS.

(1) Maximum allowable take-off weight: 73,000 pounds.

(2) Maximum overload landing weight: 73,000 pounds.

(3) Maximum allowable indicated airspeed: Refer to Speed and Load Factor Limitations Chart, figure 35, Appendix II.

(4) Do not lower flaps at airspeeds in excess of the following limitations:

Flap Angle	*Indicated Airspeed*
50 degrees	144 mph
40 degrees	154 mph
30 degrees	158 mph
20 degrees	202 mph

(5) Do not lower landing gear or operate with gear extended at speeds in excess of 144 mph.

(6) Do not lower landing lights at speeds in excess of 144 mph.

(7) When encountering severe turbulence, do not exceed 160-175 mph indicated airspeed.

(8) Do not operate engines continuously between 1600 and 1700 rpm.

(9) Do not operate engines continuously between 2300 and 2550 rpm because of possible crankshaft failures.

CAUTION

If engine overspeeding occurs, land at nearest base. Note all conditions of overspeeding on the Form 1. If engine speed was between 3100 and 3300 rpm, the engine must be inspected before further flight. If engine speed exceeded 3300 rpm, the engine must be changed.

These limitations may be supplemented or superseded by instructions included in Service publications.

1A. MINIMUM CREW REQUIREMENTS.

The minimum crew requirements of this airplane are pilot, co-pilot, and engineer. Additional crew members as required will be added at the discretion of the Commanding Officer.

2. BEFORE ENTERING FLIGHT COMPARTMENT.

a. Gross weight and loading—check load, balance, and security.

(1) The airplane should be loaded for flight with the aid of the *Handbook of Weight and Balance Data, AN 01-1B-40*, and the *Load Adjuster Slide*.

(2) The allowable center of gravity limits are 16 to 32 percent of the mean aerodynamic chord.

b. Main landing gear safety-ground-locks installed and wheels chocked.

*b*A. Check nose gear strut extension (not more than 3 7/8 inches measured from the bottom of the packing nut to the top of the fork).

c. Nose gear ground lock—installed. Torque links—engaged.

d. Ascertain that tires are properly inflated.

e. Check uplatches for unlatched position.

f. See that all plugs and covers are removed from carburetor air scoops, exhaust tail pipes, pitot tubes, and ventilating scoops.

CAUTION

Drain the pitot-static drain sump in the nose wheel well: Water in the sump will effect the accuracy of all pitot-static instruments.

g. ACCESS TO AIRPLANE.—Enter the airplane through the main cargo doorway on the left side of the airplane, or through the pilots' doorway on the right side of the flight compartment.

3. ON ENTERING FLIGHT COMPARTMENT.

Note

A pilots' check list is attached to the arm of the pilots' seat.

a. STANDARD CHECK.

(1) Fuselage fuel tank selector valve (when fuselage tanks are carried)—"OFF."

(2) Fuselage oil tank selector—"OFF."

(3) Check to see that all circuit breakers are set.

(4) Landing gear control — "DOWN" and in notch; solenoid locking pin in place.

(5) Check to see that landing gear emergency extension valve control is in "CLOSED" (forward) position.

(6) Ignition switches—"OFF."

(7) With co-pilot in position to hold rudder pedals, disengage gust lock warning tape and release gust lock. Check all controls for free and full movement.

Note

If gusty or windy conditions necessitate it, the gust lock may be left engaged during the run-up and taxi. The gust lock MUST be released prior to take-off.

CAUTION

Warning tape reel is spring loaded. Avoid letting tape wind up with a snap, as the gust lock pin may hit and damage instruments. When tape is wound, snap pin into retaining clip.

WARNING

Check if full movement of the controls is possible after the gust lock handle is placed in the "OFF" position. If not, determine cause and correct before take-off to avoid unsafe condition during flight.

(8) Emergency air brake pressure—950 to 1050 psi.

(9) Mixture controls—"IDLE CUT-OFF."

(10) Cowl flaps — "OPEN." Selector valves — "OFF."

(11) Master battery switch—"OFF." ("ON" if external power is not used—this will be considered an emergency procedure.)

(12) Parking brake—"ON."

(13) Vacuum selector valve — "ALL INSTRUMENTS— R PUMP" or "ALL INSTRUMENTS—L PUMP."

(14) Propellers—full "INCREASE RPM."

(15) Superchargers—"LOW."

(16) Carburetor heat—"COLD."

(17) "AC POWER" switch—"ON."

(18) Generator switches—Check "ON."

(19) Hydraulic system by-pass valve—"SYSTEM OPERATIVE."

(20) Automatic pilot oil shut-off valve—"ON."

(21) Automatic pilot servo control—"OFF."

(22) De-icer and anti-icer switches—"OFF."

(23) Static selector control—"AIRSPEED TUBE."

(24) Carburetor air filter control—"RAM," then "NEUTRAL."

(25) Set altimeters.

b. SPECIAL CHECK FOR NIGHT FLIGHTS.

(1) Flight compartment dome light—"ON."

(2) Instrument, compass, spot, and automatic pilot light switches—"ON."

(3) Warning lights—"DIM."

(4) Tail light—"BRIGHT."

(5) Wing lights—"BRIGHT."

(6) Recognition lights — momentarily "ON." (Lights can be checked through drift meter.)

(7) Landing light switch—"ON."

Note

To conserve bulb life and to avoid heavy current load on the battery, use the landing lights only as necessary. Switch to "RETRACT" for 15 seconds, then "OFF."

(8) Flight compartment dome light—"OFF."

3A. AUXILIARY POWER PLANT OPERATION.

a. PRE-STARTING CHECK.

(1) Examine the exterior of the unit for loose parts, oil leaks, fuel leaks, and loose electrical connections.

(2) Check the oil level with the bayonet gage under the filler cap. The oil level should be up to the "F" mark.

(3) Check the fuel tank for an adequate fuel supply and the cap for security.

b. ELECTRICAL STARTING.

(1) Turn the pilot's battery switch "ON."

(2) Check that equalizer switch is "OFF."

(3) Auxiliary power plant ignition switch "ON."

(4) Throttle control between the "IDLE" and "RUN" positions.

Note

No choking will be necessary at temperatures above 10°C (50°F). At lower temperatures choking may be accomplished by moving the throttle control to the "CHOKE" position.

(5) Hold the two interconnected starter switches to the "START" position, then move the other starter switch to "START" position. When engine starts release the switches.

Note

Do not place throttle lever in the "RUN" position until the engine has warmed up.

c. MANUAL STARTING.—The manual starting procedure is identical to the electrical starting procedure except that the starting cord is used instead of the generator starter. The starting switches are left off.

d. AUXILIARY POWER PLANT OPERATION.

(1) Do not run the engine at or near maximum rpm until after it has warmed up.

(2) After the engine is warmed up the generator is put on the line by placing starter switch in the "RUN" position.

(3) When the auxiliary power plant and engine generators are on the line the equalizer switch should be turned "ON."

e. STOPPING THE AUXILIARY POWER PLANT.

(1) Turn the starting switch to "OFF" position.

(2) Equalizer switch—"OFF."

(3) Move the throttle control to the "IDLE" position for 5 minutes.

(4) Turn the ignition switch off.

4. FUEL SYSTEM MANAGEMENT.

a. GENERAL.—The fuel system consists essentially of four independent tank systems, each engine being directly connected through a selector valve to either a main or an auxiliary tank. Various tank-to-engine combinations may be obtained by positioning the four selector valve controls and the two cross-feed controls as shown in figure 16 and as outlined in the following procedures. For proper operating fuel pressures and rate of flow per hour, refer to Power Plant Chart, Section III.

Note

When operating the engines under the condition of high rpm and low manifold pressure with the booster pumps in "HIGH," fuel pressure may reach 18 to 19 psi. During approach, when booster pumps are in "HIGH," and engine rpm is 2100 to 2300, fuel pressure may reach 21 psi.

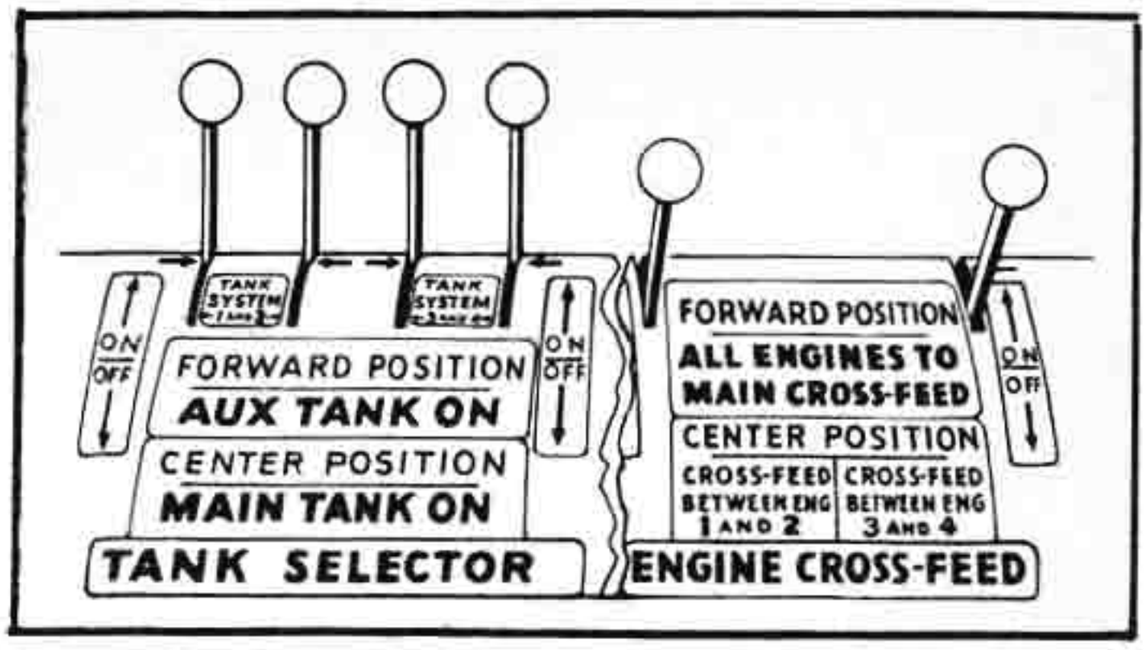


Figure 18—Normal Operating Condition

b. STARTING ENGINES, GROUND OPERATIONS, AND TAKE-OFF.

(1) Tank selector controls—"MAIN TANK ON."

(2) Cross-feed controls—"OFF."

(3) Main tank electric fuel pumps—"LOW" for starting, "HIGH" for take-off.

(4) Check for unobstructed fuel flow by operating each engine on both its MAIN and AUXILIARY tank prior to take-off.

c. THREE OR TWO-ENGINE OPERATION.

(1) Electric fuel pump for inoperative engine—"OFF."

(2) Tank selector for inoperative engine—"OFF."

d. CRUISING.—The vapor vent return line from the carburetor on each engine returns to that engine's main wing tank. Upon reaching cruising altitude, use fuel in the following order:

(1) AUXILIARY TANKS.—The auxiliary tanks may be used to supply fuel to their respective engines, one tank to two engines on one side, or if necessary, one tank to all engines, by proper use of the selector and cross-feed controls.

(a) AUXILIARY TANKS TO RESPECTIVE ENGINES.

1. Selector valves—"AUX. TANK ON."

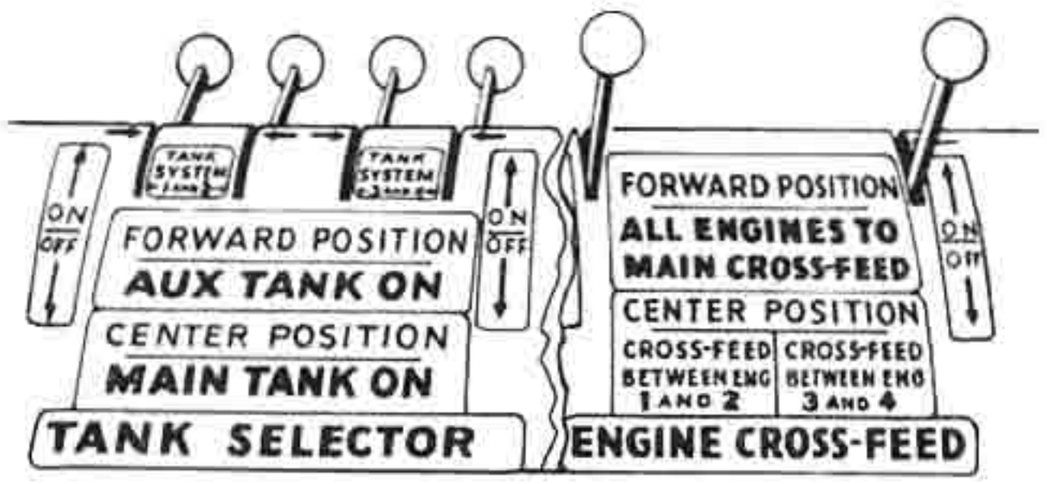


Figure 19 — Auxiliary Tanks to Respective Engines

2. Cross-feed valves—"OFF."

3. Electric fuel pumps for auxiliary tanks, "HIGH" or "LOW" as required, then "OFF" if pressure is maintained by engine driven pumps alone.

(b) OUTBOARD AUXILIARY TANKS TO TWO ENGINES.

1. Cross-fed valves — "CROSS-FEED BETWEEN 1 AND 2" and "CROSS-FEED BETWEEN 3 AND 4."

2. Selector valves—No. 1 and No. 4, "AUX. TANK ON." No. 2 and No. 3 "OFF."

3. Electric fuel pumps for No. 1 and No. 4 auxiliaries—"HIGH" or "LOW" as required, then "OFF" if pressure can be maintained with engine pumps alone.

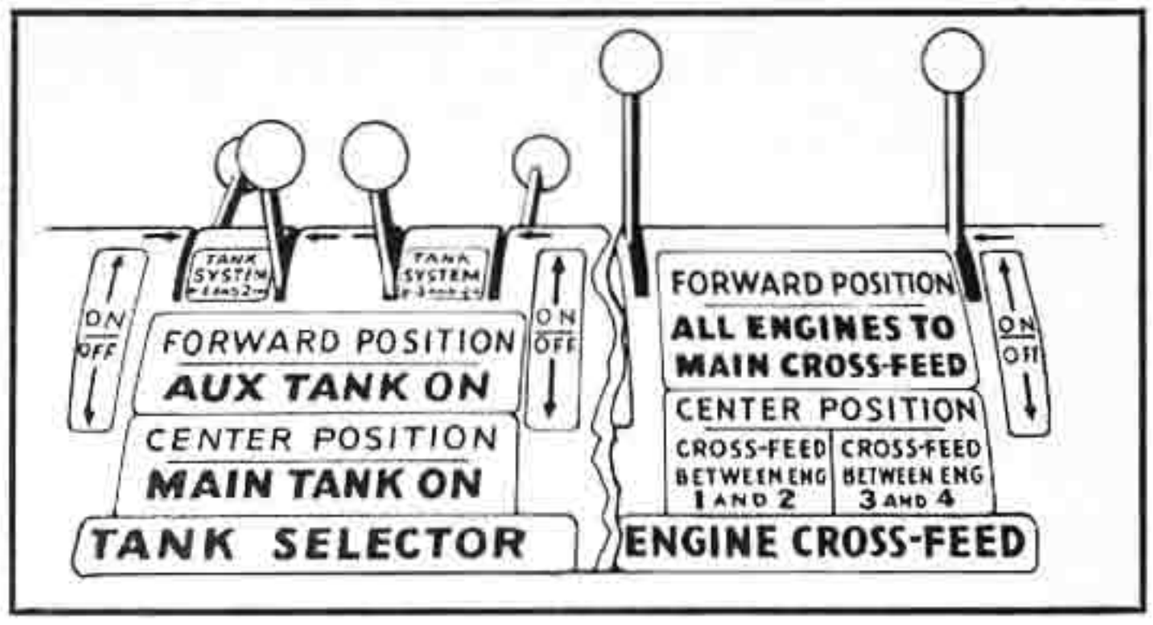


Figure 20 — Outboard Auxiliary Tanks to Both Engines

(c) LEFT OUTBOARD AUXILIARY TANK TO ALL ENGINES.

1. Cross-feed—both to "ALL ENGINES TO CROSS-FEED."

2. Selector valves — No. 1, "AUX TANK ON." Nos. 2, 3, and 4, "OFF."

3. Electric fuel pump for No. 1 auxiliary "HIGH" or "LOW" as required, then "OFF" if pressure can be maintained with engine pumps alone.

(2) MAIN TANKS.

(a) All four selectors—"MAIN TANK ON."

(b) Both cross-feeds—"OFF."

(c) Electric fuel pumps for main tanks—"HIGH" or "LOW" as required, then "OFF" if fuel pressure can be maintained with engine pumps alone.

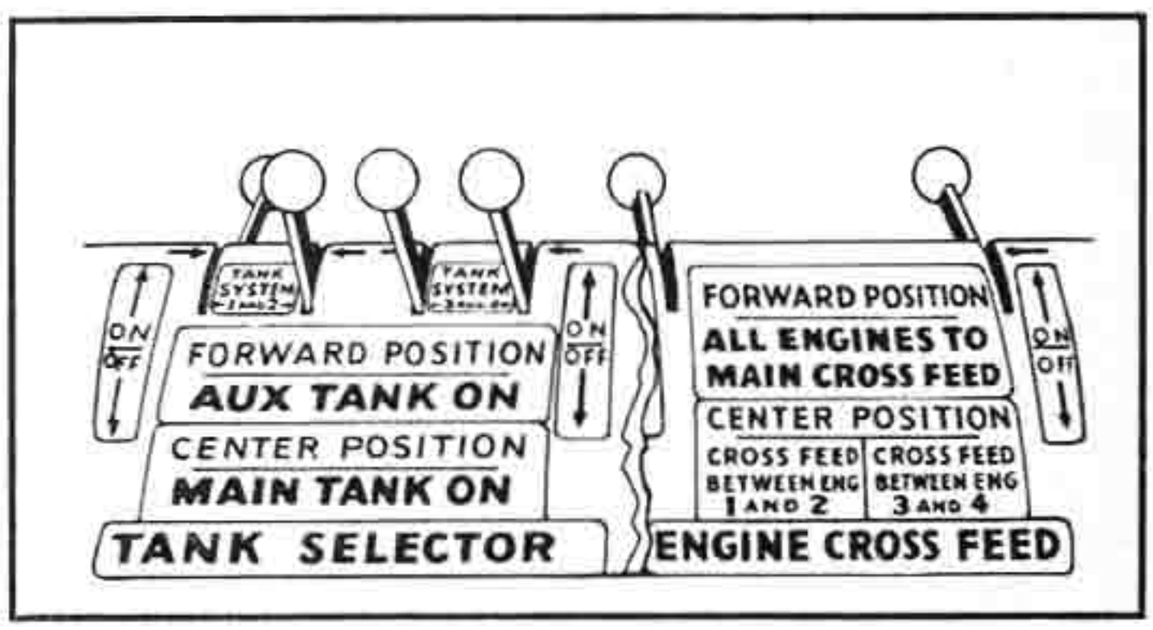


Figure 21 — Left Outboard Auxiliary Tank to All Engines

e. ENGINE FAILURE IN FLIGHT.—If an engine fails in flight due to loss of fuel pressure, immediately check for adequate fuel in tank selected and switch on booster pump for tank from which failing engine is drawing fuel. If this step does not bring up the pressure immediately, a failure other than engine-driven

pump failure or lack of fuel is indicated, and the faulty engine should be isolated. Immediately switch the engine that is still operating, on the side affected, to its respective tank system and do not use fuel from the system in which the failure occurred. The cross-feed control for the affected side must be "OFF."

f. BEFORE LANDING.

(1) Check fuel quantities.

(2) Operate each engine from its respective main tank.

(3) If this is impossible, operate on tanks containing largest quantity of fuel.

(4) Electric fuel pumps for tanks in use—"HIGH."

5. OIL SYSTEM MANAGEMENT.

a. GENERAL.—The oil cooler exit doors are automatically operated by a temperature control valve attached to the cooler.

b. OIL TRANSFER SYSTEM.—If the dual oil quantity gauges on the main instrument panel indicate that the oil level in any nacelle tank is low, proceed as follows:

(1) Set four-way selector valve mounted near the floor on the right rear wall of the crew compartment to the engine number affected.

(2) Set oil transfer pump circuit breaker.

(3) Hold oil transfer pump switch "ON."

(4) Watch both the gauge on the side of the fuselage tank and the nacelle tank quantity gauge on the instrument panel. When the oil quantity gauge on the main instrument panel shows the nacelle tank to be approximately ¾ full, proceed cautiously so as not to overfill the nacelle tank. The pump transfers approximately one gallon of oil per minute.

Note

If an overload on the transfer pump (due to cold oil in the lines, or other causes) causes the pump circuit breaker to trip, shut down for two or three minutes and allow the pump motor to cool before continuing operation. In extremely cold weather it may be necessary to stop and start two or three times to get the congealed oil flowing through the lines. Do not operate by holding the circuit breaker in the closed position. This should be attempted only in case of an emergency when there is a definite oil shortage to the engines.

6. STARTING ENGINES.

a. Post fire guard.

b. With ignition switches "OFF," pull the propeller through in the direction of rotation a minimum of two complete turns to determine if all combustion chambers are clear and free from fuel or oil which may result in a hydraulic lock which is indicated by abnormal effort required to rotate the propeller.

c. Fuel tank selectors—"MAIN TANK ON."

d. Cross-feed—"OFF."

e. Carburetor heat—"COLD."

CAUTION

The engines should never be started with the carburetor air temperature controls in "HOT" position. Serious damage and fire may result from a backfire. During icing conditions, start the engine with the controls in the "COLD" position, then move the control to "HOT." Carburetor air filter control must be in "RAM" position when carburetor air temperature controls are in "HOT."

f. Filter doors—"RAM," then "NEUTRAL."

Note

If hydraulic system pressure is insufficient, hydraulically-operated units must be positioned by use of the hydraulic hand pump.

g. Cowl flaps—full "OPEN."

h. Supercharger—"LOW."

i. Propellers—full "INCREASE RPM."

j. Throttles—¼ open.

k. Master ignition switch—"ON."

Note

Start engines No. 3, 4, 2, 1, in that order.

l. Operate starters. Starter switch "ON" (10 to 15 seconds), then mesh-and-boost switch—"ON."

m. Allow propeller to make one complete revolution, then turn engine ignition switch to "BOTH."

CAUTION

The engine should start in less than 45 seconds after meshing. However, if engine fails to start within this time, shut down and allow starter motor to cool for approximately three minutes before repeating operation.

n. Electric fuel pumps for main wing tanks—"LOW."

o. Engage the electric primer and hold in the "ON" position until after engine has started and engine speed stabilizes.

p. Mixture control—Move gradually to "TAKE-OFF AND CLIMB" after engine is running. To prevent backfiring, movement of the mixture control to "TAKE-OFF AND CLIMB" position should occur slightly before disengaging the primer in order to allow the carburetor to come up to operating pressures and start functioning in a normal manner. (Return control immediately to "IDLE CUT-OFF" if engine does not continue to run, or flooding will result.)

CAUTION

Whenever engine backfires in starting, do not shut down immediately, but continue turning engine with electric starter (priming intermittently as required) until engine has ceased backfiring, is running smoothly, and burning fuel has been drawn through the engine. When starting at air temperatures above 27°C (80°F), take special care to avoid flooding engines. Do not wet blower before starting. Do not prime a hot engine.

q. If oil pressure does not come up to 40 psi within 30 seconds after starting, stop engine and investigate.

r. Check hydraulic pressure after starting No. 3 engine.

Note

Engine-driven hydraulic pumps are mounted on engines No. 2 and No. 3.

7. ENGINE WARM-UP AND ACCESSORY CHECK.

CAUTION

When operating engines on the ground, if the fuel pressure suddenly drops to zero and the engine keeps running normally, shut it down immediately and investigate. The fuel pressure line to the pressure transmitter or the dilution solenoids may have broken. If operation is continued with such a break existing, fuel will be pumped into the nacelle, creating a possible fire hazard.

a. Idle engines at 1000 rpm until the oil temperature is above minimum of 40°C and oil pressure is below 100 psi. Then increase engine speed to 1200 to 1400 rpm to prevent fouling of spark plugs.

b. Master battery switch "ON." Battery cart disconnected.

c. Electric fuel pumps "OFF." Check operation of engine-driven pumps.

8. SCRAMBLE TAKE-OFF.

a. Landing gear safety locks—REMOVED.

b. Dilute engine and propeller-feathering oil in accordance with existing atmospheric conditions.

c. Check oil temperature rise. Temperature must rise at least 10°C above residual oil temperature prior to take-off.

d. Electric fuel pumps for tanks in use—"HIGH."

Note

If absolutely necessary, under emergency conditions only, other than normal tank combinations may be used for take-off.

9. ENGINE AND ACCESSORY OPERATING GROUND TEST.

a. Hydraulic pressure—Within limits (pumps on engines No. 2 and 3).

b. Automatic pilot—125 psi (pump on engine No. 2).

c. Instrument and automatic pilot vacuum—Within limits with selector valve at "ALL INSTRUMENTS—RH PUMP" (No. 3 engine), then at "ALL INSTRUMENTS—LH PUMP" (No. 2 engine).

d. Gyro horizon and automatic pilot gyro horizon—"UNCAGED."

e. Set and uncage the two directional gyros and the automatic pilot directional gyro.

Note

Gyro instruments are left uncaged at all times during operation except in maneuvers that would exceed gyro limits.

f. Ignition switch check. (To be accomplished before taxiing.)

(1) Throttles—700 rpm.

(2) Master ignition switch—"OFF" momentarily. Observe that the engines completely cease firing. Perform this check as rapidly as possible in order to prevent severe backfire when switch is turned on again.

(3) If all engines do not cease firing, a magneto ground lead may be open. Shut down the engines and caution personnel to remain clear of the propellers until the difficulty has been remedied.

CAUTION

The usual ignition system check before take-off will be unreliable when magneto ground lead trouble exists.

g. Check propeller governor as follows:

(1) Increase engine speed to 1500 rpm and lock throttles.

(2) Move propeller controls through entire range twice, then return to "INCREASE RPM." Note that the minimum governing speed is 1200 rpm.

(3) Propeller feathering control—Check for proper operation.

h. Check superchargers. With propeller controls in "INCREASE RPM," open throttles to 1700 rpm and move the supercharger control, without pausing, to "HIGH" position notch. Increase manifold pressure to 30 inches Hg (at sea level) and lock the throttles. When the engine speed has stabilized, shift the supercharger to "LOW" position notch. A decrease in manifold pressure is an indication that the two-speed supercharger is operating properly. When moving the supercharger control from one position to the other the control should be moved quickly, without pausing.

i. With all generators on, check the amperage at 1800 rpm. Amperage at each generator should be equal (within 3 to 5 amperes of each other).

CAUTION

Do not operate engines at high manifold pressures longer than is necessary. Cooling of the cylinder heads, barrels, and ignition harness is insufficient for prolonged periods of operation above 1400 rpm on the ground. Ground operation of the engines should be made with the airplane headed into the wind to aid cooling.

j. Cruising fuel-air mixture check.

(1) Throttles—1700 rpm.

(2) Mixture controls—"AUTO-RICH."

(3) After engine speeds and instruments have stabilized, move mixture control to "AUTO-LEAN" and observe engine rpm change.

(4) A change of over 25 rpm increase or 75 rpm decrease as a result of the mixture change indicates an excessively rich or lean carburetor.

k. Open throttles to 30 inches Hg manifold pressure (sea level) and check all engine instruments for desired range.

Note

A drop in oil pressure when the engine speed is increased is an indication that further warm-up is required.

l. Check magnetos by switching ignition from "BOTH" to "L" to "BOTH" to "R" momentarily. The maximum permissible drop on one magneto is 65 rpm.

m. Acceleration and deceleration check.

(1) Mixture control—"AUTO-RICH."

(2) Check acceleration and deceleration of each engine.

(3) An engine should accelerate rapidly and smoothly with no tendency to backfire.

(4) Repeat the check with mixture controls in "AUTO-LEAN." Do not exceed the rpm used in the magneto check.

n. Idle speed check.

(1) Throttles—Closed.

(2) Idle speed should be 600 rpm.

o. Remove and stow landing gear safety locks.

p. Entrance ladders—up and stowed. All doors closed. Door warning light on instrument panel—OFF.

10. TAXIING INSTRUCTIONS.

a. Adequate thrust is usually obtained on hard-surface runways by using 1000 rpm on each engine.

b. Release parking brake.

*b*A. Exercise care when taxiing over rough terrain.

c. Use nose-wheel steering wheel to change airplane's direction. A steady pressure on the wheel is adequate.

Note

Do not use brakes for steering.

d. Avoid excessive use of brakes while taxiing.

e. Avoid high taxiing speeds, excessive movement of the nose gear, and fluctuation of the nose gear strut. The rolling inertia of the airplane at high speeds resists turning and causes sidewise skipping of the nose wheel.

11. TAKE-OFF.

a. For necessary take-off distance, refer to Take-Off, Climb, and Landing Charts, Appendix I.

b. Make the following check:

(1) Hydraulic pressure—Within limits.

(2) Landing gear control—"DOWN" and in notch (green lights on). Solenoid pin in place.

(3) Emergency landing gear extension valve—"CLOSED" (handle down).

(4) Automatic pilot servo controls—"OFF" (control handle up). Check for free movement of all controls.

(5) Tab controls—zero (or as experience dictates).

(6) Propellers—"INCREASE RPM."

(7) Mixture controls—"TAKE-OFF AND CLIMB."

(8) All fuel tank selector controls—"MAIN TANK ON."

(9) Both cross-feed controls—"OFF."

(10) Electric fuel pumps for main wing tanks—"HIGH."

(11) Cowl flaps—"TRAIL" (for all climbs).

(12) Wing flaps—15-20 degrees.

(13) Pitot head heaters—"ON" (if icing conditions prevail).

(14) Gust lock—OFF (If left on due to gusty or windy conditions).

Note

Check that free and correct movement of the controls is possible after disconnecting the gust lock.

c. Taxi into take-off position. Use entire available runway for take-off. Stop in take-off position with airplane and nose wheel parallel to runway.

d. Advance throttles to 30 inches Hg manifold pressure. Release brakes; advance throttles smoothly to 50 inches Hg manifold pressure (engines speed 2700 rpm maximum).

e. Use steering wheel to maintain direction of roll until rudder becomes effective at approximately 50 to 60 mph IAS.

f. Ease back on control column. When definitely airborne, retract landing gear.

g. After gear has been raised, reduce power to Rated Power and establish best climbing airspeed in accordance with Characteristic Speed Chart, Figure 34.

h. Raise wing flaps.

i. Reduce power to optional climbing power.

j. The following table shows the above reduction of take-off power:

MANIFOLD PRESSURE	PROPELLER RPM	LOW BLOWER
50 in. Hg	2700	(Take-off power 5 minutes only)
Step 1		
38.5 in. Hg—Step 2	2550	(Rated power)
Step 3		
33 in. Hg—Step 4	2300	(Optional climbing power)
Step 5		
26.5 in. Hg—Step 6	2230	(Maximum cruise)

12. ENGINE FAILURE DURING TAKE-OFF.

a. If engine failure makes it imperative to feather the propeller immediately, use the procedure as outlined in Section IV, paragraph 2.*a.*

b. In approaches with three engines follow normal procedures. When certain of reaching the landing field, the wing flaps should be lowered from the 20 degrees down to the 40 degrees down position.

13. CLIMB.

a. For the best climbing airspeeds under various gross weights, refer to Take-Off, Climb, and Landing Charts, Appendix I.

b. Oil temperature—Within limits.

c. Climb with cowl flaps positioned to maintain cylinder head temperatures within limits.

d. On reaching cruising altitude, shut electric fuel pumps off, one at a time, unless engine pumps alone do not maintain sufficient pressure. If necessary to operate electric fuel pumps to assist engine-driven pumps in maintaining pressure, operate electric pumps in "LOW" if possible in order to avoid undue wear on the electric pumps.

e. High blower climbing powers should be used in accordance with the Take-Off, Climb, and Landing Charts, Appendix I.

14. GENERAL FLYING CHARACTERISTICS.

a. GENERAL.—When climb has been completed, level off and reduce power to that desired for cruising, depending on flight plan.

(1) COWL FLAPS.—Before closing cowl flaps, allow head temperatures to reduce to (or slightly below) maximum allowable for cruising. Adjust cowl flaps to maintain head temperature.

(2) MIXTURE.—"CRUISE" (auto lean).

Note

Do not attempt to manually lean the carburetors below the "CRUISE" setting. The "CRUISE" position will automatically supply the proper mixture.

(3) Hydraulic by-pass valve "OFF" (system by-passed) during cruising flight when it is not necessary to adjust any of the hydraulically-operated units. All hydraulic controls with the exception of the wing flap control should be in "NEUTRAL" or "OFF" during this period to prevent movement of the units. The wing flap control must be left in the "UP" position when the flaps are up.

(4) When critical altitudes for low blower have been reached, close throttles to approximately one-half open in order to avoid excessive manifold pressure after shifting to high blower. Shift supercharger control to "HIGH" rapidly and without hesitation. Reset throttles to obtain the desired manifold pressure.

(5) When it is possible to obtain the desired power in low blower ratio, avoid using the high blower ratio. The high blower fuel consumption is greater at equal powers.

Note

During cruising flight, "de-sludge" blower every two hours. Reduce manifold pressure approximately 3 inches and shift the blower control to its opposite setting. After approximately 10 minutes, return the control to its original setting and resume original manifold pressure.

(6) Refer to Flight Operation Instruction Charts, Appendix I, for ranges and recommended power settings.

(7) If fuselage tanks are installed, always use the fuel from these tanks first, after reaching cruising altitude. All four engines may be supplied from one fuselage tank, but when the sight gauge on the tank shows approximately 50 gallons, switch to the condition of one fuselage tank to two engines on one side only. When the sight gauge on the fuselage tank registers approximately 20 gallons, switch to the other fuselage tank or to the wing tank system, whichever is applicable. Avoid draining fuselage tanks dry.

(8) When encountering severe turbulence, maintain an indicated air speed of 160-175 mph. At this speed range, optimum control is assured with no danger of structural failure. For effects of weight on stalling speeds, refer to Characteristic Speed Chart, figure 34. To determine limitations on speed as wing tank fuel is consumed, refer to Speed and Load Factor Limitations Chart, figure 35.

b. CARBURETOR HEAT. — When icing conditions prevail, use carburetor heat continuously in flight rather than periodically.

Periodical use of heat during extremely low temperatures may bring air temperatures up to a point that will cause ice to form in the induction system. At extremely low temperatures, ice particles are heated sufficiently by the carburetor heat to melt them. On passing into the induction system this moisture may freeze again if carburetor heat is not constantly applied. When flying with the mixture control in "CRUISE" *during icing conditions,* apply sufficient carburetor heat to keep the needle of the carburetor temperature gauge outside the yellow limit markings of —10°C to +15°C. The red marking at +40°C is a warning that the detonation range is being approached. When icing conditions no longer exist, return the carburetor air temperature levers to the "COLD" position.

Note

Filters must be in "RAM" position before carburetor heat can be applied. As carburetor heat is applied, manifold pressure will drop with a resultant decrease of power.

c. AUTOMATIC PILOT.—The airplane is equipped with a Type A-3A Jack & Heintz automatic pilot. Operation of this equipment is conventional.

14A. TURBULENT AIR AND THUNDERSTORM FLYING.

Note

Flight through a thunderstorm should be avoided if it is at all possible. However, since circumstances may force you at some time to enter a zone of severe turbulence, you should be familiar with the techniques recommended for flying the airplane under such conditions.

a. GENERAL.—Power setting and pitch attitude are the keys to proper flight technique in turbulent air. The power setting and pitch attitude required for the desired penetration airspeed *(figure 21A)*, and established before entering the storm must—if maintained throughout the storm—result in a constant airspeed, regardless of any false readings of the airspeed indicator. Specific instructions for preparing to enter a storm and flying in it are given in the following paragraphs.

b. APPROACHING THE STORM.—It is imperative that you prepare the airplane prior to entering a zone of turbulent air. If the storm cannot be seen, its proximity can be detected by radio crash static. Prepare the airplane as follows:

(1) Disengage auto-pilot.

(2) Propeller controls 2200 rpm for gyroscopic stability.

(3) Mixture controls "AUTO-RICH."

(4) Pitot tube heater switch—"ON."

(5) Carburetor heat—As required.

(6) Throttles adjusted as necessary to obtain penetration speed. *(See figure 21A.)*

(7) Check suction gage for desired reading and gyro instruments for proper settings.

(8) Safety belt tightened. (Check with crew members.)

(9) Turn off any radio equipment rendered useless by static.

(10) Make sure trailing antenna is not extended.

(11) At night, turn cockpit lights full bright or use dark glasses to minimize blinding effect of lightning.

CAUTION

Do not lower gear and flaps as they merely decrease the aerodynamic efficiency of the airplane.

c. IN THE STORM.

(1) Maintain power setting and pitch attitude (established before entering the storm) throughout the storm. Hold these constant and your airspeed will be constant—regardless of the airspeed indicator.

(2) Devote all attention to flying the airplane.

(3) Expect turbulence, precipitation, and lightning, and don't allow them to cause undue concern.

(4) Maintain attitude. Concentrate principally on holding a level attitude by reference to the artificial horizon.

(5) Don't chase the airspeed indicator, since doing so will result in extreme airplane attitudes. If a sudden gust should be encountered while airplane is in a nose high attitude, a stall might easily result. A heavy rain, by partial blocking of the pitot tube pressure head, may decrease the indicated airspeed reading by as much as 70 mph.

(6) Use as little elevator control as possible to maintain your attitude in order to minimize the stresses imposed on the airplane.

(7) The altimeter is unreliable in thunderstorm flying because of differential barometric pressures within the turbulent area. A gain or loss of several thousand feet may be expected. Make allowance for this error in determining minimum safe altitude.

Note

Normally, the least turbulent area in a thunderstorm will be at altitudes up to 6000 feet above the terrain. Altitudes between 10,000 feet and 20,000 feet are usually the most turbulent.

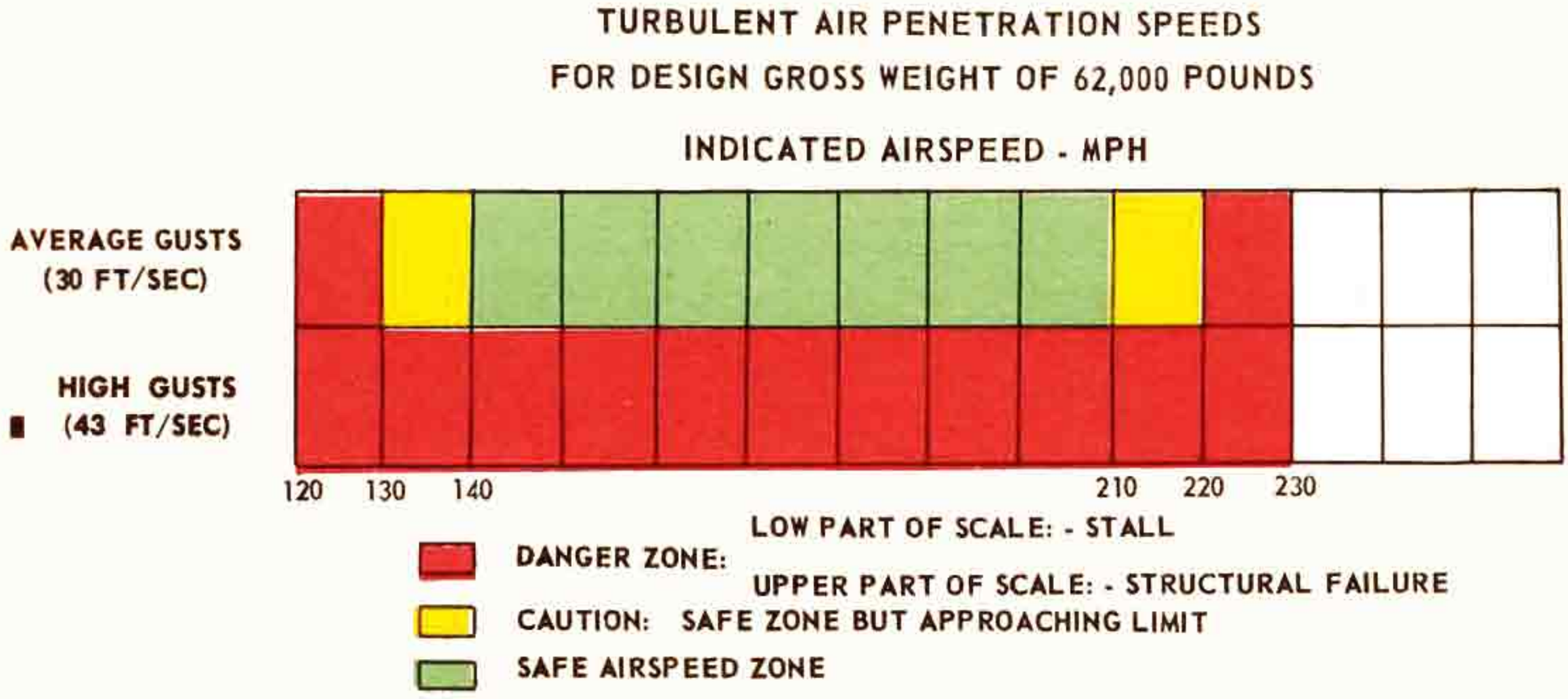


Figure 21A—Turbulent Air Penetration Speeds

15. STALLS.

The airplane has good stalling characteristics with any set of conditions of wing flap setting and landing gear position. The pilot is warned of an impending stall by buffeting which occurs at approximately 5 mph above the speed for complete stall. When the airplane stalls, the nose drops and there may be a slight rolling motion in either direction. Normal corrective procedures are adequate for recovery. With power on, the stalling characteristics are amplified above those with power off.

POWER-OFF STALLING SPEEDS
AIRSPEED INDICATOR READING (MPH)

GROSS WEIGHT	FLAP POSITION		
	UP	HALF DOWN	FULL DOWN
40,000	83	70.5	68
45,000	88	75	72
50,000	93	79	76
55,000	97.5	83	80
60,000	102	86.5	83
65,000	106	90	86.5
70,000	110	93.5	89.5
73,000	112.5	96	91.5

16. SPINS.

a. Intentional spinning is prohibited.

b. In the event of an accidental spin, normal methods of recovery should be used.

17. ACROBATICS.

All acrobatics are strictly prohibited.

18. DIVING.

Refer to Speed and Load Factor Limitations Chart, figure 35, for diving limitations under various gross weights.

19. APPROACH AND LANDING.

a. DESCENT.

(1) For passenger comfort, do not exceed a descent of 600 feet per minute.

(2) Do not exceed recommended cruising powers.

(3) Never exceed the permissible indicated gliding speeds given on the Speed and Load Factor Limitations Chart, figure 35.

Note

In case of extremely cold outside air conditions, it may be necessary to avoid over-cooling of the engines by increasing power required through the use of wing flaps or landing gear. (Do not exceed airspeed limits for degree of lowered flaps or for landing gear down.)

b. INITIAL APPROACH.

(1) Automatic pilot—"OFF."

(2) Mixture—"TAKE-OFF AND CLIMB."

(3) Check fuel quantities.

(4) Fuel tank selector valves — "MAIN TANK ON."

(5) Both cross-feed controls—"OFF" (unless necessary).

(6) Carburetor heat—"COLD."

(7) Air filter control—"RAM."

(8) Superchargers—"LOW."

(9) Hydraulic by-pass valve—"SYSTEM OPERATIVE."

(10) Electric fuel pumps for tanks selected — "HIGH."

(11) Cowl flaps—"CLOSED." (Open if and as necessary to maintain cylinder head temperature within allowable limits.)

(12) Reduce indicated airspeed, and do not exceed the airspeed for degree of lowered flaps or landing gear down.

(13) Wing flaps—20 degrees down.

(14) De-icing systems—"OFF."

c. FINAL APPROACH.

(1) Landing gear control—"DOWN" and notched. Green lights on. Hydraulic pressure—Within limits.

(2) Propeller speed—2250 rpm.

(3) Check hydraulic brake pressure gauge. Test operate brakes.

(4) Wing flaps—40 degrees down. Return control to "NEUTRAL."

CAUTION

Do not lower flaps more than 20 degrees when landing on wet runways to avoid damage to the flaps.

(5) Approach at 120 mph IAS, or refer to Characteristic Speed Chart, figure 34.

d. LANDING.

(1) The landing speed and distance required may be obtained from the Take-Off, Climb, and Landing Charts, Appendix I. If necessary, the shorter distances given on the chart may be obtained by making contact with the nose wheel immediately after the main wheels touch the ground and applying maximum braking possible without skidding the wheels.

(2) Make a normal main wheel landing; do not make contact with the nose wheel first. The nose will be slightly above the horizontal. Do not stall and drop the airplane on the ground. A tail skid is incorporated to guard against tail damage.

(3) After ground contact, hold the nose wheel clear of the ground as long as possible by means of the elevators, then ease the nose wheel to the ground. Do not apply brakes until contact is made with the nose wheel.

(4) Apply normal even braking for deceleration.

(5) After landing, the nose steering wheel **may be** used. However, if the nose wheel shock strut is fully extended (little or no weight on the nose gear), the nose wheel will be mechanically centered and the steering inoperative. Apply brakes lightly to force nose down.

(6) After completing the landing run and while taxiing clear of the runway, carry out the following:

(a) Propellers—"INCREASE RPM."

(b) Cowl flaps—"OPEN."

(c) Wing flaps—"UP."

(d) Electric fuel pumps—"OFF."

Note

Under certain conditions, to prevent excess speed it may be desirable to cut engines No. 1 and 4. Hydraulic pumps on engines No. 2 and

3 will provide pressure to operate the hydraulic system.

e. NIGHT LANDING.—During night landings or when visibility is poor, land faster than usual. It is safer to land at higher speed than to drop the airplane in so that it will pitch forward, due to a stall, and strike the ground with the nose wheel first.

f. CROSS-WIND LANDING. — The approach is made longer than normal to allow the pilot sufficient time to establish a heading to give a ground track parallel to the runway. Alter the course of the airplane just prior to ground contact so that it is parallel to the runway, and establish ground contact with all three wheels as soon as possible. Do not raise the nose wheel from the ground once contact has been made.

g. EMERGENCY TAKE-OFF IF LANDING IS NOT COMPLETED.—If the field has been overshot, or a landing cannot be completed, apply power as required. When airborne, retract the landing gear. As soon as airspeed is above the normal final approach speed, as shown on the Characteristic Speed Chart, figure 34, retract the flaps in easy stages. During the retraction of the flaps do not allow the airspeed to fall below the flaps-up stalling speed. (See Stalling Speed Table, paragraph 15, this section.

20. STOPPING THE ENGINES.

a. When taxiing is completed, place chocks, if available, before the wheels. Do not set parking brakes until brakes are cooled.

CAUTION

Never park the brakes if they are overheated (too hot to touch). Pressure on the brakes, together with excessive temperatures resulting from hard braking, will damage the brakes or cause them to seize.

b. After brake discs have cooled sufficiently to avoid seizing, apply parking brakes.

c. After the last flight of the day, accomplish the following post flight check:

(1) Ignition switch check.

(2) Cruising fuel-air mixture check.

(3) Power check.

(4) Ignition system check.

(5) Idle speed and mixture check. With throttle against the idle stop, the engine should idle at 600 rpm. When engine speed is stabilized, move the mixture control slowly with a smooth movement toward "IDLE CUT-OFF" and carefully observe the manifold pressure gage for any change in manifold pressure during this leaning procedure. When engine speed has dropped to 400 rpm during the leaning procedure, return the mixture control to "AUTO-RICH" position. While leaning out the mixture with the mixture control, a decrease of more than ¼-inch manifold pressure during the leaning out indicates an excessively rich mixture. An immediate increase in manifold pressure not preceded by a momentary decrease in manifold pressure indicates that idle mixture is too lean.

d. (Deleted)

e. With propeller controls in "INCREASE RPM," idle engines until cylinder head temperatures are below 150°C.

f. Stop engines by moving mixture controls to "IDLE CUT-OFF" and gradually opening throttles. This will give a clean cut-off with no backfiring.

g. Engine and master ignition switches—"OFF" (after engines have stopped).

h. When a cold weather start is anticipated, dilute the engine oil according to the following schedule:

(1) Operate engines at 1000 to 1200 rpm.

(2) Maintain oil temperature below 50°C, and oil pressure above 15 psi.

Note

Avoid exceeding 50°C to prevent inadequate dilution due to vaporization of fuel. If oil temperatures go above this limit, stop the engines until the oil cools below 40°C.

(3) Dilute oil according to the following anticipated temperatures:

+ 4° to −12°C (+40° to +10°F)	2½	minutes
−12° to −29°C (+10° to −20°F)	5	minutes
−29° to −46°C (−20° to −50°F)	8	minutes

Add 1 minute dilution for each additional 5°C (9°F) below −46°C.

(4) If impossible to maintain oil temperatures below 50°C, divide dilution periods into intervals, shutting down between dilutions long enough for temperatures to drop below 40°C.

i. To dilute propeller feathering oil, increase engine speed to 1300 rpm, then feather and unfeather propeller during the final engine oil dilution.

j. To cool the APP, allow it to idle 5 minutes before stopping.

21. BEFORE LEAVING FLIGHT COMPARTMENT.

a. If possible, have wheels chocked and release the parking brake.

b. Fuel selector and cross-feed valves—"OFF."

c. All radio equipment—"OFF."

d. Automatic pilot—"OFF."

e. Master ignition switch—"OFF."

f. Check landing gear control to see that it is in the notch on the quadrant at the full "DOWN" position. Solenoid pin in place.

g. All cowl flaps—"CLOSED" when engine cylinder head temperatures drop below 120°C.

h. Carburetor air temperature controls—"HOT." This closes the air intake scoop and prevents foreign matter from entering the intake manifold.

i. Gust lock—"ON." Pull down gust lock warning tape from ceiling above the pilot's position. Hold flight controls in neutral and insert locking pin in the gust lock control on floor.

j. All lights and electric switches except generator switches—"OFF."

k. "AC POWER" switch—"OFF."

l. Master battery switch—"OFF."

m. Have pilot head cover installed.

n. Have landing gear locks installed.

Section III

FLIGHT OPERATION DATA

1. AIRSPEED AND ALTIMETER CORRECTION TABLE*

Airspeed Indicator Reading	True Indicated Airspeed (MPH)			Altimeter Installation Errors (Ft) Flaps Up (To be Added to Altimeter Reading)		
(MPH)	Flaps Up	Flaps 20°	Flaps 40°	Sea Level	10,000 Feet	20,000 Feet
80	.....	84	83	.....	....	.....
90	.....	94	93	.....	....	.....
100	.....	104	103	.....	....	.....
110	112	114	113	10	20	30
120	123	123	123	20	30	50
130	134	132	132	40	50	70
140	145	142	141	50	60	90
150	155	151	150	50	70	100
160	165	.....	.....	50	70	100
170	175	.....	.....	60	80	110
180	185	.....	.....	60	80	110
190	194	.....	.....	50	70	100
200	204	.....	.....	50	70	100
210	213	.....	.....	40	60	80
220	223	.....	.....	40	60	80
230	232	.....	.....	30	40	60
240	242	.....	.....	30	40	60
250	252	.....	.....	30	50	60

*These corrections do not account for instrument errors of airspeed indicator or altimeter.

POWER PLANT CHART

AIRCRAFT MODEL(S)	PROPELLER(S)	ENGINE MODEL(S)
C-54G R5D-5	HAMILTON STANDARD HYDROMATIC	R-2000-4, -9

GAUGE READING	FUEL PRESS.	OIL PRESS.	OIL TEMP.	COOLANT TEMP.		OIL[1] CONS.
DESIRED MAXIMUM	16-18 22	65-95 100	60-75 100	AIR COOLED		
MINIMUM IDLING	12 9	45 15				

MAXIMUM PERMISSABLE DIVING RPM:
MINIMUM RECOMMENDED CRUISE RPM: 1400
MAXIMUM RECOMMENDED TURBO RPM:

OIL GRADE: 1100 SPEC. MIL-O-6082
FUEL GRADE: 100/130 SPEC. MIL-F-5572

WAR EMERGENCY (COMBAT EMERGENCY)			MILITARY POWER (NON-COMBAT EMERGENCY)			OPERATING CONDITION			NORMAL RATED (MAXIMUM CONTINUOUS)			MAXIMUM CRUISE (NORMAL OPERATION)		
MINUTES			5 MINUTES			TIME LIMIT			UNLIMITED			UNLIMITED		
			220° C			MAX. CYL. HD. TEMP.			210° C			210° C		
			AUTO-RICH 2700			MIXTURE R. P. M.			AUTO-RICH 2550			AUTO-LEAN 2230 (L.B.) 2150 (H.B.)		
MANIF. PRESS.	SUPER-CHARGER	FUEL[2] Gal/Min	MANIF. PRESS.	SUPER-CHARGER	FUEL[2] Gal/Min	STD. TEMP. °C	PRESSURE ALTITUDE	STD. TEMP. °F	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH[3]	MANIF. PRESS.	SUPER-CHARGER	FUEL GPH[3]
						-55.0	40,000 FT.	-67.0						
						-55.0	38,000 FT.	-67.0						
			F.T.	HIGH	1.0	-55.0	36,000 FT.	-67.0						
			F.T.	HIGH	1.0	-52.4	34,000 FT.	-62.3	F.T.	HIGH	60			
			F.T.	HIGH	1.5	-48.4	32,000 FT.	-55.1	F.T.	HIGH	70	F.T.	HIGH	45
			F.T.	HIGH	1.5	-44.4	30,000 FT.	-48.0	F.T.	HIGH	80	F.T.	HIGH	50
			F.T.	HIGH	1.5	-40.5	28,000 FT.	-40.9	F.T.	HIGH	85	F.T.	HIGH	50
			F.T.	HIGH	2.0	-36.5	26,000 FT.	-33.7	F.T.	HIGH	100	F.T.	HIGH	55
			F.T.	HIGH	2.0	-32.5	24,000 FT.	-26.5	F.T.	HIGH	110	F.T.	HIGH	65
			F.T.	HIGH	2.5	-28.6	22,000 FT.	-19.4	F.T.	HIGH	125	27.0	HIGH	65
			F.T.	HIGH	3.0	-24.6	20,000 FT.	-12.3	F.T.	HIGH	140	27.5	HIGH	65
			F.T.	HIGH	3.0	-20.7	18,000 FT.	- 5.2	37.5	HIGH	145	28.0	HIGH	65
			41.5	HIGH	3.0	-16.7	16,000 FT.	2.0	38.0	HIGH	145	26.0	LOW	65
			42.0	HIGH	3.0	-12.7	14,000 FT.	9.1	38.5	HIGH	145	26.5	LOW	65
			F.T.	LOW	3.0	- 8.8	12,000 FT.	16.2	F.T.	LOW	135	27.0	LOW	65
			F.T.	LOW	3.0	- 4.8	10,000 FT.	23.4	35.0	LOW	140	27.5	LOW	65
			F.T.	LOW	3.0	- 0.8	8,000 FT.	30.5	36.0	LOW	140	28.0	LOW	65
			F.T.	LOW	3.0	3.1	6,000 FT.	37.6	36.5	LOW	140	29.0	LOW	65
			F.T.	LOW	3.5	7.1	4,000 FT.	44.7	37.0	LOW	140	29.5	LOW	65
			48.5	LOW	3.5	11.0	2,000 FT.	51.8	38.0	LOW	140	30.0	LOW	65
			50.0	LOW	3.5	15.0	SEA LEVEL	59.0	38.5	LOW	140	30.5	LOW	65

GENERAL NOTES

[1] Gal/Min: APPROXIMATE U.S. GALLON PER MINUTE PER ENGINE
[2] GPH: APPROXIMATE U.S. GALLON PER HOUR PER ENGINE.
F.T.: MEANS FULL THROTTLE OPERATION.
VALUES ARE FOR LEVEL FLIGHT WITH RAM.

FOR COMPLETE CRUISING DATA SEE APPENDIX II
NOTE: TO DETERMINE CONSUMPTION IN BRITISH IMPERIAL UNITS, MULTIPLY BY 10 THEN DIVIDE BY 12.

TAKE-OFF CONDITIONS:
2700 RPM & 50.0 IN. Hg MANIF. PRESS (S.L. ONLY)

CONDITIONS TO AVOID:
SEE SPECIAL NOTES BELOW

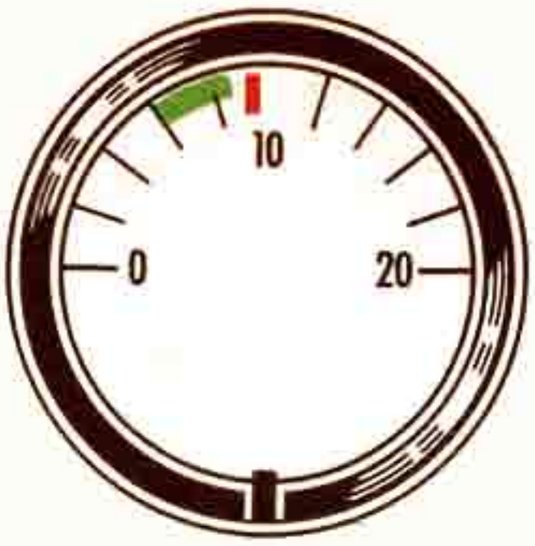
SPECIAL NOTES

1. DO NOT OPERATE ENGINES CONTINUOUSLY BETWEEN 1600 AND 1700 RPM.
2. GENERATORS DO NOT CUT-IN BELOW APPROXIMATELY 1100 RPM.
3. DO NOT OPERATE ENGINES CONTINUOUSLY BETWEEN 2300 AND 2550 RPM BECAUSE OF POSSIBLE CRANKSHAFT FAILURES.

AAFMC-526 8-1-44

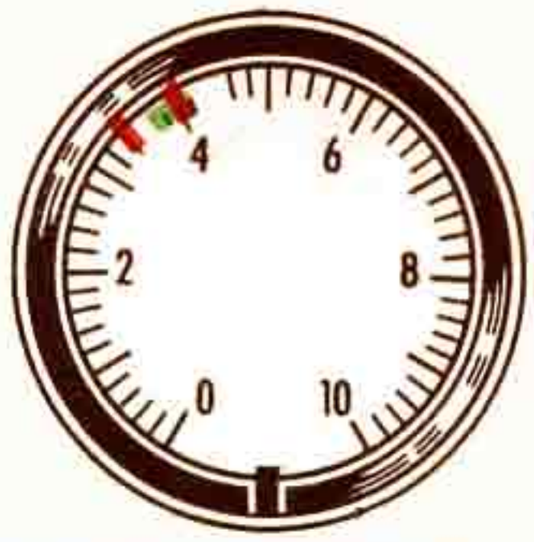
DATA AS OF 9-30-44 BASED ON FLIGHT TEST

Figure 22—Power Plant Chart



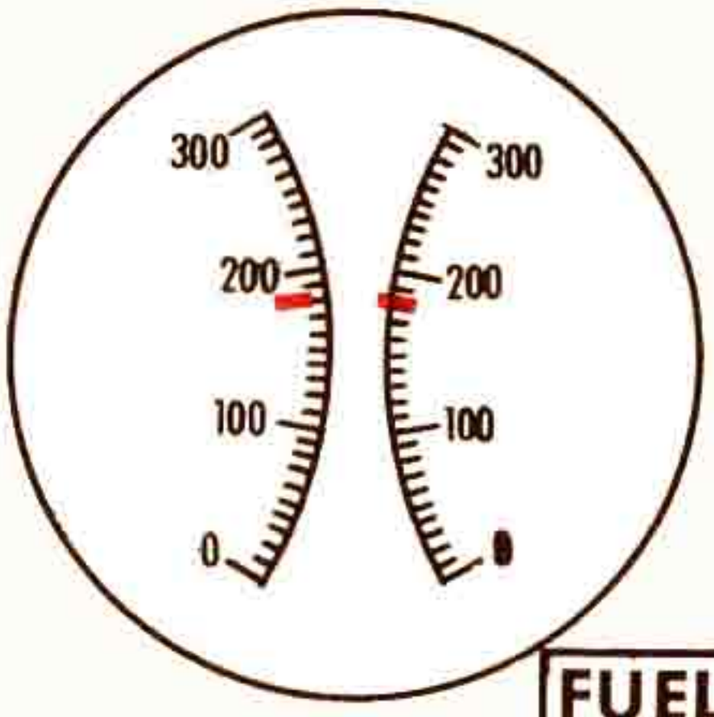
DE-ICING SYSTEM PRESSURE GAUGE

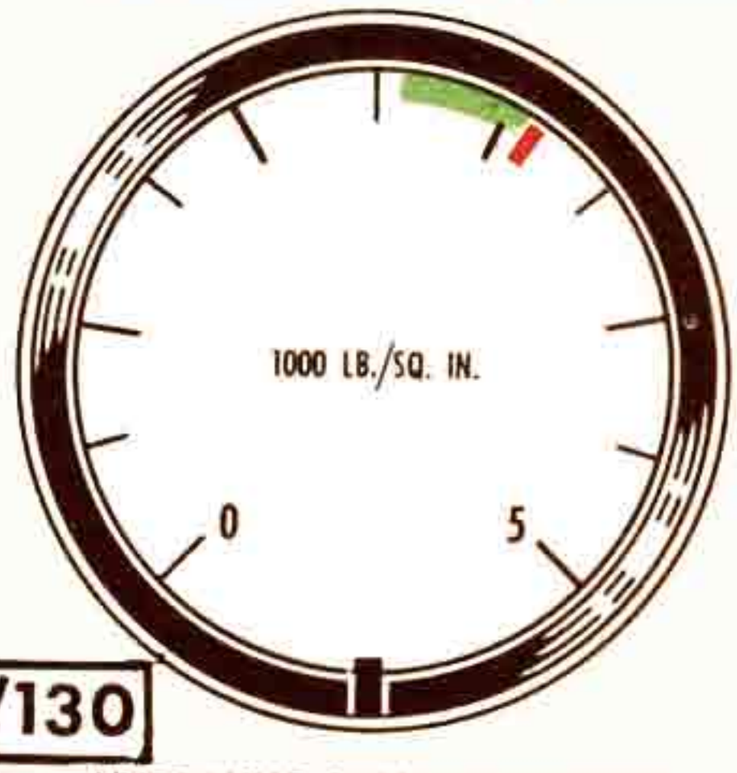
Green arc from 6 psi to 8.5 psi (Normal operation)
Red line at 10 psi (Maximum)



VACUUM PRESSURE GAUGE

Red line at 3.75 in. Hg (Minimum)
Green arc from 3.75 in Hg to 4.25 in. Hg (Normal operation)
Red line at 4.25 in. Hg (Maximum)

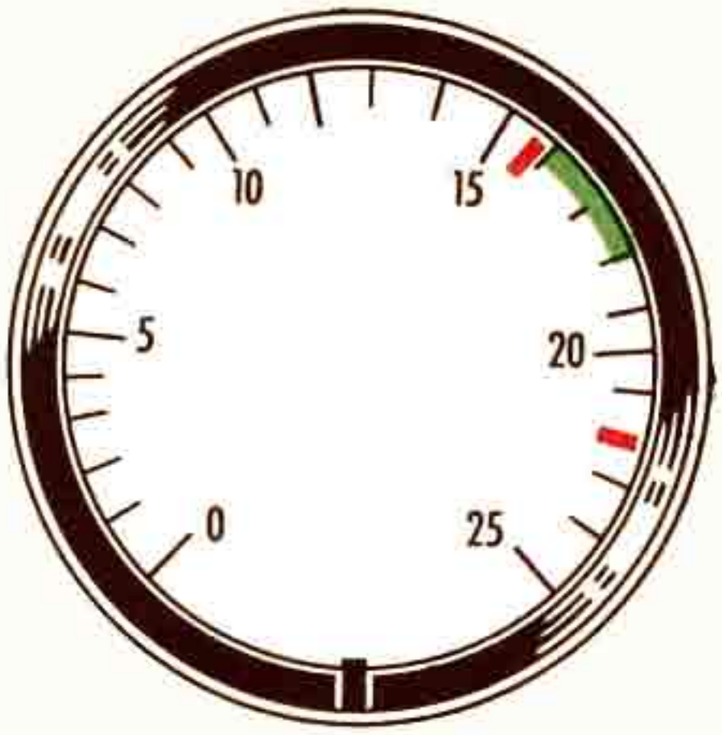




FUEL GRADE 100/130

PILOTS AND CABIN HEATER AIR TEMPERATURE GAUGE

Red line at 185°C (Maximum)

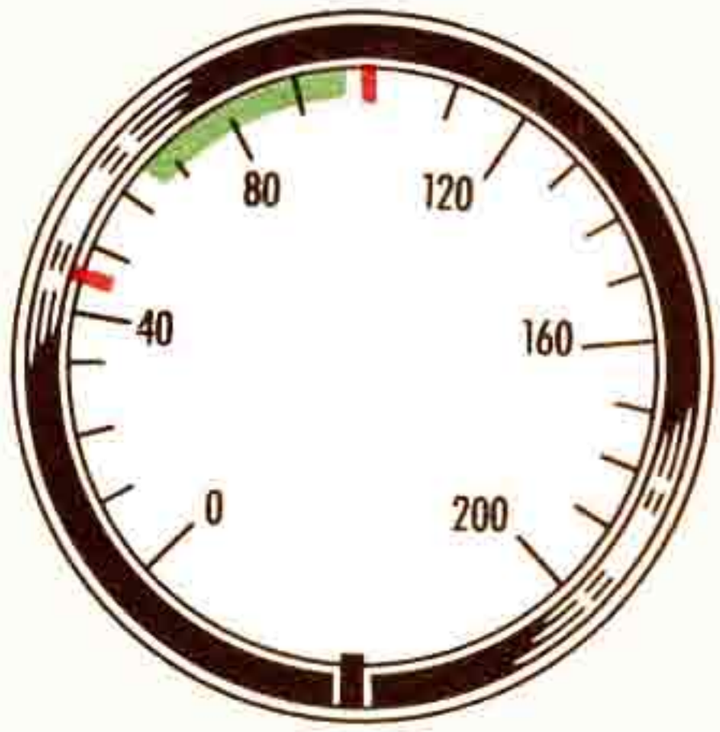


FUEL PRESSURE GAUGE

Red line at 16 psi (Minimum for flight)
Green arc from 16 psi to 18 psi (Normal operation)
Red line at 22 psi (Maximum)

HYDRAULIC PRESSURE GAUGE

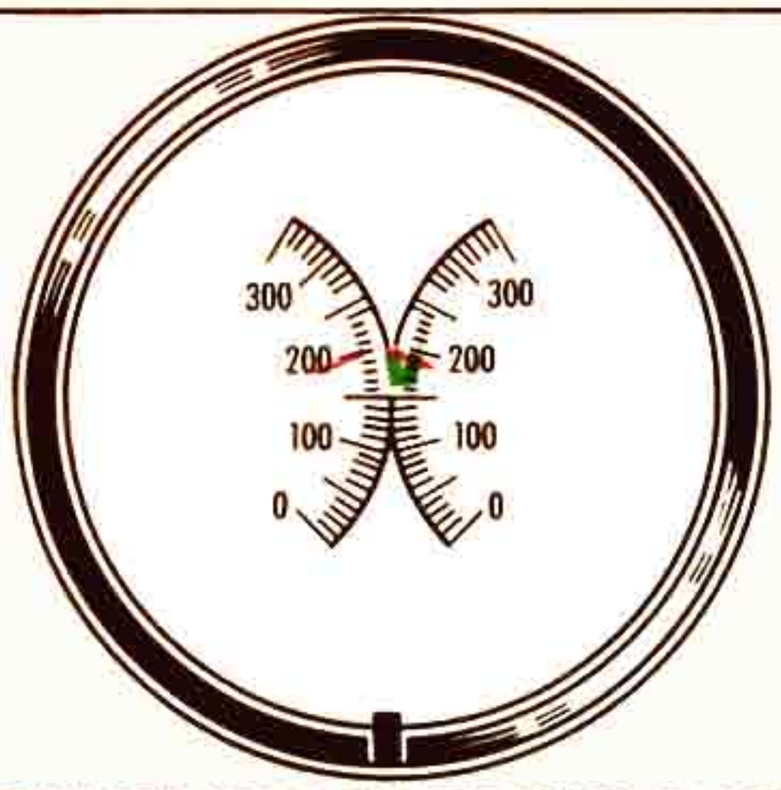
Green arc from 2600 psi to 3050 psi (Normal operation)
Red line at 3200 psi (Maximum)



OIL PRESSURE GAUGE

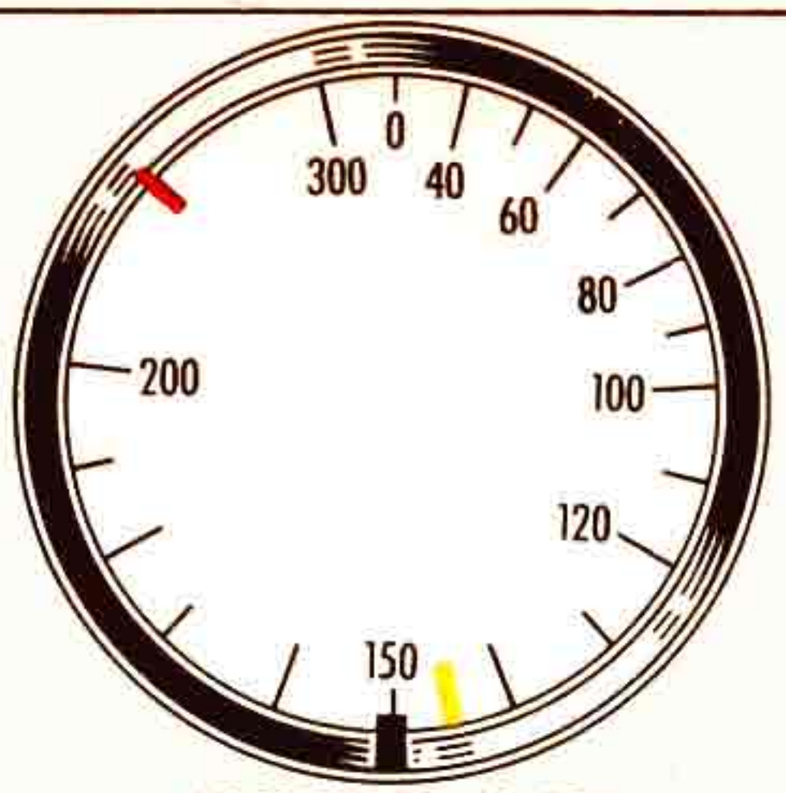
Red line at 45 psi (Minimum for flight)
Green arc from 65 psi to 95 psi (Normal operation)
Red line at 100 psi (Maximum)

Figure 23 (Sheet 1 of 2 Sheets)—Instrument Markings



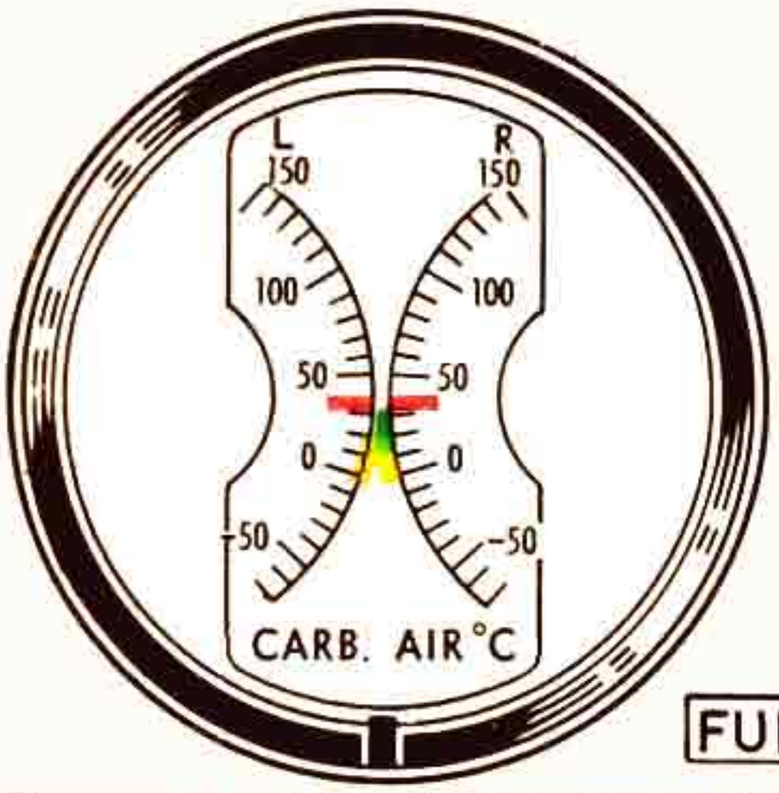
CYLINDER HEAD TEMPERATURE GAUGE

180°C Minimum tor best engine operation
Green Arc from 180°C to 210°C (Normal operation)
210°C Maximum continuous
Red line at 220°C (Maximum)



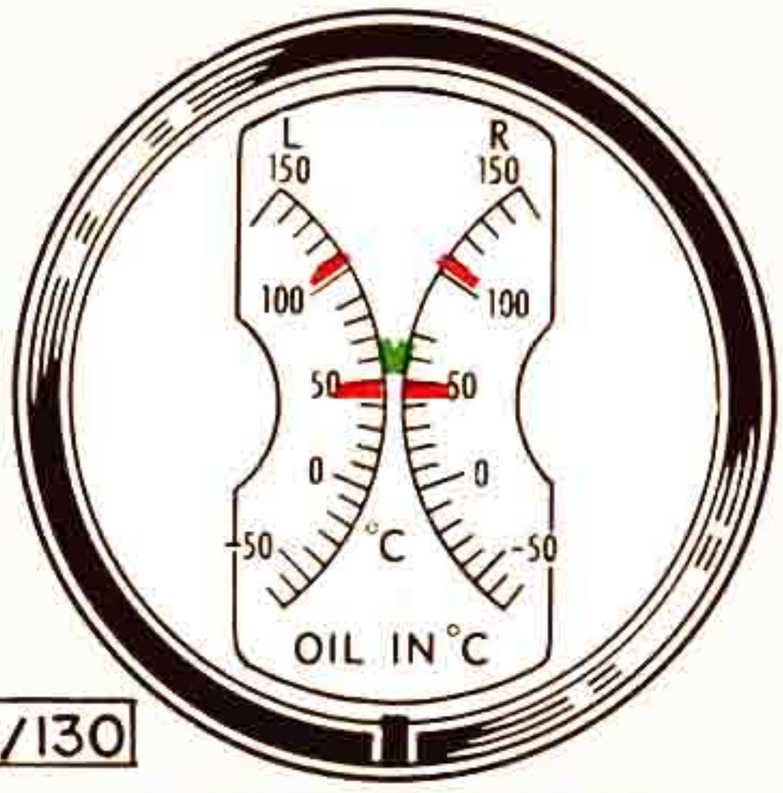
AIRSPEED INDICATOR

Yellow line at 144 mph (Landing gear and maximum flaps)
Red line at 250 mph (Maximum)
See page 17 for detailed limitations.



CARBURETOR AIR TEMPERATURE GAUGE

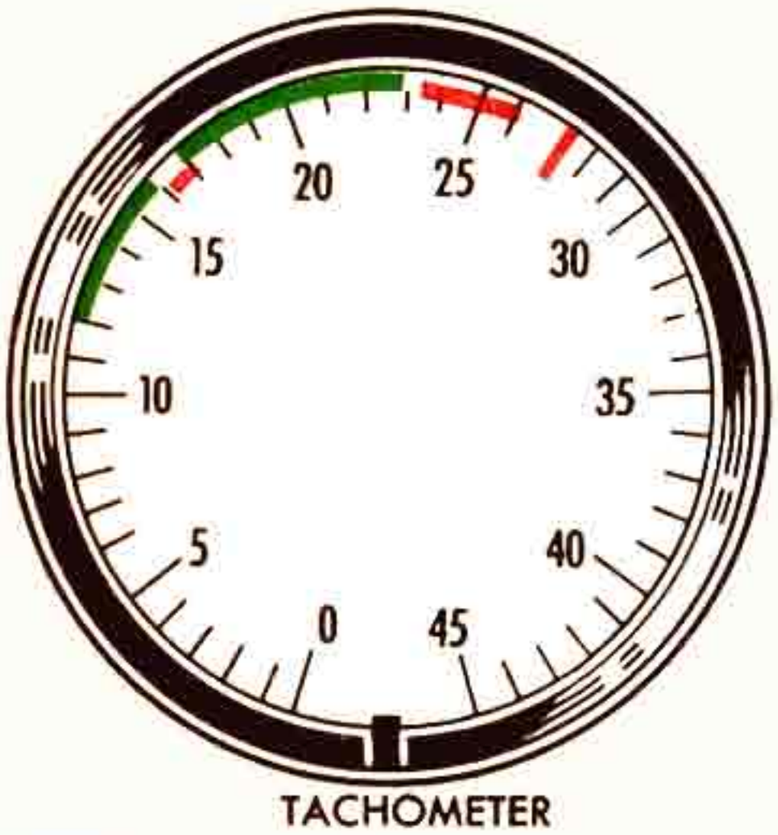
Yellow arc from —10°C to +15°C (Possible icing)
Green arc from +15°C to +40°C (Normal operation)
Red line at +40°C (Detonation)



OIL TEMPERATURE GAUGE

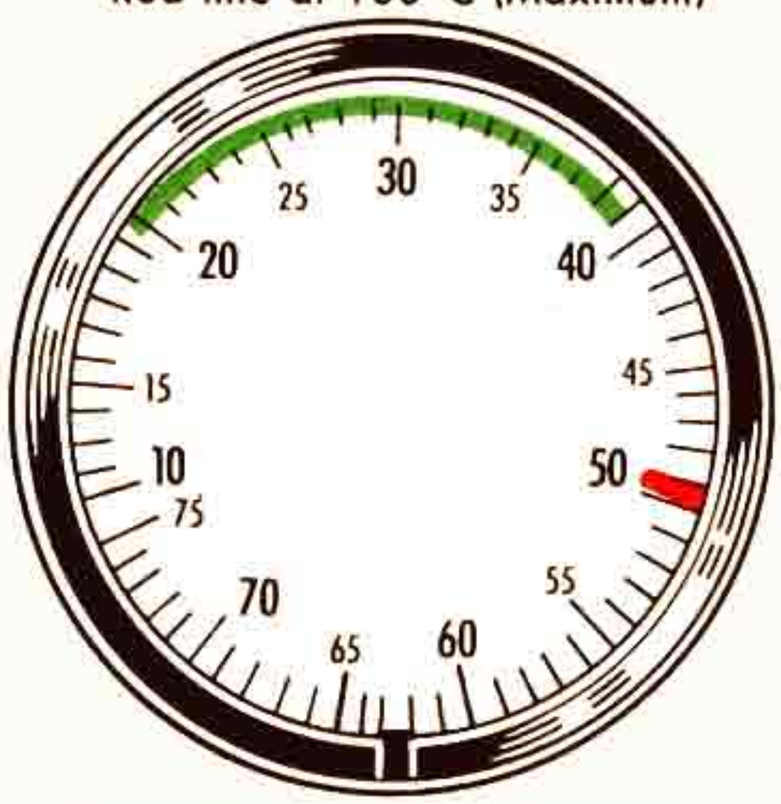
Red line at 40°C (Minimum for flight)
Green arc from 60°C to 75°C (Normal operation)
Red line at 100°C (Maximum)

FUEL GRADE 100/130



TACHOMETER

1200 rpm—Maximum endurance
1600—1700 rpm—Dangerous vibration characteristics
2300—2550 rpm—Possible crankshaft failure
2550 rpm—Maximum continuous
2700 rpm—Take-off



MANIFOLD PRESSURE GAUGE

20 in Hg.—Maximum endurance
38.5 in Hg.—Maximum continuous
50.0 in Hg.—Take-off

Figure 23 (Sheet 2 of 2 Sheets)—Instrument Markings

SECTION IV

EMERGENCY OPERATING INSTRUCTIONS

1. EMERGENCY EXITS.

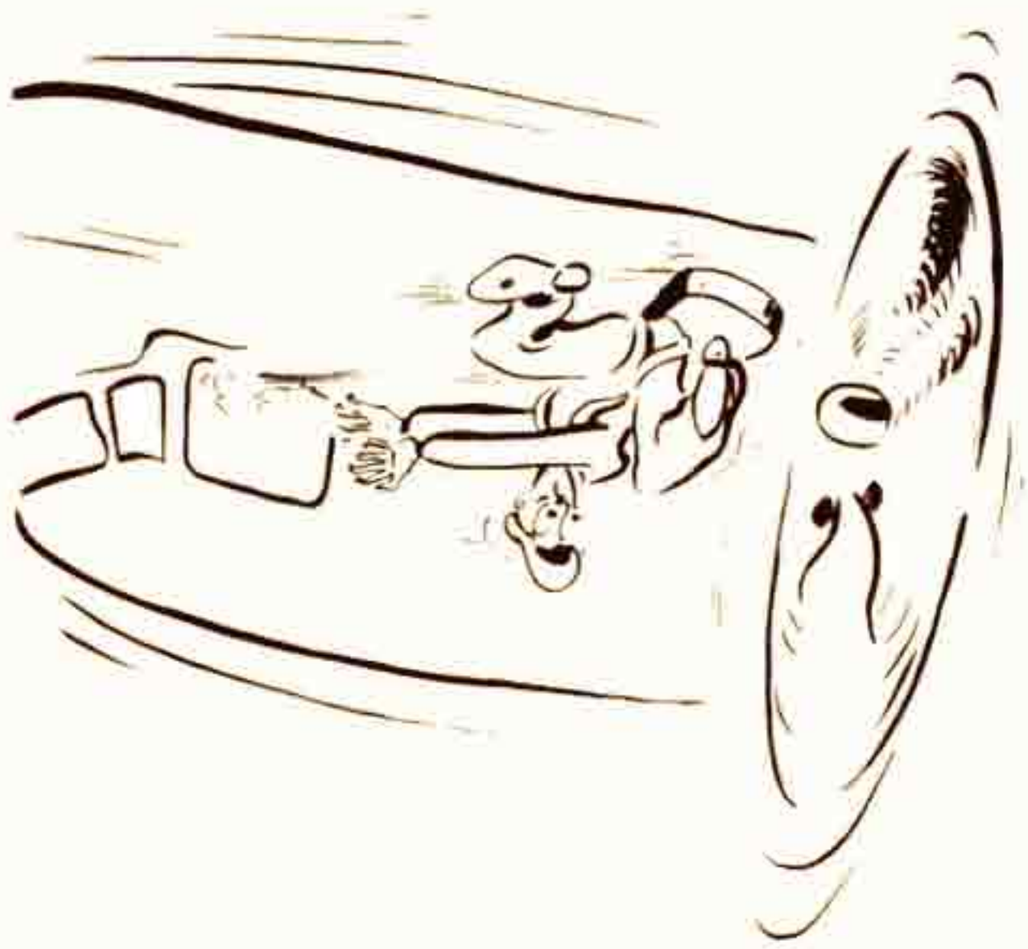
a. MAIN CARGO DOOR.

(1) FORWARD SECTION.—Prior to jettisoning this door the aircraft should be slowed down to the slowest airspeed that will maintain controlled straight and level flight with the wings at the highest practicable angle of attack. To remove this door, pull down with considerable force on the release handle at the forward edge of the doorway and push the door out.

(2) REAR SECTION.—When it is desired that this added door area be available during flight, the rear of the door may be pushed open after the forward section is jettisoned and it will swing back and remain against the fuselage.

b. AUXILIARY EXIT DOORS. — There are four auxiliary exit doors, incorporating cabin windows. Two are located on each side of the main cabin. To remove an auxiliary exit door, turn the release handle below the window in a clockwise direction and swing the door in and up until hinges disengage and the door falls free.

c. FLIGHT COMPARTMENT SIDE WINDOWS. —To remove flight compartment side windows:



WARNING

Do not use the side windows as emergency exits in flight.

(1) Turn window release handle at aft edge of window frame and slide window full aft.

(2) Press lower track catch down and turn window release handle back to clamped position.

(3) Slide window forward and remove it.

d. NAVIGATOR'S DOME.—The navigator's dome may be opened from either the inside or the outside of the airplane. To remove it from within, pull down on the release handle at the left side of the dome and on the strap at the right side. This will allow the dome to drop inward. To remove the dome from the outside, pull the release ring at the left side of the dome and at the same time kick the dome in.

e. FLIGHT COMPARTMENT DOOR.—Although this door is not quickly removable, it hinges inward and may be used as an emergency exit on the ground.

f. ALARM BELLS.

Emergency alarm bells are provided as follows: one in the crew compartment, and three in the main cabin or cargo compartment. All alarm bells are simultaneously controlled by a switch on the pilots' switch panel.

g. EMERGENCY ALARM BELL PROCEDURES.

(1) TO ABANDON AIRCRAFT.

(a) Warning—Spoken on the interphone.

(b) Warning—Three short rings on the alarm bell.

(c) Bail out—Bail out order on the interphone.

(d) Bail out—One long ring on the alarm bell.

(2) DITCHING OR FORCED LANDING.

(a) Warning — Spoken warning on the interphone.

(b) Warning—Six short rings.

(c) Prepare for ditching or forced landing—Brace—one long sustained ring of the alarm bell.

2. FIRE.

a. FIRE EXTINGUISHER CONTROLS.—The CO_2 fire extinguisher system warning lights and control handles are mounted in a row under the glareshield at the top of the pilots' instrument panel. The thermal switches in each engine section are set to operate the warning lights at 260° C. The lower cargo compartment thermal switches automatically close at 121° C.

Note

Once a cylinder valve has been opened, the discharge of the fire extinguisher cylinder cannot be stopped.

b. ENGINE FIRES.—In case of an engine fire, if altitude and other conditions permit, proceed as follows:

(1) Propeller—Feather.

(2) Mixture—"IDLE CUT-OFF."

(3) Engine Selector Valve—Pull out for affected engine.

(4) Fire Extinguisher Discharge Handle—Pull either one.

(5) Cowl Flaps—"TRAIL."

(6) Ignition—"OFF."

(7) Booster Pump—"OFF."

(8) If fire is in either inboard engine, lower landing gear.

(9) Do not restart engine.

Note

After the fire has been extinguished and the engine has cooled sufficiently the cowl flaps should be closed to obtain minimum drag.

c. WING FIRES.—If an uncontrollable nacelle or wing fire exists, abandon the airplane.

d. FUSELAGE FIRES.

(1) FLIGHT COMPARTMENT OR MAIN CABIN.—If fire occurs in the flight compartment or main cabin proceed as follows:

(a) Close all hatches, doors, and ventilating ducts and attack fire immediately with all available fire extinguishers. Crew members not actively engaged in fighting the fire will use 100% oxygen supply and will aid those engaged in fighting the fire if they are in distress.

WARNING

The products of decomposition of carbon tetrachloride and the products of combustion of various combustible materials are toxic. Prolonged exposure to these fumes is undesirable. Carbon dioxide in concentrations available in hand extinguishers in this aircraft is non-toxic.

(b) After the fire has been extinguished, to dissipate smoke and/or fumes from cabin, open only the following:

1. Two forward companionway doors.

2. Right side and left side forward auxiliary emergency exit doors.

(2) LOWER CARGO COMPARTMENTS.—When one of the lower cargo compartment warning lights flashes on:

(a) Pull the cargo compartment selector valve control for that light.

(b) Pull out either fire extinguisher discharge valve handle. If one is not sufficient, use the remaining CO_2 cylinder.

CAUTION

Always pull out the engine or cargo compartment selector valve before pulling out the fire extinguisher discharge handle or handles.

e. HAND FIRE EXTINGUISHERS.—Two 1-quart Pyrene fire extinguishers are located as follows: one above the flight compartment door and one just forward of the main cargo doorway. One CO_2 hand fire extinguisher is located by the washstand in the crew compartment and another is mounted on the main cabin aft bulkhead.

f. HEATER SYSTEM FIRES.—Use a CO_2 extinguisher for heater fires. Insert nozzle of extinguisher into trap door in the ceiling of the crew compartment and turn on the extinguisher. The CO_2 gas will circulate through the system and extinguish the fire.

3. ENGINE FAILURE DURING FLIGHT.

a. FAILURE OF ONE ENGINE.—If one engine fails during flight and it is imperative that the propeller be feathered as quickly as possible, proceed as follows:

(1) Maintain flying speed and direction.

(2) Push feathering button.

(3) Close throttle. This will sound the landing gear warning horn if the gear is up. Move throttle to approximately ¼-open to silence horn.

(4) Mixture control for dead engine—"IDLE CUTOFF."

(5) Electric fuel pump for failing engine—"OFF."

(6) If fire or broken lines make it imperative, pull engine selector valve for failing engine to cut off fuel, oil, and hydraulic fluid at the firewall.

(7) Tank-selector for dead engine—"OFF."

(8) Cross-feed for dead engine—"OFF."

(9) Cowl flaps for dead engine—"CLOSED." Return control to "OFF."

(10) Ignition for dead engine—"OFF."

(11) If either inboard engine fails, switch vacuum selector to operative engine.

(12) Generator switch for inoperative engine—"OFF."

(13) Retrim airplane as necessary.

*a*A. PROPELLER UNFEATHERING PROCEDURE:

(1) Propeller control—"DECREASE RPM."

(2) Throttle—cracked open to approximate starting position.

(3) Feathering switch button—Depress and hold down until engine speed is approximately 1000 rpm.

(4) Ignition switch—"BOTH" after propeller has rotated at least three times.

(5) Tanks selector—"ON."

(6) Electric fuel pump—"ON."

(7) Cross-feed—"ON."

(8) Mixture control—"AUTO RICH."

(9) Adjust throttle for warm-up.

(10) Cowl flaps—as required.

(11) Generator switch—"ON."

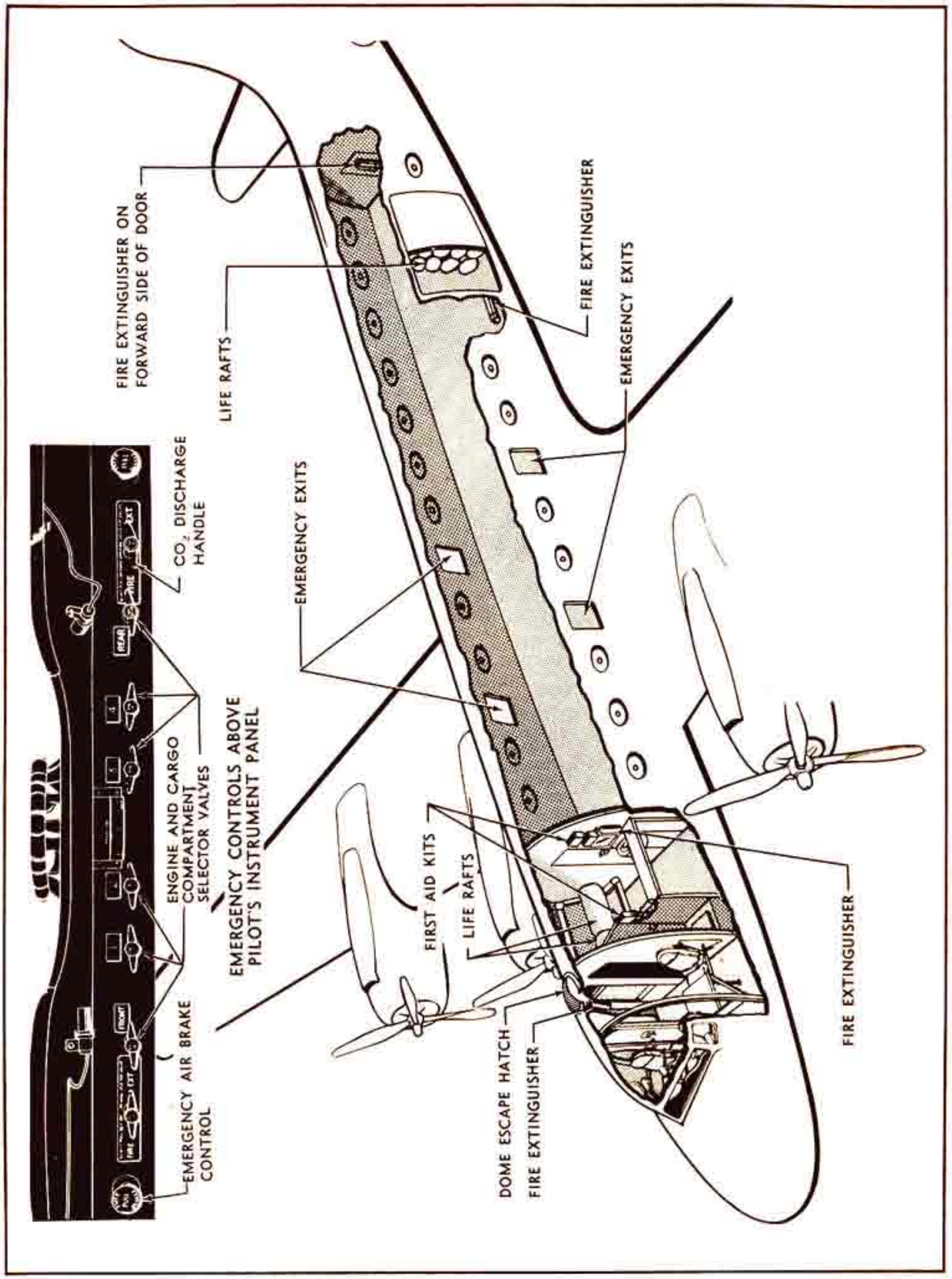


Figure 24 – Emergency Equipment and Exits

b. FAILURE OF TWO ENGINES. – Two-engine operation is not possible at a gross weight exceeding 60,000 pounds. For two-engine operation below this gross weight, refer to Flight Operation Charts, Appendix I.

c. FAILURE OF THREE ENGINES.–The proper procedure in this case is to prepare for an immediate landing.

d. ENGINE FAILURE DUE TO LOSS OF FUEL PRESSURE.—Immediately turn on electric fuel booster pump and change tanks. If fuel booster pump fails to bring up the pressure, turn off fuel booster pump, as a broken fuel line is indicated and the engine selector valve handle for the failing engine must be pulled out. Turn off fuel selector valve, and cross-feed valve for failing engine. Do not use fuel from the system in which the failure occured.

If the fuel booster pump brings up the pressure, failure of the engine-driven fuel pump, or an empty tank is indicated. Operation may be continued by use of the fuel booster pump or change of tank, whichever is applicable.

Note

If operating under the emergency condition of one fuel tank supplying all four engines and an engine failure occurs, shut off fuel to the failing engine by pulling out the engine selector valve for the failing engine. Do not disturb the setting of the fuel tank selector or cross-feed controls, as this would affect the fuel supply to the operating engines.

e. LANDING WITH ONE ENGINE INOPERATIVE.—Make a normal approach and landing.

f. LANDING WITH TWO ENGINES INOPERATIVE.—In case either one or both of the two stopped engines can be safely used for any amount of additional power and a fire hazard does not exist, unfeather the propeller, start that engine, and operate it during final approach. This is recommended because only limited performance is available on two engines. Lower the landing gear and wing flaps on final approach.

CAUTION

Once the flaps are in the full down position you have committed yourself to land. Do not attempt to go around.

4. EMERGENCY LANDING GEAR OPERATION.

a. HYDRAULIC SYSTEM FAILURE.

(1) LEAKAGE.—Any serious leakage in a hydraulic system pressure line will cause a rapid fluctuation of system pressure between 2600 and 3050 psi; extreme leakage may result in the system pressure dropping to zero.

(a) If the leakage occurs when only one of the hydraulic controls is being used, the leak is in that particular subsystem. Return the control to "OFF" or "NEUTRAL" and leave it there to isolate the leak. The remaining hydraulic controls may be used safely if sufficient fluid remains in the main hydraulic system.

(b) If the leakage occurs when all hydraulic controls are at "OFF" or "NEUTRAL," the leak is in the main supply, pressure, and return system. As such a leak cannot be isolated in flight, the fluid in the reservoir will fall to the hand pump reserve level and the system pressure will fall to zero.

Note

The system pressure will normally reduce over a period of time if the system pressure is by-passed. Therefore, when the system by-pass valve is in the "SYSTEM BY-PASSED" (up) position, the pressure gauge is not a reliable indication of leakage.

(2) REFILLING THE RESERVOIR IN FLIGHT. If a subsystem leak is isolated only after considerable fluid has been lost, it may be advisable to refill the reservoir in flight. If the leak is known to be in the main supply, pressure, and return system, there is, of course, no reason to refill the reservoir as this additional fluid would also be lost. The remote indicating hydraulic fluid quantity gauge is located on the upper instrument panel. The reservoir emergency filler and vent lines extend up through the floor in the crew compartment on the right side near the aft doorway. Fill as follows:

(a) Loosen small vent line cap one turn and wait until reservoir supercharging air pressure is relieved.

(b) Remove caps from both lines.

(c) Attach funnel assembly (which is stowed near the filler lines) to the large line. Fill reservoir with hydraulic fluid to the proper level as indicated by the quantity gauge on the upper instrument panel.

(d) Remove funnel assembly and tightly screw on line caps.

b. EMERGENCY OPERATION OF HYDRAULIC SYSTEM.–When fluid in the rservoir falls to the reserve level, the engine-driven hydraulic pumps will run dry. Pressure may still be maintained by the accumulator, but operation of any hydraulic control will quickly cause the system pressure to fall and fail to recover. Leave all hydraulically-operated units in "OFF' or "NEUTRAL." The reservoir reserve fluid is available only through the hydraulic hand pump. The following procedure for operation of the landing gear is recommended.

(1) Hand pump to pressure tank (accumulator) shut-off valve–"CLOSED."

(2) Landing gear emergency extension valve–"OPEN" (handle up).

(3) Reduce airspeed to 144 mph.

(4) Landing gear control—"DOWN" and in notch.

(5) The landing gear should drop and latch, as indicated by lighting of the green indicator lights. (Position of landing gear may also be checked through the driftmeter.)

(6) Close landing gear emergency extension valve (forward).

(7) If the landing gear fails to latch, leave the landing gear control at "DOWN" and operate the hand pump. The reserve fluid in the reservoir is sufficient for 375 cycles (double strokes) of the hand pump, under the condition of no oil returning to the reservoir. The landing gear should be completely extended in 275 cycles.

Note

Swivel the hand pump handle to its aft position in order to obtain maximum stroke travel without interference with the control pedestal. Continue pumping, even though no back pressure is felt against the pump handle. It may require as many as sixty cycles (double strokes) of the handle to prime the pump. When back pressure is felt, continue pumping with long smooth strokes.

c. LANDING GEAR EMERGENCY EXTENSION VALVE CONTROL.—The control handle for the operation of the landing gear emergency extension valve is mounted on the right side of the control pedestal and is normally "CLOSED." In normal operation, when the landing gear is retracted, and the control handle is returned to "NEUTRAL" the gear is held in the up position by the landing gear uplatch. If the uplatch is unlatched (landing gear control handle "DOWN"), opening of the landing gear emergency extension valve permits the fluid in the struts to drain back into the reservoir, allowing the landing gear to drop and latch by its own weight. The emergency extension valve can be used in case of an operational failure of the landing gear control valve.

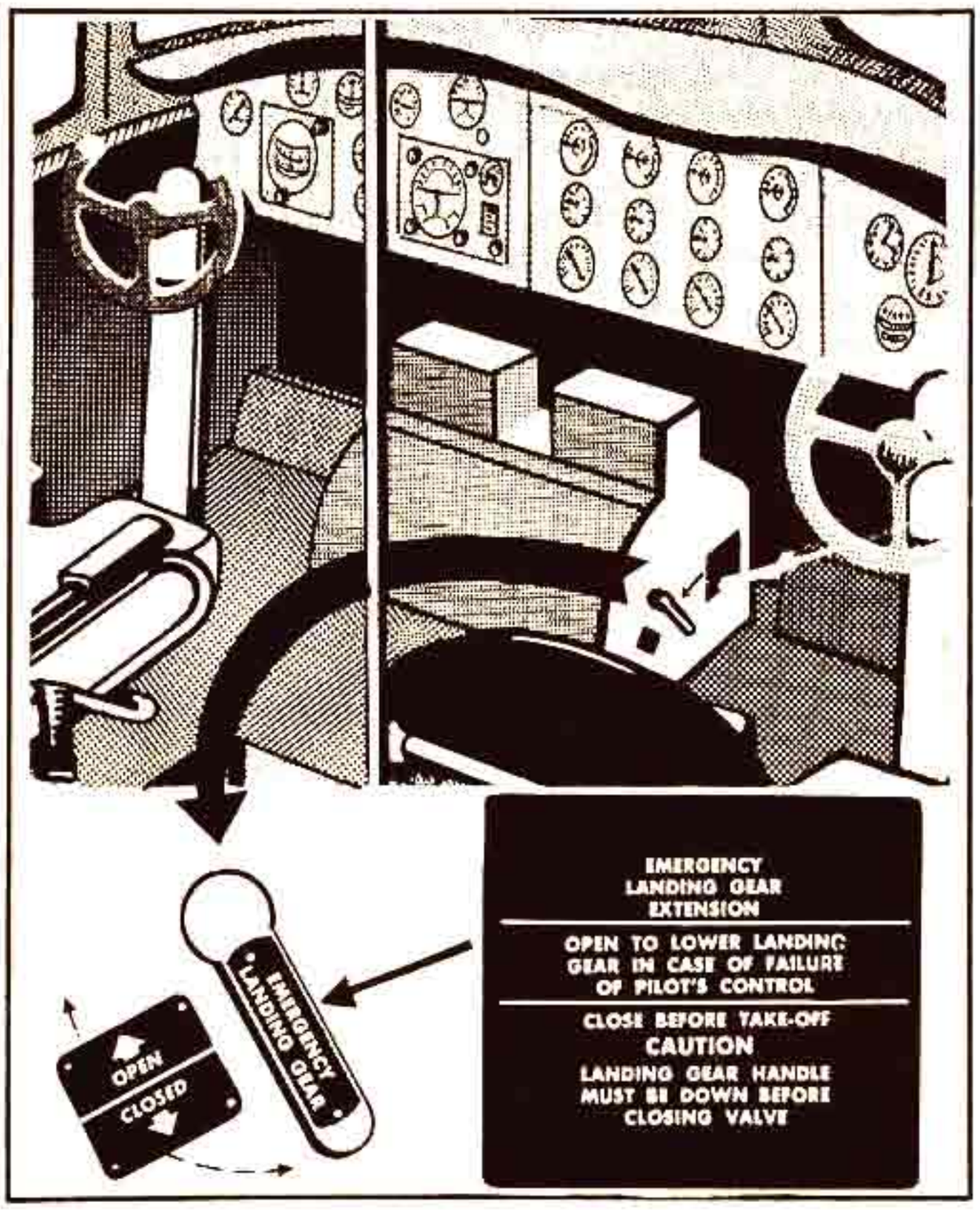


Figure 25 — Landing Gear Emergency Extension Valve Control

d. EMERGENCY OPERATION OF BRAKES. — After any hydraulic pressure failure, check the hydraulic brake pressure gauge. The hydraulic brake system has its own pressure accumulator and as long as the brake pressure gauge shows a pressure reading, normal braking to the amount of pressure indicated is possible. If no pressure reading appears on the hydraulic brake pressure gauge (located on the panel at the side of the co-pilot's seat) a failure in the brake pressure system is indicated. This is equivalent to a failure in the main pressure, supply, and return system, and operation of the hand pump will not supply braking pressure if such a failure exists. In this case, use the emergency air brake system (see *f*, following).

e. EMERGENCY OPERATION OF WING FLAPS. The wing flaps, like the other hydraulic units (with the exception of the brakes), may be operated directly by use of the hand pump. Leave "HAND PUMP TO PRESSURE TANK SHUT-OFF VALVE" in "CLOSED" position so that hand pump pressure will go direct to the wing flaps. All other controls MUST be in "OFF" or "NEUTRAL." Set wing flap control and position flaps as desired by operating the hand pump.

f. EMERGENCY AIR BRAKES.—There is an emergency air brake control handle at each end of the main instrument panel, just under the glareshield. If the hydraulic brakes fail, stop the airplane by pulling out one of these handles. Pulling the handle through its full travel will lock the main wheels, slowing down the airplane at the expense of the tires.

There is a metering type valve in the air brake system which allows intermittent brake applications by manipulating the control handle. When the handle has been pulled out far enough to apply the amount of braking desired the handle may be pushed back to a neutral position (which can be felt) and the degree of braking applied will be held. Pushing the handle in past this neutral position will release the air from the brakes. Pulling the handle out from neutral will apply more air to the brakes. Since the air supply is limited care should be exercised in attempting to meter the brakes. Full air brakes should be used unless sufficient runway is available.

Before using the air brakes, allow the airplane to slow down, utilizing as much of the runway as possible before applying air brakes. After the air brakes have been used, the hydraulic brakes will not operate prop-

erly until the brake system has been bled to remove the air.

Note

When the emergency air brake has been used, stop the engines and have the airplane towed off the field. Release the air brakes by returning the control handle to the "OFF" position.

5. EMERGENCY LANDING WITH WHEELS RETRACTED.

a. PREPARATORY TO LANDING.

(1) With the airplane in normal level flight, release external load, if carried.

(2) Remove all auxiliary doors, emergency exits, and the front section of the main cargo door.

(3) Jettison loose equipment and cargo. Tie down loose articles retained in the airplane.

(4) Warn crew members of the impending crash, and attach safety belts.

b. LANDING.

(1) Make normal initial approach.

(2) Make normal final approach and lower flaps to 40-degrees down to reduce contacting speed.

(3) Maintain adequate airspeed by use of power for full control until just before contact.

6. EMERGENCY LANDING IN WATER (DITCHING).

a. PREPARATION FOR DITCHING.

(1) If possible, use up most of the fuel supply. This lightens the airplane and reduces stalling speed. Empty tanks are also a considerable contribution to flotation. Make sure, however, that some fuel supply is available, as power is of great importance in control of the airplane during landing.

(2) Jettison loose equipment and cargo.

CAUTION

Do not remove forward section of main cargo door as this door must be closed to prevent a surge of water into main cabin upon ditching.

(3) Make certain that flight compartment door and main cargo doors are fully closed and latched.

(4) Remove all auxiliary exit doors not already removed. Release the navigator's dome and remove it.

Note

If the airplane is being flown under considerably reduced power, do not remove emergency exit doors and windows until airplane is below 1000-foot altitude; this will reduce unnecessary drag as long as possible.

(5) Remove life rafts and portable emergency transmitter from stowed positions and place where handy, but crash-proof.

b. DITCHING THE AIRPLANE.

(1) APPROACH.—Leave landing gear up. Lower flaps to full down position. Use a normal approach. This will ensure control and permit some margin of speed after leveling off, so that best point for ditching on a swell may be chosen. Use power as necessary for a fully controlled landing.

(2) MAKING CONTACT.—Use power as necessary to land on upslope of swell. Strike the sea at normal landing attitude. Use maximum UP elevator during surface contact and until the airplane has come to rest, to avoid submerging the nose of the airplane.

7. MISCELLANEOUS EMERGENCY EQUIPMENT.

a. Deleted in revision dated 22 May 1946.

b. IFF RADIO SET DETONATOR SWITCH.—Two detonator push-button switches are mounted in a box on the cross bar just aft of the pilot's seat.

c. PYROTECHNIC PISTOL AND FLARES.—A Type M-8 pistol and flares are stowed in a canvas holder strapped to the floor aft of the co-pilot's seat.

d. GUN MOUNT WITH ADAPTER.—A mount, and covered opening through which the Type M-8 pyrotechnic pistol can be fired, is located above the navigator's compartment. There is another adapter in the cover of the flare chute.

e. EMERGENCY LANDING PARACHUTE FLARES.—Two long-duration parachute flares are carried in the left wing of the airplane just outboard of the fuselage. The flares are released by pulling up on the handles on the floor to the left of the pilot's seat.

f. HAND AX.—A hand ax is held in a scabbard on the forward partition in the crew compartment.

g. FIRST-AID KITS.—Three first-aid kits are mounted in the crew compartment: one on the left forward partition, and two on the aft bulkhead. The first-aid kits contain two pockets. The external pocket, secured by a snap fastener, contains iodine and adhesive compresses for minor injuries. The other pocket, fastened by zipper and sealed, contains equipment and medicine for treatment of more serious injuries, and should be opened only when necessary.

h. LIFE RAFTS.—Ten life rafts are carried in the airplane. Two are stowed between the bunks in the crew compartment, and eight are strapped to fittings on the aft section of the main cargo door.

i. PARACHUTES.—Six QAC parachutes are stowed in a canvas bag on the left forward partition in the crew compartment.

j. PORTABLE EMERGENCY TRANSMITTER.—A portable transmitter, Type SCR-578 packed in a yellow waterproof sack, and a small self-inflating antenna balloon packed in a metal canister inside a yellow waterproof sack, are strapped together and stowed in the main cabin near the main cargo door.

Section V

OPERATIONAL EQUIPMENT

1. HEATING AND VENTILATING SYSTEMS.

a. GENERAL.—Heating and ventilating is provided by three Surface Combustion heaters. Two of these heaters, located in the ceiling of the crew compartment, supply heating and ventilating air to the radio operator's and navigator's stations through flexible ducts and a wall outlet, and to the crew compartment and main cabin through a series of ceiling outlets. One heater, located in the nose of the airplane, supplies heating and ventilating air to the pilot's and co-pilot's footwarmers and windshield side panels, and to the windshield defrosters. An external airscoop on the left side of the fuselage and exhaust ducts in the floor supply ventilation. Scoops and adustable-type outlets supply outside air to each crew station and to each bunk in the crew compartment. On airplanes *C-54G-1-DO and subsequent,* fuel for the heaters is supplied by means of an electrically-driven fuel pump from the No. 2 MAIN wing tank. The heater fuel supply on airplanes *C-54G-1-DC* is drawn from the No. 3 MAIN wing tank. The combined fuel consumption of the three heaters is approximately 1½ US gallons per hour when all three heaters are operating at full capacity.

b. MAIN CABIN HEATERS. — Ventilating and combustion air is supplied to the two main cabin heaters through an external airscoop mounted on the upper left side of the airplane, just aft of the flight compartment. Electrical controls regulate the combustion rate of the heaters. The volume of air flow is controlled manually by dampers at the various outlets.

c. PILOTS' HEATER.—Ventilating and combustion air for the pilots' heating and ventilating system is supplied through an intake in the nose of the airplane, and by an electric blower. Ground operation of the pilots' heater is possible by use of the blower.

d. MAIN HEATER CONTROLS. — The controls necessary for the operation of the main cabin heaters are located on the control panel at the left of the passageway between the crew and pilots' compartment (see figure 26). These controls, and their functions, are as follows:

(1) CABIN HEATER CONTROL.—This is a variable resistance control ("COOLER —70°—HOTTER") which increases or decreases the heater output by changing the operating range of the automatic electric circuit.

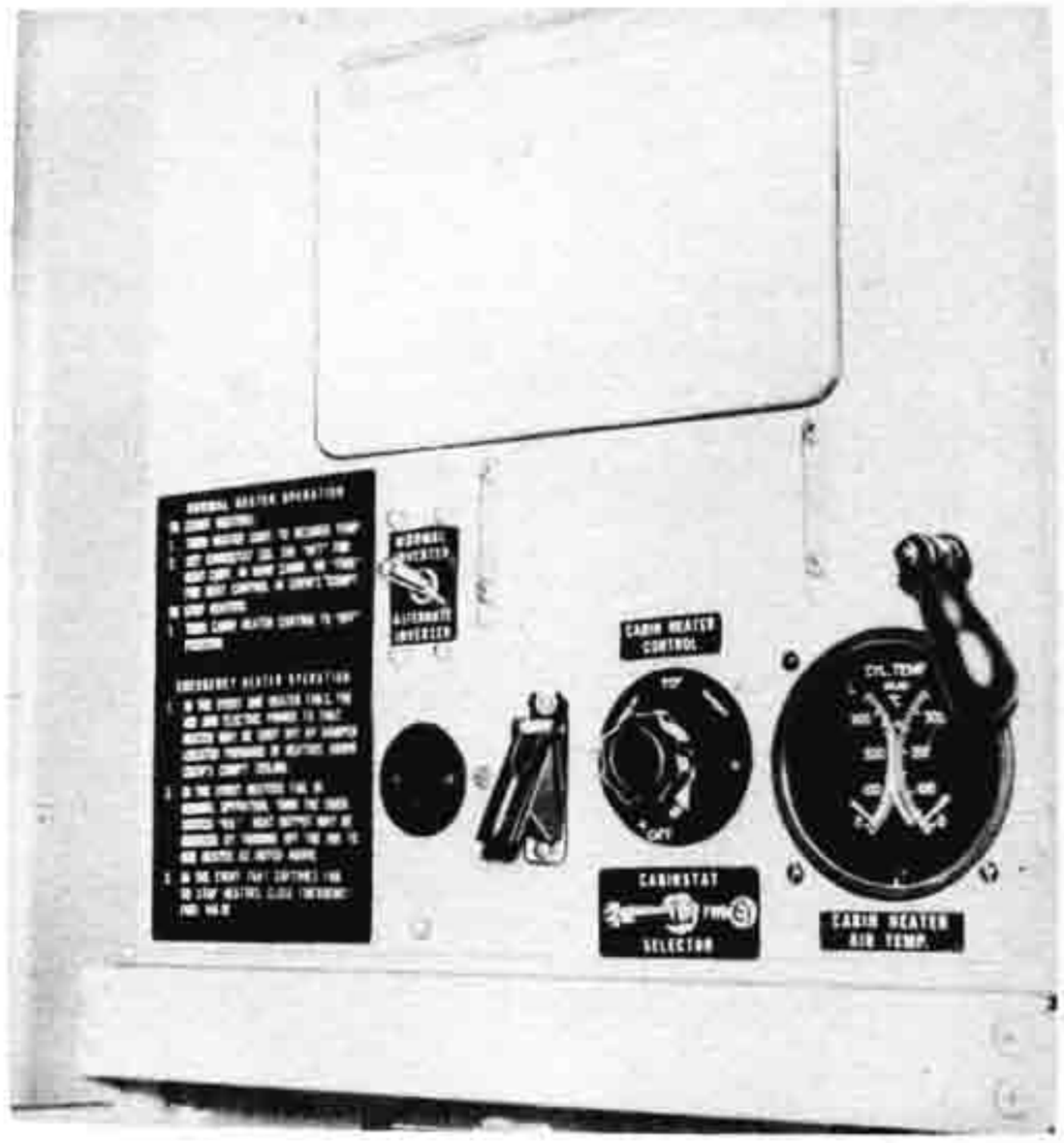


Figure 26—Cabin Heater Control Panel

When turned on and set to the desired temperature, operation of the heaters is entirely automatic.

(2) EMERGENCY SWITCH. — The guarded "EMERGENCY" switch is to be used to operate the heaters only in case of failure of the thermostatic controls.

(2A) OVERHEAT SWITCHES. — One overheat thermal switch is located just aft of each heater. Normally closed, these switches will open when a temperature of 177°C (350°F) is reached, interrupting the flow of current to the heater control relay. The relay then opens, breaking the circuits to the firewall solenoid fuel valve and the heater, and thereby discontinuing all heater operation. The consequent loss of fuel pressure causes the fuel pressure switch to open. When the temperature has lowered the overheat switches will close, but because the circuit to the firewall shut-off valves is still broken, the heaters will not resume operation. When the heaters are stopped by the action of an overheat switch they must be restarted manually.

(3) CABIN HEATER AIR TEMPERATURE GAUGE.—The dual temperature gauge mounted on the heat control panel indicates the temperature of the ventilating air at each heater outlet.

e. PILOTS' HEATER CONTROLS.

(1) PILOTS' HEATER CONTROL SWITCH. — The pilots' heater is turned on by a two-position switch located just below the glareshield in front of the pilot's seat. The footwarmer damper and de-icer dampers are air flow controls only and do not control the starting and stopping of the heaters.

(2) BLOWER CONTROL. — A blower control handle is mounted on the glareshield in front of the pilot's seat.

(3) TEMPERATURE INDICATOR GAUGE.—A heater discharge air temperature gauge is mounted on the left side of the main instrument panel.

f. OPERATION OF MAIN CABIN HEATERS.

(1) STARTING HEATERS. — When airplane attains an airspeed of at least 120 mph, turn CABIN HEATER CONTROL "ON" and set for desired temperature. Operation of the heaters is entirely automatic.

(2) STOPPING HEATERS.—Heaters may be shut off at any time in flight by turning the CABIN HEATER CONTROL "OFF," but MUST be turned off when the speed of the airplane falls below 120 mph.

(3) EMERGENCY OPERATION.—Turn guarded EMERGENCY switch "ON." This operates both heaters at full capacity. Since the EMERGENCY switch bypasses the amplifier, no thermostatic control is possible.

g. CLOTHING HEATER OUTLETS. — Suit heater outlets and rheostats are installed at stations of the pilot, co-pilot, navigator, radio operator, and one is located in the crew compartment.

2. OXYGEN SYSTEM.

a. GENERAL.—A low pressure oxygen system is installed. The complete oxygen system may be filled through a single filler valve located on the right side of the aft baggage compartment. In airplanes having a complete oxygen system for the crew and passengers, a line valve is provided in the filler line between the crew and passenger sections of the oxygen system. The oxygen line valve is located on the right side of the main cabin opposite the airplane entrance door *(16, Figure 28)*. The line valve should be opened for charging the complete oxygen system and closed when it is desired to charge only the crew section of the oxygen system. The crew section supply may be supplemented by the passenger section supply by opening the line valve. The line valve should remain closed at all other times to prevent any possible flow of oxygen from the crew section to the passenger section of the oxygen system.

b. CREW—CONTINUOUS FLOW OXYGEN REGULATORS (Airplanes C-54G-1-DC and subsequent).

(1) GENERAL.—The crew members are supplied by two Type G-1 and one Type J-1 oxygen cylinders. Check valves, for safety in combat areas, are installed between the pilot's section (connected to two Type G-1 cylinders) and the copilot, flight engineer, radio operator and navigator's section (connected to two Type J-1 cylinders). Only continuous flow oxygen masks will be used. The approximate duration of the pilot's section of the oxygen system and the approximate duration of the copilot, flight engineer, radio operator and navigator's section is given in Figure 27A.

(2) REGULATOR.— A manually controlled Type A-9A continuous flow oxygen regulator is installed at each crew station.

(3) PORTABLE OXYGEN UNITS AND RECHARGER ASSEMBLIES.—Four portable oxygen units

Item List for Figure 27 — Heating and Ventilating System

1. BLOWER
2. RAM AIR PRESSURE SWITCH
3. PILOTS' HEATER
4. SOLENOID FUEL VALVE
5. PILOTS' HEATER BLOWER CONTROL
6. SPOT DEFROSTING DUCT
7. NAVIGATOR'S AND RADIO OPERATOR'S COLD AIR OUTLET
8. NAVIGATOR'S TURRET DEFROSTING DUCT
9. TRAP DOOR FOR FIRE EXTINGUISHER
10. EXHAUST CLAMSHELLS
11. MAIN CABIN HEATERS
12. MAIN CABIN HOT AIR DAMPER
13. ANEMOSTAT
14. MAIN CABINSTAT
15. PORTABLE HEATER EXHAUST AND DRAIN
16. TOILET EXHAUST
17. CENTER WING VENT
18. MAIN CABIN EXHAUST AIR OUTLET
19. FUSELAGE FUEL TANK COMPARTMENT AIR OUTLET
20. LAVATORY EXHAUST
21. CREW COMPARTMENT ANEMOSTAT
22. CREW COMPARTMENT CABINSTAT
23. COLD AIR DAMPER
24. MAIN HEATER DRAIN LINE
25. COLD AIR DUCT DRAIN LINE
26. WINDSHIELD DEFROSTER
27. COLD AIR OUTLET
28. PILOTS' FOOT WARMER
29. FILTER
30. AUXILIARY HEATER DRAIN LINE
31. WING TANK VENT
32. FUEL PUMP
33. WINDSHIELD DEFROSTER VALVE

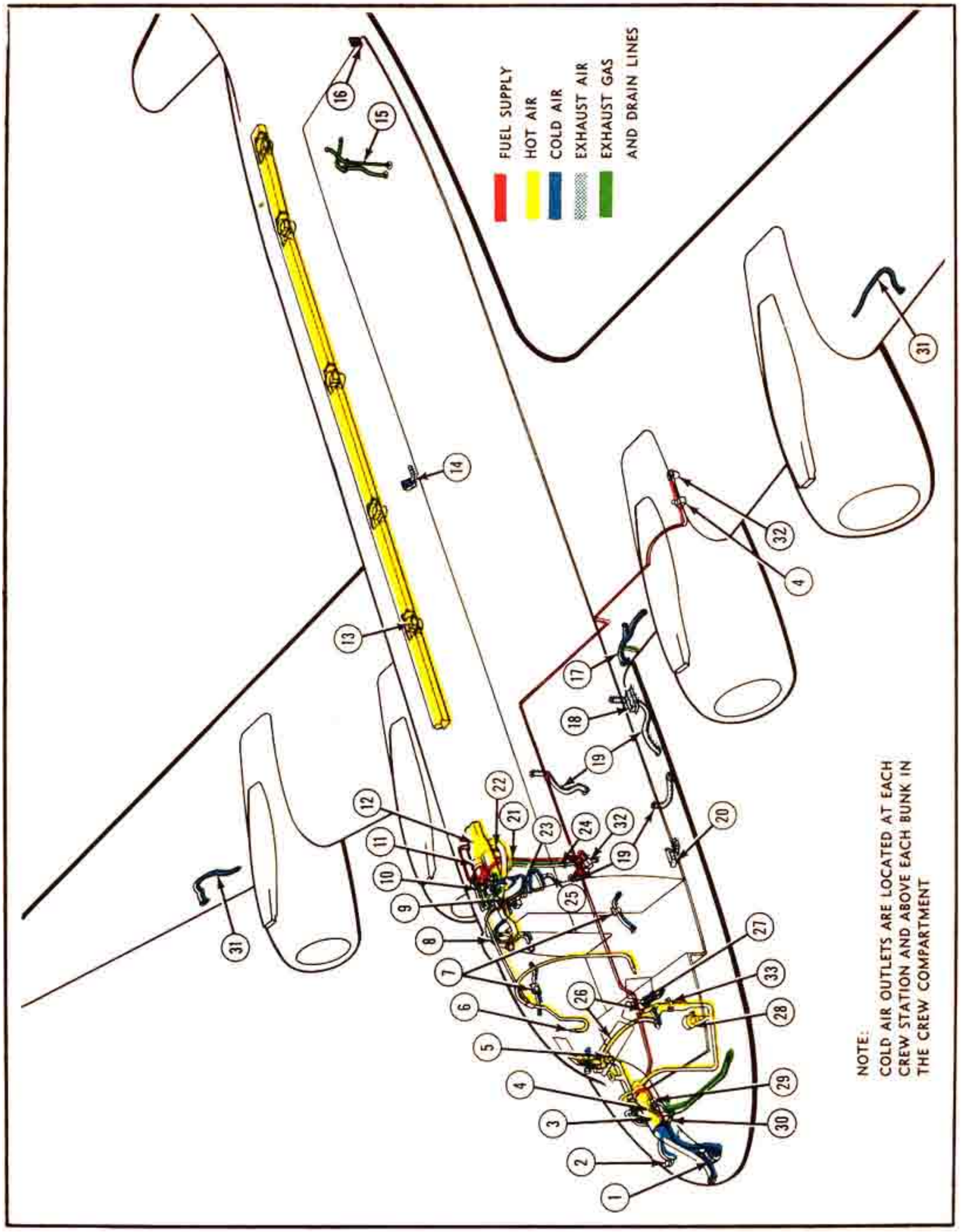


Figure 27 — Heating and Ventilating Equipment

PILOT OXYGEN DURATION - HOURS

CABIN ALTITUDE-FEET	GAGE PRESSURE - P.S.I. 400	350	300	250	200	150	100	BELOW 100
30,000	8.5	7.3	6.1	4.9	3.6	2.4	1.2	Emergency - Descend to Altitude Not Requiring Oxygen
25,000	10.3	8.9	7.4	4.9	4.4	3.0	1.5	
20,000	12.3	10.5	8.8	7.0	5.3	3.5	1.8	
15,000	14.5	12.4	10.3	8.3	6.2	4.1	2.1	
10,000	17.0	14.6	12.1	9.7	7.3	4.9	2.4	

Cylinders: 2 Type G-1
Crew: 1

Co-Pilot, Flight Engineer, Radio Operator and Navigator
OXYGEN DURATION - HOURS

CABIN ALTITUDE-FEET	GAGE PRESSURE - P.S.I. 400	350	300	250	200	150	100	BELOW 100
30,000	9.1	7.8	6.5	5.2	3.9	2.6	1.3	Emergency - Descend to Altitude Not Requiring Oxygen
25,000	11.0	9.5	7.9	6.3	4.7	3.2	1.6	
20,000	13.1	11.3	9.4	7.5	5.6	3.8	1.9	
15,000	15.5	13.3	11.1	9.9	6.7	4.4	2.2	
10,000	18.2	15.6	13.0	10.4	7.8	5.2	2.6	

Cylinders: 1 Type J-1
Crew: 4

Figure 27A—Continuous Flow Regulator Oxygen Duration Tables

are installed and located as follows: One on the post to the right and aft of the pilot's seat, one to the right of the copilot's seat, one at the radio operator's station and one in the crew compartment. Five portable unit recharger assemblies are installed and are located near the pilot and copilot's seats, near the radio operator's station, in the crew compartment and in the forward toilet compartment.

(4) CONTROLS.—A manual flow adjustment knob is incorporated in the oxygen regulator. Oxygen flow to the mask is obtained by turning the manual adjustment knob counterclockwise until the flow indicator needle of the regulator is adjusted to correspond to the cabin altitude. When the regulator is not in use, the manual control knob of the regulator should be closed by turning the knob clockwise.

(5) INDICATORS.—A pressure gage and a flow indicator are incorporated in the regulator.

(6) NORMAL OPERATION.—The flow indicator needle position of the regulator should correspond to the cabin altitude.

(7) EMERGENCY OPERATION. — With symptoms of the onset of anoxia or if smoke or fuel fumes should enter the cabin, turn the adjustment knob of the regulator to the full open position.

CAUTION

When use of the flow control adjustment knob in the fully open position becomes necessary, the airplane commander will be informed of this action. Use of the fully open position of the control knob will reduce oxygen duration of the airplane. After the emergency is over, set the control knob as required for normal operation.

c. CREW — DEMAND OXYGEN REGULATORS (Airplanes C-54G-1-DO, C-54G-5-DO and subsequent).

PILOT OXYGEN DURATION - HOURS

CABIN ALTITUDE-FEET	GAGE PRESSURE - P.S.I. 400	350	300	250	200	150	100	BELOW 100
30,000	8.6 8.8	7.4 7.6	6.1 6.3	4.9 5.0	3.7 3.8	2.5 2.5	1.2 1.3	Emergency - Descend to Altitude Not Requiring Oxygen
25,000	6.5 8.3	5.5 7.2	4.7 6.0	3.7 4.8	2.8 3.6	1.9 2.4	0.9 1.2	
20,000	5.0 9.4	4.3 8.1	3.6 6.7	2.9 5.4	2.2 4.0	1.4 2.7	0.7 1.3	
15,000	4.0 11.5	3.5 9.8	2.9 8.2	2.3 6.6	1.7 4.9	1.2 3.3	0.6 1.6	
10,000	3.2 15.2	2.3 13.0	2.3 10.9	1.7 8.7	1.4 6.5	0.9 4.3	0.5 2.2	

Black Figures Indicate Diluter Lever "NORMAL"
Red Figures Indicate Diluter Lever "100%"
Cylinders: 2 Type G-1
Crew: 1

Co-Pilot, Flight Engineer, Radio Operator and Navigator
OXYGEN DURATION - HOURS

CABIN ALTITUDE-FEET	GAGE PRESSURE - P.S.I. 400	350	300	250	200	150	100	BELOW 100
30,000	9.2 9.4	7.9 8.1	6.6 6.7	5.3 5.4	3.9 4.0	2.6 2.7	1.3 1.3	Emergency - Descend to Altitude Not Requiring Oxygen
25,000	7.1 9.0	6.1 7.7	5.1 6.4	4.1 5.1	3.0 3.9	2.0 2.6	1.0 1.3	
20,000	5.4 10.1	4.6 8.6	3.9 7.2	3.1 5.8	2.3 4.3	1.5 2.9	0.8 1.4	
15,000	4.3 12.2	3.7 10.5	3.1 8.7	2.5 7.0	1.9 5.2	1.2 3.5	0.6 1.7	
10,000	3.5 16.2	3.0 13.9	2.5 11.6	2.0 9.3	1.5 7.0	1.0 4.6	0.5 2.2	

Black Figures Indicate Diluter Lever "NORMAL"
Red Figures Indicate Diluter Lever "100%"
Cylinders: 1 Type J-1
Crew: 4

Figure 27B—Diluter Demand Regulator Oxygen Duration Tables

PASSENGER OXYGEN DURATION – MAN HOURS

CABIN ALTITUDE-FEET	GAGE PRESSURE - P.S.I.							
	400	350	300	250	200	150	100	BELOW 100
30,000	98	84	70	56	42	28	14	
25,000	106	91	76	61	46	30	15	
20,000	117	100	84	67	50	33	17	
15,000	130	111	93	74	56	37	19	
10,000	145	125	104	83	63	42	21	

Cylinders: 2 Type J-1

Figure 27C—Passenger Oxygen Duration Table

(1) GENERAL.—The crew members are supplied by two Type G-1 and two Type J-1 oxygen cylinders. Check valves, for safety in combat areas, are installed between the pilot's section (connected to two Type G-1 cylinders) and the copilot, flight engineer, radio operator, and navigator section (connected to one Type J-1 cylinder). Only demand oxygen masks will be used. The approximate duration of the pilot's section of the oxygen system and the approximate duration of the copilot, flight engineer, radio operator and navigator section is given in Figure 27B.

(2) REGULATOR. — A diluter demand oxygen regulator is installed at each crew station. The regulator automatically supplies a proper mixture of air and oxygen at all altitud..

(3) PORTABLE OXYGEN UNITS AND RECHARGER ASSEMBLIES.—Two diluter demand portable oxygen units *(5, Figure 28)* are installed for the crew. Five portable unit recharger assemblies are installed and are located near the pilot and copilot's seats, near the radio operator's station, in the crew compartment and in the forward toilet compartment.

(4) CONTROLS.

(a) Regulator Diluter Lever.—A diluter lever is provided on each regulator to select "NORMAL OXYGEN" for all normal usage or to select "100% OXYGEN" for emergency use.

(b) Regulator Emergency Valve. — The emergency valve of the regulator is always safety-wired closed and should only be opened in an emergency.

(5) INDICATORS.

(a) Pressure Gage.—Oxygen pressure gages are installed in the pilot, copilot and radio operator's stations and in the crew compartment.

(b) Flow Indicator.—A flow indicator is installed at each crew station.

(6) NORMAL OPERATION.—The regulator diluter lever should be set at the "NORMAL OXYGEN" position.

(7) EMERGENCY.—With symptoms of the onset of anoxia or if smoke or fuel fumes should enter the cabin, set the diluter lever of the regulator to "100% OXYGEN." If the oxygen regulator should become inoperative, open the emergency valve by turning the red emergency knob counterclockwise.

CAUTION

When use of "100% OXYGEN" or "EMERGENCY" becomes necessary, the pilot will be informed of this action. Use of "100% OXYGEN" or "EMERGENCY" will reduce oxygen duration of the airplane. After the emergency is over, set the diluter lever to "NORMAL OXYGEN" and close the emergency valve.

d. PASSENGERS, TROOPS OR LITTER PATIENTS.

(1) GENERAL.—The passengers, troops or litter patients are supplied by two Type J-1 oxygen cylinders (installed only when required). The passengers oxygen regulators are automatic and supply the proper oxygen required with altitude. Portable oxygen unit recharger assemblies are provided on the forward bulkhead of the main cabin and in the aft toilet compartment. A portable oxygen unit is provided on the forward bulkhead of the main cabin. The passengers oxygen pressure gage is located on the right side of the main cabin opposite the airplane entrance door. Oxygen outlet couplings are provided at each passenger station. The coupling automatically opens to supply a proper oxygen flow when the oxygen mask bayonet is attached to the coupling. The coupling will automatically close when the mask bayonet is detached. Only continuous flow oxygen masks will be used. The approximate duration for the passenger section of the oxygen system is given in Figure 27C.

(2) EMERGENCY OPERATION. — If the passengers' continuous flow regulators should become inoperative, descend to altitude not requiring oxygen.

4. LITTER PATIENTS' OXYGEN SUPPLY.

On all *C-54G* airplanes, four A-9-A constant-flow type regulators are mounted on a common unit on the right forward side of the main cargo compartment. When the airplane is being used as an ambulance, patients requiring oxygen as treatment may be placed near these regulators. Each regulator consists of an outlet, a gauge calibrated in thousands of feet, and a gauge showing system pressure. The litter patient regulators are connected into the main cabin or passenger oxygen supply. When the altitude gauge is set at a desired setting (sea level to 30,000 feet), a constant flow of pure oxygen will be supplied in the proper amount to the user's mask.

5. COMMUNICATIONS EQUIPMENT.

Note

Radio sets SCR-274-N and SCR-522-A have been replaced by radio set AN/ARC-3 on some airplanes.

a. GENERAL.—Communications equipment consists of the following:

SCR-274-N medium frequency command set, with controls mounted on the face of the control pedestal.

SCR-522-A very high frequency command set, with control box located on the control pedestal.

SCR-287-A or AN/ARC-8 liaison set, controlled by the radio operator.

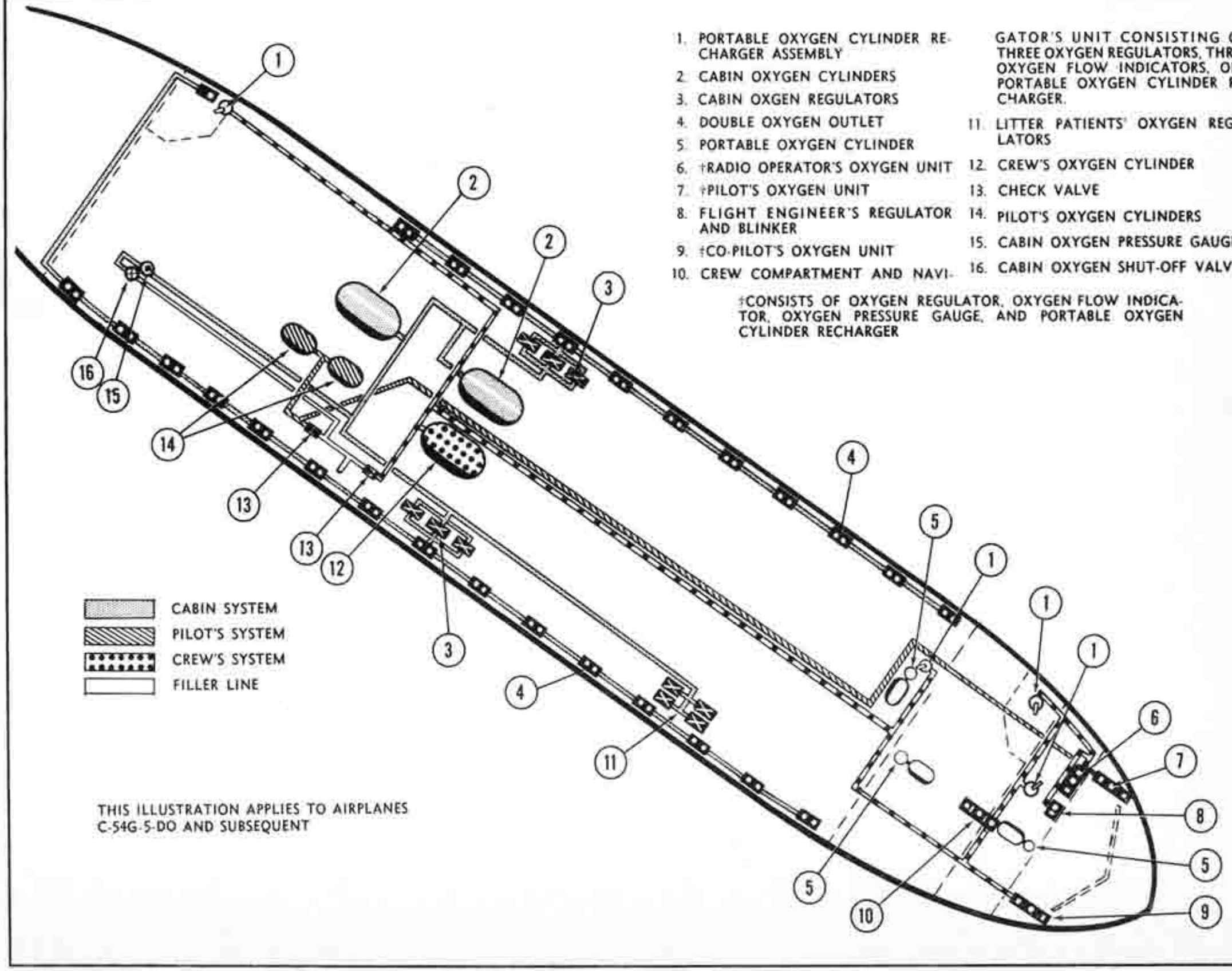


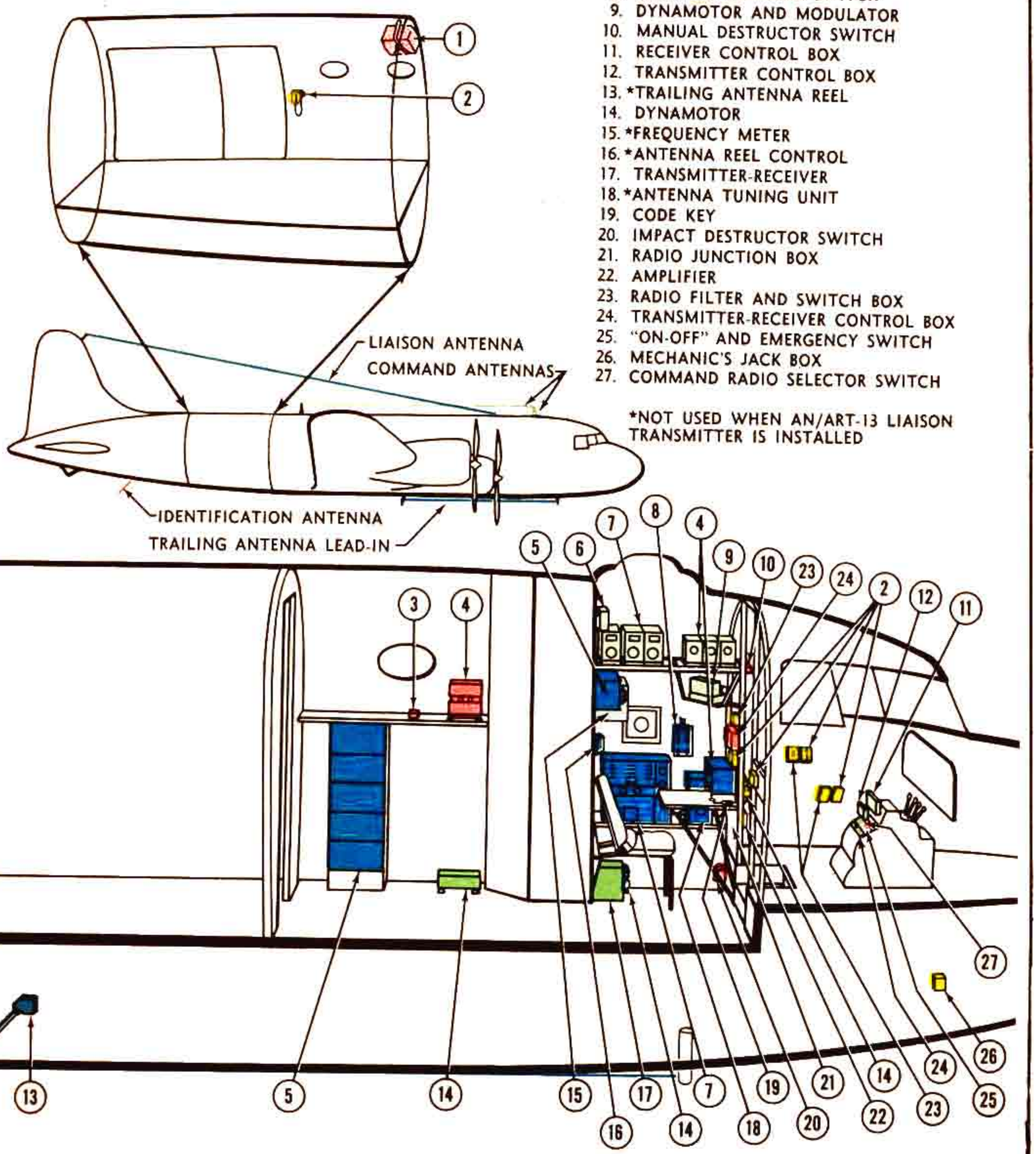
Figure 28 — Oxygen System

AN 01-40NU-1

LIAISON RADIO
SCR-274-N COMMAND RADIO
SCR-522-A COMMAND RADIO
FREQUENCY METER
IDENTIFICATION RADIO
EMERGENCY TRANSMITTER
INTERPHONE EQUIPMENT

1. DINGHY TRANSMITTER
2. MICROPHONE AND JACK BOX
3. INDICATOR BOX
4. RECEIVER
5. *SPARE TRANSMITTER TUNING UNITS
6. ANTENNA RELAY
7. TRANSMITTER
8. *ANTENNA TRANSFER SWITCH
9. DYNAMOTOR AND MODULATOR
10. MANUAL DESTRUCTOR SWITCH
11. RECEIVER CONTROL BOX
12. TRANSMITTER CONTROL BOX
13. *TRAILING ANTENNA REEL
14. DYNAMOTOR
15. *FREQUENCY METER
16. *ANTENNA REEL CONTROL
17. TRANSMITTER-RECEIVER
18. *ANTENNA TUNING UNIT
19. CODE KEY
20. IMPACT DESTRUCTOR SWITCH
21. RADIO JUNCTION BOX
22. AMPLIFIER
23. RADIO FILTER AND SWITCH BOX
24. TRANSMITTER-RECEIVER CONTROL BOX
25. "ON-OFF" AND EMERGENCY SWITCH
26. MECHANIC'S JACK BOX
27. COMMAND RADIO SELECTOR SWITCH

*NOT USED WHEN AN/ART-13 LIAISON TRANSMITTER IS INSTALLED

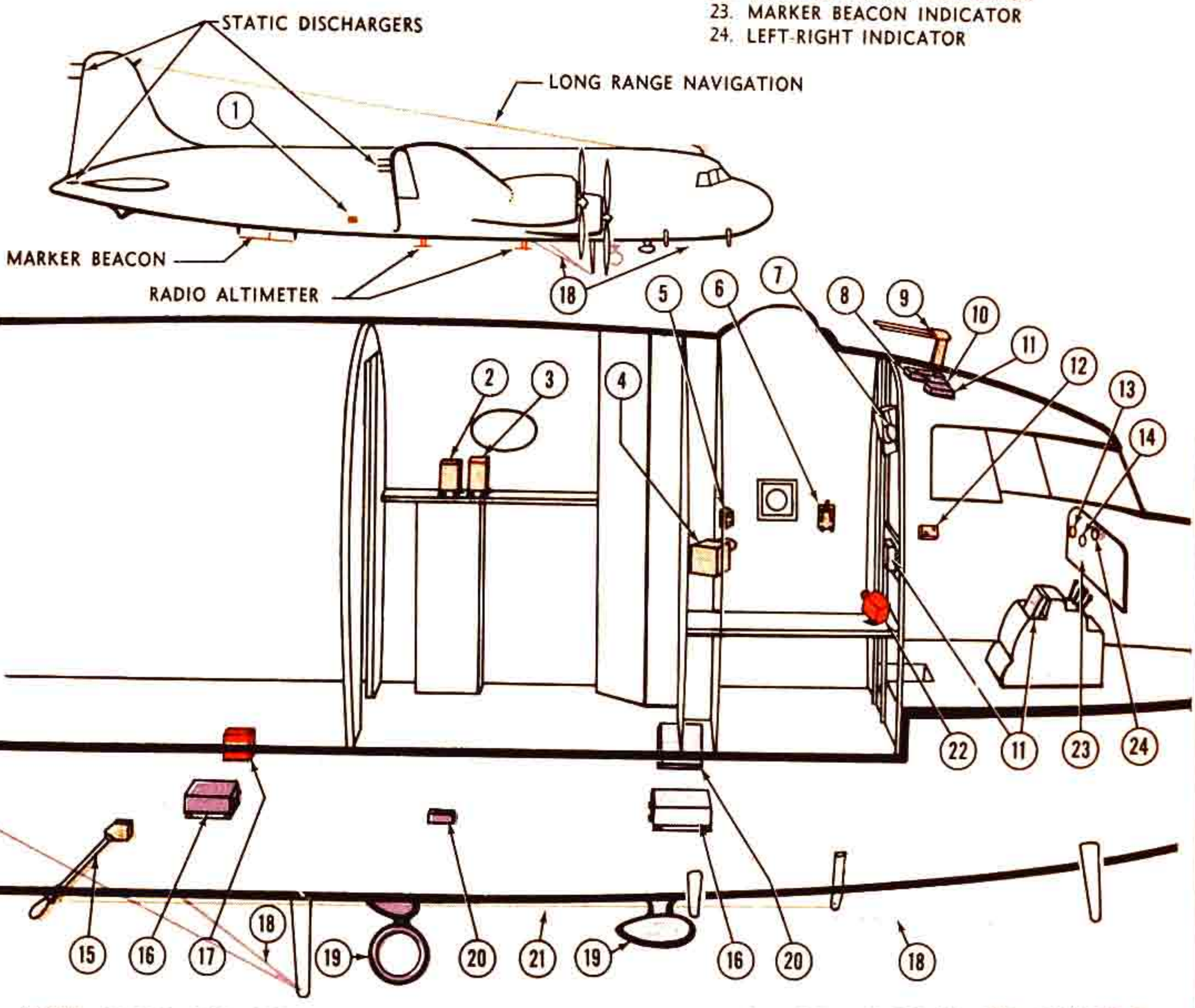


NOTE: RADIO SETS SCR-274-N AND SCR-522-A HAVE BEEN REPLACED BY RADIO SET AN/ARC-3.

Figure 29 (Sheet 1 of 2 Sheets) — Communication Equipment

MANUAL RADIO COMPASS
AUTOMATIC RADIO COMPASS
RADIO ALTIMETER
GLIDE PATH RADIO
MARKER BEACON
LONG RANGE NAVIGATION EQUIPMENT

1. MARKER BEACON RECEIVER
2. GLIDE PATH RECEIVER
3. LOCALIZER
4. LONG RANGE NAVIGATION RECEIVER
5. ANTENNA REEL CONTROL BOX
6. ANTENNA CHANGE-OVER SWITCH
7. NAVIGATOR'S BEARING INDICATOR
8. MANUAL COMPASS BEARING INDICATOR
9. GLIDE PATH ANTENNA
10. COMPASS CHART
11. COMPASS RECEIVER CONTROL BOX
12. GLIDE PATH AND LOCALIZER CONTROL BOX
13. BLIND LANDING INDICATOR
14. PILOT'S BEARING INDICATOR
15. TRAILING ANTENNA REEL
16. RADIO COMPASS RECEIVER
17. RADIO ALTIMETER RECEIVER-TRANSMITTER
18. COMPASS SENSE ANTENNA
19. COMPASS LOOP
20. RADIO COMPASS JUNCTION BOX
21. TRAILING ANTENNA LEAD-IN
22. RADIO ALTIMETER INDICATOR
23. MARKER BEACON INDICATOR
24. LEFT-RIGHT INDICATOR



NOTE: RADIO SETS SCR-274-N AND SCR-522-A HAVE BEEN REPLACED BY RADIO SET AN/ARC-3.

Figure 29 (Sheet 2 of 2 Sheets) — Communication Equipment

SCR-695-A identification equipment. The control box for this set is at the radio operator's station. The "ON-OFF" switch and an emergency switch are mounted on the control pedestal.

AN/ARN-7 radio compass, with control box on the control pedestal, and a remote control box at the navigator's station.

MN-26-C manual radio compass. The control box for this equipment is mounted in the ceiling between the navigator's station and the pilots' compartment.

RC-193-A marker beacon, operating through the AN/ARN-7 radio compass. The indicator is on the main instrument panel.

SCR-570 blind landing equipment, consisting of an RC-103-A localizer and an AN/ARN-5 glide path receiver. This equipment is operated by the pilot.

AN/APN-9 long-range navigation equipment, operated by the navigator.

SCR-578-A emergency transmitter, stowed near the door in the main cabin.

SCR-211 frequency meter, on airplanes equipped with the SCR-287-A liaison set.

SCR-718-A radio altimeter, located at the navigator's station.

Provisions only are made for the installation of AN/APN-1 radio altimeter equipment. The indicator and indicator lights will be mounted on the pilot's instrument panel.

The airplane is equipped with static dischargers, which are located as shown in figure 29.

b. INTERPHONE EQUIPMENT.—The interphone system is in operation whenever the airplane's master battery switch and the interphone circuit breaker are "ON." Interphone jack boxes are located at stations of the pilot, co-pilot, radio operator, and navigator. A jack box in the main cabin is installed near the main cargo door. All jack boxes are connected to the liaison set, the command set, and the radio compass, and reception or transmission is possible from any jack box station with the exception of the main cabin jack box. Transmission through the liaison transmitter is not possible from this station. Transmission and reception from any jack box station through the SCR-274-N command set is possible only through channel "A," as this is the only channel connected to the "COMMAND" position of the jack boxes. There is an FL-8 filter at stations of the pilot, co-pilot, and radio operator.

6. FLIGHT COMPARTMENT.

a. GENERAL.—The pilots' heating and ventilating system, SCR-274-N command radio, SCR-522-A command radio, AN/ARN-7 radio compass, RC-103-A localizer and AN/ARN-5 glide path receiver, the marker beacon, and all ice-eliminating systems may be controlled from the flight compartment.

b. HEATING AND VENTILATING.—Fuel for the pilots' heater is supplied under pressure by means of an electrically-driven fuel pump from the No. 2 MAIN wing tank on airplanes *C-54G-1-DO and subsequent,* or from the No. 3 MAIN wing tank on airplanes *C-54G-1-DC and subsequent.* A blower supplies the necessary air pressure when the airplane is not in motion. Operation is as follows:

(1) Set blower control handle, at left of compass, to extreme "ON" position for warm-up, taxiing, take-off, and landings. Set handle to extreme "OFF" position during flight.

(2) Turn heater switch "ON." This starts the blower (if the blower handle is in "ON" position), starts the heater fuel pump, and supplies electrical current to the heater.

(3) If intake scoop to nose heater should ice up during flight, blower may be used in flight.

(4) Control amount of heat by opening or closing footwarmer and windshield-defroster dampers.

(5) Stop heater by turning heater switch "OFF."

c. COMMUNICATIONS. — The SCR-274-N command set, SCR-522-A command set, SCR-695-A identification set, AN/ARN-7 radio compass, RC-193-A marker beacon, RC-103-A localizer, AN/ARN-5 glide path receiver, AN/APN-1 low altitude radio altimeter, and MN-26-C manual radio compass may all be controlled or operated from the pilot's compartment. On airplanes equipped with the AN/ARC-8 liaison radio a remote control for this equipment is installed in the ceiling of the pilots' compartment. The location and general usage of this equipment is as follows:

(1) SCR-274-N COMMAND RADIO.—This is a conventional command radio with controls mounted on the face of the engine control pedestal. The set consists of three receivers and three transmitters, and has provisions for "MCW" "CW," or "VOICE" reception and transmission.

(a) TO RECEIVE.—Select receiver tuning control covering desired reception frequency, and turn corresponding receiver control switch to "MCW" for MCW code, or to "CW" for straight CW code.

Note

Leave "A—B" selector switch in "A" position, as only channel "A" of the command radio is connected to the interphone jack boxes.

(b) TO TRANSMIT.

1. Turn transmitter power switch "ON" and allow 15 seconds for transmitter to "warm up."

2. Set transmitter control switch to "VOICE," "CW," or "TONE," depending on type of transmission desired.

3. Turn transmitter off by switching transmitter power switch "OFF."

4. To reduce battery drain and increase dynamotor life, place the emission selector switch in "VOICE" unless continued use of tone of CW is expected.

(2) SCR-522-A VHF COMMAND RADIO.—The control box is mounted on the engine control pedestal.

(a) STARTING THE EQUIPMENT.—To start the equipment, depress any one of the channel push buttons on the radio control box. If the transmitter and receiver fail to operate when a channel push button is pressed, press another channel push button and then press the push button for the desired channel.

(b) STOPPING THE EQUIPMENT.—To stop the equipment, press the "OFF" push button.

(3) COMMAND RADIO TRANSFER CONTROL SWITCH.—The two-position command radio transfer control switch, marked "VHF" and "MED FREQ," is mounted on the engine control pedestal. The "VHF" position selects the SCR-522-A set, and the "MED FREQ" position selects the SCR-274-N set.

(4) SCR-695-A IDENTIFICATION EQUIPMENT.—The control box for this set is located at the radio operator's station. An "ON-OFF" switch and a guarded "EMERGENCY" switch are mounted on the engine control pedestal. The "DETONATOR" switch for the destructor circuit is located on the radio rack directly in back of the pilot's seat.

(a) To start the equipment, turn the "ON-OFF" switch "ON."

(b) The guarded "EMERGENCY" switch is used to operate a special signal in case of an emergency. Details concerning the use of this switch should be obtained from the Communications Officer in Charge.

(c) To stop the equipment, turn the "ON-OFF" switch "OFF." Make certain that destructor plug is removed from the destructor unit as soon as the airplane lands.

(5) AN/ARN-7 RADIO COMPASS.—The AN/ARN-7 radio compass is manually tuned from the control box mounted on the face of the engine control pedestal. A second remote control box is mounted at the navigator's station. Remote bearing indicators are located on the pilot's instrument panel and on the navigator's instrument panel.

(a) Put the AN/ARN-7 compass into operation by moving the "OFF-COMP-ANT-LOOP" switch to any of the three latter positions, depending on the type of reception desired. The "CW-VOICE" switch is at the bottom of the control box.

(b) To turn off the equipment, move the "OFF-COMP-ANT-LOOP" switch to "OFF."

(6) RC-193-A MARKER BEACON RECEIVING EQUIPMENT.—The marker beacon indicator is a signal light with a jeweled face, mounted on the left side of the main instrument panel. The equipment is automatically turned on when the AN/ARN-7 radio compass is put into operation.

(7) RC-103-A LOCALIZER AND AN/ARN-5 GLIDE PATH RECEIVER.—Controls for this equipment are incorporated in the control box which is mounted to the left of the pilot aft of the interphone equipment. Switching the "ON-OFF" switch to either "ON" or "OFF" controls both the localizer and the glide path receiver.

(8) AN/APN-1 RADIO ALTIMETER—When this equipment is installed, an altitude limit switch is mounted on the left side of the main instrument panel, and a radio altimeter and three indicator lights are located on the center instrument panel. The function of the indicator lights is as follows:

RED—Indicates flight below the "preset altitude" (limit switch setting).

AMBER—Indicates flight at approximately the "preset altitude."

GREEN—Indicates flight above the "preset altitude."

(9) MN-26-C MANUAL RADIO COMPASS.—The control box for the MN-26-C manual radio compass is mounted in the ceiling of the pilot's compartment aft of the upper electrical panel. A pilot's left-right indicator is located on the main instrument panel.

d. ICE ELIMINATING EQUIPMENT.

(1) PROPELLER ANTI-ICER.—The system consists of a single 40 US (33.32 Imperial) gallon tank (which also provides anti-icing fluid for the carburetor anti-icing system), two electrically-driven pumps, the distributing lines, and two controlling rheostats on the upper electrical panel. The amount of fluid in the tank is indicated by a gauge on the upper electrical panel. One rheostat controls the flow of fluid to the inboard propellers, and the other controls the flow of fluid to the outboard propellers. The recommended rate for supplying anti-icing fluid to each propeller is two quarts per hour, although the delivery rate may be set as high as 14 quarts per hour.

(2) CARBURETOR ANTI-ICER.—Anti-icing fluid for all four carburetors is supplied by a single electrically-operated pump from the same tank that supplies the propeller anti-icing fluid. Each engine circuit is controlled by a separate momentary-contact switch located in the upper right section of the electrical panel.

Turn on the anti-icing switch for the malfunctioning engine until engine is again operatig properly.

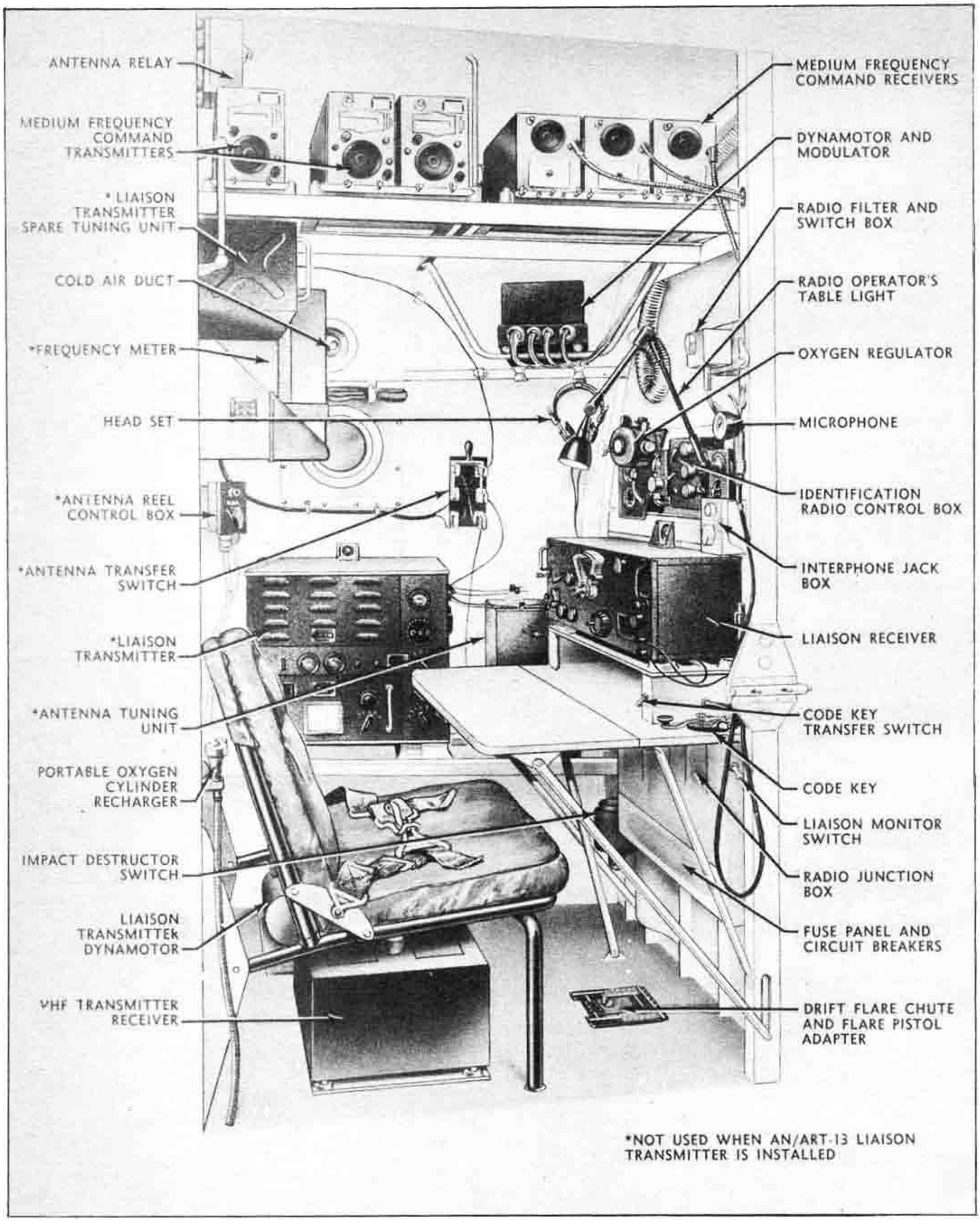


Figure 30 — Radio Operator's Station

(3) WINDSHIELD DEFROSTER.—At each side window of the pilots' compartmet is a short, flexible duct which can be used to direct warm air to any portion of these windows for defrosting.

Provisions are made on the windshield for the installation of a removable de-icer panel. A hot-air duct is routed from the pilots' heater to de-icer panel. Control of heat to the windshield panel is maintained by damper valves located on the wall outboard of each pilot's position.

The double-paneled "clear-vision" corner window at each end of the windshield is supplied with hot air for defrosting. Control of the hot air is accomplished by damper valves located on the wall outboard of each pilot's position.

(4) PITOT TUBE HEATERS.—When icing conditions prevail, turn "ON" the two pitot heater switches located on the left side of the pilot's upper instrument panel. By turning on the left-hand pitot tube heater a heating element in the main cabin ventilating airscoop is also turned on. The right-hand pitot tube heater is turned on by a separate switch. An ammeter is installed to indicate pitot heaters and airscoop heater "ON."

(5) SURFACE DE-ICER SYSTEM.—The surface de-icer system, consists of rubber boots along the leading edges. Do not land or take off with de-icer boots in operation. The de-icer control switch is located on the upper right side of the pilot's electrical panel. The surface de-icer pressure gauge is located in the lower right corner of the co-pilot's instrument panel. The correct operating pressure is 7-8 psi.

7. RADIO OPERATOR'S STATION.

a. GENERAL.—The radio operator's station is located on the left side of the pilots' compartment, aft of the pilot's seat. The radio operator is provided with a folding table, stationary chair and safety belt, a flexible duct for heating and ventilating, flexible light, and an oxygen outlet. The SCR-287-A or AN/ARC-8 liaison radio is controlled from the radio operator's station.

b. LIAISON TRANSMITTER FOR SCR-287-A RADIO.—The transmitter is a Type BC-375-C, and is mounted immediately to the left of the radio operator's chair.

(1) TUNING UNITS.—The master oscillator and power amplifier radio frequency circuits are built into the seven transmitter tuning units. These tuning units cover frequency ranges in kilocycles as shown in the following list:

TU-26-B	200 - 500 kc
TU-5-A	1500 - 3000 kc
TU-6-A	3000 - 4500 kc
TU-7-A	4500 - 6200 kc
TU-8-A	6200 - 7700 kc
TU-9-A	7700 - 10,000 kc
TU-10-B	10,000 - 12,500 kc

Five of the units are stowed in the crew compartment, one is stowed in a case on the pilots' compartment aft bulkhead above the radio operator's seat, and the seventh unit is installed in the transmitter.

(2) FREQUENCY METER.—The frequency meter, Type SCR-211, stowed on the bulkhead above the radio operator's chair, is a separate unit used only when checking signal frequency. It is completely portable and self-contained and is adaptable for adjusting the transmitters and receivers to any desired frequency in the range from 125 to 20,000 kilocycles.

(3) OPERATION OF BC-375-C LIAISON TRANSMITTER.

(a) Select the transmitter tuning unit for the desired frequency.

(b) Set signal switch to type of operation required ("CW," "VOICE," or "TONE").

(c) Set key transfer switch in "LIAISON" position.

(d) Start and stop the equipment by use of the "ON-OFF" power switch.

c. LIAISON TRANSMITTER FOR AN/ARC-8 RADIO.—The transmitter used with this set is an AN/ART-13, and is mounted on the left side of the radio operator's station.

(1) STARTING THE EQUIPMENT.—Turn the "EMISSION" selector switch to the "VOICE" position.

(2) NORMAL OPERATION.

(a) With the "EMISSION" selector switch on "VOICE," place the "CHANNEL" selector switch on the position corresponding to the frequency on which transmission is desired. This may be found on the chart on the front panel of the transmitter.

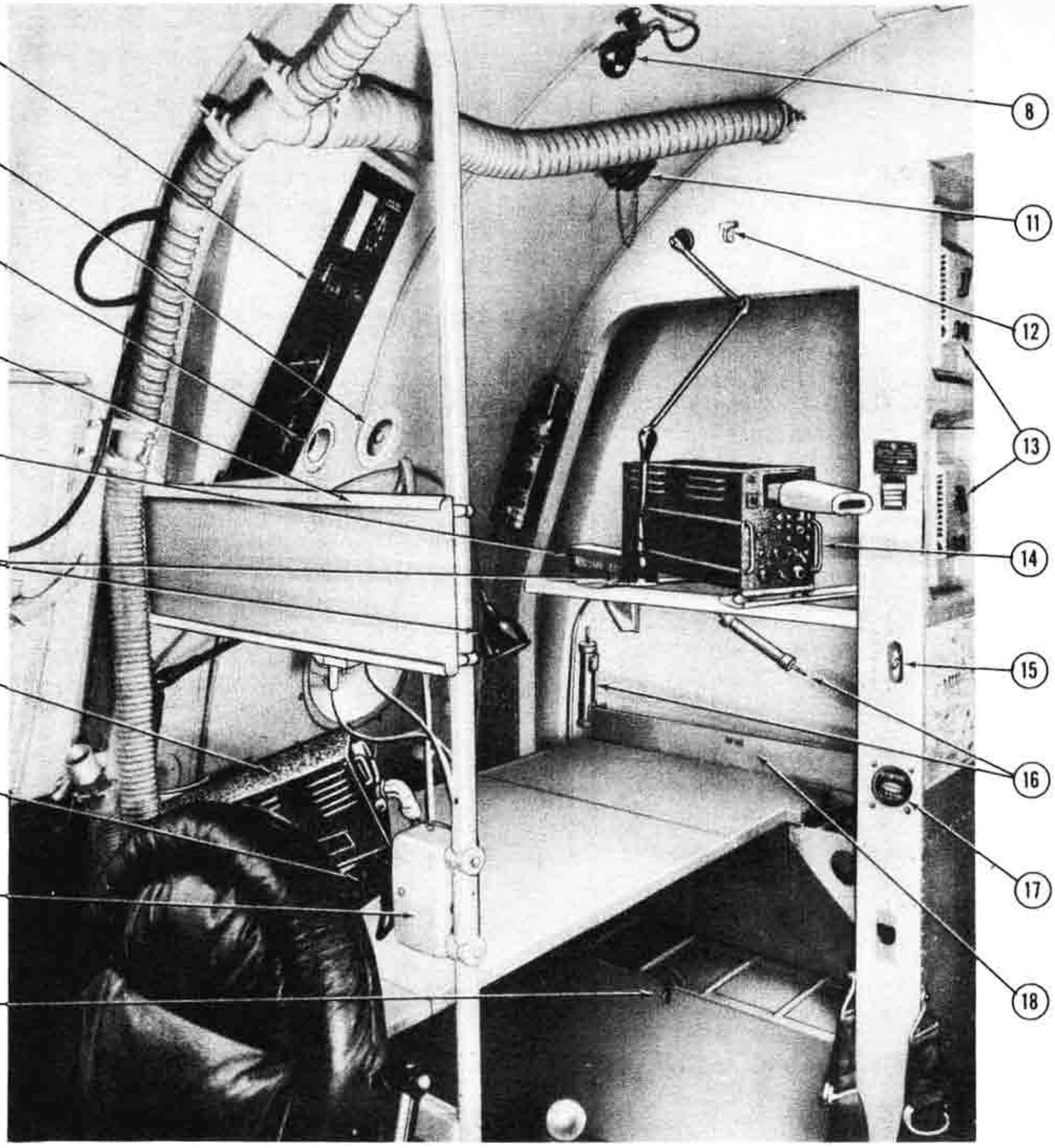
(b) When the red pilot light comes on, place the "EMISSION" selector switch on the position corresponding to the type of emission desired; either "VOICE," "CW," or "MCW."

CAUTION

Under no circumstances should the transmitter be actually operating (key down or microphone push button closed) when "EMISSION" selector switch is being operated. Such operation, especially at high altitudes, can cause an arc to occur and sustain between the contacts of the relay.

(c) STOPPING the EQUIPMENT.—Turn the "EMISSION" selector switch to the "OFF" position.

d. LIAISON RECEIVER.—The liaison receiver is a Type BC-348-A. The controls and their functions are as follows:



1. NAVIGATOR'S INSTRUMENT PANEL
2. COLD AIR DUCT
3. FREE AIR TEMPERATURE INDICATOR
4. RADIO COMPASS AND INTERPHONE CONTROL PANEL
5. RESIN LENS
6. DESK LAMPS
7. RADIO ALTIMETER
8. FLUORESCENT INSTRUMENT LIGHT
9. INSTRUMENT LIGHT CONTROL SWITCHES
10. STOWAGE BOX
11. TYPE M-8 PYROTECHNIC PISTOL GUN MOUNT
12. LOWER CARGO COMPARTMENT DOOR KEY
13. SUIT HEATER RHEOSTATS
14. LONG RANGE NAVIGATION RECEIVER INDICATOR
15. AN/APN-9 INVERTER SWITCH
16. DRIFTMETER DEHYDRATOR AND SPARE DEHYDRATOR (LOCATED HERE ON C-54G-1-DO)
17. OXYGEN FLOW INDICATOR
18. MAP CASE

Figure 31 — Navigator's Station

TUNING CONTROL.—Varies the setting of the four-gang variable tuning capacitator.

BAND SWITCH CONTROL.—Selects the desired frequency band as indicated on the dial mask.

DIAL LIGHTS CONTROL.—Varies the dial illumination.

CW OSCILLATOR.—Controls the operation of the CW oscillator as well as the AVC time constant for CW reception.

CRYSTAL FILTER.—Permits the insertion of an IF crystal filter when extreme selectivity is desired.

BEAT FREQUENCY.—Permits vernier adjustment of the CW frequency. In tuning, this control should be near the zero beat position (arrow on knob pointing up).

VOLUME.—To provide sensitivity adjustment on MVC operation and output level adjustment on AVC operation. When switching from "MVC" to "AVC" or vice versa, it is necessary to readjust this control to maintain a given volume level.

AVC-OFF-MVC SWITCH.—Removes all power from the receiver in the "OFF" position. In the "MVC" position, the receiver is operative with manual volume control. When the switch is in the "AVC" position the automatic volume control is functioning. Start the equipment and do all tuning up with this switch at "MVC." To stop the equipment, place the switch at "OFF."

e. LIAISON ANTENNA CHANGE-OVER SWITCH.—The double-pole double-throw knife switch on the left wall of the radio operator's station switches the transmitter from the trailing liaison antenna to the fixed liaison antenna, and vice versa. This switch also provides the antenna connection for the AN/APN-9 long range navigation radio equipment. When the liaison set is using the trailing wire antenna, radio set AN/APN-9 will be switched to the fixed antenna; conversely, when the liaison set is using the fixed antenna, radio set AN/APN-9 wil be switched to the trailing antenna. Both sets cannot use the same antenna simultaneously. When the AN/ARC-8 liaison radio is installed the trailing antenna and the change-over switch are deleted. A coupler is installed between the AN/APN-9 long range navigation equipment and the AN/ART-13 transmitter to permit simultaneous operation of the two sets.

8. NAVIGATOR'S STATION.

a. GENERAL.—The navigator's station is located in the pilots' compartment, just aft of the co-pilot's seat. A navigation dome is installed at the top of the fuselage surface, forward of the crew compartment bulkhead. A folding table, installed at the aft bulkhead of the compartment, may be stowed against the bulkhead. When the table is extended, it reaches to the shelf aft of the co-pilot's seat. An adjustable stool may be used for sitting at the table, or to stand on when sighting through the navigation dome. Two assist handles are located on the aft bulkhead, one on the left side of the crew compartment door, and the other above the door.

b. HEATING AND VENTILATING.—A flexible duct from the main cabin heaters is used for heating and ventilating and may be used for defrosting the navigation dome.

c. COMMUNICATIONS.

(1) GENERAL.—An interphone jack box and a remote control box for the AN/ARN-7 radio compass are mounted on a channel at the forward side of the navigator's station. Additional radio equipment consists of the AN/APN-9 long range navigational equipment and the SCR-718-A radio altimeter. The MN-26-C radio compass control box is located in the ceiling of the pilots' compartment and the navigator has access to this equipment.

(2) REMOTE CONTROL BOX FOR AN/ARN-7 RADIO COMPASS.—To change control from the control box on the engine control pedestal to the one at the navigator's station, proceed as follows:

(a) Set the function switch of the remote control box to the "COMP" or the "ANT" position.

(b) Push the "CONTROL" switch. The green light will come on indicating that this remote control box now has control of the equipment.

(c) To turn off the equipment, turn the function switch of the remote control box to the "OFF" position.

(3) AN/APN-9 LONG RANGE NAVIGATION EQUIPMENT.

(a) GENERAL.—The AN/APN-9 radio equipment is used to determine the geographic position of the airplane.

(b) RADIO RECEIVER-INDICATOR. – The receiver is used to select one of four frequencies from a ground-operated transmitting station and to supply the indicator with electrical impulses. The receiver-indicator is mounted on the right side of the airplane, at the navigator's station.

(c) OPERATION OF AN/APN-9 LONG RANGE NAVIGATION EQUIPMENT.

1. To start the equipment, turn the "PWR ON-OFF" switch to the "ON" position.

2. Adjust the "CHANNEL" selector to the correct frequency range.

3. Turn the "FILTER IN-OUT" switch to the "OUT" position. If electrical disturbances affect signal reception, and trace patterns on the oscilloscope are erratic and distorted, turn the "FILTER IN-OUT"

switch to "IN" position. The "FILTER IN-OUT" switch may be turned from "IN" to "OUT" during any stage of operation to achieve a better signal-to-noise ratio. Normal operating position of this switch is "OUT."

4. To turn off the equipment, move the "PWR ON-OFF" switch to the "OFF" position.

(4) SCR-718-A HIGH ALTITUDE RADIO ALTIMETER.

(a) GENERAL.—The SCR-718-A radio altimeter indicator is installed at the navigator's station. The nominal range of the SCR-718-A radio altimeter is 0 to 40,000 feet and the indicator shows aircraft height above terrain. It is housed in a metal cabinet mounted on the navigator's table, just aft of the co-pilot. A scale on the face of the indicator is graduated from 0 to 5,000 feet. When the indicator is operated, a green trace in the form of a circle with two lobes upon it appears next to the scale. One lobe appears at 0 and the other at a point corresponding to aircraft height above terrain.

(b) OPERATION OF ALTIMETER.—All operating controls and the height-indicating dial of radio altimeter SCR-718-A are on the face of the indicator.

d. MISCELLANEOUS EQUIPMENT.

(1) LIGHTING.—A flexible desk lamp is installed on the shelf aft of the co-pilot's seat. A small spotlight on the post inboard of the desk lamp, and another spotlight on the ceiling of the compartment over the table are mounted so that they may be directed to any desired position on the table. The desk lamp is provided with a dimming rheostat, adjacent to the base of the stand. The spotlights are dimmed by a rheostat located adjacent to the light on the post.

(2) DRIFT METER.—A type B-3 drift meter is installed on the forward inboard side of the navigator's station. Canvas containers for drift signals are located on the aft face of the crew compartment forward partition. The flare chute door is in the floor under the radio operator's table. This door incorporates an adapter for firing the pyrotechnic pistol.

(3) INSTRUMENT PANEL.—The navigator's instrument panel, located at the forward outboard side of the station, includes:

(a) Radio compass indicator.

(b) Flux Gate compass.

(c) Altimeter.

(d) Airspeed indicator.

(e) Clock.

(4) ADDITIONAL INSTRUMENTS.—A type 0.5 standard and a mounting unit for an MK II astro compass are installed in the navigation dome. An outside air temperature indicator is located over the flight compartment entrance door.

(5) STOWAGE.—A large stowage container for the navigator's instruments is installed under the table at the aft bulkhead of the compartment. A chart drawer is located under the top bunk in the crew compartment. Canvas bags for stowing the M-8 signal flare pistol and flares are located on the floor outboard of the drift meter.

Section VI

EXTREME WEATHER OPERATION

1. ARCTIC OPERATION.

a. PREPARATION FOR FLIGHT.

(1) Check Y-drains and oil tank sumps to be sure the oil is not congealed. If necessary, warm oil until it flows freely and remove any ice that may have collected in the drains or sumps.

(2) Check that the propeller anti-icing tank is full.

b. STARTING ENGINES.

(1) Pull propeller through five or six blades by hand before engaging starter.

(2) Use an external power source if available.

(3) Cowl flaps must be open and no attempt should be made to accelerate warm-up period by closing cowl flaps.

(4) To assist starting at low temperatures, wet the blower by moving the mixture control momentarily to "CRUISE" and immediately returning it to "IDLE CUT-OFF." If engine is warm from a previous run, do not wet blower before starting.

(5) Prime engine lightly immediately before engaging starter. While the engine is turning over by starter action, prime intermittently until there is regularity of firing.

Note

Moisture forms quickly on spark plugs during cold starts. After three or four unsuccessful attempts, remove at least one plug from each cylinder and heat to dry electrodes. Attempt start immediately after replacing plugs.

(6) Keep carburetor air temperature controls in "COLD" position.

CAUTION

Use of carburetor heat during starting may result in serious damage and fire if the engine backfires.

c. ENGINE WARM-UP.

(1) Do not run up engine to more than 1000 rpm until oil temperature reaches 40° C (lower red line of oil temperature gage). Oil pressures should be maintained within limits.

(2) If outside air temperature is below —20° C (—4° F), use sufficient carburetor heat to improve vaporization and prevent backfire.

(3) Never turn on electrically-heated suits, or any other electrical equipment not absolutely needed, until generators are operating. When subjected to excessive drain, storage batteries deteriorate rapidly in cold weather; therefore, none but essential electrical equipment should be used until the generators are supplying current.

Note

Generators cut in at 1100 rpm.

d. FEATHERING CHECK.

(1) Run engine at 1500 rpm, momentarily push feathering switch in, and check for a drop of 200 or 300 rpm. Pull out feathering switch.

e. TAKE-OFF.

(1) If deep, heavy snow interferes with take-off run but permits taxiing, move slowly up and down the take-off course several times to pack down runway before attempting actual take-off. Never take off with snow or ice on wing or tail surfaces. Pay particular attention to movable surfaces to see that hinges and controls have free and full movement.

f. IN FLIGHT.

(1) Following take-off from snow- or slush-covered fields, let landing gear remain in "DOWN" position long enough for moisture either to dry off or freeze, thereby guarding against the gear freezing in the retracted position. In case the hydraulic pressure regulator sticks in the *open* position, operate landing gear handle several times. If this fails to raise landing gear, return to field and, upon landing, tap valve lightly with hammer or apply external heat to unstick valve.

(2) To prevent flaps from freezing in position after take-off from snow- or slush-covered fields, operate flap control through several complete cycles.

(3) To ensure continued propeller governing, increase propeller speed momentarily by about 200 rpm every half hour.

(4) During long range cruising in cold temperatures at low power settings, the pilot may discover the engines running rough or backfiring due to poor vaporization of the fuel. To eliminate this condition, it will be necessary to use carburetor heat or higher power settings.

(5) When icing conditions prevail, use carburetor heat as necessary to maintain the carburetor air temperature outside the icing range. Carburetor heat is effective as an ice preventive, and hence should be used continuously to prevent ice formation rather than periodically to remove ice.

(6) Operate anti-icing and de-icing systems as necessary.

(7) Icing conditions have caused trim tabs to freeze. In the event that trim tabs appear to be frozen the following preload, as indicated by trim tab position markers in the cockpit, may be applied at speeds below 240 mph IAS without seriously accelerating the airplane should the tab suddenly move to the indicated settings:

Aileron	2 degrees
Elevator	2 degrees
Rudder	5 degrees

One crew member should guard the main flight controls when loading the tab controls in this manner. If the trim tab mechanism moves but the tab does not produce an effect, this would indicate that the freezing is between the tab drum and the tab and that the tab control action is simply compressing the spring. An additional check of the tab can be made by the application of rudder pedal force. If the control forces on the rudder pedal are extremely high, it is further indication that the tab mechanism is frozen aft of the tab drive drum or at the tab linkage on the torque tube. If application of the rudder does not free the tab, all tab controls should be returned to the original trim condition or to zero.

CAUTION

If the trim tabs cannot be freed return the trim control to its original position to prevent serious trouble in case the tab thaws on final approach.

g. LANDING.

(1) Turn off all electrical equipment possible at least 1 minute before final approach to save batteries when rpm is lowered and generators cut out.

(2) When letting down for landing, watch engine temperatures closely. Atmospheric temperature inversions are common in winter and ground temperature may be 15° to 30°C colder than at altitude. Therefore, keep cylinder head temperatures above 100°C, by maintaining sufficient power and closing cowl flaps, to assure good fuel vaporization thus minimizing the danger of backfiring and cutting out. Also the oil temperature should be maintained over 40°C.

WARNING

Do not fail to use sufficient carburetar heat during approach and landing. If necessary to circle again and full power is applied, carburetor heat should be regulated accordingly.

(3) Use brakes sparingly and not until absolutely necessary after setting airplane down.

(4) Carburetor air control in "HOT" position while taxiing.

h. STOPPING ENGINES.

Oil dilution instructions are outlined in section II, paragraph 20 g.

i. PARKING.

(1) When the airplane is parked for the night, leave some aperture, such as a side window, partly open. If this is not done, lack of air circulation within the compartment will cause frosting of windows.

(2) Leave the brakes *off* on parked airplanes. If brakes are on, the pressure will cause the de-boosters to leak due to contraction of de-booster seals.

(3) Place covers or tarpaulins over wings, tail and windshields to prevent frost formation.

j. SUMP DRAINAGE.

(1) Drain the sumps of fuel and oil tanks frequently to remove ice and water that may have collected. Water gets into the fuel and oil systems in the form of ice and snow when the tanks are serviced. Additional water is added in the form of condensation. If allowed to remain, subsequent drops in temperature may freeze this water in constricted regions causing stoppage of fuel and oil flow.

Appendix I

EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS

1. The following Flight Operation Instruction Charts give complete performance of the airplane in steady level flight. Charts covering seven ranges of weight for four-, three-, and two-engine operation are furnished.

2. Each chart contains five columns showing ranges and corresponding operating data for conditions varying from maximum continuous power to maximum range. Steps in range between adjoining columns are nearly equal. In order to allow sufficient reserve for differences from ideal conditions, the range values quoted have been decreased five percent and the fuel consumptions increased five percent from the values which were obtained in flight test with the engine settings listed in the operating data.

3. In any of the alternate cruising conditions columns except that for maximum continuous power it is intended that the operating data at all altitudes give the same distance flown per gallon of fuel burned. At some altitudes, however, the value of miles per gallon for a column falls between the values obtained for auto-lean and auto-rich operation at the speed for maximum power with auto-lean mixture setting. In these cases auto-lean operation is listed, and the number of miles per gallon is greater than for the other altitudes in the same column.

4. The engine settings listed in the operating data are such that the given manifold pressures can be obtained at the designated pressure altitudes on an Army hot day as well as on a standard day. Otherwise the charts are based on standard atmospheric conditions. When the air temperature is different from standard, the range and true airspeed are nearly the same as for standard temperature, but the indicated airspeed varies appreciably. For temperatures greater than standard, the indicated airspeed is less than it is for standard temperature.

5. No fuel allowance has been made on the charts for warm-up, take-off, or climb. Refer to the Take-off, Climb, and Landing Chart to obtain the fuel quantity consumed during these operations. No reserve has been included for navigational error or other contingencies. Therefore, enter the chart with the fuel quantity available after subtracting the warm-up, take-off, and climb allowance and reserves appropriate for the mission.

6. All data presented are for no wind. When there is a wind, use conventional methods to calculate air distances, and use these air distances in the charts.

7. Use the chart which includes the weight of the airplane during the part of the flight being planned. To obtain the range originally selected, follow the operating data in the same numbered column on succeeding charts as the gross weight decreases because of fuel being consumed.

8. The range values quoted depend upon steady operation at conditions given in the corresponding operating data. If a flight consists of a number of periods of operation under widely different conditions, it can be planned as a number of short flights.

9. During flight, the charts can be used to keep a continuous record of the gross weight and of the amount of fuel remaining, so that, if necessary, a new flight plan can be worked out at any time for any new set of conditions.

10. No range values at the higher gross weights are shown on the charts for the lighter fuel loads at the higher power settings. The purpose of these blank spaces is to avoid speed and loading combinations that can exceed safe structural limits. With heavy fuselage weights and light fuel loads (light wing weight), stresses can be imposed on the wing roots that are in excess of the allowable safety factors. These stresses are proportioned to the aircraft speed (i.e., the faster the aircraft goes, the greater the stress). Therefore, range figures have been omitted opposite the fuel loads in the columns where the resulting speeds would be dangerous. Examination of the charts will show that this speed and weight relationship becomes less and less critical as the aircraft weight decreases. The aircraft should be flown only at the power settings shown under the column in which range values are given for the amount of fuel aboard. It will be noted also that in Column I (maximum continuous power column) power settings are not listed for low altitudes inasmuch as the maximum IAS of 250 mph would be exceeded. (For further detail, see the speed and load factor chart, figure 35, sheet 3).

AIRCRAFT MODEL(S)
C-54G
R-5D-5

TAKE-OFF, CLIMB & LANDING CHART

ENGINE MODEL(S)
R-2000-4-9

TAKE-OFF DISTANCE FEET

GROSS WEIGHT LB.	HEAD WIND M.P.H.	HEAD WIND KTS.	HARD SURFACE RUNWAY AT SEA LEVEL GROUND RUN	HARD SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 3000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	HARD SURFACE RUNWAY AT 6000 FEET GROUND RUN	HARD SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT SEA LEVEL GROUND RUN	SOD-TURF RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 3000 FEET GROUND RUN	SOD-TURF RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOD-TURF RUNWAY AT 6000 FEET GROUND RUN	SOD-TURF RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT SEA LEVEL GROUND RUN	SOFT SURFACE RUNWAY AT SEA LEVEL TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 3000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 3000 FEET TO CLEAR 50' OBJ.	SOFT SURFACE RUNWAY AT 6000 FEET GROUND RUN	SOFT SURFACE RUNWAY AT 6000 FEET TO CLEAR 50' OBJ.
73,000	0	0	2700	4650	3200	5650											3850	5900	5450	8300
	15	13	2000	3700	2400	4550											2750	4550	3950	6450
	30	26															1950	3300	2700	4800
	45	39																		
60,000	0	0	1650	2750	1950	3250											2650	4100		
	15	13	1200	2150	1400	2550											1850	3100		
	30	26															1150	2200		
	45	39																		
45,000	0	0	850	1400	1000	1600											1050	1750		
	15	13	550	1000	700	1200											650	1200		
	30	26															350	750		
	45	39																		

NOTE: INCREASE CHART DISTANCES AS FOLLOWS: 75°F + 10%; 100°F + 20%; 125°F + 30%; 150°F + 40%

DATA AS OF 6-1-46 BASED ON FLIGHT TEST AND CALCULATION

OPTIMUM TAKE-OFF WITH 2700 RPM, 50.0 IN.HG. & 20 DEG. FLAP IS 80 PERCENT OF CHART VALUES

CLIMB DATA

GROSS WEIGHT LB.	AT SEA LEVEL BEST I.A.S. MPH	AT SEA LEVEL BEST I.A.S. KTS	AT SEA LEVEL RATE OF CLIMB F.P.M.	AT SEA LEVEL GAL. OF FUEL USED	AT 5000 FEET BEST I.A.S. MPH	AT 5000 FEET BEST I.A.S. KTS	AT 5000 FEET RATE OF CLIMB F.P.M.	AT 5000 FEET FROM SEA LEVEL TIME MIN.	AT 5000 FEET FROM SEA LEVEL FUEL USED	AT 10,000 FEET BEST I.A.S. MPH	AT 10,000 FEET BEST I.A.S. KTS	AT 10,000 FEET RATE OF CLIMB F.P.M.	AT 10,000 FEET FROM SEA LEVEL TIME MIN.	AT 10,000 FEET FROM SEA LEVEL FUEL USED	AT 15,000 FEET BEST I.A.S. MPH	AT 15,000 FEET BEST I.A.S. KTS	AT 15,000 FEET RATE OF CLIMB F.P.M.	AT 15,000 FEET FROM SEA LEVEL TIME MIN.	AT 15,000 FEET FROM SEA LEVEL FUEL USED	AT 20,000 FEET BEST I.A.S. MPH	AT 20,000 FEET BEST I.A.S. KTS	AT 20,000 FEET RATE OF CLIMB F.P.M.	AT 20,000 FEET FROM SEA LEVEL TIME MIN.	AT 20,000 FEET FROM SEA LEVEL FUEL USED	AT 25,000 FEET BEST I.A.S. MPH	AT 25,000 FEET BEST I.A.S. KTS	AT 25,000 FEET RATE OF CLIMB F.P.M.	AT 25,000 FEET FROM SEA LEVEL TIME MIN.	AT 25,000 FEET FROM SEA LEVEL FUEL USED
73,000	140	120	770	95	140	120	710	6.2	150	135	115	560	14.6	230	135	115	440	24.8	325	135	115	250	39.1	455						
60,000	135	115	1140	95	135	115	1080	4.5	135	130	110	920	9.3	180	125	110	800	15.0	230	125	110	600	22.1	300	120	105	260	34.7	390
45,000	125	110	1770	95	125	110	1720	2.9	120	125	110	1540	5.9	145	120	105	1420	9.2	180	115	100	1200	13.0	215	110	95	800	18.0	250

POWER PLANT SETTINGS: (DETAILS ON FIG. SECTION III)

DATA AS OF 6-1-46 BASED ON FLIGHT TEST AND CALCULATION

FUEL USED (U.S. GAL.) INCLUDES WARM-UP & TAKE-OFF ALLOWANCE

LANDING DISTANCE FEET

GROSS WEIGHT LB.	BEST IAS APPROACH POWER OFF MPH	POWER OFF KTS	POWER ON MPH	POWER ON KTS	HARD DRY SURFACE AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.	FIRM DRY SOD AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.	WET OR SLIPPERY AT SEA LEVEL GROUND ROLL	AT SEA LEVEL TO CLEAR 50' OBJ.	AT 3000 FEET GROUND ROLL	AT 3000 FEET TO CLEAR 50' OBJ.	AT 6000 FEET GROUND ROLL	AT 6000 FEET TO CLEAR 50' OBJ.
73,000	115	100	135	115	2400	3900	2650	4250	2850	4550												
60,000	105	95	120	105	1950	3300	2150	3550	2350	3850							6650	8000	7300	8700	8000	9500
45,000	90	75	105	95	1500	2600	1600	2800	1750	3000							5000	6150	5450	6650	5950	7200

DATA AS OF 6-1-46 BASED ON FLIGHT TEST AND CALCULATION

OPTIMUM LANDING IS 80% OF CHART VALUES

REMARKS:

NOTE: TO DETERMINE FUEL CONSUMPTION IN BRITISH IMPERIAL GALLONS, MULTIPLY BY 10, THEN DIVIDE BY 12

RED FIGURES ARE PRELIMINARY DATA, SUBJECT TO REVISION AFTER FLIGHT CHECK

LEGEND
I.A.S. : INDICATED AIRSPEED
M.P.H. : MILES PER HOUR
KTS. : KNOTS
F.P.M. : FEET PER MINUTE

Figure 32 — Take-off, Climb and Landing Chart

AAFHC-528 6-1-46

AIRCRAFT MODEL(S)
C-54G & R6D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 73,000 TO 70,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		3540			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]				3540		
1550	1350	3300	1960	1700	2440	2120	2870	2490	3300	3400	2955
		3000			2190	1900	2550	2215	3000	3040	2640
		2700					2310	2010	2700	2700	2345
		2400			SEE SPECIAL NOTE (3)				2400	2350	2040
		2100							2100	2010	1745

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.55 STAT. (.48 NAUT.) MI./GAL.)						(.66 STAT. (.57 NAUT.) MI./GAL.)						(.78 STAT. (.68 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
						25000																			25000						
2550	F.T.	A.R.	540	268	233	20000	2500	32.5	A.R.	465	255	222	2300	30.0	A.R.	355	234	203	2150	27.5	A.L.	265	196	170	20000						
2550	38.0	A.R.	580	266	231	15000	2350	35.0	A.R.	455	257	223	2150	33.0	A.R.	365	240	208	2150	30.5	A.R.	300	222	193	15000	2150	25.0	A.L.	230	200	174
2550	F.T.	A.R.	555	269	234	10000	2400	31.5	A.R.	450	251	218	2200	30.0	A.R.	355	235	204	2100	29.0	A.R.	305	223	194	10000	2000	29.0	A.L.	245	216	188
						5000	2200	34.5	A.R.	430	244	212	2000	33.5	A.R.	350	231	201	2000	31.0	A.R.	290	217	188	5000	1950	31.5	A.L.	235	211	183
SEE	SPECIAL NOTE	(3)				S.L.	2150	36.0	A.R.	410	231	201	2000	34.5	A.R.	330	219	190	1950	33.5	A.L.	235	205	178	S.L.	1950	33.5	A.L.	235	204	177

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 70,000# TURN TO SHEET 2 FOR NEW POWER SETTINGS.
(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 71000 LB. GROSS WEIGHT WITH 2400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF *20 GAL.) TO FLY 2350 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 2000 RPM AND 29.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.
*Including 230 gal. for warm up, take-off and climb to 10,000'

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 6-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 1 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 70,000 TO 65,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. 2A SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		3540			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]				3540		
1575	1365	3300	2010	1750	2540	2200	3180	2760	3300	3580	3110
1425	1240	3000	1810	1580	2280	1980	2765	2400	3000	3210	2790
1275	1100	2700	1650	1430	2030	1760	2455	2130	2700	2840	2470
1130	980	2400	1440	1250	1780	1550	2155	1870	2400	2480	2150
		2100			SEE SPECIAL NOTE (3)		1870	1625	2100	2140	1860
		1800							1800	1800	1560
		1500							1500	1480	1280

MAXIMUM CONTINUOUS						PRESS	(.57 STAT. (.49 NAUT.) MI./GAL.)						(.69 STAT. (.60 NAUT.) MI./GAL.)						(.85 STAT. (.74 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
						25000																			25000						
2550	F.T.	A.R.	540	273	237	20000	2500	32.5	A.R.	485	260	226	2250	29.5	A.R.	345	348	208	2100	28.0	A.L.	255	218	189	20000						
2550	38.0	A.R.	580	269	233	15000	2300	35.0	A.R.	455	259	225	2100	32.5	A.R.	350	241	210	2250	26.0	A.L.	255	223	194	15000	2100	24.5	A.L.	215	203	178
2550	F.T.	A.R.	555	271	235	10000	2400	31.5	A.R.	450	252	219	2200	29.5	A.R.	340	236	205	2050	29.0	A.L.	245	220	191	10000	1950	28.5	A.L.	225	213	185
	SEE SPECIAL NOTE (3)					5000	2200	34.5	A.R.	430	244	212	2000	33.0	A.R.	330	230	200	1950	31.5	A.L.	235	214	186	5000	1900	32.0	A.L.	225	212	184
						S.L.	2150	36.0	A.R.	410	232	202	2000	33.5	A.R.	315	217	189	1950	33.5	A.L.	235	207	180	S.L.	1800	34.0	A.L.	210	198	172

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 5?) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 65,000#, TURN TO SHEET 3 FOR NEW POWER SETTINGS.
(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 67000 LB. GROSS WEIGHT WITH 2100 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 375* GAL.) TO FLY 1850 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 1950 RPM AND 31.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.
*Including 185 gallons for warm up, take-off, and climb to 5,000'

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 2 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 65,000 TO 60,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	RPM	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. # SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) AND WIND GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
		3540			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]				3540		
1590	1380	3300	2100	1820	2700	2340	3280	2850	3300	3880	3380
1440	1260	3000	1890	1650	2420	2110	3000	2600	3000	3490	3030
1290	1120	2700	1690	1470	2160	1880	2680	2330	2700	3090	2690
1150	1000	2400	1490	1300	1900	1650	2295	1900	2400	2710	2350
1000	870	2100	1300	1130	1650	1430	1990	1730	2100	2340	2030
		1800			1390	1210	1680	1460	1800	1970	1710
		1500			1150	1000	1380	1200	1500	1620	1410
		1200			SEE SPECIAL NOTE (3)		1100	950	1200	1280	1110
		900							900	940	810

MAXIMUM CONTINUOUS						PRESS	(.60 STAT. (.52 NAUT.) MI./GAL.)						(.75 STAT. (.65 NAUT.) MI./GAL.)						(.90 STAT. (.78 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
2550	F.T.	A.R.	430	252	219	25000	2550	28.0	A.R.	380	248	215	2450	26.5	A.R.	320	240	208							25000						
2550	F.T.	A.R.	540	281	244	20000	2400	32.5	A.R.	445	268	231	2250	29.0	A.R.	330	246	214	2100	28.0	A.L.	255	234	203	20000						
2550	38.0	A.R.	580	274	238	15000	2250	34.5	A.R.	425	263	228	2050	32.0	A.R.	330	244	212	2250	26.0	A.L.	255	233	202	15000	2050	24.0	A.L.	200	207	180
2550	F.T.	A.R.	555	274	241	10000	2350	31.0	A.R.	425	253	220	2150	29.0	A.R.	320	237	206	2050	29.0	A.L.	245	227	197	10000	1850	27.5	A.L.	195	205	178
						5000	2150	34.5	A.R.	410	245	213	2000	31.5	A.R.	305	229	199	1950	31.5	A.L.	235	220	191	5000	1700	31.5	A.L.	190	200	174
SEE SPECIAL NOTE (3)						S.L.	2100	36.0	A.R.	390	232	202	2000	32.5	A.R.	290	216	188	1950	33.5	A.L.	235	211	183	S.L.	1600	33.0	A.L.	175	185	161

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. [illegible]) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQ'D. HED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 60,000 LBS. FLY AS SHEET A FOR NEW POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEED: (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 60,000 LBS GROSS WEIGHT WITH 1600 GALLONS FUEL [illegible] TO [illegible] STATUTE MILES AT [illegible] ALTITUDE MAINTAIN 2150 RPM AND [illegible] MANIFOLD PRESSURE WITH MIXTURE SET AUTO RICH.
*Includes 200 gallons for Warm-up, take-off, and climb to 15,000'

LEGEND

ALT. - PRESSURE ALTITUDE
M.P. - MANIFOLD PRESSURE
GPH - GALLONS PER HOUR
MPH - TRUE AIRSPEED
KTS. - KNOTS
S.L. - SEA LEVEL
F.R. - FULL RICH
A.R. - AUTO RICH
A.L. - AUTO-LEAN
C.L. - CRUISING LEAN
M.L. - MANUAL LEAN
T.T. - TAKE-OFF THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 3 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 6-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 60,000 TO 55,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[11] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
1620	1810	3300	2180	1890	2850	2475	3490	3030	3300	4190	3640
1470	1280	3000	1970	1710	2570	2230	3145	2730	3000	3770	3280
1320	1150	2700	1760	1530	2290	1990	2800	2430	2700	3350	2910
1170	1020	2400	1560	1350	2010	1750	2460	2135	2400	2940	2550
1020	890	2100	1350	1180	1750	1520	2075	1800	2100	2540	2210
870	760	1800	1150	1000	1480	1290	1800	1560	1800	2140	1860
730	630	1500	950	830	1220	1060	1475	1280	1500	1770	1530
580	500	1200	760	660	970	840	1168	1015	1200	1400	1210
		900			720	620	870	755	900	1030	890
		600			480	410	570	495	600	680	590
		300	SEE SPECIAL NOTE (2)				285	250	300	340	300

MAXIMUM CONTINUOUS						PRESS	(.62 STAT. (.54 NAUT.) MI./GAL.)						(.79 STAT. (.69 NAUT.) MI./GAL.)						(.95 STAT. (.83 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
2550	F.T.	A.R.	430	287	232	25000	2550	28.0	A.R.	380	259	225	2400	28.0	A.R.	320	254	220	2150	28.0	A.L.	215	224	195	25000						
2550	F.T.	A.R.	540	287	249	20000	2450	32.0	A.R.	435	272	236	2200	28.5	A.R.	320	253	220	2100	28.0	A.L.	250	243	211	20000						
2550	38.0	A.R.	580	278	241	15000	2250	34.5	A.R.	425	266	231	2050	31.5	A.R.	310	247	214	2200	25.5	A.L.	245	236	205	15000	1950	23.5	A.L.	180	206	179
2550	F.T.	A.R.	555	277	240	10000	2300	31.0	A.R.	410	256	222	2100	29.0	A.R.	300	239	208	2000	29.0	A.L.	240	231	201	10000	1750	27.0	A.L.	175	199	173
						5000	2100	34.0	A.R.	380	247	214	2000	30.5	A.R.	285	228	198	1950	32.0	A.L.	230	224	195	5000	1600	29.5	A.L.	165	187	162
SEE SPECIAL NOTE (3)						S.L.	2050	35.5	A.R.	375	233	203	1950	33.5	A.L.	235	215	187	1800	34.0	A.L.	215	209	182	S.L.	1600	30.5	A.L.	150	172	149

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 55000#, TURN TO SHEET 5 FOR HIGH POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS)

EXAMPLE

AT 58000 LB. GROSS WEIGHT WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 395* GAL.) TO FLY 700 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2000 RPM AND 30.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH.

*Includes 135 gallons for warm-up, take-off and climb to 5000'.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 6-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 4 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 6-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55,000 TO 60,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR ENERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
1340	1160	2700	1830	1590	2320	2100	2965	2580	2700	3600	3120
1190	1030	2400	1610	1400	2120	1850	2610	2270	2400	3160	2740
1040	900	2100	1400	1220	1850	1600	2260	1960	2100	2740	2370
890	770	1800	1200	1040	1570	1360	1920	1670	1800	2310	2000
740	640	1500	990	860	1290	1120	1590	1380	1500	1900	1650
590	510	1200	790	680	1030	890	1260	1100	1200	1510	1310
440	380	900	590	510	760	640	925	805	900	1110	970
290	250	600	390	320	510	440	620	540	600	740	640
150	130	300	200	170	250	220	310	270	300	370	320

MAXIMUM CONTINUOUS						PRESS ALT FEET	(.65 STAT. (.56 NAUT.) MI./GAL.)						(.84 STAT. (.73 NAUT.) MI./GAL.)						(1.03 STAT. (.90 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000						
						35000																			35000						
2550	F.T.	A.R.	290	244	212	30000	2550	23.0	A.R.	290	244	212	2550	23.0	A.R.	290	244	212							30000						
2550	F.T.	A.R.	430	277	241	25000	2550	28.0	A.R.	380	268	233	2350	26.0	A.R.	310	262	228	2150	24.0	A.L.	215	241	209	25000						
2550	F.T.	A.R.	540	291	253	20000	2400	31.5	A.R.	420	276	240	2200	28.5	A.R.	305	257	223	2050	27.0	A.L.	240	247	214	20000	2000	19.5	A.L.	165	202	175
2550	38.0	A.R.	580	281	244	15000	2200	34.0	A.R.	405	268	233	2000	31.0	A.R.	295	250	217	2150	25.0	A.L.	230	238	207	15000	1050	23.0	A.L.	170	207	180
2550	F.T.	A.R.	555	280	243	10000	2300	30.5	A.R.	390	257	223	2050	28.5	A.R.	285	240	209	1950	28.5	A.L.	225	230	200	10000	1600	26.0	A.L.	155	191	166
						5000	2050	34.0	A.R.	375	247	215	1950	31.5	A.L.	235	227	197	1800	32.0	A.L.	215	220	191	5000	1600	27.5	A.L.	145	178	155
SEE SPECIAL NOTE (3)						S.L.	2000	35.5	A.R.	360	234	203	1950	33.5	A.L.	235	218	189	1700	34.0	A.L.	200	206	179	S.L.	1800	28.0	A.L.	130	161	140

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 50000#, TURN TO SHEET 6 FOR MIN POWER SETTINGS.
(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 52000 LB. GROSS WEIGHT WITH 1200 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 670 GAL.) TO FLY 1260 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 1950 RPM AND 28.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN.
Includes 170 gallons for warm up, take-off, and climb to 10,000'.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 5 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 50,000 TO 45,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	840
	2700	41.5	HIGH	A.R.	5	220	840

FOR DETAILS SEE POWER PLANT CHART (FIG. 2A5EC-1111)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
890	780	1800	1240	1080	1650	1430	2030	1760	1800	2470	2140
740	650	1500	1030	890	1360	1180	1690	1460	1500	2040	1770
590	520	1200	820	710	1080	940	1350	1170	1200	1610	1400
450	390	900	610	530	800	700	990	860	900	1190	1030
300	260	600	400	350	530	460	660	570	600	790	640
150	130	300	200	180	270	230	330	285	300	400	340

MAXIMUM CONTINUOUS					PRESS ALT. FEET	(.67 STAT. (.59 NAUT.) MI./GAL.)						(.89 STAT. (.77 NAUT.) MI./GAL.)						(1.10 STAT. (.96 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																															
2550	F.T.	A.R.	290	252	219	40000 35000 30000	2550	23.0	A.R.	290	259	225	2550	23.0	A.R.	290	259	225	2250	19.5	A.R.	215	237	206	40000 35000 30000						
2550	F.T.	A.R.	430	285	247	25000	2550	28.0	A.R.	380	275	239	2350	25.5	A.R.	300	268	233	2150	24.0	A.L.	215	252	219	25000						
2550	F.T.	A.R.	540	296	257	20000	2400	31.5	A.R.	420	280	243	2150	28.0	A.R.	295	261	227	2000	26.5	A.L.	225	248	216	20000	2050	20.0	A.L.	165	215	187
2550	38.0	A.R.	580	284	247	15000	2200	34.0	A.R.	405	270	234	2000	30.5	A.R.	285	252	219	2100	24.5	A.L.	215	239	208	15000	1800	22.5	A.L.	155	208	181
2550	F.T.	A.R.	555	284	245	10000	2250	30.5	A.R.	385	258	224	2050	29.0	A.L.	245	241	210	1900	28.0	A.L.	205	228	198	10000	1600	25.0	A.L.	145	191	166
SEE SPECIAL NOTE (3)						5000	2050	34.0	A.R.	375	249	216	1950	31.5	A.L.	235	230	201	1700	31.5	A.L.	195	217	188	5000	1600	26.0	A.L.	135	177	154
						S.L.	2000	35.0	A.R.	350	234	203	1950	33.5	A.L.	235	221	192	1600	33.5	A.L.	185	201	175	S.L.	1600	26.5	A.L.	115	154	134

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 45,000#, TURN TO SHEET 7 FOR NEW POWER SETTINGS.
(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 50000 LB. GROSS WEIGHT WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 320* GAL.) TO FLY 650 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 2550 RPM AND F.T. IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH.
*Includes 160 gallons for warm up, take-off, and climb to 10,000'

LEGEND

ALT.	PRESSURE ALTITUDE	F.R.	FULL RICH
M.P.	MANIFOLD PRESSURE	A.R.	AUTO-RICH
GPH	U.S. GAL. PER HOUR	A.L.	AUTO-LEAN
TAS	TRUE AIRSPEED	C.L.	CRUISING LEAN
KTS.	KNOTS	M.L.	MANUAL LEAN
S.L.	SEA LEVEL	F.T.	FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 6 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 45,000 TO 40,000 POUNDS

EXTERNAL LOAD ITEMS
NONE

NUMBER OF ENGINES OPERATING: FOUR

LIMITS	RPM	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700 2700	50.0 41.5	LOW HIGH	A.R. A.R.	5 5	220 220	840 840

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND). GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL.
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
450 300 100	390 260 130	900 600 300	630 420 210	550 360 180	840 560 280	730 490 240	1050 700 350	910 520 260	900 600 300	1270 840 420	1100 730 365

MAXIMUM CONTINUOUS						PRESS	(.70 STAT. (.61 NAUT.) MI./GAL.)						(.93 STAT. (.81 NAUT.) MI./GAL.)						(1.16 STAT. (1.02 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000						
2550	F.T.	A.R.	290	275	239	35000 30000	2550	23.0	A.R.	290	269	234	2500	23.0	A.R.	285	269	234	2250	20.0	A.R.	220	255	221	35000 30000						
2550	F.T.	A.R.	430	290	252	25000	2550	28.0	A.R.	375	281	244	2300	25.5	A.R.	290	273	237	2150	24.0	A.L.	215	261	227	25000						
2550	F.T.	A.R.	540	299	260	20000	2400	31.0	A.R.	405	283	246	2100	28.0	A.R.	255	264	229	1950	26.0	A.L.	210	248	216	20000	2000	19.5	A.L.	155	220	191
2550	38.0	A.R.	580	286	247	15000	2150	33.5	A.R.	390	272	236	2250	26.0	A.L.	255	254	221	2050	24.5	A.L.	205	239	208	15000	1700	22.0	A.L.	145	206	179
2550	F.T.	A.R.	555	284	246	10000	2250	30.0	A.R.	370	260	226	2050	29.0	A.L.	245	244	212	1850	27.5	A.L.	195	227	197	10000	1600	24.0	A.L.	135	191	166
						5000	2000	33.5	A.R.	360	249	216	1950	31.5	A.L.	235	233	202	1800	31.0	A.L.	180	214	186	5000	1600	25.0	A.L.	125	174	151
SEE SPECIAL NOTE (2)						S.L.	2000	34.5	A.R.	335	235	204	1950	33.5	A.L.	235	223	194	1600	32.0	A.L.	170	198	172	S.L.	1600	25.0	A.L.	105	148	128

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 44000 LB. GROSS WEIGHT WITH 600 GAL.* OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 280* GAL.) TO FLY 700 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 1600 RPM AND 31.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN.
*Includes 320 gallons for warm-up, take-off, and climb to 5000'.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 7 of 19 Sheets) — Flight Operation Instruction Charts

Revised 29 January 1951

AN 01-40NU-1

AIRCRAFT MODEL(S)
C-54G & R-6D-6

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 73,000 TO 70,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.5	LOW	A.R.	5	220	630
	2700	41.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1740	1510	3300	2125	1845	2490	2160	3270	2890	3300	3400	2950
1580	1380	3000	1925	1670	2240	1945	2950	2560	3000	3030	2630
		2700	1725	1500	1995	1730	2635	2290	2700	2700	2345
		2400	1395	1210	1755	1525	2325	2020	2400	2400	2085
		2100	1200	1040	1530	1330	2015	1750	2100	2050	1780
					SEE SPECIAL NOTE (3)						

MAXIMUM CONTINUOUS						PRESS	(.62 STAT. (.54 NAUT.) MI./GAL.)						(.71 STAT. (.62 NAUT.) MI./GAL.)						(.93 STAT. (.81 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000																			30000						
						25000																			25000						
						20000																			20000						
						15000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		15000						
2550	F.T.	A.R.	915	232	201	10000	2400	31.5	A.R.	335	208	181													10000						
2550	37.0	A.R.	920	224	194	5000	2250	35.0	A.R.	340	210	182	2000	34.0	A.R.	270	193	168							5000						
2550	38.5	A.R.	920	216	187	S.L.	2100	38.5	A.R.	325	201	175	2000	35.5	A.R.	265	188	163	1950	33.5	A.L.	175	162	141	S.L.	1950	33.5	A.L.	175	162	141

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 70,000# TURN TO SHEET 9 FOR NEW POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 3B, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 72000 LB. GROSS WEIGHT WITH 5000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 325 GAL.) TO FLY 2200 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2000 RPM AND 38.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH.

LEGEND

ALT. : PRESSURE ALTITUDE	F.R. : FULL RICH
M.P. : MANIFOLD PRESSURE	A.R. : AUTO-RICH
GPH : U.S. GAL. PER HOUR	A.L. : AUTO-LEAN
TAS : TRUE AIRSPEED	C.L. : CRUISING LEAN
KTS. : KNOTS	M.L. : MANUAL LEAN
S.L. : SEA LEVEL	F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 8 of 19 Sheets) — Flight Operation Instruction Charts

AN 01-40NU-1

AIRCRAFT MODEL(S)
C-54G & R5D-6

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 70,000 TO 65,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630
	2700	45.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[3] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1760	1530	3300	2200	1910	2610	2265	3395	2950	3300	3525	3060
1600	1390	3000	1985	1735	2355	2045	3070	2665	3000	3170	2750
1440	1250	2700	1775	1540	2095	1820	2750	2390	2700	2810	2440
		2400	1565	1360	1840	1600	2425	2105	2400	2460	2135
		2100	1365	1285	1595	1385	2110	1830	2100	2130	1850
		1800	1165	1010	1350	1170	1790	1555	1800	1800	1560
		1500	965	840	1115	970	1480	1285	1500	1480	1285
					SEE SPECIAL NOTE (3)						

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.64 STAT. (.56 NAUT.) MI./GAL.)						(.73 STAT. (.63 NAUT.) MI./GAL.)						(.96 STAT. (.83 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
						25000																			25000						
						20000																			20000						
2550	38.0	A.R.	435	228	198	15000	2550	27.5	A.R.	305	194	168													15000						
2550	F.T.	A.R.	420	235	204	10000	2450	31.5	A.R.	340	215	187	2200	29.5	A.R.	260	190	165							10000						
2550	37.0	A.R.	420	228	198	5000	2250	35.0	A.R.	335	213	185	2000	33.5	A.R.	255	197	171	1950	32.0	A.L.	175	168	146	5000	1950	32.0	A.L.	175	168	146
2550	38.5	A.R.	420	219	190	S.L.	2200	36.5	A.R.	320	204	177	2000	35.0	A.R.	250	190	165	1950	33.5	A.L.	175	170	146	S.L.	1950	33.5	A.L.	175	170	146

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 65,000#, TURN TO SHEET 10 FOR NEW POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 66000 LB. GROSS WEIGHT WITH 2400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 500 GAL.) TO FLY 1840 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 2200 RPM AND 29.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 9 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-520 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 65,000 TO 60,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630
	2700	41.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1]. MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
					SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						
1775	1545	3300	2270	1970	2775	2410	3545	3080	3300	3825	3320
1610	1400	3000	2050	1780	2500	2175	3200	2780	3000	3435	2980
1450	1260	2700	1830	1590	2220	1930	2860	2485	2700	3030	1630
1290	1120	2400	1620	1415	1945	1690	2525	2195	2400	2645	2295
1125	980	2100	1405	1220	1690	1470	2200	1910	2100	2290	1990
960	780	1800	1195	1040	1430	1240	1875	1630	1800	1930	1675
		1500	990	860	1180	1025	1560	1355	1500	1590	1380
		1200	785	680	935	815	1240	1080	1200	1250	1085
		900	585	510	690	600	920	800	900	925	805
					SEE SPECIAL NOTE (3)						

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.65 STAT. (.56 NAUT.) MI./GAL.)						(.76 STAT. (.66 NAUT.) MI./GAL.)						(1.02 STAT. (.89 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																			40000 35000 30000						
2550						25000																				25000						
2550	F.T.	A.R.	390	230	200	20000	2450	32.0	A.R.	325	213	185														20000						
2550	38.0	A.R.	435	236	205	15000	2300	35.0	A.R.	335	220	191	2050	32.0	A.R.	245	192	167								15000						
2550	F.T.	A.R.	420	241	209	10000	2400	31.5	A.R.	340	221	192	2200	29.5	A.R.	260	204	177	2050	29.0	A.L.	185	183	159		10000						
2550	37.0	A.R.	420	231	200	5000	2200	35.0	A.R.	330	217	188	2000	33.5	A.R.	255	202	175	1950	32.0	A.L.	175	183	159		5000	1950	32.0	A.L.	175	183	159
2550	38.5	A.R.	420	222	193	S.L.	2150	38.0	A.R.	315	207	180	2000	34.5	A.R.	250	193	168	1950	33.5	A.L.	175	179	155		S.L.	1950	33.5	A.L.	175	179	155

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 60,000#, TURN TO SHEET 11, FOR NEW POWER SETTINGS.
(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 10, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 64000 LB. GROSS WEIGHT WITH 3000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 420 GAL.) TO FLY 3400 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 1950 RPM AND 32.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 10 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-520 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 60,000 TO 65,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630
	2700	41.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
					SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						
1800	1560	3300	2380	2070	2975	2410	3735	3245	3300	4195	3640
1635	1430	3000	2150	1870	2675	2325	3360	2920	3000	3760	3265
1465	1270	2700	1920	1670	2375	2065	2990	2600	2700	3320	2880
1300	1130	2400	1690	1470	2080	1810	2620	2275	2400	2900	2520
1125	980	2100	1470	1275	1800	1565	2280	1980	2100	2500	2170
970	840	1800	1245	1180	1525	1325	1935	1680	1800	2095	1820
810	700	1500	1030	895	1255	1090	1600	1390	1500	1720	1490
645	560	1200	820	715	1000	870	1280	1110	1200	1360	1180
SEE SPECIAL NOTE (3)		900	605	525	740	645	965	840	900	1000	870
		600	400	350	500	435	640	555	600	670	580
		300	200	175	250	220	320	280	330	330	285

MAXIMUM CONTINUOUS						PRESS	(.67 STAT. (.58 NAUT.) MI./GAL.)						(.82 STAT. (.71 NAUT.) MI./GAL.)						(1.06 STAT. (.90 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000																			40000						
						35000																			35000						
						30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		30000						
						25000																			25000						
2550	F.T.	A.R.	400	243	211	20000	2450	32.5	A.R.	340	231	201													20000						
2550	38.0	A.R.	435	243	211	15000	2300	35.0	A.R.	335	230	200	2100	32.0	A.R.	260	212	184							15000						
2550	F.T.	A.R.	420	246	214	10000	2400	31.5	A.R.	340	227	197	2200	29.5	A.R.	260	211	183	2050	29.0	A.L.	185	196	170	10000	1950	28.5	A.L.	165	184	160
2550	37.0	A.R.	420	235	204	5000	2200	34.5	A.R.	325	221	192	2000	33.0	A.R.	250	206	179	1950	32.0	A.L.	175	191	166	5000	1900	32.0	A.L.	170	189	164
2550	38.5	A.R.	420	225	195	S.L.	2150	36.0	A.R.	305	209	182	2000	34.0	A.R.	240	196	170	1950	33.5	A.L.	175	188	161	S.L.	1800	34.0	A.L.	160	178	154

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 55,000#, TURN TO SHEET 12 FOR NEW POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 20, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 58000 LB. GROSS WEIGHT WITH 1200 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 250 GAL.) TO FLY 820 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2300 RPM AND 35.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH.

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

AAFHC-528 5-1-48

AIRCRAFT MODEL(S)
C-54G & RSD-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55,000 TO 50,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630
	2700	41.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[2]							
1490 1325 1160	1290 1150 1010	2700 2400 2100	2010 1770 1540	1745 1540 1340	2540 2225 1925	2205 1935 1675	3185 2760 2510	2770 2400 2180	2700 2400 2100	3620 3185 2740	3150 2765 2380
1090 925 655	935 805 570	1800 1500 1200	1310 1085 860	1040 940 750	1625 1340 1060	1410 1165 920	2140 1660 1320	1860 1440 1045	1800 1500 1200	2300 1880 1485	2000 1630 1290
490 325 160	425 280 135	900 600 300	640 425 210	555 370 185	780 520 260	680 450 225	880 650 325	850 565 280	900 600 300	1080 720 360	930 625 315

MAXIMUM CONTINUOUS						PRESS	(.71 STAT. (.62 NAUT.) MI./GAL.)						(.86 STAT. (.75 NAUT.) MI./GAL.)						(1.08 STAT. (.94 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000 35000 30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000 35000 30000						
2550 2550	F.T. 38.0	A.R. A.R.	405 435	252 268	219 215	25000 20000 15000	2450 2300	32.5 34.5	A.R. A.R.	240 235	241 237	209 206	2250 2100	29.5 32.0	A.R. A.R.	255 250	222 222	193 193	2100 2250	28.0 26.0	A.L. A.L.	190 190	206 206	179 181	25000 20000 15000	2950	26.5	A.L.	155	185	161
2550 2550 2550	F.T. 37.0 38.5	A.R. A.R. A.R.	420 420 420	268 238 228	218 206 198	10000 5000 S.L.	2250 2150 2100	31.0 34.5 36.0	A.R. A.R. A.R.	225 215 205	220 223 211	200 194 183	2150 2000 2000	29.5 32.5 32.5	A.R. A.R. A.R.	245 240 225	215 208 188	187 182 172	2050 1950 1350	29.0 32.0 33.5	A.L. A.L. A.L.	185 175 175	204 198 181	177 172 166	10000 5000 S.L.	1900 1750 1650	28.0 32.0 34.0	A.L. A.L. A.L.	160 155 145	190 187 173	165 162 150

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 22) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 50,000#, TURN TO SHEET 13 FOR RPM POWER SETTINGS.

EXAMPLE

AT 52000 LB. GROSS WEIGHT WITH 1800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 250 GAL.) TO FLY 2150 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 2050 RPM AND 29.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 5-1-48 BASED ON: FLIGHT TEST

Figure 33. (Sheet 12 of 19 Sheets) — Flight Operation Instruction Charts

AAFHC-528 8-1-46

AIRCRAFT MODEL(S)
C-54Q & RSD-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 50,000 TO 45,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.	FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)
WAR EMERG.								
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630	
	2700	41.5	HIGH	A.R.	5	220	630	

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[1]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[2]							
1000	870	1800	1365	1085	1520	1520	2155	1870	1800	2530	2200
840	730	1500	1130	980	1440	1250	1775	1540	1500	2090	1810
660	580	1200	900	780	1140	990	1405	1220	1200	1650	1430
495	430	900	665	580	840	730	1035	900	900	1210	1050
330	285	600	445	385	560	485	675	585	600	800	695
165	145	300	220	190	280	245	340	295	300	400	345

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.74 STAT. (.64 NAUT.) MI./GAL.)						(.93 STAT. (.80 NAUT.) MI./GAL.)						(1.14 STAT. (.99 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000 35000 30000						
2550	F.T.	A.R.	305	240	208	25000	2550	28.0	A.R.	285	235	204	2400	28.5	A.R.	245	210	182	2150	24.0	A.L.	165	196	170	25000						
2550	F.T.	A.R.	410	259	225	20000	2450	32.0	A.R.	330	247	215	2250	29.0	A.R.	245	230	200	2100	28.0	A.L.	190	220	191	20000						
2550	38.0	A.R.	435	253	220	15000	2250	34.5	A.R.	325	241	208	2050	31.5	A.R.	240	226	196	2250	28.0	A.L.	190	217	188	15000	2000	24.0	A.L.	145	194	168
2550	F.T.	A.R.	420	253	220	10000	2350	31.0	A.R.	315	233	202	2100	29.0	A.R.	235	218	189	2050	29.0	A.L.	185	211	183	10000	1800	27.5	A.L.	145	190	165
2550	37.0	A.R.	420	241	209	5000	2100	34.5	A.R.	300	225	195	2000	31.0	A.R.	225	210	182	1950	32.0	A.L.	175	203	176	5000	1600	31.0	A.L.	135	181	157
2550	38.5	A.R.	420	230	200	S.L.	2050	35.5	A.R.	285	213	185	2000	32.0	A.R.	210	197	171	1900	33.5	A.L.	170	195	168	S.L.	1600	32.0	A.L.	125	167	145

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 45,000#, TURN TO SHEET 14 FOR NEW POWER SETTINGS.

EXAMPLE

AT 48000 LB. GROSS WEIGHT WITH 1200 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 300 GAL.) TO FLY 1140 STAT. AIRMILES AT 25000 FT. ALTITUDE MAINTAIN 2600 RPM AND 26.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT.	: PRESSURE ALTITUDE	F.R.	: FULL RICH
M.P.	: MANIFOLD PRESSURE	A.R.	: AUTO-RICH
GPH	: U.S. GAL. PER HOUR	A.L.	: AUTO-LEAN
TAS	: TRUE AIRSPEED	C.L.	: CRUISING LEAN
KTS.	: KNOTS	M.L.	: MANUAL LEAN
S.L.	: SEA LEVEL	F.T.	: FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R6D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 45,000 TO 40,000 POUNDS

EXTERNAL LOAD ITEMS
ONE FEATHERED PROPELLER

NUMBER OF ENGINES OPERATING: THREE

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	630
	2700	41.5	HIGH	A.R.	5	220	630

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
500 330 165	435 290 145	900 600 300	700 460 230	610 400 200	915 600 300	795 520 260	1120 750 375	975 650 325	900 600 300	1325 875 440	1050 960 380

MAXIMUM CONTINUOUS						PRESS	(.77 STAT. (.67 NAUT.) MI./GAL.)						(1.0 STAT. (.87 NAUT.) MI./GAL.)						(1.24 STAT. (1.08 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000 35000 30000						
2550	F.T.	A.R.	310	252	218	25000	2550	28.0	A.R.	285	248	214	2400	28.0	A.R.	240	240	208	2150	24.0	A.L.	165	219	190	25000						
2550	F.T.	A.R.	415	269	229	20000	2450	32.0	A.R.	330	252	219	2200	28.5	A.R.	235	235	204	2050	27.5	A.L.	180	225	196	20000						
2550	38.0	A.R.	435	257	223	15000	2200	34.0	A.R.	315	245	213	2000	31.0	A.R.	225	228	198	2200	25.5	A.L.	175	218	189	15000	1900	23.5	A.L.	130	194	168
2550	F.T.	A.R.	420	256	222	10000	2300	30.5	A.R.	300	235	204	2050	28.5	A.R.	215	219	190	2000	28.5	A.L.	170	211	183	10000	1650	26.5	A.L.	125	182	158
2550	37.0	A.R.	420	243	211	5000	2100	34.0	A.R.	290	226	196	2000	30.0	A.R.	205	207	180	1850	32.0	A.L.	165	203	176	5000	1600	28.5	A.L.	115	170	148
2550	38.5	A.R.	420	232	201	S.L.	2000	35.5	A.R.	275	213	185	1950	33.5	A.L.	175	198	172	1750	34.0	A.L.	155	189	164	S.L.	1600	29.5	A.L.	105	156	135

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

EXAMPLE

AT 45000 LB. GROSS WEIGHT WITH 600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 975 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 1650 RPM AND 26.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 14 of 19 Sheets) — Flight Operation Instruction Charts

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 65,000 TO 80,000 POUNDS

EXTERNAL LOAD ITEMS
TWO FEATHERED PROPELLERS
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. (IN. HG.)	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	420
	2700	41.5	HIGH	A.R.	5	220	420

FOR DETAILS SEE POWER PLANT CHART (FIG. 22-SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[a] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[b]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[a]								
2160	1875	3300	2475	2150	2690	2335	3185	2765	3300	3215	2990
1960	1700	3000	2210	1920	2390	2075	2790	2420	3000	2820	2650
1750	1520	2700	1940	1685	2090	1815	2395	2080	2700	2420	2100
1550	1345	2400	1700	1475	1710	1485	2115	1835	2400	2040	1770
1350	1170	2100	1460	1265	1425	1235	1770	1535	2100	1695	1560
1150	1000	1800	1225	1065	1255	1095	1420	1230	1800	1365	1170
950	825	1500	990	860	1015	880	1045	910	1500	1070	1015
755	655	1200	790	685	800	695	820	710	1200	840	730
560	485	900	590	510	600	520	600	520	900	610	530
				SEE SPECIAL NOTE (3)							

MAXIMUM CONTINUOUS						PRESS	(.64 STAT. (.56 NAUT.) MI./GAL.)						(.65 STAT. (.57 NAUT.) MI./GAL.)						(.66 STAT. (.58 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
						25000 20000 15000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		25000 20000 15000						
2550	38.5	A.R.	280	175	162	10000 5000 S.L.	2450	38.0	A.R.	285	170	148	2400	37.5	A.R.	255	165	143	2350	37.0	A.R.	245	161	140	10000 5000 S.L.	2300	37.0	A.R.	235	157	136

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32 PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 60,000#, TURN TO SHEET 16 FOR NEW POWER SETTINGS.

(3) STRUCTURAL LIMITS EXCEEDED (SEE PARAGRAPH 1B, EXPLANATION AND USE OF FLIGHT OPERATION INSTRUCTION CHARTS).

EXAMPLE

AT 63000 LB. GROSS WEIGHT WITH 2100 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 300 GAL.) TO FLY 1460 STAT. AIRMILES AT S.L. FT. ALTITUDE MAINTAIN 2450 RPM AND 38.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT.	PRESSURE ALTITUDE	F.R.	FULL RICH
M.P.	MANIFOLD PRESSURE	A.R.	AUTO-RICH
GPH	U.S. GAL. PER HOUR	A.L.	AUTO-LEAN
TAS	TRUE AIRSPEED	C.L.	CRUISING LEAN
KTS.	KNOTS	M.L.	MANUAL LEAN
S.L.	SEA LEVEL	F.T.	FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. — (Sheet 15 of 19 Sheets) — Flight Operation Instruction Charts

AAFHC-528 4-1-46

AIRCRAFT MODEL(S)
C-54Q & R5D-5
ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 60,000 TO 65,000 POUNDS

EXTERNAL LOAD ITEMS
TWO FEATHERED PROPELLERS
NUMBER OF ENGINES OPERATING: TWO

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	420
	2700	41.5	HIGH	A.R.	5	220	420

FOR DETAILS SEE POWER PLANT CHART (FIG. 22-SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND)[2]. TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
2235	1855	3300	2655	2305	3035	2635	3790	3290	3300	3840	3340
2025	1760	3000	2385	2070	2715	2356	3375	2930	3000	3415	2965
1815	1575	2700	2120	1840	2400	2080	2960	2570	2700	2995	2600
1600	1390	2400	1855	1610	2080	1805	2550	2210	2400	2570	2230
1400	1215	2100	1600	1390	1785	1550	2155	1870	2100	2175	1890
1190	1035	1800	1340	1085	1485	1290	1755	1525	1800	1775	1540
1080	940	1500	1085	940	1200	1040	1390	1205	1500	1410	1225
880	765	1200	850	740	925	805	1040	905	1200	1050	910
675	585	900	610	530	650	565	695	605	900	700	610
390	340	600	405	350	430	375	445	385	600	420	365
195	170	300	200	175	215	185	220	190	300	230	200

MAXIMUM CONTINUOUS						PRESS	(.67 STAT. (.58 NAUT.) MI./GAL.)						(.71 STAT. (.62 NAUT.) MI./GAL.)						(.74 STAT. (.64 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
						25000 20000 15000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		25000 20000 15000						
2550	37.0	A.R.	280	187	163	10000	2500	36.5	A.R.	270	184	160	2350	36.0	A.R.	245	176	152	2250	35.0	A.R.	225	167	147	10000	2100	34.0	A.R.	200	152	132
2550	38.5	A.R.	280	182	158	S.L.	2450	38.0	A.R.	265	176	153	2300	37.0	A.R.	240	171	149	2250	36.5	A.R.	225	168	146	S.L.	2200	36.5	A.R.	215	168	142

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 33) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 55,000#, TURN TO SHEET 17 FOR NEW POWER SETTINGS.

EXAMPLE

AT 60000 LB. GROSS WEIGHT WITH 1800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 1488 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2350 RPM AND 36.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT. : PRESSURE ALTITUDE	F.R. : FULL RICH
M.P. : MANIFOLD PRESSURE	A.R. : AUTO-RICH
GPH : U.S. GAL. PER HOUR	A.L. : AUTO-LEAN
TAS : TRUE AIRSPEED	C.L. : CRUISING LEAN
KTS. : KNOTS	M.L. : MANUAL LEAN
S.L. : SEA LEVEL	F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 16 of 19 Sheets) — Flight Operation Instruction Charts

AAFMC-520 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55000 TO 50000 POUNDS

EXTERNAL LOAD ITEMS
TWO FEATHERED PROPELLERS

NUMBER OF ENGINES OPERATING: TWO

LIMITS	RPM	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	420
	2700	41.5	HIGH	A.R.	5	220	420

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART. SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1860	1615	2700	2300	2000	2800	2430	3500	3040	2700	3530	3065
1645	1430	2400	2025	1760	2375	2060	3080	2675	2400	3100	2690
1435	1245	2100	1760	1530	2055	1785	2665	2315	2100	2675	2325
1225	1065	1800	1490	1290	1735	1505	2250	1950	1800	2250	1950
1020	885	1500	1330	1055	1535	1330	1845	1600	1500	1850	1605
810	705	1200	1075	935	1225	1065	1450	1260	1200	1450	1260
600	520	900	815	710	925	805	1050	910	900	1050	910
400	345	600	475	415	550	480	695	605	600	695	605
200	175	300	235	205	270	235	345	300	300	345	300

MAXIMUM CONTINUOUS						PRESS	(.79 STAT. (.69 NAUT.) MI./GAL.)						(.51 STAT. (.79 NAUT.) MI./GAL.)						(1.16 STAT. (1.0 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000																			40000 35000 30000						
						25000 20000 15000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		25000 20000 15000						
2550	F.T.	A.R.	270	197	171	10000	2400	31.5	A.R.	225	176	155													10000						
2550	37.0	A.R.	280	195	169	5000	2250	35.0	A.R.	230	181	157	2000	33.5	A.R.	175	160	139							5000						
2550	38.5	A.R.	280	188	163	S.L.	2200	36.5	A.R.	220	174	151	2000	35.0	A.R.	175	160	139	1950	33.5	A.L.	115	134	116	S.L.	1950	33.5	A.L.	.15	134	116

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) WHEN GROSS WEIGHT IS REDUCED TO 50,000#, TURN TO SHEET 18 FOR NEW POWER SETTINGS.

EXAMPLE

AT 53000 LB. GROSS WEIGHT WITH 1500 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 150 GAL.) TO FLY 1850 STAT. AIRMILES AT S.L. FT. ALTITUDE MAINTAIN 1950 RPM AND 35.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO LEAN

LEGEND

ALT.	PRESSURE ALTITUDE	F.R.	FULL RICH
M.P.	MANIFOLD PRESSURE	A.R.	AUTO-RICH
GPH	U.S. GAL. PER HOUR	A.L.	AUTO-LEAN
TAS	TRUE AIRSPEED	C.L.	CRUISING LEAN
KTS.	KNOTS	M.L.	MANUAL LEAN
S.L.	SEA LEVEL	F.T.	FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

AAFMC-528 8-1-46

AIRCRAFT MODEL(S)
C-54G & R5D-5
ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 50,000 TO 45,000 POUNDS

EXTERNAL LOAD ITEMS
TWO FEATHERED PROPELLERS
NUMBER OF ENGINES OPERATING: TWO

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700	50.0	LOW	A.R.	5	220	420
	2700	41.5	HIGH	A.R.	5	220	420

FOR DETAILS SEE POWER PLANT CHART (FIG. 22-SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[2] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
					SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						
1250	1085	1800	1580	1370	1865	1620	2470	2145	1800	2470	2145
1040	900	1500	1310	1035	1615	1410	2040	1770	1500	2040	1770
830	720	1200	1040	905	1300	1030	1620	1410	1200	1620	1410
620	540	900	765	665	980	850	1195	1040	900	1195	1040
415	360	600	520	450	600	520	790	685	600	790	685
205	180	300	260	225	300	260	395	345	300	395	345

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.86 STAT. (.75 NAUT.) MI./GAL.)						(1.0 STAT. (.87 NAUT.) MI./GAL.)						(1.32 STAT. (1.15 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.		R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000																				40000 35000 30000						
CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																																
2550	28.0	A.R.	290	202	175	25000 20000 15000	2400	28.0	A.R.	205	175	152														25000 20000 15000						
2550	T.T.	A.R.	270	205	178	10000	2350	32.0	A.R.	220	189	164	2100	29.5	A.R.	170	170	148								10000						
2550	37.0	A.R.	280	200	174	6000	2350	34.5	A.R.	220	186	162	2000	33.5	A.R.	175	174	151	1950	32.0	A.L.	115	152	132		6000	1950	32.0	A.L.	115	152	132
2550	38.5	A.R.	280	192	167	S.L.	2100	36.5	A.R.	205	178	155	2000	34.5	A.R.	170	167	145	1950	33.5	A.L.	115	152	132		S.L.	1950	33.5	A.L.	115	152	132

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) WHEN GROSS WEIGHT IS REDUCED TO 45,000#, TURN TO SHEET 19 FOR NEW POWER SETTINGS.

EXAMPLE

AT 64000 LB. GROSS WEIGHT WITH 900 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 180 GAL.) TO FLY 980 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2000 RPM AND 33.5 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT. : PRESSURE ALTITUDE
M.P. : MANIFOLD PRESSURE
GPH : U.S. GAL. PER HOUR
TAS : TRUE AIRSPEED
KTS. : KNOTS
S.L. : SEA LEVEL
F.R. : FULL RICH
A.R. : AUTO-RICH
A.L. : AUTO-LEAN
C.L. : CRUISING LEAN
M.L. : MANUAL LEAN
F.T. : FULL THROTTLE

DATA AS OF 8-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 18 of 19 Sheets) — Flight Operation Instruction Charts

AIRCRAFT MODEL(S)
C-54G & R5D-5

ENGINE(S): R-2000-9, -4

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 46000 TO 40000 POUNDS

EXTERNAL LOAD ITEMS
TWO FEATHERED PROPELLERS

NUMBER OF ENGINES OPERATING: TWO

LIMITS	RPM	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.							
MILITARY POWER	2700.	50.0	LOW	A.R.	5	220	420
	2700	41.5	HIGH	A.R.	5	220	420

FOR DETAILS SEE POWER PLANT CHART (FIG. 22 SECT. III)

INSTRUCTIONS FOR USING CHART: SELECT FIGURE IN FUEL COLUMN EQUAL TO OR LESS THAN AMOUNT OF FUEL TO BE USED FOR CRUISING[1] MOVE HORIZONTALLY TO RIGHT OR LEFT AND SELECT RANGE VALUE EQUAL TO OR GREATER THAN THE STATUTE OR NAUTICAL AIR MILES TO BE FLOWN. VERTICALLY BELOW AND OPPOSITE VALUE NEAREST DESIRED CRUISING ALTITUDE (ALT.) READ RPM, MANIFOLD PRESSURE (M.P.) 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. AIR MILES PER GALLON (MI./GAL.) (NO WIND), GALLONS PER HR. (G.P.H.) AND TRUE AIRSPEED (T.A.S.) ARE APPROXIMATE VALUES FOR REFERENCE. RANGE VALUES ARE FOR AN AVERAGE AIRPLANE FLYING ALONE (NO WIND).[1] TO OBTAIN BRITISH IMPERIAL GAL. (OR G.P.H.): MULTIPLY U.S. GAL. (OR G.P.H.) BY 10 THEN DIVIDE BY 12.

COLUMN I		FUEL	COLUMN II		COLUMN III		COLUMN IV		FUEL	COLUMN V	
RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES		RANGE IN AIRMILES		RANGE IN AIRMILES		U.S.	RANGE IN AIRMILES	
STAUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL	STATUTE	NAUTICAL	STATUTE	NAUTICAL	GAL.	STATUTE	NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
640 420 210	555 365 185	900 600 300	800 535 265	695 465 230	965 640 320	840 555 280	1250 835 415	1085 725 360	900 600 300	1340 850 425	1165 740 370

MAXIMUM CONTINUOUS						PRESS	(.89 STAT. (.77 NAUT.) MI./GAL.)						(1.06 STAT. (.93 NAUT.) MI./GAL.)						(1.39 STAT. (1.21 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.
						40000 35000 30000	CONTINUOUS OPERATION BETWEEN 2300 AND 2550 RPM IS PROHIBITED																		40000 35000 30000						
2550	38.0	A.R.	290	211	183	25000 20000 15000	2450 2300	32.5 35.0	A.R. A.R.	225 220	198 197	173 171	2400	26.0	A.R.	170	181	157							25000 20000 15000						
2550	F.T.	A.R.	275	212	184	10000	2400	31.5	A.R.	220	197	171	2200	29.5	A.R.	170	182	158	2050	29.0	A.L.	120	188	146	10000	1950	28.5	A.L.	110	160	139
2550	37.0	A.R.	280	205	178	5000	2200	34.5	A.R.	215	192	167	2000	34.0	A.R.	170	179	155	1950	32.0	A.L.	115	165	143	5000	1950	32.0	A.L.	115	165	143
2550	38.5	A.R.	280	196	170	S.L.	2150	36.0	A.R.	205	183	159	2000	34.0	A.R.	160	170	148	1950	31.5	A.L.	115	160	139	S.L.	1850	34.0	A.L.	110	155	135

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 32) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

EXAMPLE

AT 43000 LB. GROSS WEIGHT WITH 600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 110 GAL.) TO FLY 640 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2400 RPM AND 26.0 IN. MANIFOLD PRESSURE WITH MIXTURE SET: AUTO RICH

LEGEND

ALT. : PRESSURE ALTITUDE	F.R. : FULL RICH
M.P. : MANIFOLD PRESSURE	A.R. : AUTO-RICH
GPH : U.S. GAL. PER HOUR	A.L. : AUTO-LEAN
TAS : TRUE AIRSPEED	C.L. : CRUISING LEAN
KTS. : KNOTS	M.L. : MANUAL LEAN
S.L. : SEA LEVEL	F.T. : FULL THROTTLE

DATA AS OF 5-1-46 BASED ON: FLIGHT TEST

Figure 33. (Sheet 19 of 19 Sheets) — Flight Operation Instruction Charts

Revised 29 January 1951

Appendix II

ENGINEERING DATA

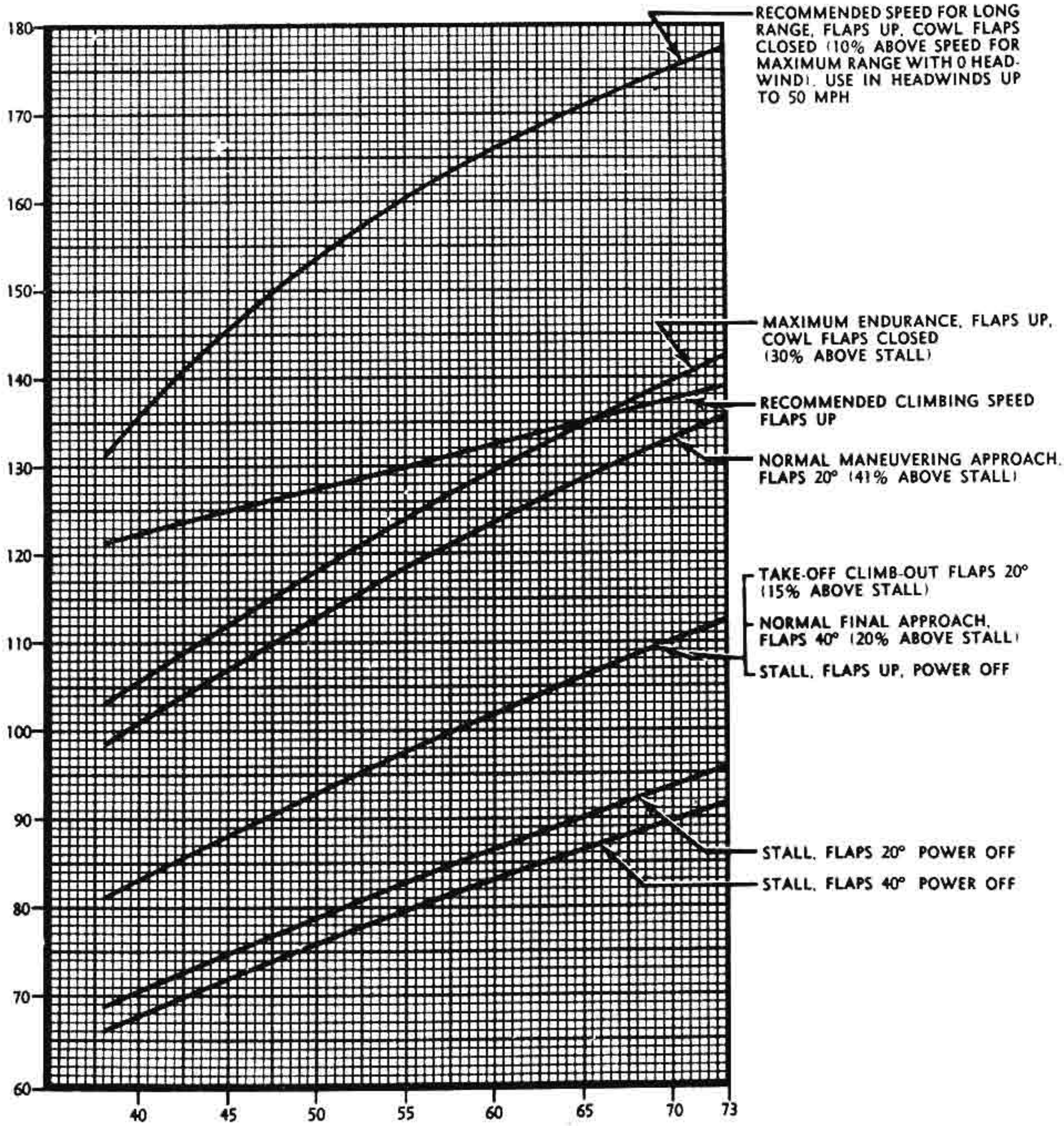


Figure 34 — Characteristic Speed Chart

EXPLANATION AND USE OF THE SPEED AND LOAD FACTOR CHART

These curves are cross plots of four variables.

1. Airplane gross weight
2. Maximum permissible indicated level flight speed
3. Total weight of fuel in the wing tanks
4. Ultimate wing load factor

These variables are so arranged that if any two of these quantities are known, the other two may be readily determined.

These curves are based on the following system of fuel loading:

1. All fuel will be loaded symetrically about the airplane centerline.
2. In loading any fuel weight less than 12,036 pounds (2006 gallons), it will be equally distributed between the inboard and outboard main tanks.
3. In loading any fuel weight over 12,036 pounds (2006 gallons), fill the outboard auxiliaries to capacity first, then the inboard auxiliaries with the balance of fuel.*
4. The fuel must be used symmetrically about the centerline of the airplane, emptying the auxiliaries first in any sequence, then all four main tanks simultaneously.

* If for any reason it is desired to fill the inboard auxiliary tanks before the outboard auxiliaries it is permissible to do so. However, the gross weight of the airplane may be increased above the 60,700 pound zero fuel weight by *only* that weight of fuel in the main tanks and the outboard auxiliaries (up to a maximum gross weight of 82,500 pounds). Any fuel in the inboard auxiliary tanks must be considered to be the same as cabin load; that is its weight must be included in the zero fuel weight.

The boundary condition, or limiting operating conditions, of the speed and load factor chart, noted in the clockwise direction, are as follows:

1. Zero wing fuel.
2. Maximum level flight speed.
3. Maximum allowable gross weight under operational limitations.
4. The airplane must be so loaded and handled that it may be able, at all times, to satisfactorily withstand an ultimate wing load factor of at least 3.0

Explanation of the Term "Load Factor"

When the airplane is accelerated in any direction, all parts of the plane experience inertia forces in the opposite direction. The "load factor" express the ratio of these inertia loads to the normal pull of gravity. For example, a load factor of 3.0 means that the airplane and its parts have inertia forces acting on them equal to three times their normal weights; or a 100 pound object actually weighs 300 pounds under a 3.0 load factor. The *"maximum load factor made good"* is the maximum value which the airplane can safely withstand under given loading conditions. The *"absolute maximum load factor"* is the largest value which the airplane can safely withstand under any conditions.

The *"limit load factor"* is in all cases, the maximum value at which the airplane can safely operate under the conditions stipulated without parts of the structure yielding: i.e., stretching so far that they will not come back to their original shape after the load is reduced to normal. The *"ultimate load factor"* is that value which, if exceeded, will cause parts of the airplane to actually break; it is by definition 1.50 times the limit value.

In the chart on the following page all values of load factor are ultimate values; and they all refer to vertical acceleration in which the airplane accelerates upward and the inertia loads act downward.

Figure 35 (Sheet 1 of 3 Sheets)—Speed and Load Factor Limitations Chart

The following examples demonstrate specific applications of the chart:

Example 1—The gross weight at take-off is predetermined. What is the minimum amount of fuel required in the wing tanks and the maximum speeds permissible with this amount of fuel?

For a take-off gross weight of 64,000, the origin is at point (A). Enter the chart at this point and rise vertically to intersect the 3.75 load factor line. The minimum weight of wing fuel required it 3,300 pounds (approximately 550 gallons). Proceed horizontally to the speed scales, the maximum permissible level flight speed is 228 mph.

Example 2—The amount of fuel required for a particular flight is known; what are the maximum take-off gross weight and flight speeds permissible?

The fuel required is, for example, 6,000 pounds. The origin is now point (B). Descend vertically to the gross weight scale and horizontally to the speed scales. The maximum take-off gross weight is 66,700 pounds, the maximum permissible level flight speed is 237 mph.

Example 3—Having determined the minimum wing fuel or maximum take-off gross weight in accordance with Examples 1 or 2; what are the maximum permissible speeds at any instant during flight, and what maximum ultimate load factor may the airplane be expected to withstand at this instant? First, it is necessary to determine the instantaneous gross weight: This may be computed by the following formula:

Inst. G.W. =(G.W. at T. O.)—(total fuel in airplane at T.O.)+(total fuel remaining in airplane). (For conversion, 1 gallon=6 lbs.)

For an instantaneous gross weight of 63,500 pounds and 5,000 pounds of fuel in the wing tanks the origin is point (C). The maximum permissible speed is 247 mph for level flight. The ultimate load factor is approximately 3.95.

Attention is called to the fact that as fuel is used from the wing tanks, the permissible top speed decreases, following a constant load factor line.

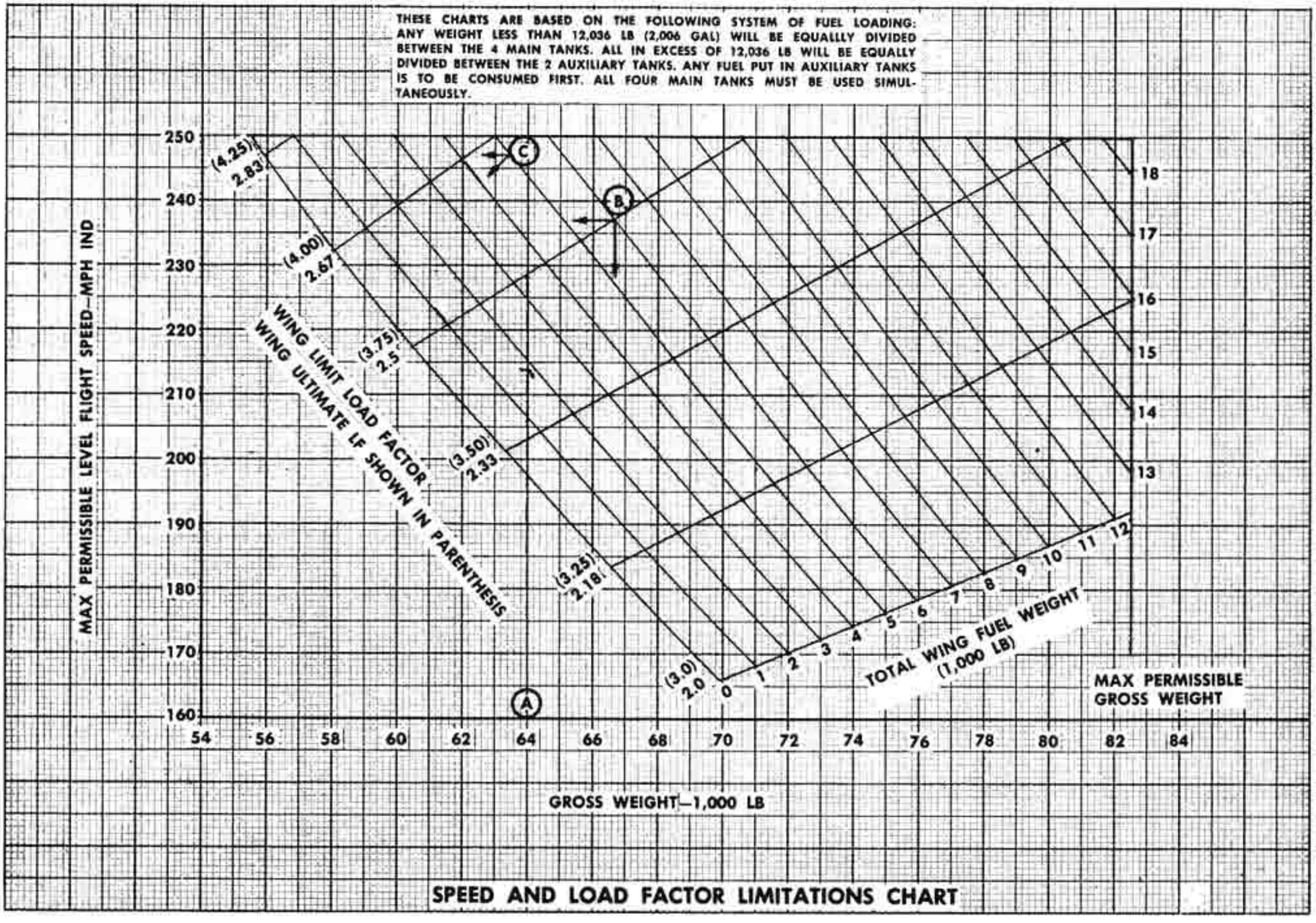


Figure 35 (Sheet 3 of 3 Sheets)—Speed and Load Factor Limitations Chart