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HANDBOOK
FLIGHT OPERATING INSTRUCTIONS

USAF SERIES
B-17G
AIRCRAFT

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE
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CENTRAL PRESS INC., MARION, INDIANA
MAY, 1950 - 500

1 AUGUST 1944
REVISED 22 AUGUST 1949

LIST OF REVISED PAGES ISSUED

INSERT LATEST REVISED PAGES. DESTROY SUPERSEDED PAGES.

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Page No.	Date of Latest Revision
i	1 June 1948
1	15 January 1946
* 3	22 August 1949
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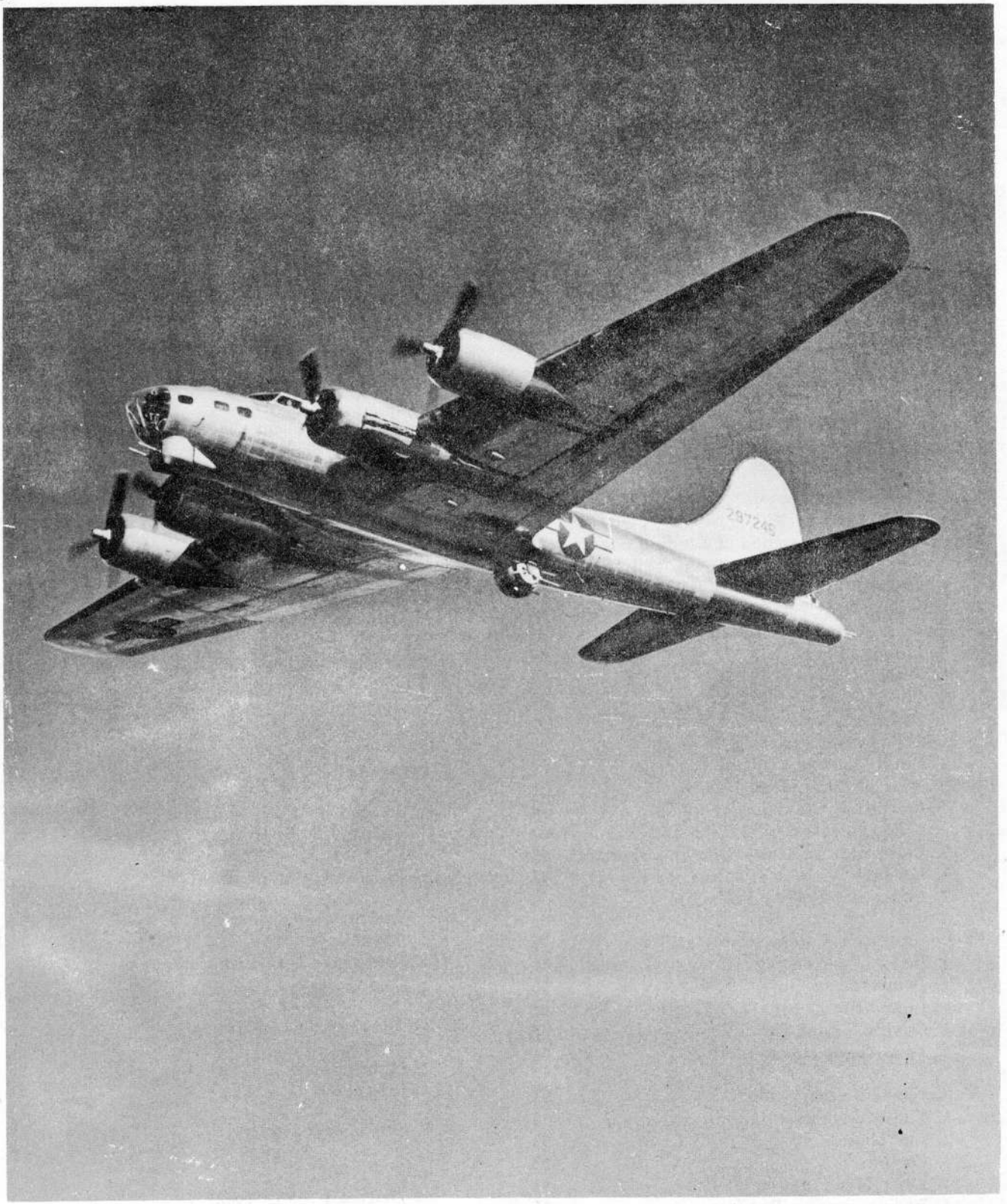
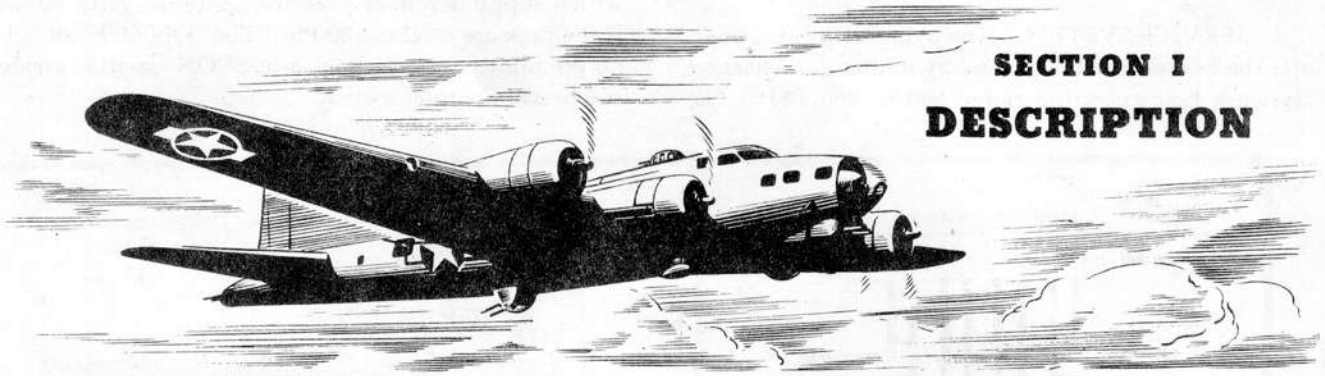


Figure 1—B-17G Bombardment Airplane



SECTION I
DESCRIPTION

1. AIRPLANE.

a. The over-all dimensions of the B-17G airplanes are: length 74 feet 9 inches; height (taxiing position) 19 feet 1 inch; span 103 feet 9 inches.

b. The landing gear, tail gear, wing flaps, and bomb doors are electrically operated, and the brakes and cowl flaps are hydraulically operated.

c. The crew includes pilot, copilot, navigator, bombardier, upper turret gunner, lower turret gunner, radio operator, side gunner(s), and tail gunner. The airplane can be entered either through the main entrance door on the right side of the airplane just forward of the horizontal stabilizer, or through the front hatch in the bottom of the fuselage below the pilot's compartment.

d. The G's defensive armament consists of a chin turret, ball turret, and top turret (each mounts two .50 caliber machine guns). There are two single .50 caliber machine guns in the waist compartment, two in the nose compartment, one in the radio compartment, and twin flexible .50 caliber machine guns in the tail.

e. The internal bomb racks will carry bombs up to the 2000-pound size and each external rack will carry one 4000-pound bomb.

f. Automatic flight control equipment with formation stick control is provided.

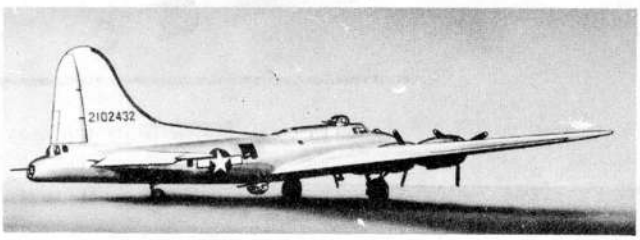


Figure 2—Three-Quarter Rear View

2. POWER PLANT

a. ENGINES.—The aircooled Wright engines have integral reduction gears which drive the propellers.

b. TURBOS.—B-2 or B-22 G. E. Turbos are used to boost manifold pressure for take-off or for high altitude flight. All G's have the Minneapolis-Honeywell Electronic Turbosupercharger Control System.

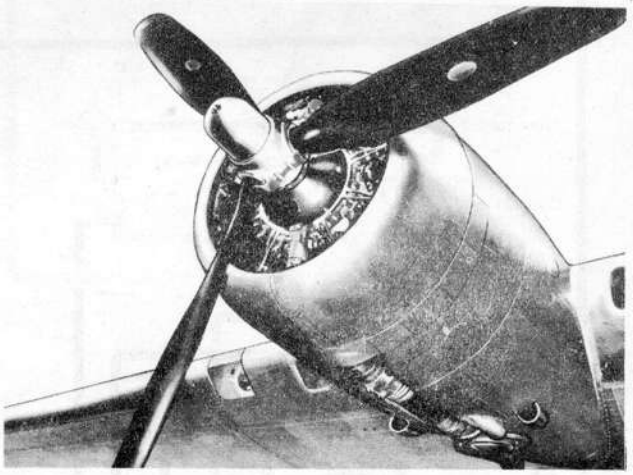


Figure 3—Power Plant

c. PROPELLERS.—The Hamilton standard three bladed hydromatic propellers have constant speed control and are full feathering.

d. AUTOMATIC ENGINE CONTROL.—If engine cables are severed, three controls will automatically assume predetermined positions: inter-coolers cold, throttles wide open, and propellers for 1850 engine RPM. The turbo setting will usually remain as it was before damage. Functioning of the automatic control for a unit will not affect any other unit.

3. HYDRAULIC SYSTEM.

a. SERVICE SYSTEM.—The hydraulic system operates the brakes, cowl flaps, and hydraulic gun chargers (system's best operating range 600 to 800 PSI). The pressure cut-out switch regulates the electric pump which supplies system pressure. A relief valve opens if the pressure reaches 900 PSI. The "ON-OFF" switch on the pilot's control panel, when "ON", will override the pressure cut-off switch.

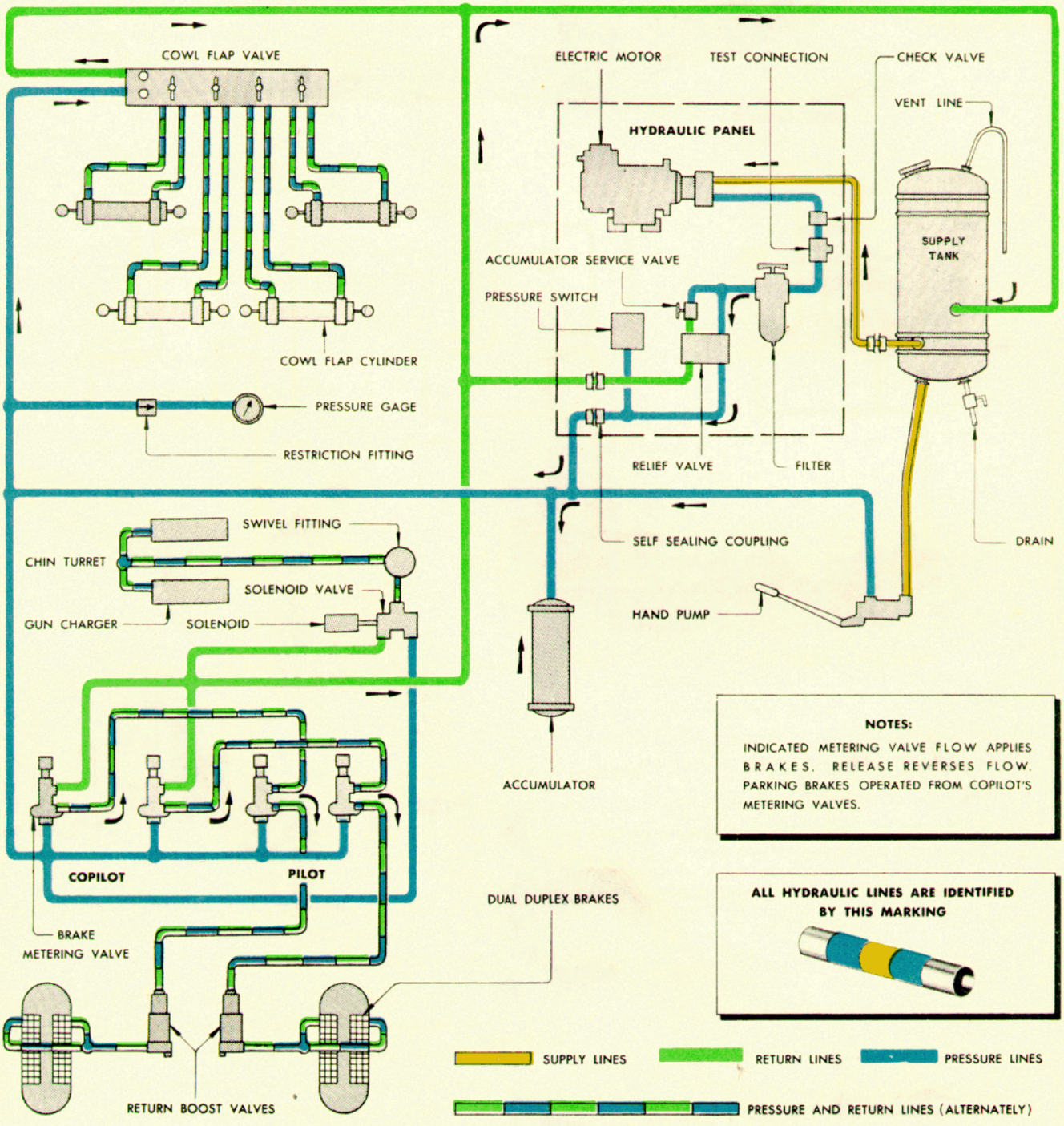


Figure 4—Hydraulic Flow Diagram

b. PRESSURE GAGE.—The pressure of the service system is indicated by a gage on the pilot's instrument panel.

c. HAND PUMP.—The hand pump on the copilot's side wall is used when the airplane is on the ground or when the electric pump fails.

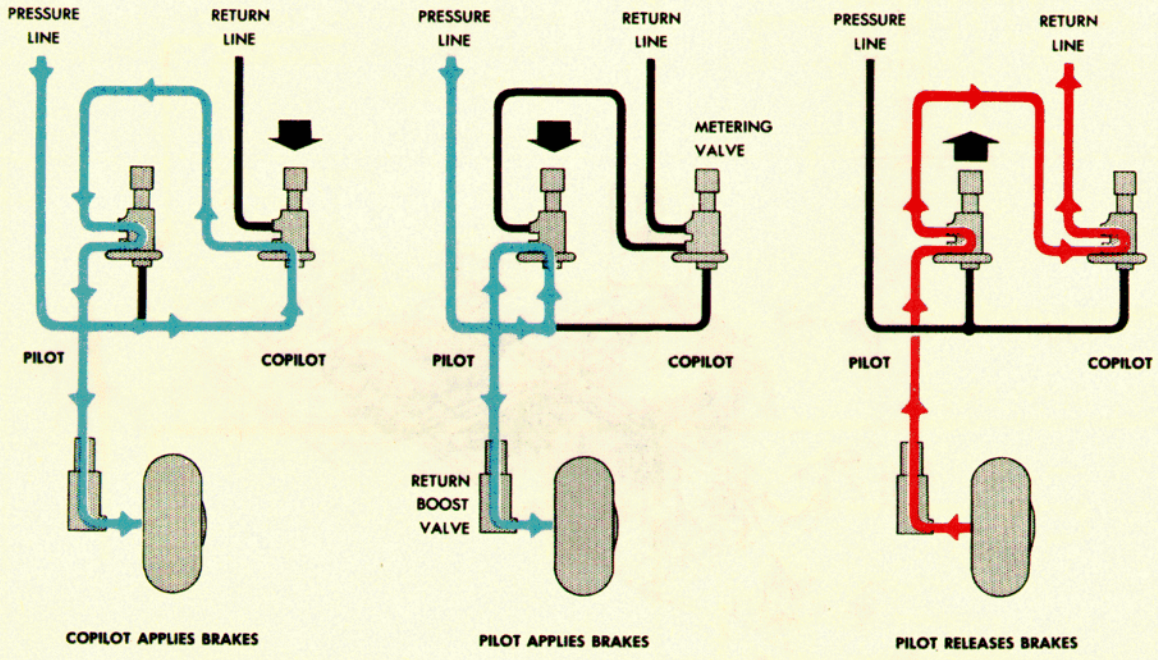
4. FUEL SYSTEM.

Each engine has an independent fuel system. The fuel supply for one engine can be used by another if the fuel is transferred to the other engines's tank through the fuel transfer system. Tanks are self-sealing.

Fuel Specification AN-F-48
Recommended Grade 100/130
Alternate Grade 91/98

Note

For operating limits with alternate grade fuel, refer to paragraph 3.*a.*(7), Section II.



NORMAL BRAKE OPERATION

IN ORDER TO SIMPLIFY THE BRAKE SYSTEM IT HAS BEEN DESIGNED IN SUCH A MANNER THAT PRESSURE TO THE BRAKES IS APPLIED ONLY THROUGH THE PILOT'S METERING VALVES, AND OIL IS RETURNED TO THE TANK THROUGH THE COPILOT'S METERING VALVES. THUS, WHEN THE COPILOT DESIRES TO OPERATE THE BRAKES, PRESSURE FROM HIS VALVE PASSES THROUGH THE PILOT'S BEFORE REACHING THE BRAKES. CONVERSELY, IF THE PILOT HAS APPLIED PRESSURE TO THE BRAKES, OIL WILL FLOW BACK TO THE TANK THROUGH THE COPILOT'S VALVE WHEN THE BRAKES ARE RELEASED.

WARNING

REMEMBER THAT THE ELEVATORS ARE INEFFECTIVE WHEN IAS GETS DOWN TO ABOUT 30 M.P.H. AND LESS; THUS, TROMPING ON THE BRAKES TOO HARD AT LOW GROUND SPEEDS CAN PUT YOUR B-17 OVER ON ITS NOSE. GET THE TAIL DOWN WHILE THE ELEVATORS ARE STILL EFFECTIVE: THEN KEEP IT DOWN BY BRAKING EASY.

Figure 5—Brake Operation Diagram

FUEL QUANTITY DATA (GAL.)

Tanks	*No.*	*Capacity (each)*
No. 1 & 4 ENGINE TANKS	2	425
No. 2 & 3 ENGINE TANKS	2	213
INBOARD FEEDER TANKS	2	212
TOKYO TANK CELLS (1-5)	2	270
TOKYO TANK CELLS (6-9)	2	270
BOMB BAY TANKS	2	410

TOTAL CAPACITIES	
ENGINE TANKS	1276
ENGINE TANKS & INBOARD FEEDERS	1700
ENGINE TANKS, INBOARD FEEDERS & TOKYOS	2780
ENGINE TANKS, INBOARD FEEDERS, TOKYOS & BOMB BAY TANKS	3600

NOTE: USABLE FUEL IS SLIGHTLY LESS THAN QUANTITY LISTED

a. FUEL BOOST PUMPS. — Electrically-driven fuel boost pumps, controlled by toggle switches on the central control panel, supply pressure required for engine starting, and supplement the engine-driven fuel pumps for take-off and for high-altitude flight. The boost pumps are normally turned off after the climb from take-off is well under way and started again at 15,000 to 18,000 feet to prevent vaporization in the fuel lines to the engine-driven pumps. Booster pump pressure at engine No. 3 fuel strainer is used to supply the cylinder head primer.

b. FUEL SHUT-OFF VALVES.—There are four fuel shut-off valves, controlled by switches on the central control panel, in the fuel lines between each booster pump and fuel strainer. These valves stop the fuel flow if the lines are severed.

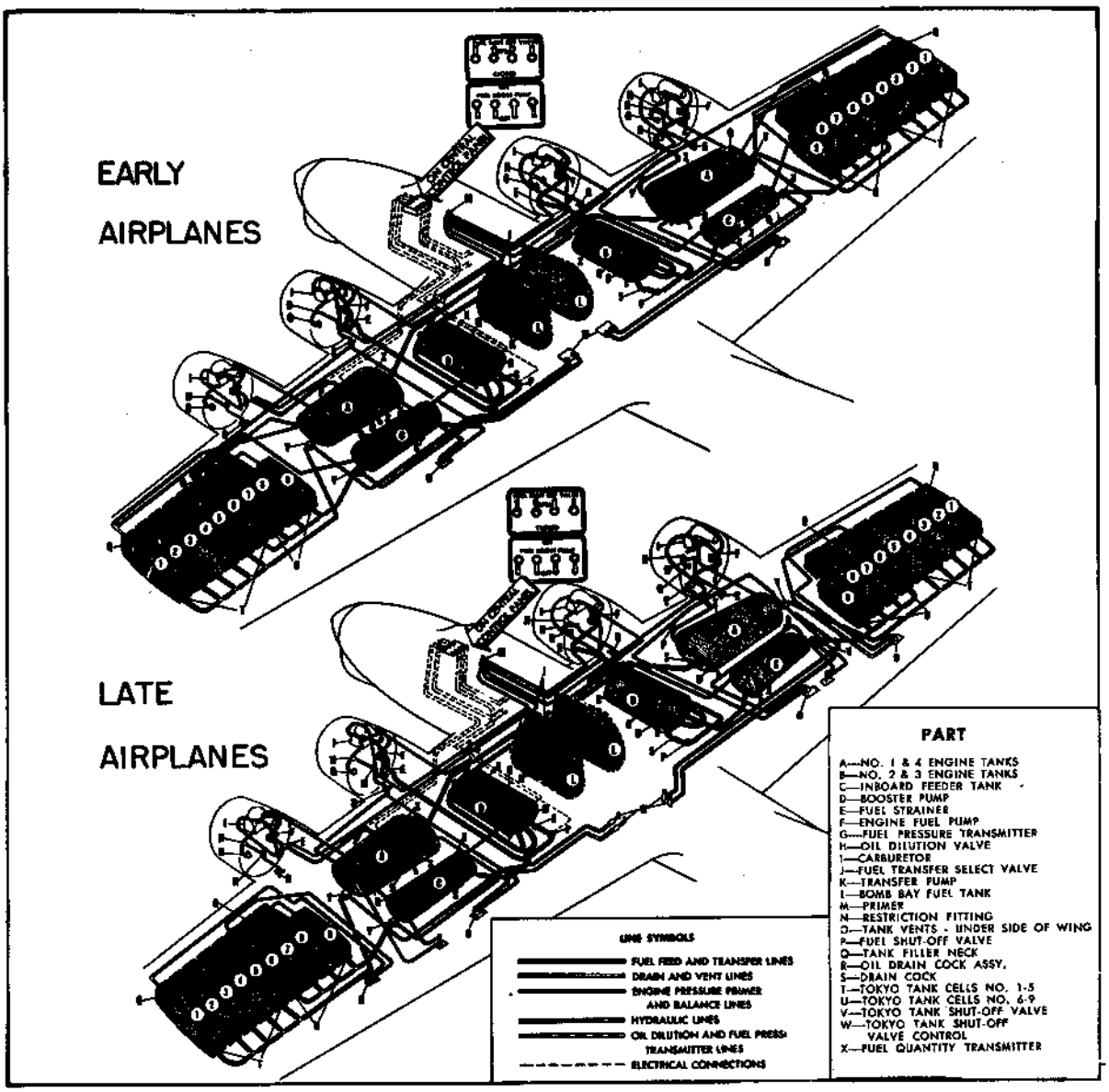


Figure 6—Fuel System Diagram

c. PRIMER.—The primer control is used to prime each of the four engines. In the OFF position the control is locked. To prime, push the handle down, make your selection, and pump the charge to the engine.

IMPORTANT

Don't leave the primer handle out. Pressure from the No. 3 fuel booster pump is on the suction side of the primer and overpriming will result if the priming operation is not ended with the handle in the locked ("OFF") position.

d. FUEL TRANSFER SYSTEM.

(1) An electric motor-driven pump and two selector valves transfer the fuel. The motor switch and selector valve controls are below the door at the rear of the control cabin. Transfer of fuel can only be made from tanks on one side to tanks on the other side of the airplane.

WARNING

Do not use bomb bay valve position unless the bomb bay tanks are installed. It is recommended that a 6 inch length of hose, plugged at the outer end, be attached to the bomb bay valve ports.

(2) The Tokyo tanks have shut-off valves in the lines leading from each group of cells. The controls for these valves are in the bomb bay or in the radio compartment. Keep the valves "CLOSED" except when transferring fuel from Tokyo tanks to main tanks. Do not transfer unless and until the fuel level of the main tanks has dropped to 100 gallons per engine. The valve must be "CLOSED" after the transfer is completed.

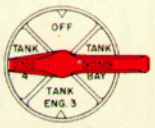
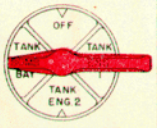
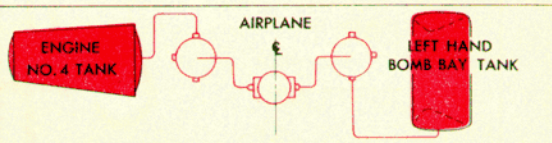
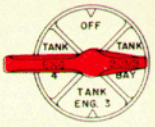
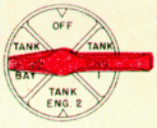
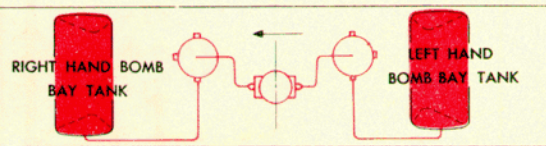
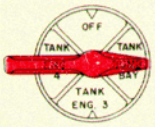
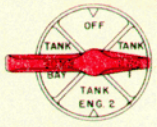
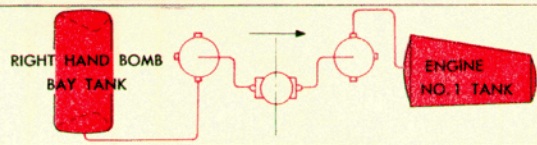
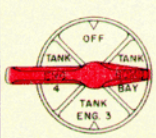
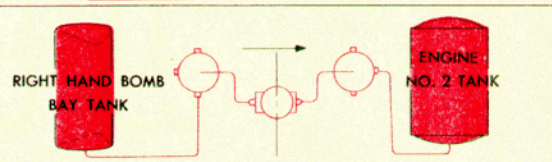
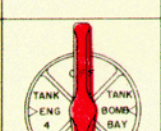
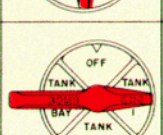
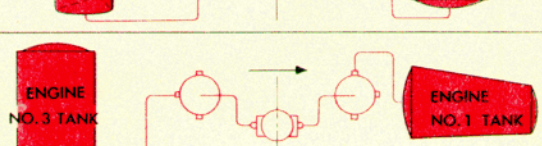
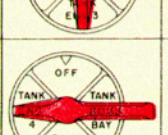
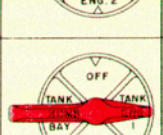
DESIRED TRANSFER		OPERATION OF CONTROLS			FLOW PATTERN
		R. H. VALVE	SWITCH	L. H. VALVE	
LEFT HAND TO RIGHT HAND TANK EXAMPLE: FROM LEFT HAND BOMB BAY TO ENGINE NO. 4 TANK					
LEFT HAND TO RIGHT HAND TANK (TWO TRANSFERS REQUIRED) EXAMPLE: FROM LEFT HAND BOMB BAY TO ENGINE NO. 1 TANK BY WAY OF RIGHT HAND BOMB BAY TANK	STEP 1				
	STEP 2				
RIGHT HAND TO LEFT HAND TANK EXAMPLE: FROM RIGHT HAND BOMB BAY TO ENGINE NO. 2 TANK					
RIGHT HAND TO RIGHT HAND TANK (TWO TRANSFERS REQUIRED) EXAMPLE: FROM ENGINE NO. 3 TO ENGINE NO. 4 TANK BY WAY OF ENGINE NO. 1 TANK	STEP 1				
	STEP 2				

Figure 7—Fuel Transfer Diagram

5. OIL SYSTEM.

a. Each engine has a self-sealing oil tank which holds 37 gallons plus about a 10 percent expansion space. The maximum fuel load requires all four oil tanks completely filled (148 gallons). The propeller feathering pump receives its supply from the "IN" line.

b. The oil temperature regulator is in the "OUT" line. Since the oil cooler shutters are automatic, there are no oil cooler controls in the cockpit. Each tank contains a "hopper" or oil heat accelerator, which allows the cold oil in the tank to gradually mix with the warm oil returning from the engine.

c. The oil dilution system allows dilution of the oil with gasoline at the end of any engine operation so that the engine may be started more easily.

d. The oil tanks should be filled with engine oil Specification Number AN-O-8, grade 1120, for normal operation. Grade 1100 is suitable for cold weather operation.

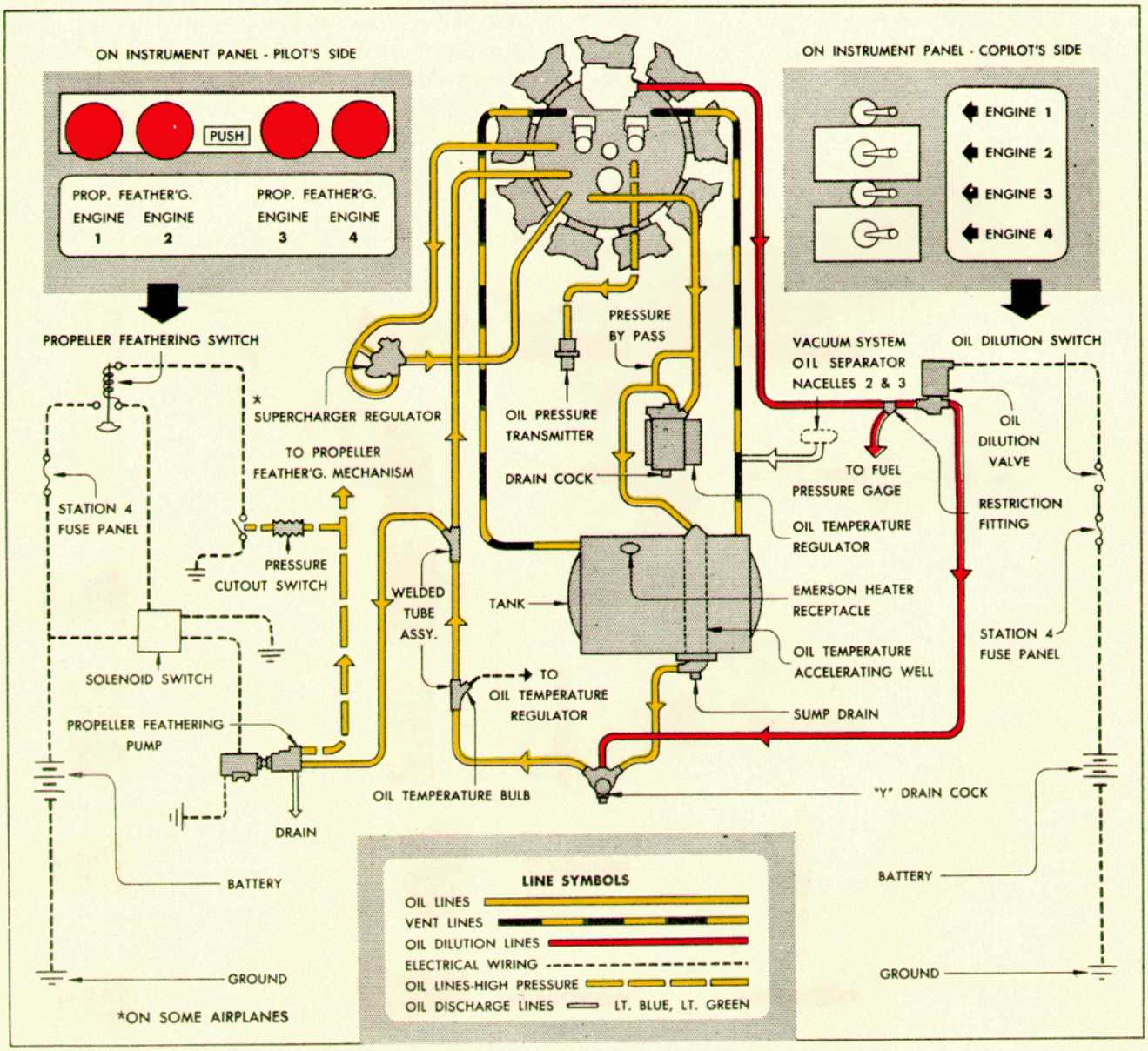


Figure 8—Oil Flow Diagram

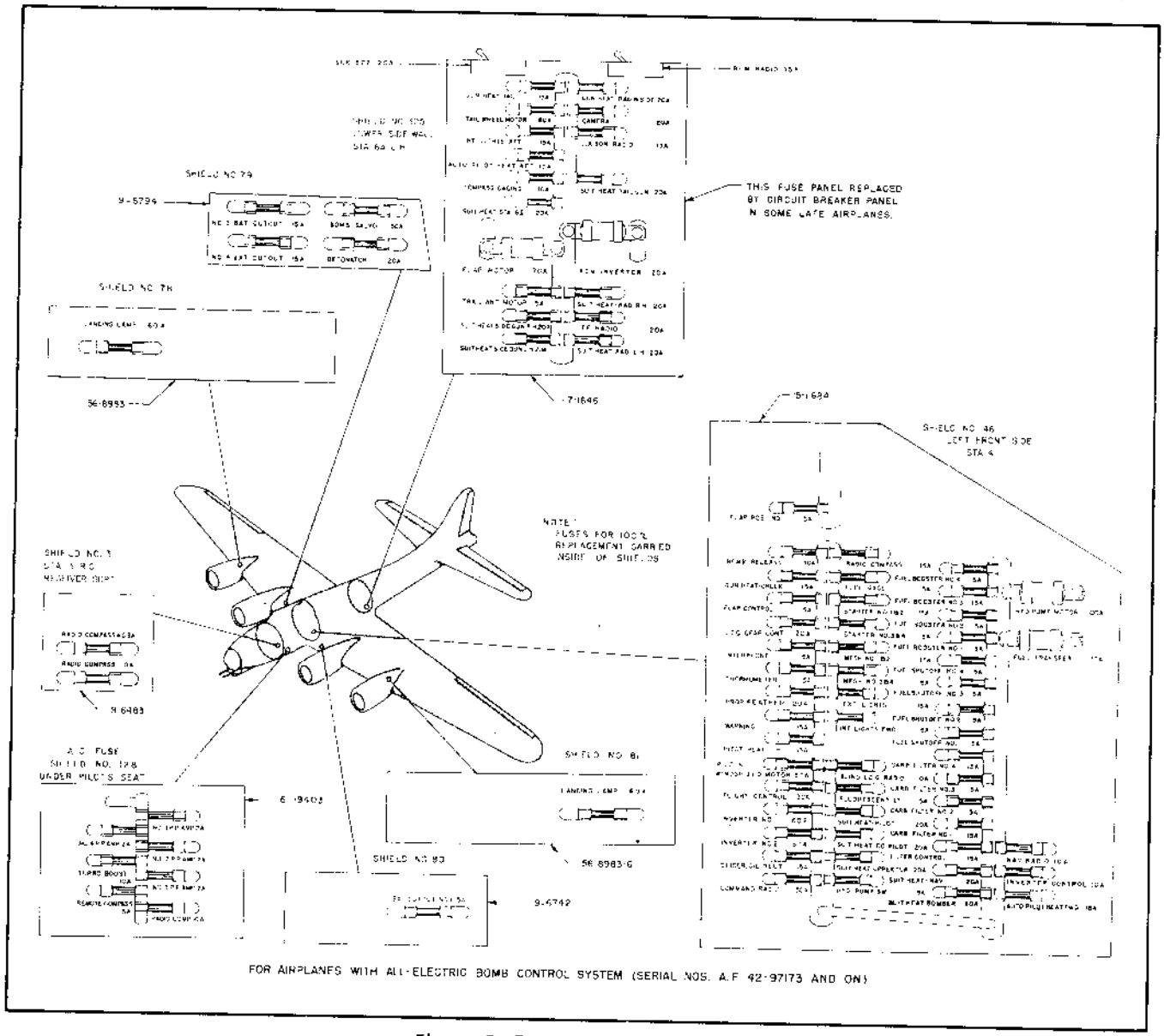


Figure 9—Fuse Location Diagram

6. ELECTRICAL SYSTEM.

a. Four engine-driven generators, and three storage batteries in the wing, supply 24 volt DC electrical power. Toggle switches on the pilot's panel control the three battery switch solenoids.

b. A gasoline engine-driven generator unit stowed either in the side gunner's compartment or in the radio compartment may be operated on the ground to recharge the batteries, operate the radio, or in an emergency to start the engine.

c. Alternating current for the autosyn instruments, power plant control, radio compass, and remote compass is furnished by the "MAIN" inverter under the pilot's seat, or the "SPARE" inverter under the copilot's seat. On early airplanes, the position of the double throw switch on the pilot's control panel determines which inverter is in use. Late airplanes have an automatic changeover relay to assure continuous AC power. If one inverter fails, the relay automatically turns the other inverter on.

7. HEATING.

a. HOT AIR HEATING SYSTEM.

(1) DESCRIPTION.—Air passing over the tail pipes of each inboard engine is heated in a jacket or heat exchanger. The air then passes through a second heat exchanger and heats, by radiation, the air going to the cabin. The cabin air is taken in through the carburetor air scoop and passes through the secondary exchanger, then to the cabin. Heated air for the cabin is always available as long as one inboard engine is functioning.

(2) CABIN HEAT CONTROL.—The cabin heat controls on the forward bulkhead of the radio compartment to the right of the door have three positions, "HOT", "COLD", and "OFF".

(3) OUTLET CONTROLS.—Cabin temperature can be controlled at the following outlets:

(a) The bombardier's heat outlet and control is at his right; nose defroster control is below the bombsight window.

(b) The navigator's control is on the right side of the airplane opposite the navigator's table.

(c) The astrodome defroster control is above the entrance way to the nose compartment.

(d) The controls for the pilot and copilot are above the rudder pedal stirrups.

(e) The windshield defroster is controlled by a knob in the "V" of the windshield.

(f) Heat control for the radio compartment is at the left of the radio operator's chair.

(g) The tail gunner's heat control is on the left side directly opposite the rear escape hatch.

b. SUIT HEATERS.—Ten rheostat controlled receptacles are provided for electric suit heater plugs.

c. AUTOPILOT HEAT.—Autopilot units are on electric heating pads connected to receptacles above the tail wheel and on the autopilot bracket in the tunnel below the copilot.

d. GUN BREECH HEATERS.—Electric heating units are on the breeches of all flexible guns.

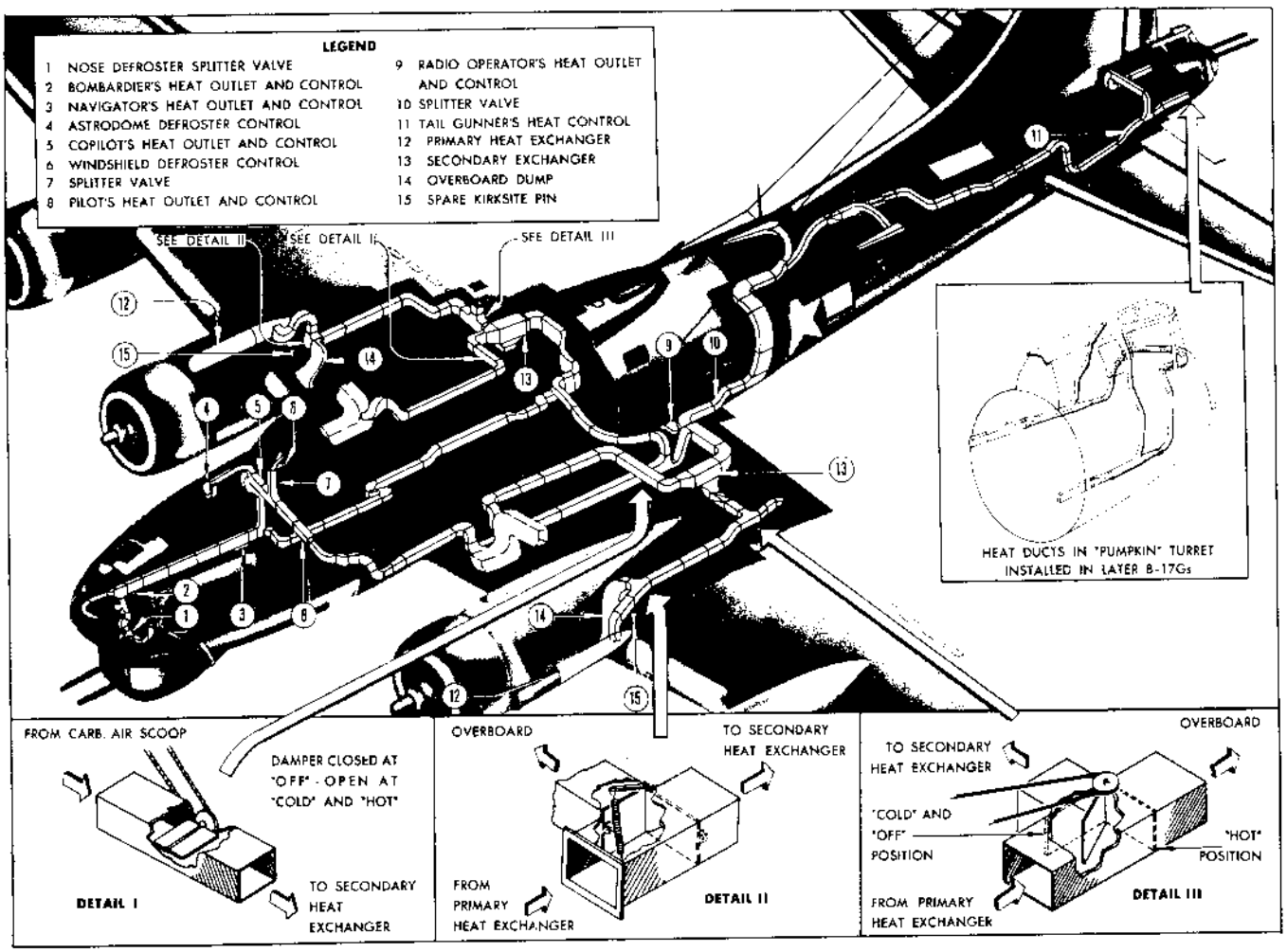


Figure 10—Cabin Air Heating System Diagram

8. VACUUM AND DEICER SYSTEM.

The 2 and 3 engines drive the vacuum pumps. The selector valve on the pilot's sidewall, allows selection of either pump to deflate the boots. The other pump handles all other vacuum equipment. The deicer control valve, when "ON", connects the pressure side of the vacuum pumps to the distributor valve and starts its motors. When "OFF", it by-passes the pressure overboard. This stops the distributor motors.

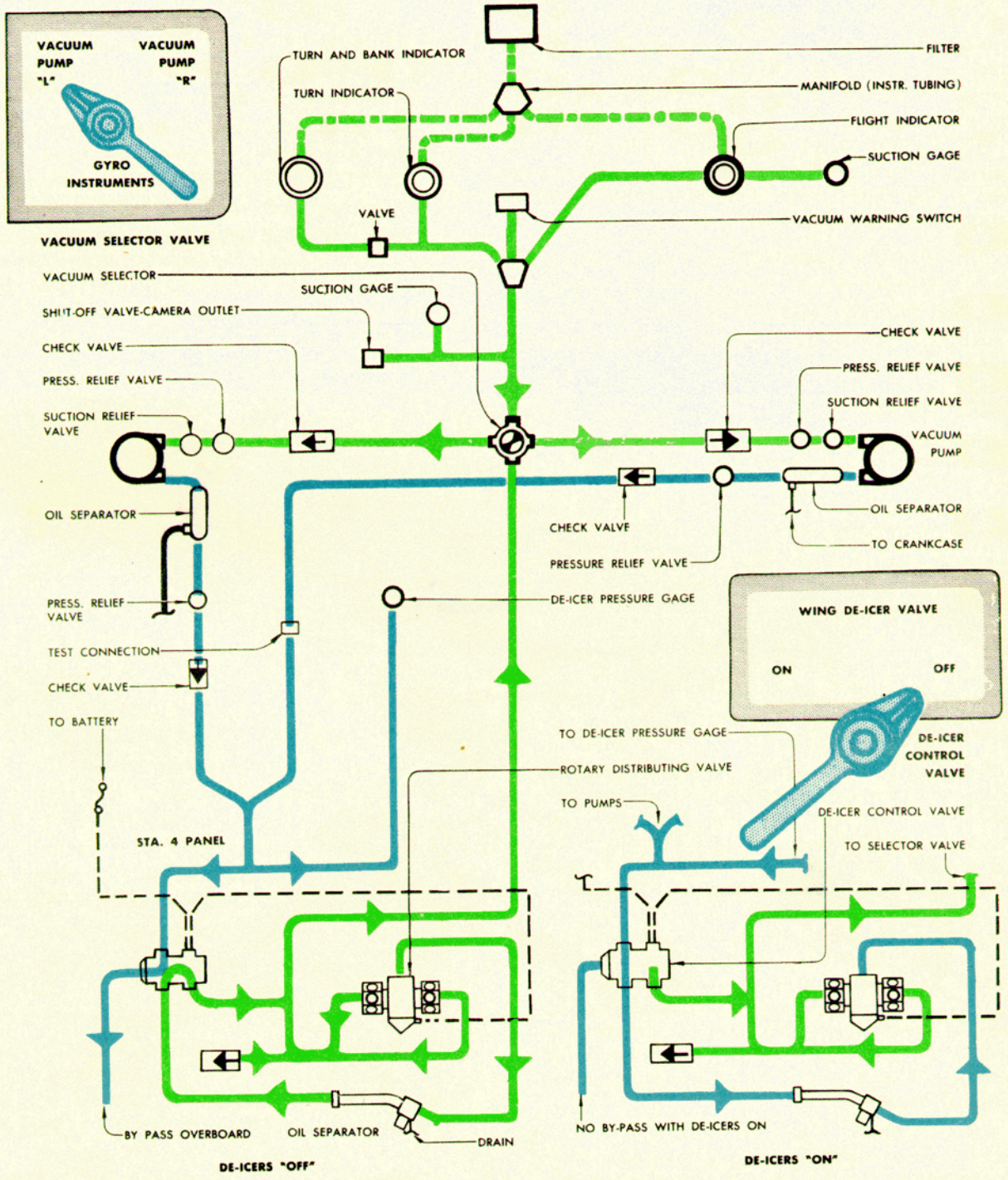


Figure 11—Vacuum and Deicer Flow Diagram

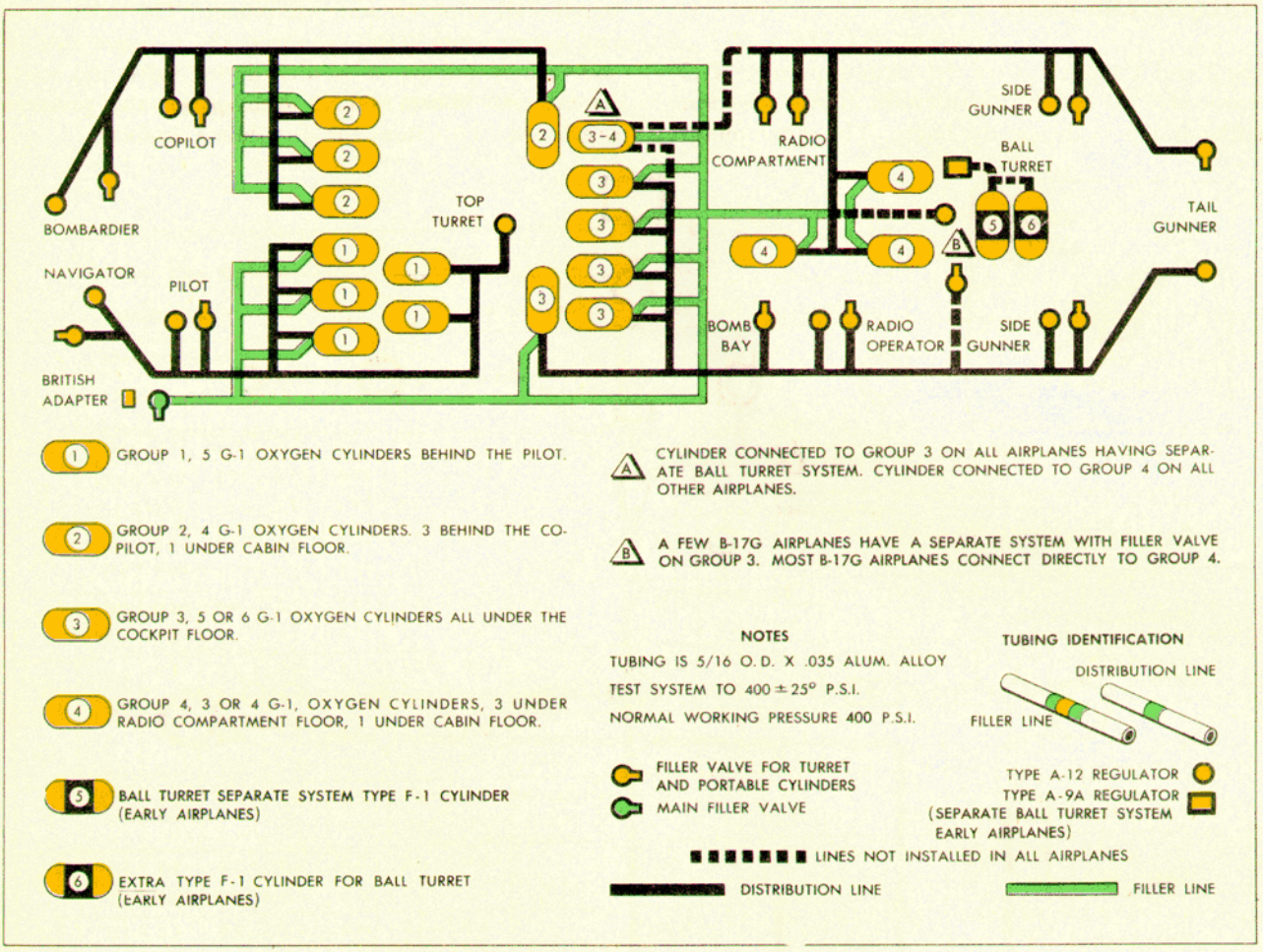


Figure 12—Oxygen Flow Diagram

9. OXYGEN SYSTEM.

a. SUPPLY SYSTEM.—There are four independent oxygen systems, operating at 400 PSI normal pressure. Each system serves a separate portion of the crew thus preventing a complete loss of supply if a distributor line is severed. A check valve at each cylinder prevents loss of system pressure if a bottle is punctured. Eighteen type G-1 bottles (some early airplanes have one or two type F-1 bottles for the ball turret) hold the oxygen supply. The system filler valve is just aft of the forward entrance hatch. Late airplanes have the ball turret directly connected to one of the systems through a swivel gland. Brackets are conveniently located for the walk-around bottles which may be refilled at the recharging valve of any demand regulator or filler station.

b. REGULATORS.—There are A-12 demand regulators and indicator panels at each crew station. Ball turrets have A-9A constant-flow regulators in airplanes having separate turret cylinders.

c. INDICATOR PANELS.—A blinker, on the indicator panel, opens when oxygen flows from the regulator. The blinker closes when the oxygen stops. If the auto-mix is on and the airplane is on the ground, do not be surprised if the blinker shows no oxygen is flowing as the adjustment does not necessarily add oxygen at ground level. The gage shows the pressure for the cylinders supplying that station.

CAUTION

EXERCISE EXTREME CAUTION TO INSURE THAT OXYGEN EQUIPMENT DOES NOT BECOME CONTAMINATED WITH OIL OR GREASE. FIRE OR EXPLOSION MAY RESULT WHEN EVEN SLIGHT TRACES OF OIL OR GREASE COME IN CONTACT WITH OXYGEN UNDER PRESSURE.

MAN HOURS OF AVAILABLE OXYGEN

BLACK FIGURES INDICATE AUTO-MIX "ON"

RED FIGURES INDICATE AUTO-MIX "OFF"

CAUTION—THE AUTO-MIX IN THE OFF POSITION RAPIDLY DIMINISHES THE AVAILABLE OXYGEN SUPPLY. DO NOT USE THIS POSITION UNLESS IT IS NECESSARY TO GET **PURE OXYGEN!**

AIRCO REGULATORS

TYPE A-12

	Alt. Ft. \ Gage Pres.	400	350	300	250	200	150	100	50	
GROUP 1 & 3 (5 G-1 Cylinders)	40,000	41.5 41.5	35.6 35.6	29.4 29.4	23.6 23.6	17.8 17.8	12.0 12.0	5.8 5.8		EMERGENCY
	35,000	29.5 29.5	25.3 25.3	20.9 20.9	16.8 16.8	12.6 12.6	8.5 8.5	4.0 4.0		
	30,000	21.5 22.0	18.5 18.9	15.2 15.6	12.2 12.5	9.2 10.4	6.0 6.2	3.0 3.0		
	25,000	16.5 21.0	14.1 18.0	11.5 14.9	9.0 11.9	7.0 9.0	4.7 6.0	2.0 2.9		
	20,000	13.0 23.5	11.1 20.2	9.2 16.6	7.4 13.3	5.5 10.1	3.7 6.8	1.5 3.2		
	15,000	10.0 28.5	8.6 24.5	7.0 20.2	5.7 16.2	4.0 12.2	3.9 8.2	1.4 3.9		
	10,000	8.0 48.5	6.8 41.7	5.6 34.4	4.5 27.6	3.4 20.8	2.3 14.0	1.1 6.7		
	5,000	6.5 —	5.5 —	4.6 —	3.7 —	2.8 —	1.8 —	1.0 —		
	S. L.	5.5 —	4.7 —	3.9 —	3.1 —	2.3 —	1.5 —	0.7 —		
GROUP 2 & 4 (4 G-1 Cylinders)	40,000	33.2 33.2	28.6 28.5	23.6 23.6	19.0 18.9	14.2 14.2	9.6 9.6	4.6 4.6		EMERGENCY
	35,000	23.6 23.6	20.2 20.3	16.8 16.7	13.4 13.4	10.2 10.1	6.8 6.8	3.4 3.3		
	30,000	17.2 17.6	14.8 15.1	12.2 12.5	9.8 10.0	7.4 7.6	5.0 5.0	2.4 2.4		
	25,000	13.2 16.8	11.2 14.4	9.2 11.9	7.4 9.6	5.6 7.2	3.8 4.8	1.8 3.3		
	20,000	10.4 18.8	9.0 16.2	7.4 13.3	6.0 10.7	4.4 8.1	3.0 5.4	1.4 2.6		
	15,000	8.0 22.8	6.8 19.6	5.6 16.2	4.6 13.0	3.4 9.9	2.4 6.6	1.2 3.2		
	10,000	6.4 38.8	5.4 33.4	4.6 27.5	3.6 22.1	2.8 16.7	1.8 11.2	0.8 5.4		
	5,000	5.2 —	4.4 —	3.6 —	3.0 —	2.2 —	1.4 —	0.8 —		
	S. L.	4.4 —	3.8 —	3.2 —	2.4 —	1.8 —	1.2 —	0.6 —		

PIONEER REGULATORS

TYPE A-12

	Alt. Ft. \ Gage Pres.	400	350	300	250	200	150	100	50	
GROUP 1 & 3 (5 G-1 Cylinders)	40,000	41.5 41.5	35.6 35.6	29.4 29.4	23.6 23.6	17.8 17.8	12.0 12.0	5.8 5.8		EMERGENCY
	35,000	29.5 30.0	25.3 25.8	20.9 21.3	16.8 17.1	12.6 12.9	8.5 8.7	4.0 4.2		
	30,000	21.5 22.5	18.5 19.3	15.2 15.9	12.2 12.8	9.2 9.6	6.0 6.5	3.0 3.1		
	25,000	16.5 22.0	14.1 18.4	11.5 15.6	9.0 12.5	7.0 9.4	4.7 6.3	2.0 3.0		
	20,000	13.0 39.0	11.1 33.5	9.2 26.6	7.4 22.2	5.5 16.7	3.7 11.3	1.5 5.4		
	15,000	10.0 38.0	8.6 32.6	7.0 26.9	5.7 21.6	4.0 16.3	3.9 11.0	1.4 5.3		
	10,000	8.0 37.5	6.8 32.2	5.6 26.6	4.5 21.3	3.4 16.1	2.3 10.8	1.1 5.2		
	5,000	6.5 28.5	5.5 24.5	4.6 20.2	3.7 16.1	2.8 12.2	1.8 8.2	1.0 3.9		
	S. L.	5.5 30.0	4.7 25.8	3.9 21.3	2.3 17.1	2.3 12.9	1.5 8.7	0.7 4.2		
GROUP 2 & 4 (4 G-1 Cylinders)	40,000	33.2 33.2	28.6 28.5	23.o 23.6	19.0 18.9	14.2 14.2	9.6 9.6	4.6 4.6		EMERGENCY
	35,000	23.6 24.0	20.2 20.6	16.8 19.0	13.4 13.7	10.2 10.3	6.8 6.9	3.4 3.3		
	30,000	17.2 18.0	14.8 15.5	12.2 12.8	9.8 10.2	7.4 7.7	5.0 5.2	2.4 2.5		
	25,000	13.2 17.6	11.2 14.7	9.2 12.5	7.4 10.0	5.6 7.6	3.8 7.1	1.8 2.4		
	20,000	10.4 31.2	9.0 26.8	7.4 22.1	6.0 17.8	4.4 13.4	3.0 9.0	1.4 4.3		
	15,000	8.0 30.4	6.8 26.1	5.6 21.6	4.6 17.3	3.4 13.0	2.4 8.8	1.2 4.2		
	10,000	6.4 30.0	5.4 25.9	4.6 21.3	3.6 17.1	2.8 12.9	1.8 8.7	0.8 4.2		
	5,000	5.2 22.8	4.4 19.6	3.6 16.2	3.0 13.0	2.2 9.8	1.4 6.6	0.8 3.1		
	S. L.	4.4 24.0	3.8 20.6	3.2 17.0	2.4 13.7	1.8 10.3	1.2 7.0	0.6 3.3		

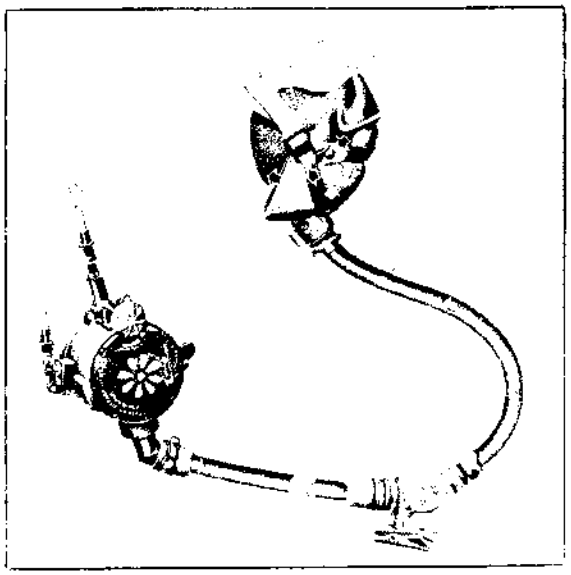


Figure 13—Mask and Regulator

Each crew member has an oxygen mask and an A-12 demand regulator is placed at each crew station. The portable bottles also have regulators.

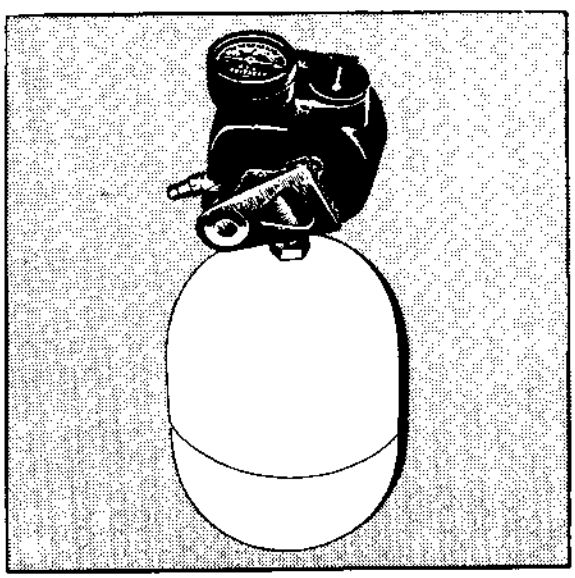


Figure 14—Portable Oxygen Bottle

The portable oxygen bottles each have a mask hose coupling, a recharge valve, and an A-13 demand regulator with an attached suspension clamp.

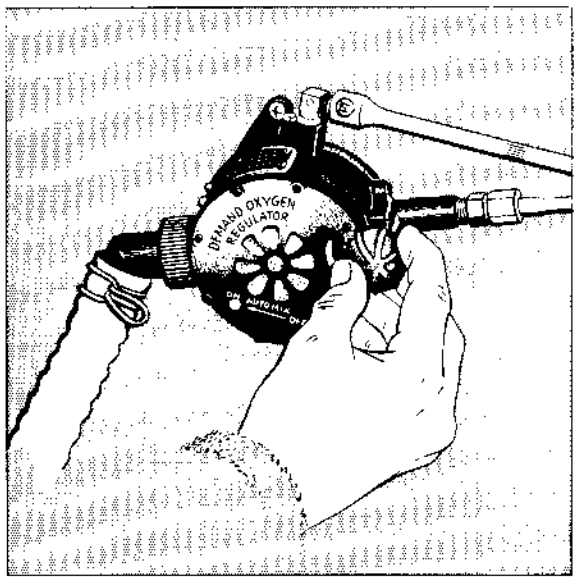


Figure 15—Regulator

When in "AUTO" the A-12 demand regulator supplies the proper mixture of air and oxygen. Altitude determines the percentage of oxygen.

d. USE OF OXYGEN EQUIPMENT.

(1) Have your own mask which has been checked for fit by the oxygen officer.

(2) Carry your bail-out cylinder charged to 1800 pounds.

(3) Check to see that there is a portable "walk-around" unit at each station, filled to 400 pounds, and in working order.

(4) Check system pressure before flight; it should be 400 pounds.

(5) Check function of demand regulator in both "ON" and "OFF" positions. Flow gage should function when auto-mix is "OFF".

(6) Check knurled collar on elbow connecting mask hose to regulator for tightness.

(7) Open emergency valve to check flow; then close. This valve should not be open except in case of emergency.

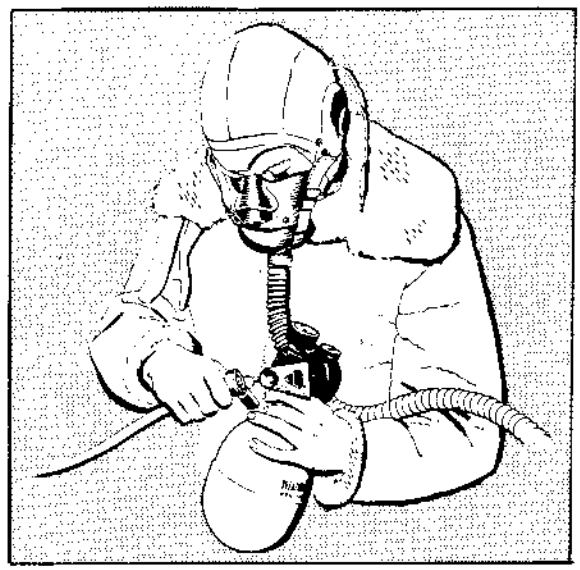


Figure 16—Filling Portable Bottle

To recharge portable bottles, connect recharging nipples to the filler valve on any supply hose in the distributing lines.

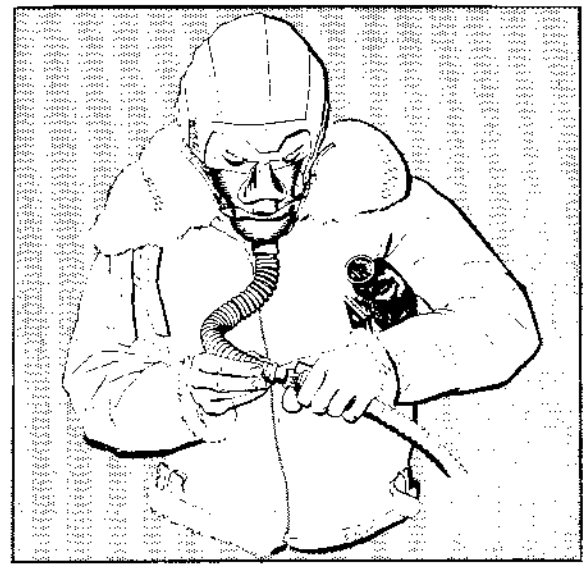


Figure 17—Disconnecting from Regulator

Remove the end connection of the mask hose from the fitting on the end of the feeder hose coming from the demand regulator.

(8) Turn regulator to auto-mix "ON" position.

(9) Use auto-mix "OFF" only—

WHEN OXYGEN OFFICER ADVISES THE USE OF PURE OXYGEN BEFORE TAKE-OFF, IN WHICH CASE, USE IT ALL THE WAY UP AS PROTECTION AGAINST "BENDS"

WHEN TREATING MEN FOR SHOCK, LOSS OF BLOOD, OR AS PROTECTION AGAINST POISONOUS GAS.

(10) Start using oxygen at 10,000 feet. At night use oxygen from ground up, with auto-mix in "ON" position.

(11) In flight above 10,000 feet, always use "walk-around" unit when moving from one station to another.

(12) Remember the "walk-around" unit can be recharged from any main system filler valve.

Figure 18—Connecting Portable Bottle

Open the spring cover of the regulator connection and snap in the male fitting on end of the mask hose. Clamp portable unit to clothing.

10. COMMUNICATION EQUIPMENT.

a. GENERAL.—The radio and interphone systems provide communication between the airplane and ground stations, between the airplane and other airplanes, and between crew members in the airplane. The radio equipment also provides for reception of weather, range and marker beacon signals, automatic direction finding, blind landing guidance, and ground and interplane identification.

b. INTERPHONE SYSTEM.—There are interphone jack boxes at ten places in the airplane. When the selector switch at any station is in the CALL position, that station may be heard at all other stations regardless of the position of their selector switches. If all switches are on INTER, any station may be heard at all other stations. Any station may listen to the command or radio compass receivers or transmit on command transmitter. All stations except radio operator can listen to VHF but only the pilot, copilot, and bombardier can transmit on this radio. Only the radio operator can receive or transmit on the liaison radio equipment. All stations have throat microphones controlled by PUSH-TO-TALK switches on control wheels, gun handles, or cords.

c. OTHER COMMUNICATIONS EQUIPMENT. Instructions for the operation of other equipment will be found in the section covering the compartment where such equipment is installed.

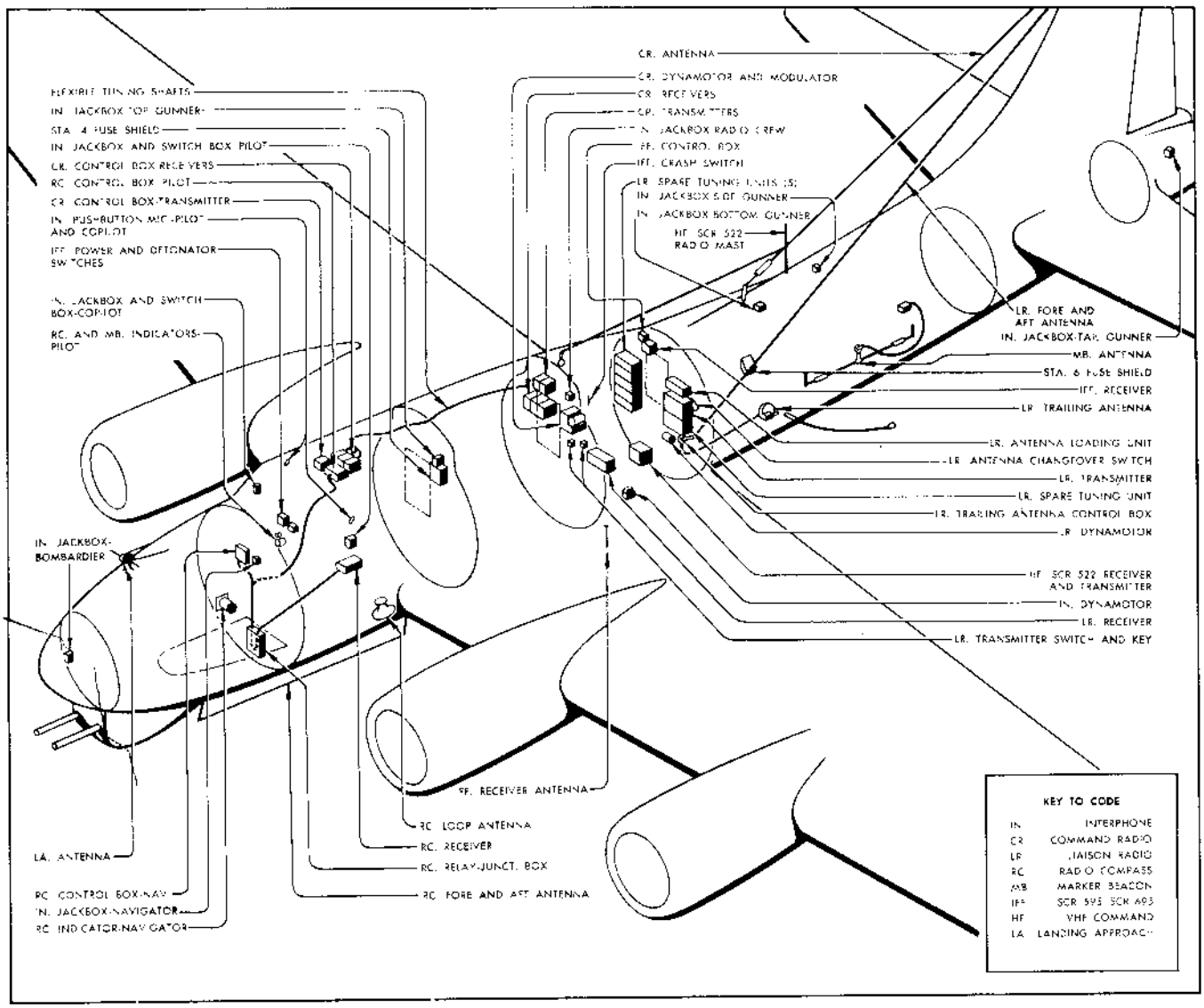
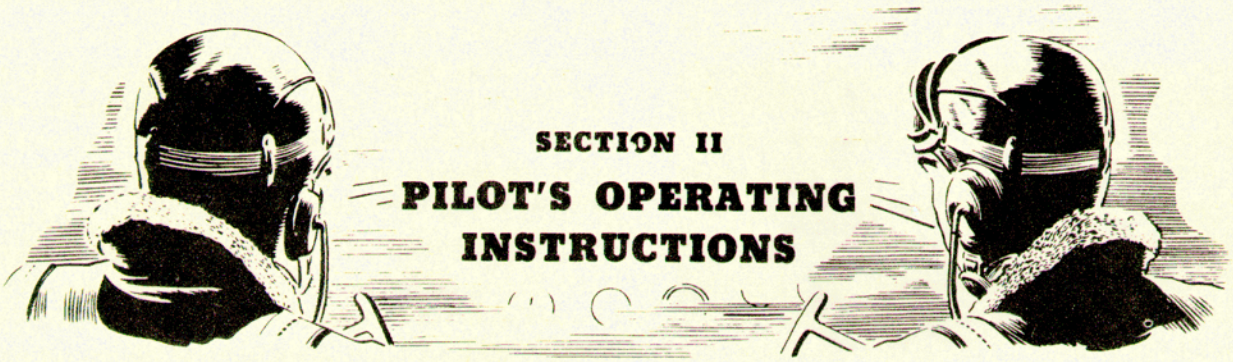


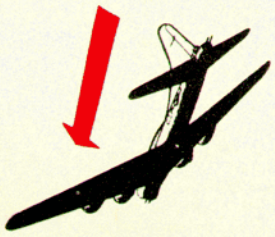
Figure 19—Communications Equipment



SECTION II
PILOT'S OPERATING INSTRUCTIONS

1. RESTRICTIONS.

DON'T lower flaps at speeds in excess of 147 MPH!

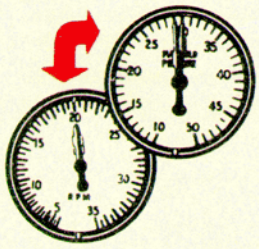


DON'T dive in excess of 270 or 305 MPH as placarded.

WARNING

Military power is limited to 5 minutes under normal conditions. Use for longer periods in emergency cases only.

DON'T exceed 47.5 inches HG manifold pressure!



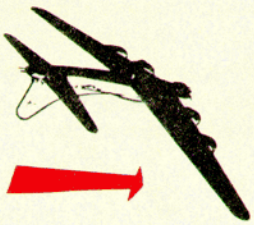
DON'T exceed 30 inches HG below 2100 RPM!

DON'T stall the airplane! (Except for training purposes.)

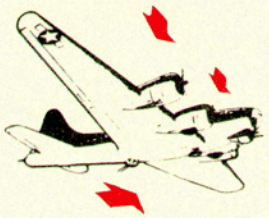
DON'T spin!

DON'T roll!

DON'T loop!



DON'T attempt inverted flight!



Don't fly the airplane at maximum gross weight (64,500 pounds) UNLESS auxiliary wing tanks are full!

CAUTION

All power settings given in this section are for use with 100 octane fuel only. See appendix III for restrictions to be observed when using 91 octane fuel.

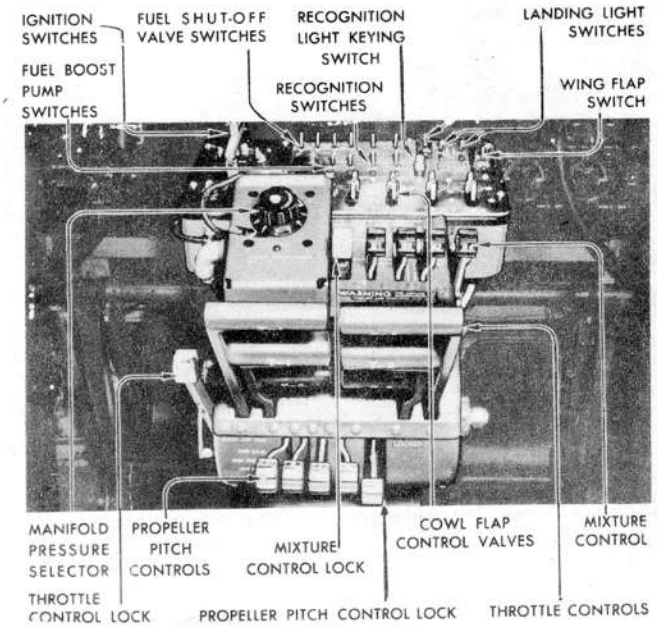


Figure 20—Engine Control Stand

2. OPERATIONAL EQUIPMENT.

a. CENTRAL CONTROL PANEL AND AISLE STAND.

(1) WING FLAP AND LANDING GEAR CONTROLS.—The wing flap motor is controlled by a toggle switch on the aisle stand. At 147 MPH, it takes from 15 to 30 seconds to lower the flaps. Do not lower wing flaps at speeds above 147 MPH.

WARNING

IN RETURNING THE SWITCH FROM "DOWN" TO "OFF" BE SURE THE TOGGLE SWITCH DOES NOT SNAP TO "UP." THIS WOULD IMMEDIATELY RETRACT THE FLAPS.

(2) LANDING GEAR.—A toggle switch above the salvo switch at the top center of the instrument panel operates the landing gear. The green indicator lamp lights when the landing gear is fully extended.

(3) COWL FLAP VALVES.—Four valves on the aisle stand control the cowl flaps (one for each nacelle). Turn the valve to "LOCKED" when the flap is properly adjusted. The flaps will travel slowly if the valve is slightly "cracked." This aids in making close adjustments.

(4) FUEL BOOST CONTROLS.—Four toggle switches on the aisle stand control the fuel booster pumps. These pumps supply pressure for starting and priming and prevent vaporization due to hot fuel, and high altitude.

(5) FUEL SHUT-OFF VALVE SWITCHES.—Four toggle switches on the aisle stand control the fuel shut-off valve solenoids, and permit the fuel to be shut off at the tank if the line is severed. If the electric power fails, the valves open.

(6) IDENTIFICATION LIGHTS.—Two switches and a keying button permit signalling with any combination of the four lights.

(7) PROPELLER FEATHERING SWITCHES.

(a) Four red push button switches on the instrument panel control propeller feathering. When the switch is pushed, the feathering pump supplies oil pressure for the operation. The switch releases when the propeller is feathered and the process may be stopped any time by pulling the switch button by hand.

(b) To unfeather, hold the switch button in until the propeller is in the governing range.

NOTE

When unfeathering a propeller on a cold engine set the RPM control for minimum governor speed until oil pressure and temperature are satisfactory. Turn off ignition after feathering if the engine is to remain inoperative any length of time. Don't operate more than one feathering switch at a time, except in emergency.

(8) TURBOSUPERCHARGER CONTROLS.

(a) GENERAL.—The B-17G has the Minneapolis-Honeywell Electronic Turbosupercharger Control System. A knob, on the pilot's aisle stand, controls the manifold pressure and turbo RPM of all four engines at once. If the pilot wishes to reduce the manifold pressure on any engine he may do so by retarding the throttle.

1. The divisions on the manifold pressure selector dial are numbered from "0"-"10". Turn the dial clockwise to close the waste gate and increase the manifold pressure. Under normal conditions the dial range from 0 to 8 will satisfy all requirements. The numbers 9 and 10 are for emergency only.

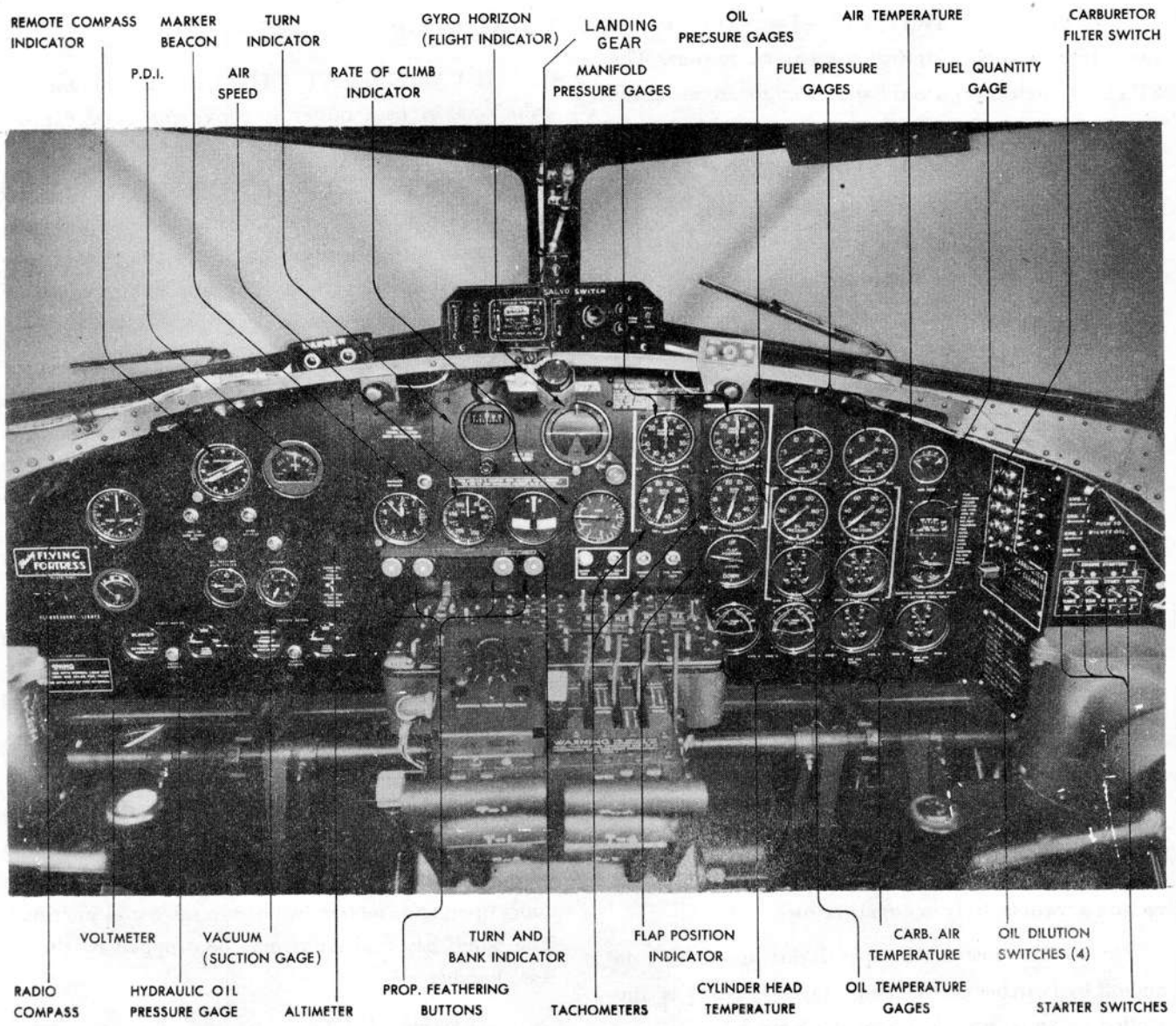


Figure 21—Pilot's Instrument Panel

b. COPILOT'S AUXILIARY PANEL.

(1) CARBURETOR AIR FIILTER CONTROLS.

(a) A double throw toggle switch on the auxiliary panel controls the carburetor air filter valve motors. Four amber lights show when the filters are ON and the valves open, and four green lights show when they are OFF. If a lamp fails to light, its valve has not completely opened or closed.

(b) Keep the air filters ON for every operation below 15,000 feet.

(2) OIL DILUTION SWITCHES.

(a) The four momentary contact switches operate valves which admit fuel to the oil lines. When oil dilution is necessary after an engine run, do not attempt dilution unless oil temperature is 40°C (104°F) or below. If this limit is exceeded, stop the engine and allow to cool well below 40°C. Then restart engine and proceed with dilution.

(b) Dilution time chart is on the switch panel. During dilution, move the propeller control from extreme increase to extreme decrease RPM slowly several times to fill the propeller feathering system with diluted oil and prevent sluggish operation at next start.

(3) STARTER SWITCHES.—Two START and two MESH switches control the engine starters. The START switch energizes the starter motor, rotating the inertia flywheel. The MESH switch engages the starter and engine jaws while the START switch is held on.

(4) PARKING BRAKES.—The parking brakes use the regular braking system and so must have minimum system pressure (400 PSI) to be effective. The handle is at the bottom of the instrument panel. Do not set the parking brake while the brake drums are hot as it may damage the brakes.

(5) FUEL INDICATOR.—The fuel indicator (liquidometer) on the extreme right of the instrument panel will show the amount of fuel in any of the six main tanks. A six position switch, below the indicator, selects the tank to be checked. Fuel in the Tokyo tanks is not shown until transferred into the main tanks.

(6) INSTRUMENT LIGHTING.

(a) Three spot lamps light the instrument panel and a fourth on the ceiling lights the compass panel. Two types of light are available: for flood lighting with visible fluorescent light, rotate the shutter to the left; for ultra-violet activation of the luminous pain on the instrument dials, rotate the shutter in the opposite direction approximately one-quarter turn.

(b) The instrument spot lights are turned on and off by switches on the lamps. Light intensity is controlled by an adjustable iris in the lamp.

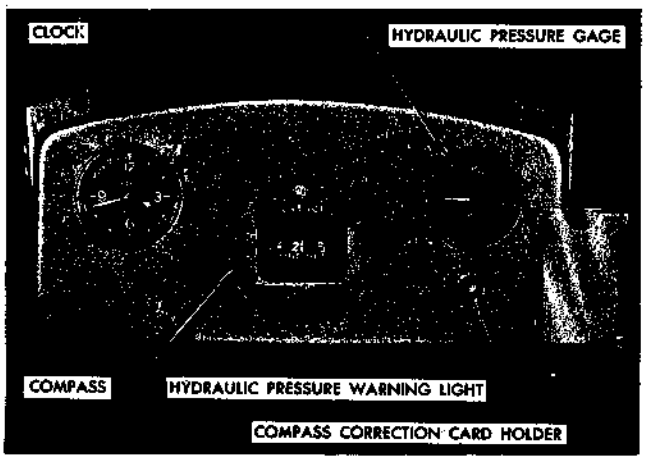


Figure 22—Pilot's Ceiling Instruments

c. CONTROLS AT PILOT'S LEFT.

(1) CABIN HEAT OUTLET.—Control for the pilot's cabin heat outlet is above the rudder pedal stirrups.

(2) VACUUM PUMP CONTROL.—The "GYRO INSTRUMENTS" selector valve on the side wall permits use of either vacuum pump for the gyro instruments, suction from the other pump being connected to the surface deicer system. *(See figure 11.)*

(3) DEICER CONTROL.—The deicer valve on the floor panel controls the surface deicer boots. When "ON", it starts the deicer distributor and connects the pressure from both vacuum pumps and the suction from one to the distributor valve. When "OFF", the distributor motor is stopped, the pressure is by-passed overboard, and the suction from one pump keeps the boots deflated.

(4) PROPELLER ANTI-ICER CONTROL.—Two rheostats on the floor panel are used to turn the propeller anti-icer pump motors on and off and to control their speeds.

(5) EMERGENCY BOMB RELEASE.

(a) Early B-17G's have emergency bomb release handles at the pilot's left, and on the front bulkhead in the bomb bay. When either handle is pulled the doors open and the bombs drop in salvo and unarmed. The bomb bay fuel tanks may be dropped by the release handle.

(b) Later B-17G's have the all-electric bomb control system. Three toggle switches, one on the bombardier's panel, one above the copilot's instrument panel, and the third on the forward bulkhead in the bomb bay, allow emergency release of the bombs. Any one of these switches opens the bomb doors electrically and releases the bombs when the doors reach 4 inches from full open. The entire operation takes about 12 seconds. In addition a manual bomb door release is provided on the front bulkhead of the bomb bay. The manual release does not salvo bombs or bomb bay tanks.

(6) LANDING APPROACH CONTROL.—The landing approach control box is aft of the interphone jack box. The unit controls both the RC-103 localizer and AN/ARN-5 glide path receiver.

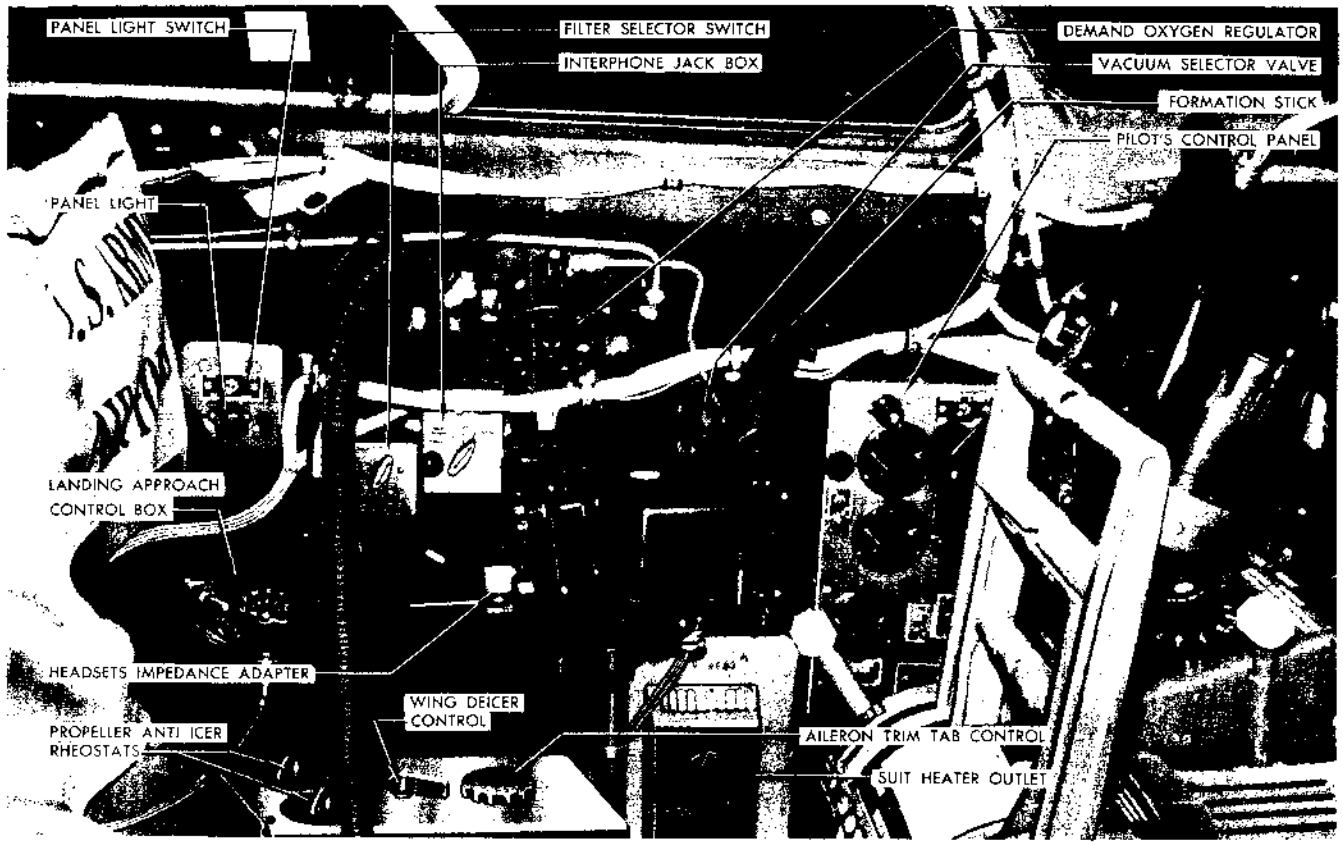


Figure 23—Controls at Pilot's Left

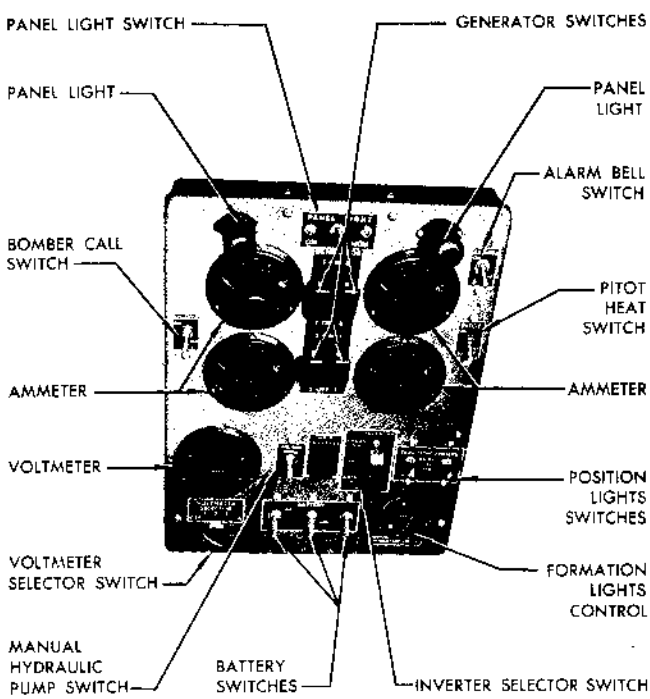


Figure 24—Pilot's Control Panel

d. PILOT'S CONTROL PANEL.

(1) ALARM BELL.—The navigator's station, radio compartment, waist compartment, and tail section have alarm bells which are operated by a switch on the pilot's panel.

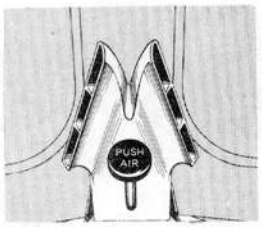
(2) BOMBARDIER CALL.—A switch on the pilot's panel operates the bombardier's call light.

(3) GENERATOR CONTROL SWITCHES. Four switches on the pilot's panel control the generator relays in each nacelle which connect the generator to the DC power bus.

(4) BATTERY SWITCHES.—Three switches on the pilot's panel control the solenoid switches in the battery compartments which connect the batteries to the DC power bus.

(5) INVERTER SWITCH.—Late airplanes have an automatic changeover relay which switches to the "SPARE" inverter if voltage output of the "MAIN" inverter falls below 70 volts. The switch should be on "SPARE" for relay check when making the battery check-out. If everything is in order, the switch should be turned to "MAIN" for the starting procedure. When "MAIN" is switched to "SPARE", allow two minutes before returning the switch to "MAIN", allowing relay to cool and thereby prevent its jamming.

(6) HYDRAULIC PUMP SWITCH.—This switch automatically keeps the pressure between 600 and 800 PSI. If the automatic pressure feature fails, hold the switch in MANUAL to maintain cut-out pressure.



e. DEFROSTER CONTROL.—A red button, in the vee of the windshield, controls the hot air for defrosting the pilot's and copilot's windshields.

f. TRIM TAB CONTROLS.

(1) Turn the knob on pilot's floor panel 3 3/4 turns for complete aileron tab travel.

(2) Turn the wheel on the floor in front of the control pedestal seven turns for complete rudder tab travel.

(3) Turn the wheel on the left side of the control pedestal about six turns for complete elevator tab travel. It has a friction brake to prevent creeping.

g. LOCKS.

(1) AILERON LOCK.—A forked pin, clipped to the pilot's control column, locks the aileron in a neutral position when inserted in the hole in the left control column over the center spoke of the control wheel.

(2) RUDDER AND ELEVATOR LOCK.—When the left-hand lever in the floor aft of the engine control stand is pulled up, the rudder will lock when moved to neutral and the elevator will lock when placed in the down position. The lever itself has a spring lock to hold it either up or down.

(3) When the right-hand lever on the floor aft of the engine control stand is down, the tail wheel will lock when centered. A spring plunger locks the lever in the up position.

h. AUTOMATIC FLIGHT CONTROL EQUIPMENT.

(1) C-1 AUTOPILOT. — The autopilot control panel is on the aft side of the lower control stand. To engage the autopilot:

(a) Turn "ON" master and stabilizer switches.

(b) CAREFULLY TRIM AIRPLANE FOR STRAIGHT AND LEVEL FLIGHT.

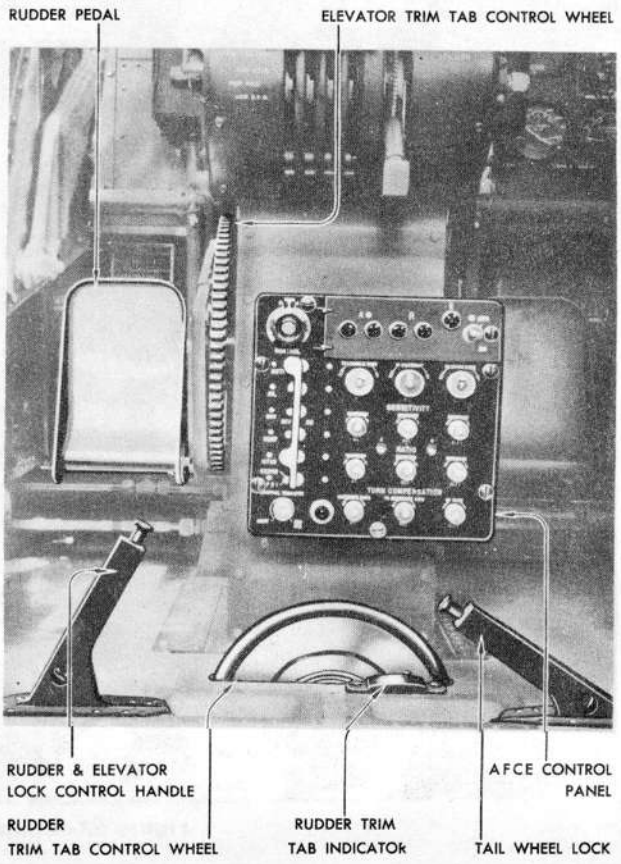


Figure 25—Lower Control Stand

(c) Turn "ON" tell-tale lights.

(d) After master and stabilizer switches have been "ON" for 10 minutes, switch "ON" PDI and servo switches.

(e) Center PDI by turning airplane and resuming straight and level flight.

(f) With PDI on "ZERO," adjust rudder centering knob until both rudder tell-tale lights go out. Immediately turn rudder switch "ON."

(g) With wings level, adjust aileron centering knob until both aileron tell-tale lights go out. Immediately turn aileron switch "ON".

(h) With airplane flying level, adjust elevator centering knob until both elevator tell-tale lights go out. Immediately turn elevator switch "ON".

(i) Observe PDI, artificial horizon, and rate-of-climb or altimeter instruments. Then carefully retrim all centering knobs until airplane is flying as straight and level as possible, with PDI on center.

(j) With autopilot engaged, all course corrections must be made with turn control ONLY. Always turn knob with a slow steady movement.

WARNING

Do not engage rudder, aileron, or elevator switches until their respective tell-tale lights go off.

(2) FORMATION STICK CONTROL (Late Airplanes).—A formation stick for easily maneuvering the airplane through the autopilot is located on the left of the pilot and the right of the copilot.

(a) OPERATING PRECAUTIONS.

1. Check the PDI on zero before turning the function selector to "ON SERVO BOOST".

2. When flying with selector at "ON SERVO BOOST" the autopilot has no control, and the pilot must fly the airplane with the formation stick just as he would with manual controls.

3. Do not use the autopilot turn control when the function selector is at the "ON SERVO BOOST" position.

4. To avoid tumbling the gyro, never bank the airplane more than 40 degrees. But, in an emergency if a 40-degree bank has been exceeded, hold the plane in level flight for 10 minutes before turning the function selector away from the "ON SERVO BOOST" position. This will allow the gyro to erect itself again.

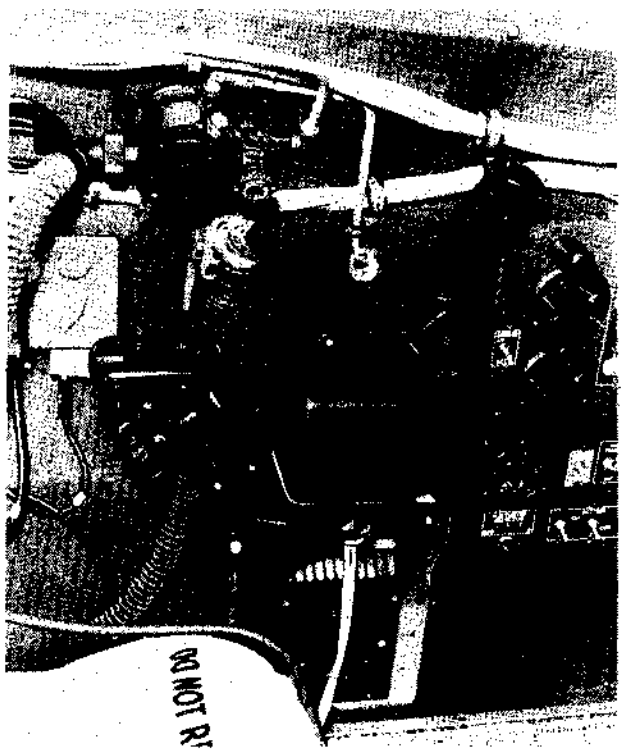


Figure 25A Pilot's Formation Stick

i. PILOT'S OPERATING INSTRUCTIONS.

(1) BEFORE TAKE-OFF.—Be sure the autopilot master switch and the formation stick function selector are both in the "OFF" position.

(2) AFTER TAKE-OFF. — Engage autopilot in regular way.

(3) COORDINATE BOMBARIER'S TURNS.—Coordinate bombardier's turns with "TURN COMPENSATION" knob on the autopilot control panel.

(4) CHECK TURN COORDINATION.—If turn-control turns are not coordinated, adjust the aileron and rudder turn control trimmers on the autopilot control panel.

(5) ENGAGE THE FORMATION STICK.—Turn the formation stick function selector (figure 25B) to "ON SERVO BOOST," "ON," or "ON" ELEV. ONLY," depending upon the type of operation desired, press the transfer button on the stick to be used, and then maneuver the airplane by moving the stick as explained in the following paragraphs.

(a) "ON SERVO BOOST" POSITION.—Used when flying a wing position in a tight formation or when quick maneuvering is desired. Move the stick to maneuver the airplane as a manual control stick would be moved. Rudder is automatically coordinated with aileron control. Ratio can be adjusted to coordinate the controls while going in and cut of turns.

(b) "ON" POSITION.—Used when in a wing position of a loose formation, or when very little maneuvering is desired, such as for cross-country course corrections. In the "ON" position, handle the stick as follows:

1. STRAIGHT - AND - LEVEL FLIGHT.—Leave the stick in center, and the autopilot will automatically maintain straight-and-level flight.

2. TO CLIMB OR GLIDE.—Move the stick backward or forward as necessary to get the desired change in altitude, and hold it there until ready to return to level flight.

3. TURNS.—For a right turn, move and hold the stick to the right for the desired bank (maximum bank is 25 degrees) and return stick to center when turn is complete. Left turn is executed in the same manner except that stick is moved to the left.

Note

The autopilot gives some up-elevator in a turn automatically, but more elevator action can be accomplished by moving the stick backward or forward.

(c) TO CHANGE FROM "ON SERVO BOOST" POSITION TO "ON" OR "OFF" POSITION.—Hold the airplane level while changing the selector from one position to another.

(d) TO CHANGE FROM "ON" OR "OFF" TO "ON SERVO BOOST".—Make sure that the PDI is on zero before changing from any position to "ON SERVO BOOST."

(6) ON ELEV. ONLY.—Use this position when the bombardier has control.

(a) Hold the stick back of center to climb and forward to glide. Movement of the stick to right or left will have no effect.

(b) Turns may be made by the directional panel (bombardier) or by the autopilot turn control.

(7) "OFF" POSITION.—To fly the airplane on autopilot without using the sticks, turn the function selector to the "OFF" position.

(8) TO TRANSFER CONTROL.

(a) Only one stick can be engaged at a time. To transfer control from pilot to copilot, press the button on top of the copilot's stick. Release the button immediately, as only a momentary contact is needed.

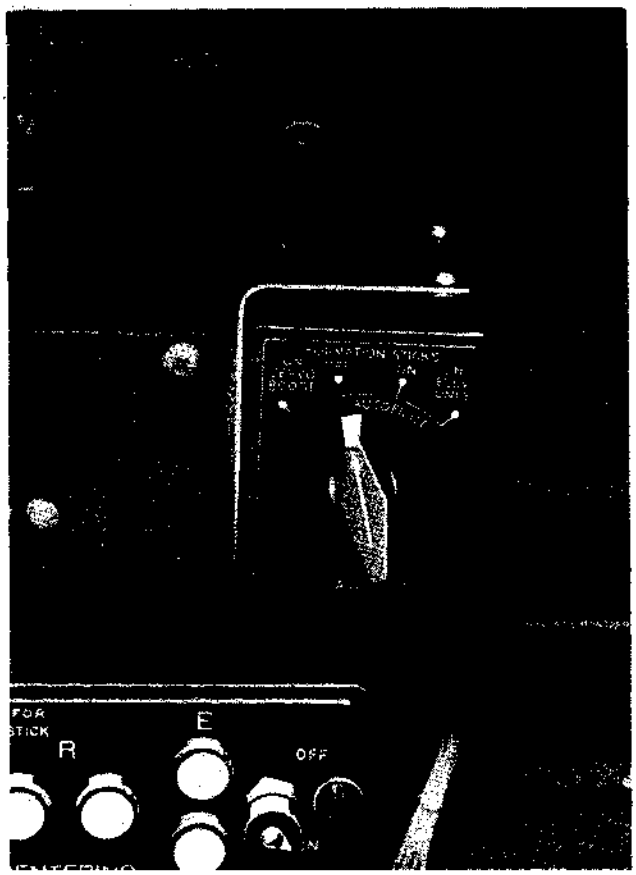


Figure 25B—Function Selector

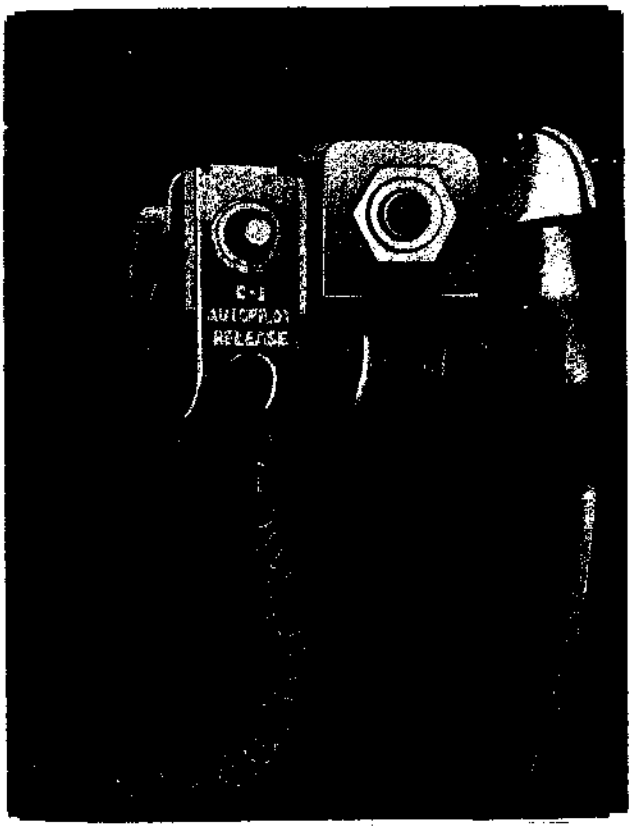


Figure 25C—Autopilot Release Switch

(b) The pilot can take control from the copilot y pressing the button on the pilot's stick.

(c) If the pilot and copilot both press at the same time the pilot's stick will gain control.

Note

When autopilot is first engaged the pilot's stick has control first, no matter how the selector is positioned, and regardless of which stick had control when the autopilot was disengaged. The selector can be moved without transferring the control from either stick.

(9) TO RELEASE THE AUTOPILOT.—Press either of the two autopilot release switches momentarily; the autopilot servos will disengage immediately and return the airplane to manual control.

(10) TO RE-ENGAGE THE AUTOPILOT FOLLOWING OPERATION OF THE RELEASE SWITCH.—Snap the autopilot master switch off; then manually retrim the airplane and re-engage the autopilot in the regular way. If the release switch is pressed accidentally, the autopilot can be re-engaged immediately by snapping the master switch off, then

right back on again, and throwing on the remaining autopilot switches without the usual adjustments. This quick re-engagement can be used only if the stick is not moved while the autopilot is disengaged.

(11) TO USE THE MICROPHONE.—Squeeze the trigger on the front of the stick while talking.

(12) LANDING.—It is not advisable to use the formation stick for landings unless the manual controls are inoperative, because the stick does not provide separate aileron and rudder control and it also limits the range of control surface movement.

Note

Do not use the formation sticks as a means of support when getting in or out of seats.

f. CONTROL AT COPILOT'S RIGHT.

(1) PRIMER.—The primer control has five positions (one for each engine and an OFF position in which the primer handle is locked). To operate, push the handle down, turn the control (valve) to the proper position, and pump the charge to the engine.

IMPORTANT

Don't leave the primer handle out. Pressure from the No. 3 fuel booster pump is on the suction side of the primer and overpriming will result if the priming operation is not ended with the handle in the locked (OFF) position.

(2) CARBURETOR TEMPERATURE CONTROLS.—The intercooler shutters are controlled from a stand in front of the copilot. Each cable is operated by a slide, latching in any desired position. To release the latch, pull handle out.

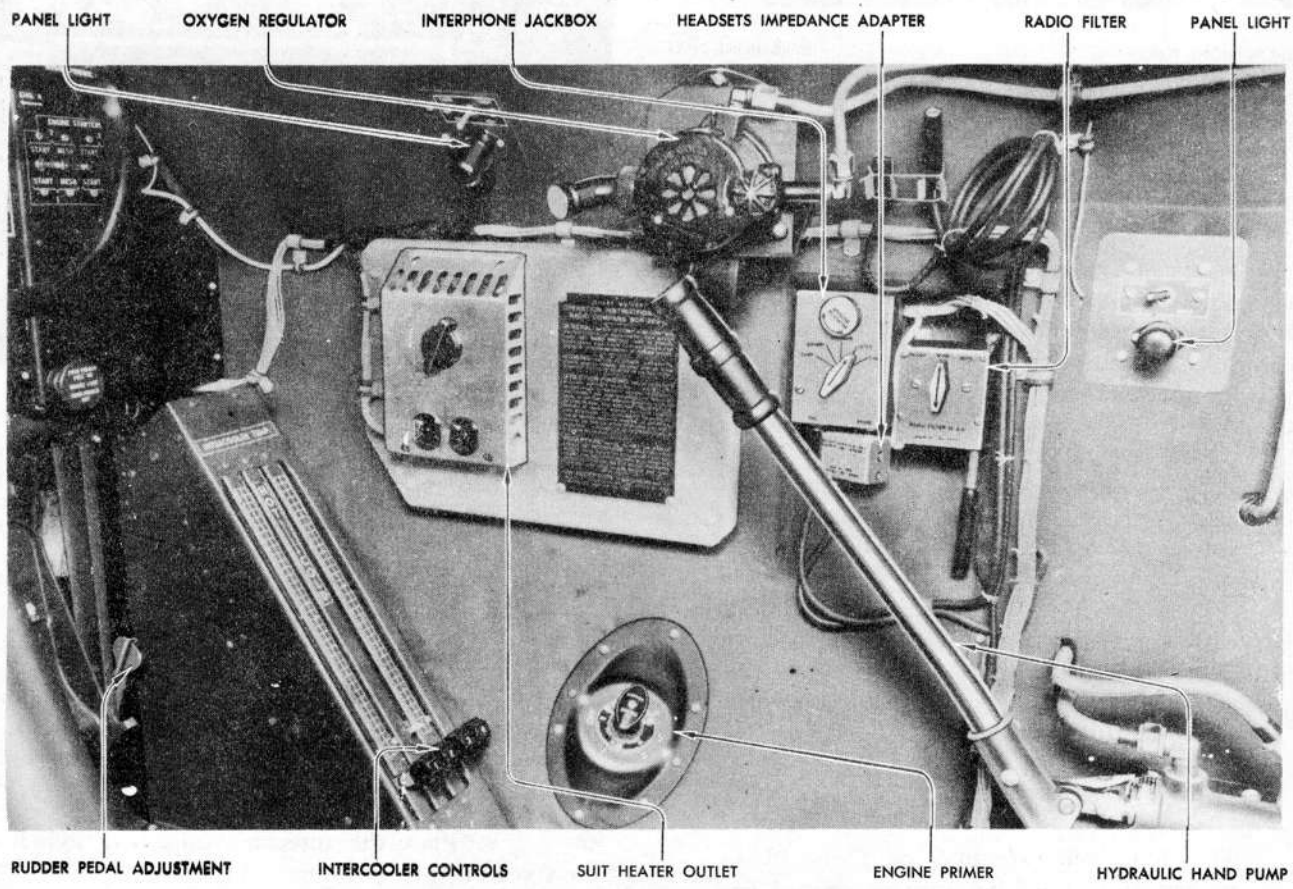


Figure 26—Controls at Copilot's Right

(3) HYDRAULIC HAND PUMP. — The hydraulic hand pump furnishes pressure in case the electric pump fails.

(4) KEY CASE.—The key case on the side wall contains two keys which fit all locks in the airplane.

j. RUDDER PEDAL ADJUSTMENT. — Rudder pedal tilt may be varied to any of five positions by a locking pin and sector at the outside corner of each pedal.

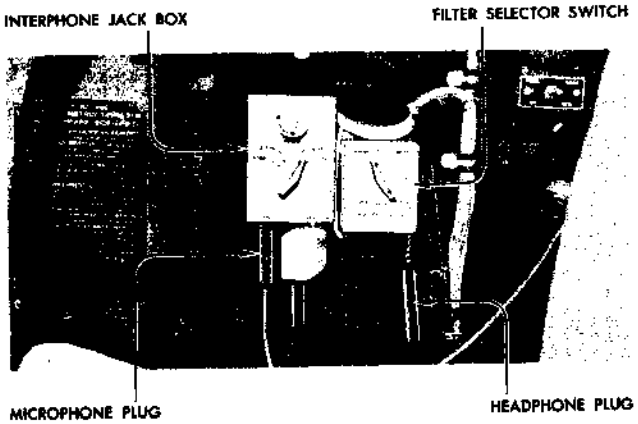


Figure 27—Microphone and Headset Plugs

k. PILOT'S COMMUNICATION CONTROLS.

(1) GENERAL.

(a) All communications equipment may be operated to some extent from the pilot's compartment. Receiver and transmitter frequency selection may be controlled with the exception of the liaison equipment which must have both its transmitter and receiver frequencies set by the radio operator.

CAUTION

For normal operation of all communications equipment, the filter selector switch should be set at "BOTH." To receive the radio range without possibility of voice interference, set the selector switch to "RANGE." To receive voice without range interference, set selector switch to "VOICE."

NOTE

The head set extension cord should be plugged into the filter selector control box as shown in figure 27, and not into the interphone jackbox or the receiver control box.

IMPORTANT

When the throat microphone is being used for either interphone or radio communication, it must be adjusted so that its two circular elements are held snugly against each side of the throat just above the "Adam's apple." SPEAK SLOWLY, DISTINCTLY, AND IN A NORMAL TONE OF VOICE. Shouting will seriously distort the voice signal.

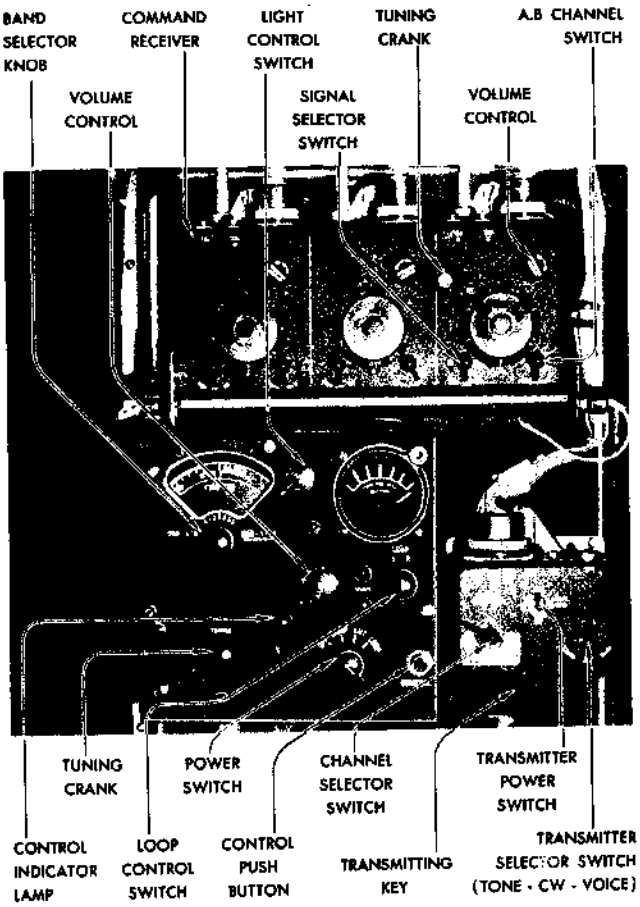


Figure 28—Radio Controls Pilot's Compartment Ceiling

(b) A possible means of limiting noise level in all radio equipment, caused by adverse conditions such as rain, snow, ice, or sand, is to direct the radio operator to proceed as follows:

1. Place the antenna change-over switch to the fixed antenna position.

2. Release approximately 50 feet of the trailing wire antenna.

3. Ground the trailing wire antenna post directly to the airplane structure (for instance, the metal support for the transmitter tuning units).

(2) INTERPHONE EQUIPMENT AN/AIC-2. An interphone jack box is provided for both pilot and copilot. (refer to Section I, paragraph 10.)

(3) COMMAND SET SCR-274-N.—The command set is designed for short-range operation and is used for communicating with nearby aircraft for tactical purposes and with ground stations for navigational and traffic control purposes.

(a) RECEIVING.—The interphone jack box *(figure 23)* switch must first be placed in the "COMMAND" position. The receiver control box *(figure 28)* is divided into three sections, each controlling the particular receiver to which it is connected. Reception of a signal of a specific frequency as indicated on the dial is accomplished by the use of the section of the receiver control box which controls the particular receiver involved. The desired receiver is turned on and off by a switch in the left forward corner of the control box section used. This switch, in addition to having an "OFF" position, has two selective positions marked "CW" and "MCW", which indicate the type of signal which is to be received. The "A-B" switch should be left in the "A" position at all times and need not be turned off when the receivers are turned off.

Note

When tuning receiver for a definite frequency, always turn dial a little to each side of the frequency calibration mark to find the point where the signal is strongest.

(b) TRANSMITTING.

1. Before transmitting, adjust radio receiver to the same frequency as the station with which you desire to talk, and listen in to be sure that the operator is not talking to someone else. If the station is transmitting, take advantage of the opportunity to more accurately set the airplane receiver on the assigned frequency, and when the other operator is finished, proceed with your transmission.

2. Throw the "OFF-ON" switch *(figure 28)* on the transmitter control box to the "ON" position. Select type of transmission desired with switch marked "TONE-CW-VOICE". With the switch in the "VOICE" position, the microphone from any interphone jack box switched to "COMMAND" position will be operative and voice will be transmitted when the push-to-talk button on the control wheel is pressed. With the switch turned to the "CW" position, a continuous wave, or unmodulated signal, will be transmitted. Greatest effective range can be obtained on "CW". Range is most limited when operating on "VOICE".

3. On both the "CW" and "TONE" positions, the mircophones are inoperative, and signaling by code is accomplished by a key which is located on the forward end of the transmitter control box.

Note

To reduce battery drain and to increase dynamotor life, the "TONE-CW-VOICE" switch should be left on "VOICE" unless continued use on "CW" or "TONE" is expected.

(4) VHF COMMAND SET SCR-522.—The VHF set is designed for short range, line-of-sight transmission and is used for communicating with near-by aircraft and ground stations. A push button panel on the central control stand provides selection of four crystal controlled frequencies by remote control of the transmitter-receiver unit in the camera well. All stations except the radio operator can receive, but only the pilot, copilot, and bombardier can transmit on VHF.

(5) RADIO COMPASS AN/ARN-7.

(a) Set the interphone jack box switch *(figure 27)* to the "COMP" position, if aural reception of the radio compass receiver is desired. If only visual indication is desired, the switch does not have to be set in the "COMP" position.

(b) The radio compass equipment is designed to perform the following functions:

1. Aural reception from the fixed antenna or from the rotatable loop. For signal reception during interference caused by precipitation static or proximity of signals, the loop will prove superior.

2. Aural-null directional indication of an incoming signal with the loop only in use.

3. Visual unidirectional indication of an incoming signal.

(c) The receiving unit is turned on or off by a switch on the face of the remote control box, which in addition to having an "OFF" position, has three other positions: "COMP", "ANT", and "LOOP".

1. With the switch in "COMP" position, both rotatable loop and fixed antenna are in use.

2. In the position marked "ANT" only the fixed antenna is in use.

3. With the switch turned to the "LOOP" position, only the rotatable loop is in use.

(d) If the green indicator on the face of the control box does not light, depress button marked "CONTROL" to establish control of the set by this unit. Select frequency band desired as indicated in kilocycles on the face of control box and tune by use of the crank to the desired frequency. The loop may be rotated to any position as indicated on the radio compass azimuth indicator by use of switch marked "LOOP L-R". *(See figure 43.)* This particular operation is possible only when operating on "LOOP" position of the selector switch. During periods of severe precipitation static, operate on "LOOP". For best aural reception rotate the loop by means of the "LOOP L-R" switch until a maximum signal is obtained. Proper volume may be obtained by use of the knob marked "AUDIO".

(6) LANDING APPROACH EQUIPMENT SCR-570.—The landing approach control box on the sidewall beside the pilot controls the RC-103 Localizer and AN/ARN-5 Glide Path receivers under the copilot's seat. A visual indicator is on the pilot's instrument panel.

(7) LIAISON SET SCR-287.—The liaison equipment is to be used for long-range communication. The type of reception and transmission desired must be forwarded to the radio operator, who will in turn put the radio equipment in operating condition. Only the radio operator can receive or transmit on this equipment.

(8) RADIO SET SCR-695 (IFF).—The remote "OFF-ON" switch for this equipment is located on the top of the instrument panel hood. The two destroyer push-button switches are located to the left of the "OFF-ON" switch. The destroyer switches should be used only when it is contemplated abandoning the airplane over enemy territory. When both destroyer push-buttons are pressed simultaneously, a detonator is set off in the received which is located in the waist compartment. The explosion of the detonator will destroy the receiver internally. No damage should be done to either the airplane or personnel at the time of destruction of the set, but bodily contact with the receiver at the time of detonation should be avoided.

Note

Regeneration adjustment of the IFF set must be made on the ground prior to flight in order to insure correct operation of equipment.

(9) MARKER BEACON EQUIPMENT RC-43. Since the operation of the marker beacon equipment is fully automatic, no manual operation is necessary. As the ship passes over a fixed point from which a marker beacon signal is being transmitted, the signal is picked up by the receiver, causing the indicator to flash on, showing the pilot that he has passed over a marker beacon. The marker beacon equipment is simultaneously turned on when the radio compass is put into operation. The position of the interphone jack box switch does not affect the operation of the marker beacon equipment.

(10) NAVIGATION RADIO AN/APN-9.—The navigation aid radio is on a bracket above the navigator's table. It is operated entirely by the navigator.

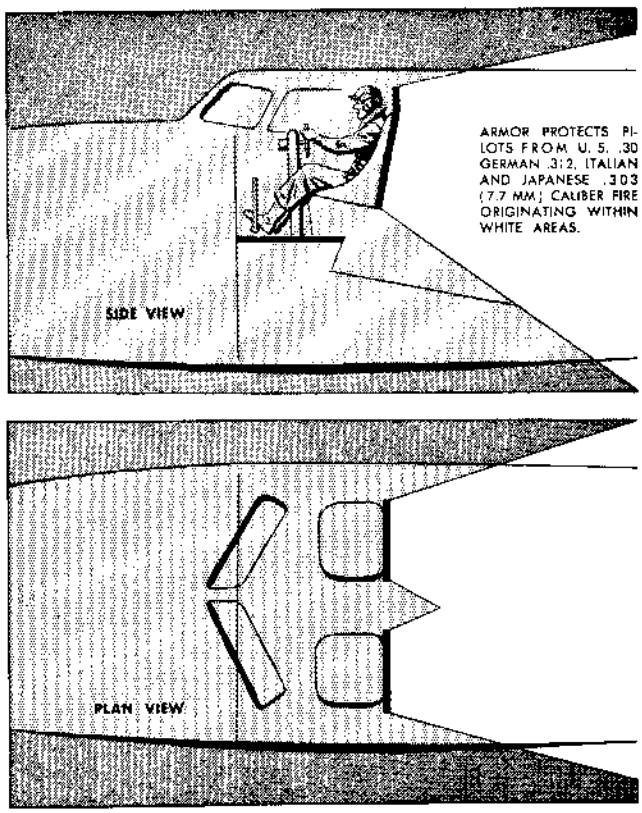


Figure 29—Pilot's Armor Protection

2A. MINIMUM CREW REQUIREMENTS.

The minimum crew requirements of this airplane are a pilot, copilot, and engineer. Additional crew members as required to accomplish special mission will be added at the discretion of the Commanding Officer.

3. FLIGHT INSTRUCTIONS.

a. PILOT'S PREFLIGHT.

(1) POWER PLANT.

(a) Propellers and anti-icer boots. Check for nicks, torn or loose anti-icer boots, if installed, and for leaking anti-icer fluid.

(b) Check nacelles for loose fasteners or cowl flaps, and check entire nacelle for oil leaks.

(c) Check turbos for freedom of bucket wheels and clearance.

(d) Check exhaust system for loose joints.

(e) Check waste gate for looseness and full open position.

(2) WINGS.

(a) Inspect deicer boots for condition.

(b) Check for fuel leaks in center section area. Determine that flight engineer has checked gas and oil caps for tightness.

(3) LANDING GEAR.—Main wheels and assemblies. Check for worn spots on tires, cracks in rims, condition of hydraulic lines, proper inflation of tires, and condition of drag line and drag strut. Check for cleanliness of exposed portions that would obstruct pistons.

(4) GENERAL EXTERIOR OF THE AIRPLANE. —Visually check the following:

(a) Pitot tubes for covers removed.

(b) Belly, whip and clothes line antennas for condition.

(c) Trailing antenna retracted.

(d) Lower ball turret in locked position, door fully closed and locked.

(e) Doors and hatches, particularly the tail gunner's escape hatch.

(f) Control surfaces and trim tab alignment. Controls in neutral. External locks removed.

(g) Tail wheel tire for proper inflation, wear and condition of the entire assembly.

(5) AIRPLANE INTERIOR.

(a) While going through the airplane, check and clear aerial engineer's report to be sure that the C.G. is between 19 percent and 32 percent of the Mean Aerodynamic Chord. For all normal landings of the airplane, the C.G. will be forward of 32 percent. However, if an excessive load is placed in the rear of the airplane, the airplane will have neutral or negative stability. It is possible to trim the airplane with an unstable loading, but is difficult to fly, especially if instrument flight is necessary. It is also much easier to inadvertently stall when flying an unstable airplane on instruments. Loading for forward C.G. positions is preferred because in addition to being easier to fly, it gives a smooth increase in elevator forces required to pull out of dives. An airplane that is made unstable by improper loading has reversed force-velocity relation in dive pull-outs so that a structural failure resulting from improper use of the elevator is more likely to occur than if the airplane were stable.

(b) Learn proper application of and use of the LOAD ADJUSTER. Check main passageway, compartment doors, turrets, and side guns not obstructed.

(c) Check control cables.

(d) Check bomb bay tanks and covers for fumes or gasoline leaks.

(e) Check storage of miscellaneous equipment in bomb bay.

(f) Check to see that emergency landing gear drop crank is in place.

(g) Check bombs for proper installation.

(h) Check to see that proper number of parachutes are on board.

(i) Check oxygen masks. See that all personnel are equipped. Check condition of masks, condition of main oxygen system and all walk-around bottles for proper pressure.

(6) FLIGHT DECK.

(a) Turret caged.

(b) Check maps to be sure all necessary maps are aboard.

(c) Check copies of instrument let-down procedure, radio facility chart, and radio aid to navigation, for condition, and to be sure they are all current issues.

(7) ALTERNATE FUEL GRADE OPERATING LIMITS (91/98).

(a) Take-off: 2500 RPM
41 in. Hg at S.L.
A.R. Mixture

(b) Max. Continuous: 2300 RPM
35 in. Hg at S.L.
A.R. Mixture

(c) Max. Auto-lean: 1800 RPM
28 in. Hg at S.L.

b. BEFORE STARTING ENGINES.

(1) FORM NO. 1 LOADING AND PASSENGER LIST.

(a) List all personnel; name, rank, and ASN before leaving the line. This list should agree with a loading list made out and left with the ground crew. Follow instructions inside form cover.

1. Pilot note FORM 1A.

2. Check fuel and oil.

3. Note the status of the airplane and the headings "Explanation" and "Remarks." (Pilot signs name and rank after last entry under "Remarks").

(b) Keep the center of gravity between 19 and 35% of MAC.

1. The normal gross weight limit is 54,000 pounds, and the maximum gross weight is 64,500 pounds.

(c) Pilot checks crew for knowledge and use of oxygen system and masks. Each crew member checks his station for proper operation.

(d) Pilot checks presence of weather charts.

(2) ENGINEER'S REPORT.—The reports, containing all items on the Engineer's Preflight Report, must be made out by the engineer and checked by the pilot.

(3) ADJUST SEAT AND RUDDER PEDALS.

(4) PARKING BRAKES.—Set parking brakes or the wheels will run up on the chocks and make them difficult to remove; check hydraulic pressure when you set parking brake.

(5) CLEAR COMBUSTION CHAMBER. — Pull propellers through by hand three complete revolutions ten minutes before starting to clear chambers.

(6) PITOT HEAD COVERS.—Remove covers.

(7) FLIGHT CONTROL CHECK.—Make sure ELEVATOR AND RUDDER LOCK lever is flush with the floor and remove and stow the AILERON LOCKING PIN. (Whenever the AILERON LOCKING PIN is in use, a red ribbon must extend from the pin to the engine throttle.)

(a) After control surfaces have been unlocked, pilot and copilot should visually check that surface control movement follows operation of each set of surface controls.

(8) FUEL TRANSFER VALVES AND SWITCH. —Should be in the "OFF" position.

(9) FUEL SHUT-OFF SWITCHES.—All switches must be "ON." (Never turn these switches off except in emergency.)

(10) COWL FLAPS.—Open cowl flaps regardless of outside temperature. After opening, turn valves to "LOCKED" to prevent creeping of the flaps and loss of hydraulic pressure.

(11) TURBO CONTROL.—Set manifold pressure selector at "0."

(12) IDLE CUT-OFF.—Mixture controls should be in "ENGINE OFF" position.

(13) HIGH RPM.—Place propeller control levers in full "HIGH RPM" position and lock.

(14) AUTO PILOT.—Place switches in "OFF" position. Leave "OFF" until after take-off.

(15) CARBURETOR FILTERS.—Must be "ON" for all operations under 15,000 feet. See that warning lights are on.

(16) INTERCOOLERS. — Turn intercoolers to "COLD."

(17) DEICERS AND ANTI-ICERS. — WING AND PROPELLERS. — Turn all control valves to "OFF" position.

(18) CABIN HEAT OFF.—Cabin heat must be off during ground operation to keep fluid from boiling away.

(19) GENERATORS.—See that generator switches are "ON."

(20) HYDRAULIC VALVES.—Turn switch to "AUTO." If pressure is below 200 PSI, hold the switch in "MANUAL" until pressure reaches 250 PSI.

(21) FLIGHT INDICATOR AND GYROS UNCAGED.—The gyros must always be uncaged except when airplane is being taxied over rough ground or when caging is necessary for blind flying procedure.

(22) LANDING GEAR SWITCH "OFF".—DO NOT TURN ON BATTERY SWITCHES UNLESS LANDING GEAR SWITCH IS "OFF"

(23) EXTERNAL POWER.—Connect.

c. STARTING ENGINES.

(1) FIRE GUARD.—Post fire guards at the proper stations for each engine. All propellers must be clear.

(2) BATTERY SWITCHES.—Turn all three battery switches on pilot's panel to "OFF." ("ON" if external power is not used—this will be considered an emergency procedure.)

(3) IGNITION SWITCHES.

(a) Call "Clear the props" to ground crew.

(b) Move emergency switch to "ON."
each battery switch separately for individual battery failure.

(c) With "SPARE" inverter operating, check each battery switch separately for individual battery failure.

(4) INVERTERS.—Switch on "SPARE" inverter during battery check. Check AC voltage on pilot's instrument panel. Switch to "MAIN" inverter and again check AC voltage before continuing with engine starting procedure. AC output between 100 and 120 volts is necessary for proper operation of the electronic turbosupercharger control system.

Note

If "MAIN" is switched to "SPARE" or "OFF" allow two minutes interval before returning switch to "MAIN." The heater coil in the changeover relay must be allowed to cool before the relay can return to its original position.

(5) FUEL BOOSTER PUMPS. — Turn all fuel booster pumps "ON." Pressure should be 8 PSI.

(6) START ENGINES.—Sequence is 3, 4, 2, and 1.

(a) Set throttles for approximately 800 RPM.

(b) Direct copilot to energize and mesh No. 3 starter. After one revolution of propeller, turn magneto (ignition) switch to "BOTH."

(c) Prime by hand (mixture control must be in "ENGINE OFF" until engine fires). It is best to use short, quick strokes in priming as it atomizes the fuel.

(d) If engine fails to start, repeat steps *(b)* and *(c)*.

CAUTION

DO NOT ADVANCE THROTTLE. IT LEANS THE MIXTURE AND INCREASES THE CHANCE OF BACKFIRE.

(e) When engine fires, move mixture controls to "AUTO RICH," and, if necessary, continue hand priming *just enough* to keep engine running. Note oil pressure. If not up in 30 seconds, stop engine.

(f) COLD WEATHER STARTING. — Before starting engine, operate primer with one or two long strokes to expel air and then proceed as per steps *(b)* through *(e)*.

(g) If engine stops, return mixture control to "ENGINE OFF," cut ignition and repeat starting procedure.

(h) In case of fire in the nacelle, try to blow out by opening throttle and cowl flaps. If this fails, stop engine and booster pump and close fuel shut-off valve. On airplanes with engine fire extinguishers also close cowl flaps and pull fire extinguisher (both charges if necessary).

(7) FLIGHT INDICATOR.—As the engine operating vacuum pump (No. 2 or 3) is started, watch flight indicator and check for rapid response.

(8) EXTERNAL POWER.—Disconnect.

d. BEFORE TAXIING.

(1) CHECK INSTRUMENTS.—Check at 1800 engine RPM.

(a) Oil pressure.

Note

Emergency allowable oil pressure range is 50 to 85 pounds per square inch. If the minimum high altitude oil pressure of 50 pounds per square inch cannot be maintained with a ground setting of 70 pounds per square inch, it will be permissible to raise the sea level relief valve setting to a maximum of 85 pounds per square inch as an emergency measure only.

(b) Oil temperature.

(c) Cylinder head temperatures.

(d) Fuel pressures.

(e) Carburetor air temperatures.

(f) Free air temperature.

(g) Tachometers.

(h) Manifold pressures.

(i) Hydraulic pressures.

(j) Clock.

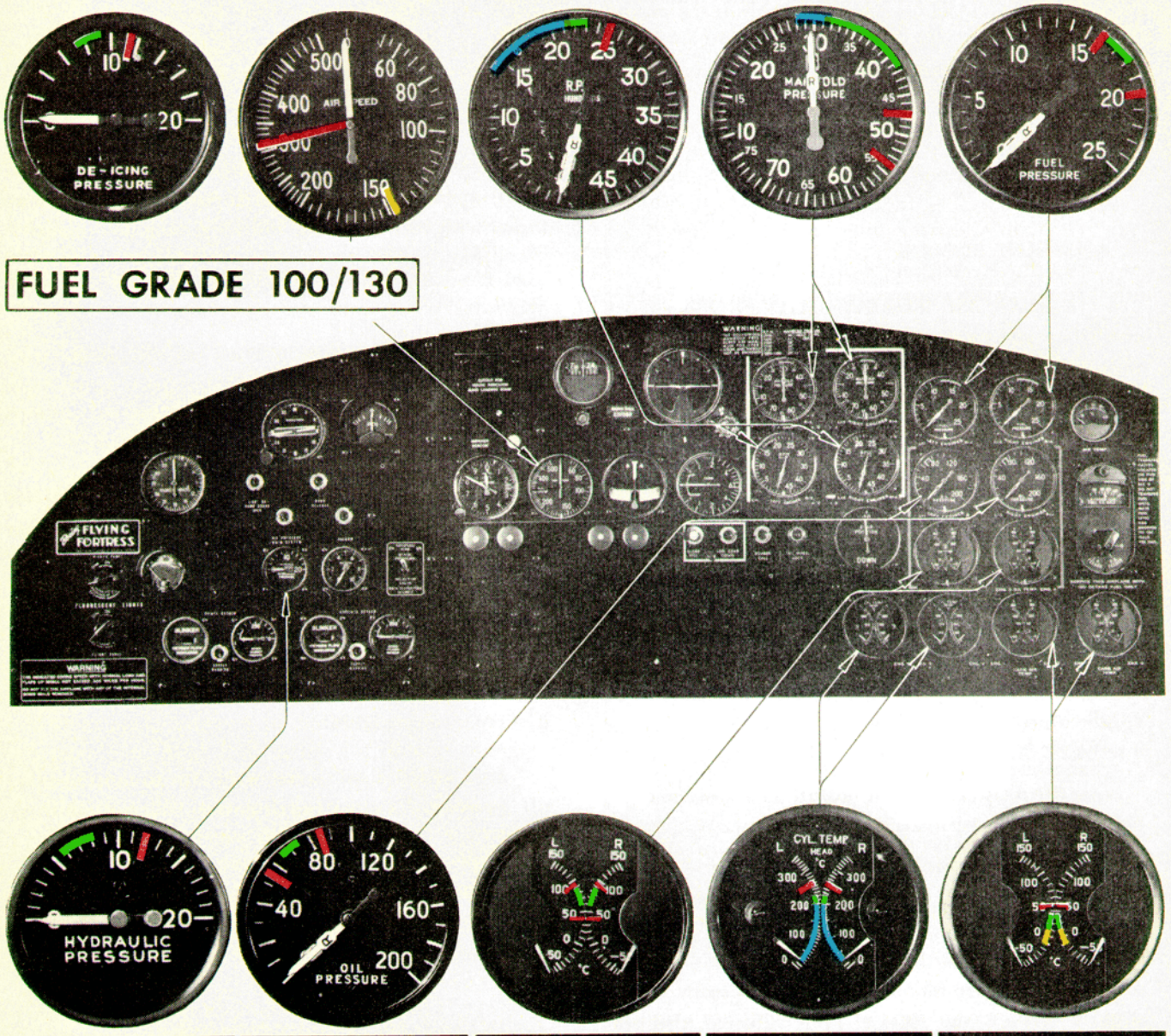
DE-ICING PRESSURE (ON OVERHEAD PANEL)	
OPERATING RANGE	7.4-9.3 PSI
MAXIMUM PRESSURE	11.8 PSI

AIRSPEED INDICATOR	
MAXIMUM PERMISSIBLE WITH FLAPS DOWN	147 MPH-IAS
MAXIMUM PERMISSIBLE	305 MPH-IAS

TACHOMETER	
OPERATING RANGE:	
Auto Lean	1400-2100 RPM
Auto Rich	2100-2300 RPM
MAXIMUM TAKE-OFF RPM	2500

MANIFOLD PRESSURE	
OPERATING RANGE:	
Auto Lean	28-31 IN.
Auto Rich	31-41.5 IN.
MAXIMUM PERMISSIBLE FOR TAKE-OFF	47.5 IN.
WAR EMERGENCY POWER	54 IN.

FUEL PRESSURE	
OPERATING RANGE	16-18 PSI
MINIMUM PERMISSIBLE	16 PSI
MAXIMUM PERMISSIBLE	20 PSI



HYDRAULIC PRESSURE	
OPERATING RANGE	575-825 PSI
PRESSURE CUT-OUT	1200 PSI

OIL PRESSURE	
OPERATING RANGE	65-75 PSI
MINIMUM PERMISSIBLE	55 PSI
MAXIMUM PERMISSIBLE	85 PSI

OIL TEMPERATURE	
OPERATING RANGE	60°-88°C
MINIMUM PERMISSIBLE	40°C
MAXIMUM PERMISSIBLE	95°C

CYLINDERHEAD TEMPERATURE	
OPERATING RANGE:	
Auto Lean	25°-218°C
Auto Rich	218°-232°C
MAXIMUM PERMISSIBLE	260°C

CARBURETOR AIR TEMPERATURE	
DESIRED RANGE	+15°-+38°C
ICING DANGER RANGE	-10°-+15°C
DETONATION DANGER	+50°C

Figure 29A—Instrument Limitations

(k) Magnetic compass.

(2) VACUUM PRESSURES.—Return engines to 1000 RPM and check vacuum on engines 2 and 3. This should be 3½" to 4" Hg.

(3) ALTIMETER. — Turn on radio equipment and call control tower. Ask for:

(a) Altimeter setting.

(b) Radio equipment check on frequency, and signal strength.

(c) Weather information.

(d) Taxiing instructions.

e. ENGINE RUN-UP.

(1) EXERCISE TURBOS AND PROPS.—Open cowl flaps and set throttles at 1500 RPM. Set manifold pressure selector at "8." Run propellers to full low RPM and note drop indicated by tachometers. Return propellers to high RPM.

Set manifold pressure selector to "0." Check generator voltage.

(2) ENGINE RUN-UP.—Run each engine up individually, as follows:

(a) Run up to 28" Hg. and check magnetos. Note any engine roughness by watching for jerking movement of cowling. If roughness is noticed, run engine up to full throttle without turbo boost for 3 or 4 seconds, then return to 28" Hg. and recheck.

(b) Advance throttle to full open position and hold. Check engine instruments for proper readings.

(c) Set manifold pressure selector to "8" and check for 2500 RPM allowing for tachometer fluctuation. If propeller goes higher than 2500 RPM due to rigging, move propeller control down until it starts to drop below 2500 RPM. Control may then be moved slightly upward and locked. Thus adjusted, the propeller will not overspeed during take-off.

(d) Reduce the throttle slowly to 1500 RPM leaving generator "ON."

NOTE

Cowl flaps must ALWAYS be open.

f. BEFORE TAKE-OFF.

(1) DOORS AND HATCHES.—Check the following closed:

(a) Navigator's compartment entrance hatch.

(b) Main entrance door.

(c) Tail gunner's escape hatch.

(d) Radio compartment top hatch. (Be sure it is locked securely.)

(2) GYROS AND ALTIMETER.—Set directional gyro to correspond with magnetic compass. When lined up for take-off see that compass readings correspond with each other and with direction of runway.

(3) WING FLAPS.—Run wing flaps up and down to test.

(4) Deleted in revision dated 1 March 1948.

(5) BOOSTER PUMPS.—Turn booster pumps "ON."

(6) CHECK INSTRUMENTS AND WARNING LIGHTS.—Recheck for erratic indications and proper take-off readings.

(7) AUTO RICH.—Do not use "EMERGENCY RICH."

(8) HIGH RPM. — Move propeller controls to give 2500 engine RPM.

(9) TRIM TABS.—Set trim tabs to desired take-off position. (Normal settings are "0" for all three tabs.)

(10) CHECK CONTROLS.—Move all flight controls through their full travel and check for freedom of movement.

(11) TAIL WHEEL.—Unlock tail wheel for taxiing to line up position on runway. Then, before starting take-off, LOCK TAIL WHEEL.

g. TAKE-OFF.—When lined up on runway check to see:

(1) Cowl flaps open.

(2) Manifold pressure selector set at "8."

(3) 2500 RPM.

(4) Tail wheel locked.

Set brakes and run engines up to 25" Hg. Release brakes and advance all throttles smoothly to full take-off power. Use rudder for control of airplane. Do not use take-off power for more than 5 minutes.

h. AFTER TAKE-OFF.

(1) WHEELS.—Raise gear when sure airplane is past safe landing on the field and is under complete flying control. Check visually that landing gear is up and green light is off. Brakes should be applied when well off the runway to stop wheels.

(2) POWER REDUCTION.—When an air speed of 130 MPH is reached, turn manifold pressure selector dial to give 38 Hg., then reduce props for 2300 engine RPM.

NOTE

In reducing power, manifold pressure is reduced first then engine RPM. When power is increased, engine RPM is raised first, then manifold pressure.

(3) COWL FLAPS.—Close cowl flaps as needed to regulate head temperatures.

(4) Retract wing flaps, if used, when above 500 ft.

(5) Turn booster pump OFF and check fuel pressure.

i. BEFORE LANDING.

(1) RADIO ALTIMETER.—When approaching the field contact the control tower for traffic instructions, wind, and altimeter setting.

(2) CREW POSITIONS.—Engineer check crew for proper landing positions. Radio operator retract antenna. Gunners check guns for proper landing positions.

(3) AUTO PILOT.—Turn auto pilot off.

(4) BOOSTER PUMPS.—Turn booster pump "ON."

(5) AUTO RICH.—Place mixture controls to "AUTO RICH."

(6) INTERCOOLERS. — Turn intercoolers to "COLD" (unless needed to prevent carburetor icing).

(7) CARBURETOR FILTERS. — Check to see that they are "ON."

(8) WING DE-ICERS.—Check to see that they are "OFF."

(9) LANDING GEAR.

(a) VISUAL.—When the indicated air speed is 180 MPH or less, lower the landing gear. Check visually that all wheels are properly extended.

(b) LIGHT.—The green lamp will light when landing gear is full down.

(c) SWITCH OFF.—Return the landing gear switch to neutral when the green light goes on.

(10) BRAKE PRESSURE.—Check hydraulic system for 800 PSI. Be sure cowl flap controls are "LOCKED." Check pedal pressure for firmness.

(11) RPM 2300.

(12) WING FLAPS.—At 147 MPH indicated air speed or less, lower the wing flaps as required.

j. FINAL APPROACH.

(1) TURBO CONTROLS.—Set manifold pressure selector dial to "8." (In event of emergency take-off during attempted landing).

(2) FLAP SETTING. — Full down for normal landings, however partial flaps produce better results in heavy headwinds.

(3) CALL AIRSPEEDS.—The copilot will call indicated airspeeds below 120 MPH.

k. END OF LANDING ROLL.

(1) HIGH RPM.—Place propeller controls in high RPM position.

(2) TURBO CONTROLS.—Turn manifold pressure selector dial to "0."

(3) COWL FLAPS.—Open cowl flaps.

(4) WING FLAPS.—Raise wing flaps. If damage to flaps exists due to mud or slush, raise them when ground contact is made. Wing flaps help decrease speed during landing roll.

(5) Deleted in revision dated 1 March 1948.

(6) BOOSTER PUMPS.—Turn off booster pumps.

(7) TAIL WHEEL.—Do not unlock the tail wheel until the end of the roll except in an emergency.

l. SECURING AIRPLANE.

(1) ENGINES.

(a) As necessary, dilute oil as per decals. Make entry on form 1A of the number of minutes and time of day.

(b) Open throttles to 1000 RPM.

(c) Move mixture controls to "IDLE CUT OFF."

(2) RADIO.—Turn compass, command receiver and command transmitter to OFF and check liaison set with radio operator.

(3) SWITCHES.—Turn all electrical switches except generator switches "OFF." A.C. power must not be turned off until engine instruments have settled to their neutral positions.

(4) CHOCKS.—Hold airplane in place with brakes until chocks are in place. Release brakes to avoid damage to expander tubes.

(5) CONTROLS LOCKED.—Place control column in full forward position, center rudder pedals, and pull elevator and rudder lock lever up. Place aileron lock in control column and fasten the red ribbon to the throttle.

(6) FORM 1.—Compute pilot time carefully. Time ends when airplane is in position on the ramp. Time is entered in hours and tenths.

---

4. GENERAL FLYING CHARACTERISTICS.

a. GENERAL STABILITY.

(1) Increased power on the inboard engines makes the airplane slightly tail heavy. Increased power on the outboard engines does not affect the trim.

(2) Closed cowl flaps on the inboard engines likewise increase tail heaviness, but the outboard engines' cowl flaps have little effect on the trim.

(3) With the airplane properly trimmed for a landing with power off and flaps down, the pilot may apply power, throw the flap switch into the up position and go around with no change in trim tab setting if a second approach is necessary. The flaps retract at a satisfactorily slow rate.

b. TAKE-OFF.—During the take-off run, directional control should be maintained with rudder movement and throttles, differential throttling being done with the outboard engines as much as possible.

c. CLIMB.—The airplane requires very little elevator trim and the elevator control pressure builds up rapidly as the climbing speed is reduced below normal.

d. LEVEL FLIGHT.—In normal flight, turns can be made smoothly with aileron control only. In instrument flight, the pilot should pay attention to holding the wing level, because directional stability produces a noticeable turning tendency with one wing down.

e. ROUGH AIR OPERATION.

(1) The ailerons and rudder can be used without fear of overloading them. It is almost impossible to damage them without deliberately attempting to do so. The control forces required are small enough and the surface responses large enough to maintain control.

(2) Elevators, however, need careful handling to assure smooth operation. Unless care is used, it is possible to overload the elevators in thunderstorms, squalls, and cumulous cloud formations.

(3) In rough air, operate so as to hold constant air speed with the elevator. Correct for changes in altitude with power. In rapidly rising air currents it may be necessary to lower the landing gear.

(4) Do not dive through a cloud layer, or through rough air at maximum diving speed. Do not attempt high speed flight in rough air.

f. ICE PREVENTION PROCEDURE.

(1) When operating under icing conditions, use the following procedure:

(a) Carburetor air filters ON and intercooler shutters to maintain carburetor inlet temperatures of 20°C. (68°F.) to 38°C. (100.4°F.). Under icing conditions the filters may be left ON up to 20,000 feet.

For emergency ice removal (carburetor) see Section III, paragraph 15.

g. OBTAINING MAXIMUM PERFORMANCE.

(1) The ceiling and climb at 35,000 feet are as great or greater than that of many fighter airplanes, but the high speed is not as great as most fighters at normal altitudes; therefore, in order to outperform any enemy at 35,000 feet it will be necessary to outclimb him rather than to outdistance him.

(2) The increase of speed obtained by nosing the airplane down below the horizontal at rated power and at any high power condition is smaller than that obtained by fighters.

(3) Use this technique to get maximum climb:

(a) Maintain the proper climbing air speed (135 MPH indicated.)

(b) In all emergencies (pursuit by enemy, etc.) increase engine speed to 2500 RPM. This increases propeller efficiency and rate of climb under conditions of climbing speed and high altitude and doesn't hurt the engine. Don't use less than 2500 when primarily interested in a high rate of climb at high altitudes.

(c) Some airplanes have B-2 turbos and others have B-22 turbos (a name plate on the exhaust will identify the B-22). B-2 turbos have a governed speed of 23,400 RPM. B-22 have a governed speed of 26,400 RPM. To preserve turbo life and avoid possible unstable manifold pressure at high altitudes, reduce the manifold pressure with the selector at the rate of 1½" for every 1000 feet over 27,500 for military power (30,000 feet for rated power) with the B-2 turbos. Make the same reductions at 30,000 for military and 34,000 for rated power with the B-22 turbos. Use of governed speed will give better critical altitude performance but shortens turbo life.

(d) The outboard engines have higher critical altitudes than the inboards by approximately 2000 to 3000 feet, and the inboard engine without boilers in the stack has a 1500-foot higher critical altitude than the engine with the boilers in the stack. The critical altitude of the outboard engines as far as limiting turbo RPM is concerned is 31,000 feet.

h. LANDING.—The approach for landing requires very little change in elevator trim. The airplane becomes slightly tail heavy as the flaps are lowered, but if it is trimmed slightly nose heavy at 147 MPH with the flaps up, it will be properly trimmed at 120 MPH with the flaps down. This is a satisfactory approach speed for gross weights below 50,000 pounds.

i. STALLS.

(1) Stalling characteristics are very satisfactory. There is never a sharp tendency to roll. Yawing is suppressed enough to make any rolling at the stall of a very mild nature. Buffeting of the elevators always gives several miles per hour warning of an approaching stall.

(2) A pitching motion started by the elevators should be damped slowly. It will easily reduce the air speed well below the stall unless it is deliberately stopped.

(3) Full flap reduces the stalling speed about 15 MPH for gross weights between 40,000 and 45,000 pounds, but full military power for the same loading conditions may reduce the stalling speed another 15 MPH. Accidental or deliberate yawing will increase the stalling speed and increase any tendency to roll at the stall.

(4) The ailerons have a tendency to overbalance and reverse their effectiveness at the stall. For example, if the left wing tends to drop at the stall and the right aileron is used in an attempt to bring up the wing, the aileron operating forces will decrease and cause full aileron deflection, but the response will be an increase in the roll to the left. So—WHEN RECOVERING FROM A STALL HOLD THE AILERONS IN NEUTRAL. DON'T ATTEMPT TO USE THEM.

(5) Use normal procedure to recover from a stall. Regain normal air speed first by operation of the elevators. This may put the airplane in a dive of 30° or less (preferably less). Use the rudder to keep the wing level during a stall. Recover from the dive in a smooth manner. If a smooth recovery is not made the

airplane may restall or structural failure may result from excessive load factors.

(6) It should not be necessary to increase air speed more than 20 MPH to regain normal flight, and after practice even less.

j. SPINS.—The airplane is unlikely to spin; as it not designed for this maneuver, never attempt it.

k. DIVES.—Some B-17G airplanes are limited to a maximum diving speed of 270 MPH. Others have a maximum diving speed of 305 MPH. SEE WARNING PLACARD IN AIRPLANE!

Remember, during the dive the elevator trim tab must be set to maintain zero elevator force and must be used with great care. This trim tab is very sensitive.

l. PRECAUTIONS.

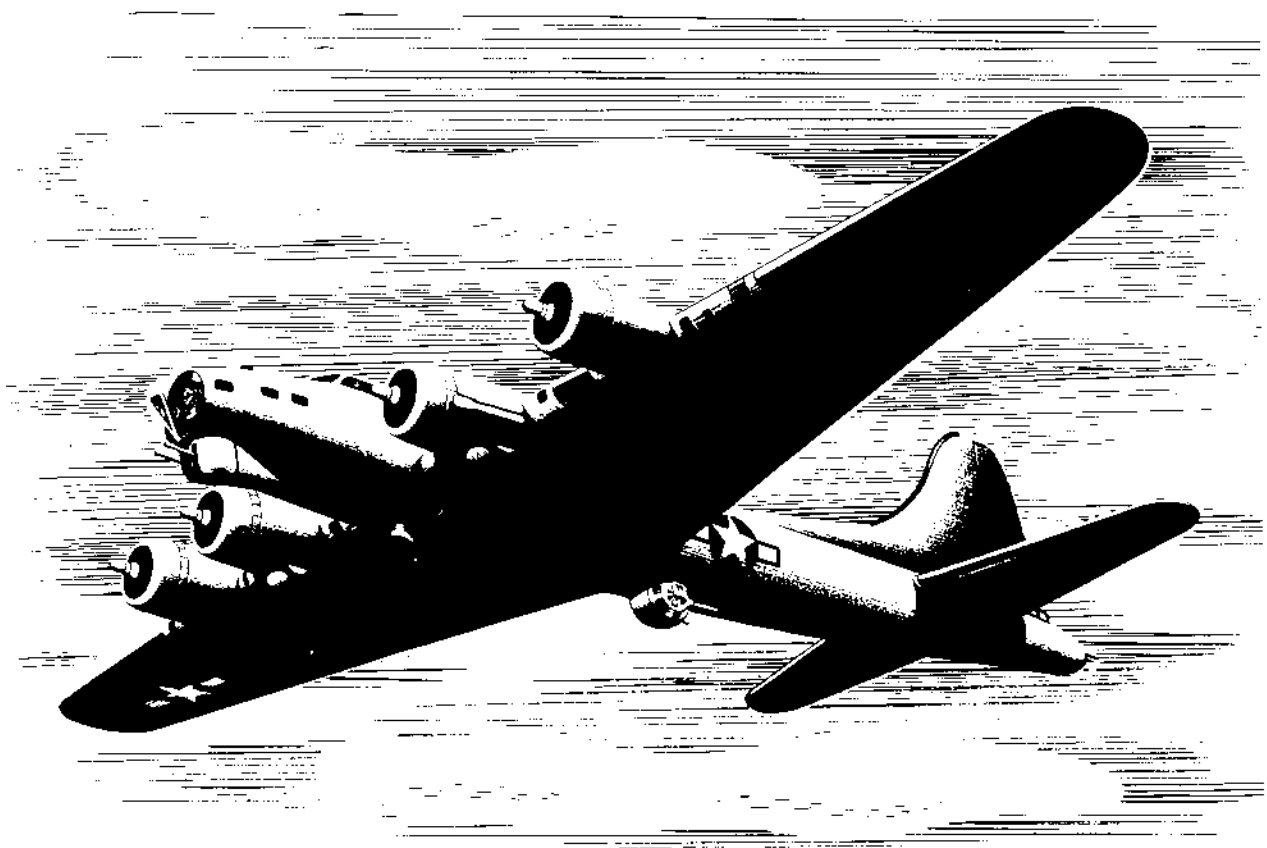
(1) MAXIMUM LOAD.

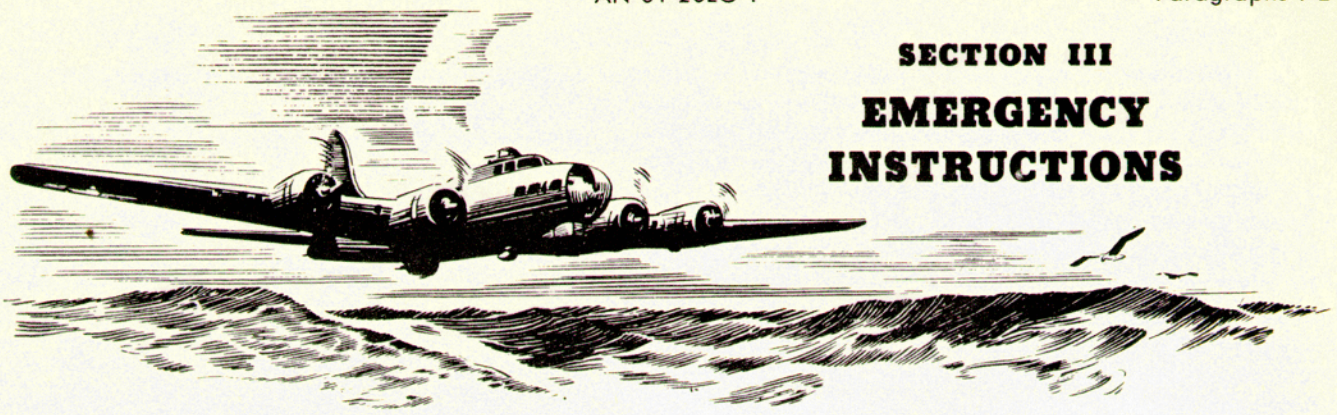
(a) These airplanes, with modified landing gear, and full Tokyo tanks, can be safely flown with a gross weight of 64,500 pounds if the following restrictions are carefully observed.

(b) The Tokyo tanks must be filled to relieve strain on the wings during flight. Take-offs with a gross weight of over 56,000 pounds must be made on smooth fields or prepared runways. Make no pivot turns on one wheel while taxiing.

(c) Follow *(b)* with all airplanes having wing (Tokyo) tanks when these tanks are more than ½ full. At 64,500 gross weight the maximum indicated air speed shall be 230 MPH; maximum maneuver permissible at 64,500: positive, 2.056; negative, 1.22; landing gear, 2.1.

(2) 1600 POUND BOMBS.—If the airplane has B-7 bomb shackles, jettison 1600-pound bombs in a safe place, unarmed **before landing**. Never exceed the airplane's gross weight while carrying these bombs. Do not undertake severe maneuvers.





SECTION III
EMERGENCY INSTRUCTIONS

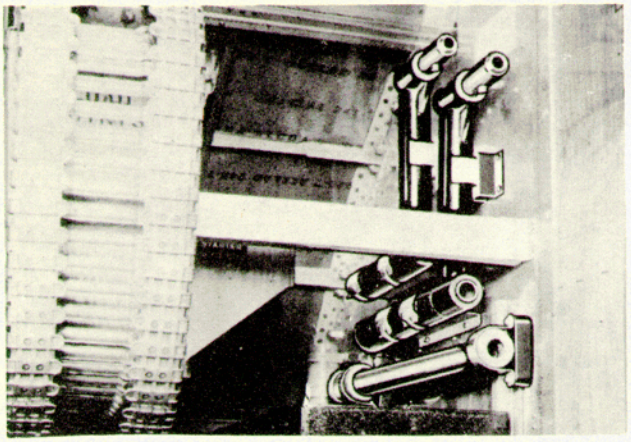


Figure 30—Hand Cranks Stowed—Right Side

1. HAND CRANKS.

Cranks for manual operation of landing gear, wing flaps, and bomb bay doors, and for hand starting of engines, are stowed on the aft bulkhead of the radio compartment. Crank extensions for use when operating engine starters, bomb doors, and wing flaps are stowed adjacent to the cranks.

2. EMERGENCY OPERATION OF LANDING GEAR.

Each main landing gear is operated through hand crank connections to the left and right of the door in the bomb bay's forward bulkhead.

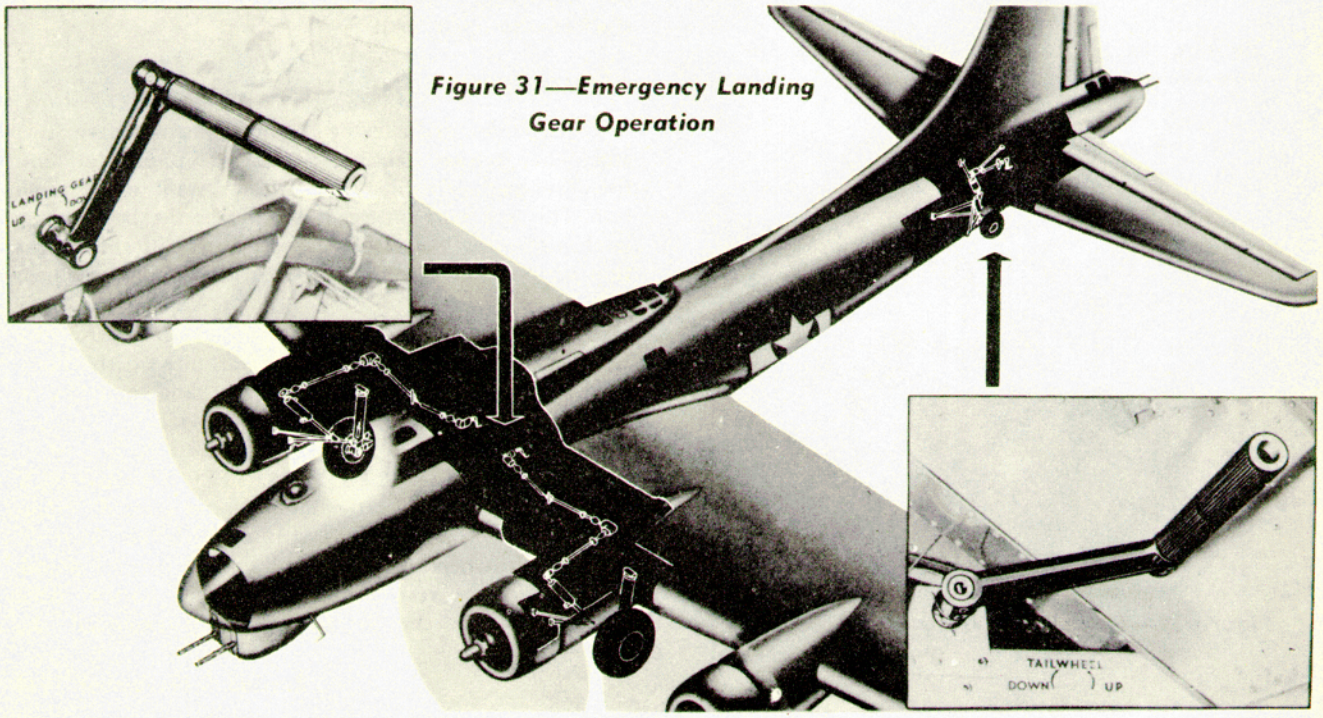


Figure 31—Emergency Landing Gear Operation

The following instructions will be observed regarding emergency operations of the landing gear retraction system. At the first indication of malfunction in normal operation of the landing gear retracting systems, no further attempt will be made to operate the system electrically. Turn all landing gear switches "OFF," proceed to lower the main and tail wheels by manual operation, and land the airplane. In the event that any of the retracting mechanisms appear to be jammed, and difficulty is experienced in turning the manual hand crank, the complete electrical system will be turned "OFF." Prior to turning off the electrical system make certain that the sustained altitude does not require fuel booster pump operation, and turn turbo boost selector to "ZERO." It will be noted that all electrical instruments, radio, lights, and electrical accessory equipment will be turned "OFF" during this period. The electrical system load should be lightened by first switching "OFF" individual electrical circuits, then the generator switches, and finally all battery switches. After the electrical system has been turned "OFF," further attempts will be made to lower the defective gears. If no success is obtained with the electrical system turned "OFF," the system will again be switched "ON" by reversing the above procedure; first switch all batteries "ON," switch all generators "ON," and then return additional electrical equipment to use as required. Further attempts to lower the landing gear will be made at the discretion of the airplane crew, with the assistance of the control tower, if available.

DANGER

Be sure the landing gear switch is OFF before you attempt hand cranking.

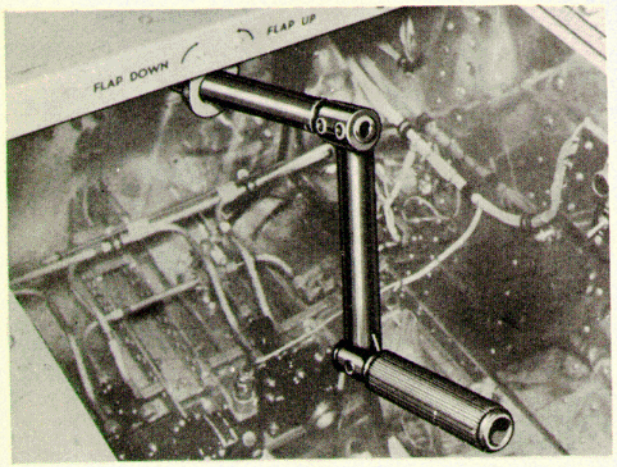


Figure 32—Emergency Wing Flap Operation

3. EMERGENCY OPERATION OF THE TAIL WHEEL.

The crank used for manual operation of the landing wheels is also used for manual operation of the tail wheel. Insert the crank into the connection in the tail wheel compartment and rotate as desired.

4. EMERGENCY OPERATION OF WING FLAPS.

Lift the camera pit door in the floor of the radio compartment and insert the hand crank into the torque connection at the forward end of the pit. Rotate the crank clockwise to lower the flaps and counterclockwise to raise them.

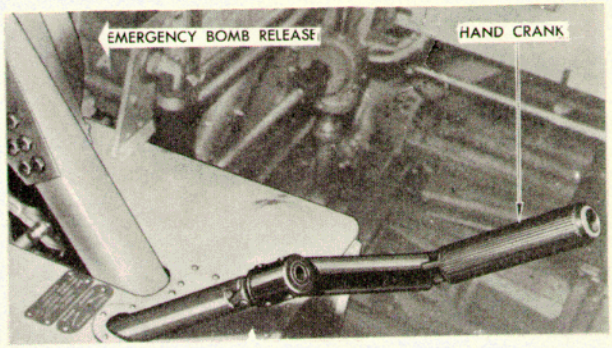


Figure 33—Emergency Bomb Bay Door Operation

5. EMERGENCY OPERATION OF BOMB DOORS.

Insert the hand crank into the torque connection in the step at the forward end of the catwalk in the bomb bay and rotate clockwise to close the doors and counterclockwise to open them.

6. EMERGENCY BOMB RELEASE.

a. Airplanes with cable bomb controls have two emergency release handles, one to the pilot's left and the other at the forward end of the catwalk in the bomb bay. The first part of the pull releases the bomb door latches opening the doors independently of the retraction screws. The latter part salvos the bombs unarmed.

b. Airplanes with the all electric bomb control system have three SALVO SWITCHES, one on the bombardier's panel, one on the copilot's panel and one in the bomb bay on the upper left sidewall.

c. DOOR RETRACTION AFTER EMERGENCY RELEASE.—To retract the bomb doors after an emergency release in airplanes with cable bomb controls, rewind the wheel on the bombardier's control stand, and extend the retracting screws as in normal door opening. When the screws are fully extended the

latches will engage and the doors may be closed in the normal manner.

7. FIRE IN FLIGHT.

a. FUSELAGE FIRES.

(1) There are three fire extinguishers: a carbon tetrachloride in the navigator's and radio compartments and a carbon dioxide in the pilot's compartment.

(2) 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.

(3) After the fire has been extinguished, to dissipate smoke and fumes from fuselage, the following procedure is recommended:

(a) For smoke and/or fumes in or aft of the bomb bay, with pilot's compartment bulkhead door closed, open only the following:

1. Two aft bulkhead doors.
2. Bomb bay doors.
3. Main entrance door as far as possible.

(b) For smoke and/or fumes forward of the bomb bay, with rear bomb bay bulkhead door closed, open only the following:

1. Forward bulkhead door.
2. Pilot, copilot and bombardier clear vision panels.
3. Bomb bay doors.

b. ENGINE FIRES DURING FLIGHT.

(1) ENGINE AND ACCESSORY COMPARTMENT.

(a) Feathering button—Depress.

(b) Mixture control—"IDLE CUT-OFF."

(c) Fuel shut-off valve—"CLOSED."

(d) Select affected engine.

(e) Release CO_2 as soon as engine stops.

Note

The engine fire extinguisher has been deleted on some airplanes.

(f) Cowl flaps—Slightly open.

(g) Lower landing gear if fire is in an inboard nacelle.

(h) Ignition switch—"OFF."

(i) Shut down engine completely.

(j) Do not restart engine.

(k) Land as soon as possible.

CAUTION

Leave propeller feathered. Do not attempt to restart engine.

Note

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

(2) EXHAUST SYSTEM.

(a) Move mixture control to lean.

(b) Attempt to blow out fire by engine run-up.

(c) Leave cowl flaps open.

(d) Close fuel shut-off valve to engine affected.

(e) Use CO_2 if fire is progressing into engine accessory section.

7A. ENGINE FAILURE.

In event of engine failure in flight, the propeller of the damaged engine must be feathered immediately to prevent excessive vibration and possible fire.

a. FEATHERING PROCEDURE.

(1) Reduce manifold pressure. Turn manifold pressure knob to "0."

(2) Move throttle to "CLOSED."

(3) Depress feathering button.

(4) Set mixture control to "IDLE CUT-OFF."

(5) Turn fuel booster pump switch to "OFF."

(6) Move fuel shut-off switch to "OFF."

(7) Turn ignition switch to "OFF" after propeller stops turning.

(8) Turn off the generator switch on the engine which is being feathered.

(9) Do not restart engine unless practice feathering is being accomplished.

b. UNFEATHERING PROCEDURE.

(1) Move propeller control to "LOW RPM."

(2) Crack throttle open to approximate starting position.

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

(4) Turn ignition switch to "ON" after propeller has rotated at least three times.

(5) Turn fuel shut-off switch to "ON."

(6) Turn fuel booster pump switch to "ON."

(7) Move mixture control to "AUTO-RICH."

(8) Adjust throttle to proper manifold pressure for engine warm-up.

(9) Turn generator switch to "ON" and release feathering button when the engine reaches 1000 rpm.

(10) Allow engine to warm up at low rpm.

8. WARNING SIGNALS.

The pilot can communicate with the crew through the interphone system, phone call lamp, and the alarm bell system. The bells under the navigator's and radio operator's tables and in the tail compartment are controlled by a toggle switch on the pilot's electrical control panel.

9. FIRST-AID KITS.

There are kits on the bomb-sight storage box in the navigator's compartment, on the wiring diagram box on the back of the copilot's seat, and on the bulkhead forward of the lower turret.

10. EMERGENCY RELEASE OF BALL TURRET.

a. In an emergency landing with landing gear up, much damage to the airplane can be prevented by dropping the ball turret. It takes about twenty minutes to do this. The steps are as follows:

(1) Turn the guns aft and down.

(2) Remove the azimuth gear case by taking out four bolts which hold it.

(3) Remove the safety retaining hooks with a socket wrench if available, or by breaking them off with a hammer.

(4) If there is time, disconnect the electrical plug and the oxygen line.

(5) Drop the turret by removing the twelve yoke connection nuts. The turret may land up on the fire cut-off cam, but a swift kick from the aft side of the ball will dislodge it.

Note

If time permits, salvage the computing sight before dropping the turret. To remove the sight, disconnect the three flexible drive cables at the left, right and far sides of the sight. Disconnect the electrical plug. Free the sight by removing the sight retaining rod.

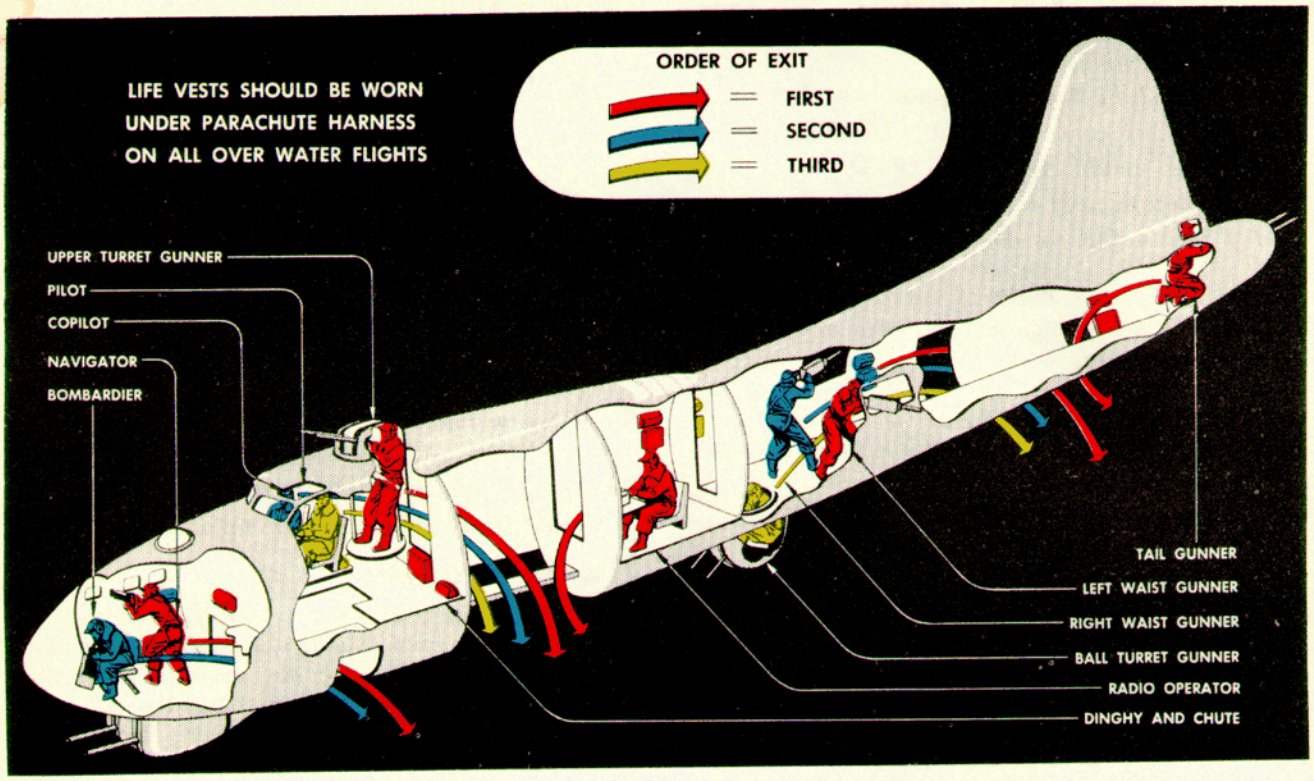


Figure 34—Emergency Escape Routes

11. HOW TO BAIL OUT OF THE B-17.

a. PROCEDURE WHEN WEARING CONVENTIONAL SEAT OR BACK-TYPE PARACHUTE.—When an emergency develops and it is necessary to bail out of your airplane, there is no time for confusion or second guessing. The procedure must be automatic. The instructions below and the diagram show through what hatches and in what order crew members should make their exit. Ground drills based on this procedure will help you obtain the efficiency and speed necessary to abandon your airplane successfully and safely.

The emergency alarm bell procedure for bail out is as follows:

(1) Warning—spoken warning on the interphone.

(2) Warning—three short rings on the alarm bell.

(3) Bail out—bail out order on the interphone.

(4) Bail out—one long ring on the alarm bell.

Wherever possible, jump from the after end of the hatch. Where several crew members bail out of the same exit, each should inspect the others to make sure that all are wearing a full complement of securely fastened equipment.

(1) PILOT.—Exits third out forward end of bomb bay. (Alternate exit, out front entrance door.) Is last to leave plane.

(2) COPILOT.—Exits second through forward end of bomb bay.

(3) BOMBARDIER.—Exits second through front entrance door.

(4) NAVIGATOR.—Exits first out of front entrance door.

(5) UPPER TURRET GUNNER.—Exits first out forward end of bomb bay.

(6) RADIO OPERATOR.—Exits first through after end of bomb bay.

(7) RIGHT WAIST GUNNER.—Exits second through main entrance door.

(8) LEFT WAIST GUNNER.—Exits first out main entrance door.

(9) BALL TURRET GUNNER.—Exits third out of main entrance door.

(10) TAIL GUNNER. — Exits through small emergency door in tail.

b. PROCEDURE WHEN WEARING QUICK ATTACHABLE CHUTE HARNESS.—When the order is given over the intercom and the alarm bell to "Abandon Airplane," each crew member will remove the individual seat-type dinghy and breast-type parachute from their respective positions near his station, snap them onto his QAC harness, and exit through the hatch specified. The following instructions, used with the diagram, show the positions of the dinghies and the parachutes, the correct exit hatch, and the order of bailing out. Where several crew members bail out of the same hatch, each should check the others to make sure that all are wearing a full complement of equipment, securely fastened. Wherever possible, jump from the after end of the hatch. Remember, a life vest should be worn under the QAC harness on all overwater flights. The lanyard on the dinghy should be snapped onto the D-ring on the life vest.

Periodic ground drills will familiarize your crew members with the operation of the QAC harness and the order of bail-out.

(1) PILOT.—Parachute mounted on floor, directly behind pilot's seat in pilot's cabin. Dinghy worn in seat position. Pilot is third to exit through forward end of bomb bay. (Alternate exit, out front entrance door.) Last to leave plane.

(2) COPILOT.—Parachute mounted on floor directly behind copilot's seat in pilot's compartment. Dinghy worn in seat position. Exits second through forward end of bomb bay. (Alternate exit, through front entrance door.)

(3) BOMBARDIER.—Parachute mounted in navigator's compartment on right-hand wall directly opposite navigator about half-way up on wall. Dinghy mounted in naviagtor's compartment near floor on the right-hand side, half the distance forward from bulkhead. Exits second through front entrance door.

(4) NAVIGATOR.—Parachute mounted on bulkhead armor plating directly above door, on inner side of navigator's compartment. Dinghy mounted alongside and to rear of bombardier's dinghy. Exits first through front entrance door.

(5) UPPER TURRET GUNNER. — Parachute mounted on floor just forward of bomb bay bulkhead on left side. Dinghy mounted on forward wall of bomb bay bulkhead in turret compartment, directly below entrance to bomb bay. Exits first through forward end of bomb bay.

(6) RADIO OPERATOR.—Parachute mounted on right-hand wall just forward of rear bulkhead of radio compartment, three-fourths way up side of wall. Dinghy mounted directly beneath radio operator's parachute. Exits first through after end of bomb bay.

(7) RIGHT WAIST GUNNER. — Parachute mounted on right-hand wall just forward of rear door and even with top of door. Dinghy mounted directly beneath parachute. Exits second through main entrance door.

(8) LEFT WAIST GUNNER.—Parachute mounted on wall immediately aft and on same level as left waist window on left side. Dinghy mounted directly beneath left waist gunner's parachute. Exits first through main entrance door.

(9) BALL TURRET GUNNER. — Parachute mounted on aft right-hand side of rear bulkhead of radio compartment, about even with top of door. Dinghy mounted directly beneath ball turret gunner's parachute. Exits third through main entrance.

(10) TAIL GUNNER.—Parachute mounted on right-hand wall immediately aft and slightly above rear gunner's escape hatch. Dinghy mounted directly beneath parachute. Exits through small emergency door in tail.

12. CRASH LANDING.

a. SIGNAL.

(1) Warning—spoken warning on the interphone.

(2) Warning—six short rings on the alarm bell.

(3) Prepare for crash landing-brace—one long sustained ring on the alarm bell.

b. EGRESS.

(1) Before impact pilot should: cut engines, turn OFF master, battery, and fuel shut-off valve switches.

(2) Crew members take stations, remove parachutes and fasten safety belts at interphone and alarm bell warning.

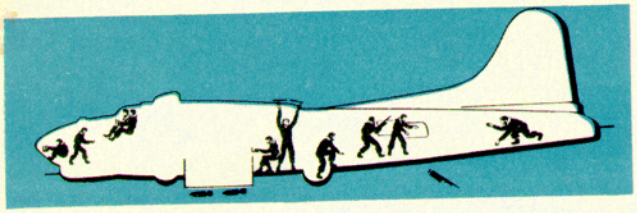
(3) Crew will abandon the plane through the assigned exit.

(4) The pilot's side windows can be used as exits.

(5) If it is necessary to exit through a hole in the aircraft structure, be careful of broken glass or metal.

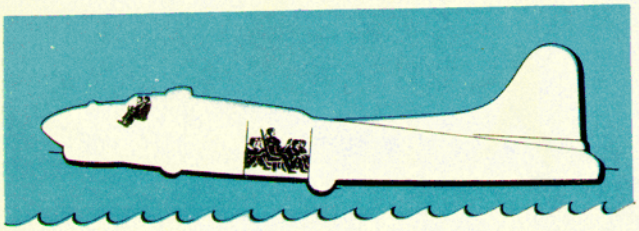
(6) If there is imminent danger of fire, all personnel should move away from the airplane at least 50 feet.

13. HOW TO DITCH THE B-17G:

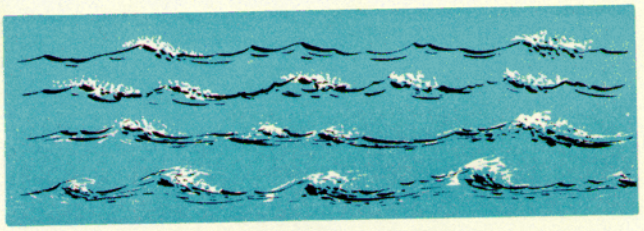


a. Jettison bombs, ammunition, and loose equipment and secure anything that might cause injury. Close bomb doors and lower hatches. If time is too short to release bombs and depth charges, place them on SAFE. Keep enough fuel to make a power landing.

b. Navigator gives radio operator position, course and speed. Latter tunes liaison set to MFDF and SOS's position and call sign continuously. R/O also turns IFF to distress, remains on intercomm., and clamps down key on order to "take to ditching post".

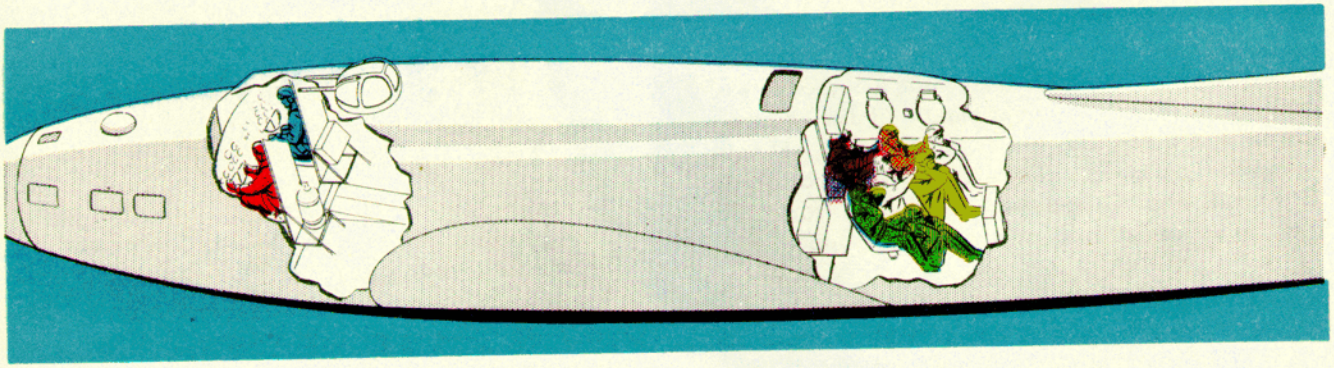


c. Here's how to tell wind direction and speed: (a) waves in open sea move downwind: (b) spray direction indicates wind direction; (c) wind lanes (series of lines or alternate strips of light and shade) also show direction; (d) approach on waves should be made into wind at right angles to them; (e) approach on swells should be made along top, parallel to swell and may be executed in winds not over 10 MPH.



HOW TO DETERMINE WIND SPEED

A few white crests	10 to 20 MPH.
Many white crests	20 to 30 MPH.
Foam streaks on water	30 to 40 MPH.
Spray from crests	40 to 50 MPH.



d. These positions should best enable crew members to withstand the impact of crash landings on either land or water. On water two impacts will be felt, the first a mild jolt when the tail strikes, the second a severe shock when the nose strikes the water. Positions should be maintained until the aircraft comes to rest. Study them carefully.

Emergency equipment for use in the dinghy should be carried to crash positions. Any equipment carried free must be held securely during ditching to prevent injury.

Parachute pads, seat cushions, etc., should be used to protect the face, head, and back.

e. KNOW YOUR DITCHING DUTIES! PRACTICE THEM! DRILL IS IMPORTANT!

Each crewman's duty is briefly and clearly indicated on next page. These duties should be studied, altered if necessary to agree with any modifications, memorized, and practiced until each member of the crew performs them mechanically. Drill is the responsibility of the pilot.

The pilot's warning to "prepare for ditching" should be acknowledged by the crew in the order given here—copilot, navigator, bombardier, flight engineer, radio operator, ball turret gunner, right waist gunner, left waist gunner, and tail gunner, *i.e.,* "copilot dtiching", "navigator ditching", etc.

Upon acknowledgement, crew members remove parachutes, loosen shirt collars and remove ties and oxygen masks unless above 12,000 feet, in which case main oxygen supply or emergency oxygen bottle is used until notification by the pilot. All crew members wearing winter flying boots should remove them. No other clothing should be removed.

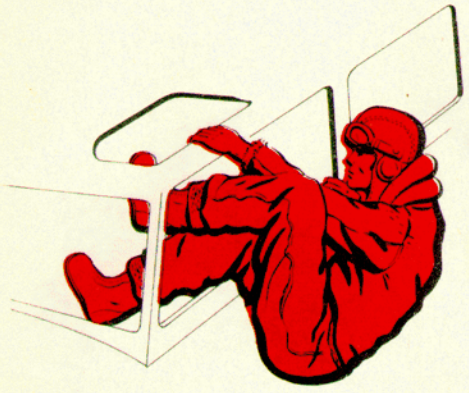
Releases on dinghies should not be pulled until the plane comes to rest.

Beware of puncturing rafts on wing and horizontal surfaces after launching. The dinghies should be tied together as soon as possible.

Injured men should get first consideration when leaving the plane.

Life vests should not be inflated inside the plane unless the crewman is certain that the escape hatch through which he will exit is large enough to accommodate both him and the vest.

When personnel are in dinghy, stock of rations and equipment should be taken by the captain (pilot or copilot). Strict rationing must be maintained. Flares should be used sparingly and only if there is a reasonable chance that they will be seen by sea or aircraft. Don't forget the Very pistol.



PILOT

(1) Warns "prepare for ditching" over interphone, gives altitude, sounds ditching bell signal (6 short rings); (2) fastens safety harness, opens right window, using axe if necessary; (3) orders R/O to ditching post; (4) five seconds before impact, orders crew to brace for ditching by giving a long sustained ring on signal bell; (5) when plane comes to rest, releases safety harness, parachute straps, exits through side window; (6) proceeds to left dinghy, cuts tie ropes, takes command.

RADIO OPERATOR

(1) Switches on liaison transmitter (tuned to MFDF), sends SOS, position and call sign continuously, turns IFF to distress, remains on intercomm, transmits all information given by navigator; (2) obtains MFDF fix, continues SOS, remains on intercomm; (3) on pilot's order clamps key, takes ditching position, inflating life vest partially, remains on intercomm, repeating pilot's "brace for ditching" to crew; (4) exits fifth from hatch, goes to left dinghy.

COPILOT

(1) Assists pilot to fasten safety harness; (2) fastens own safety harness, opens right window, using axe if necessary; (3) releases safety harness, parachute straps, exits through right window when plane comes to rest; (4) proceeds to right dinghy, cuts ropes, takes command.

LEFT WAIST GUNNER

(1) Throws his gun (remember in the later B-17G's the waist gun must be removed from its window mount), ammunition, and loose equipment overboard. Goes to the radio compartment; (2) partially inflates his vest; (3) leaves the airplane sixth and takes his place in the left dinghy.

NAVIGATOR

(1) Calculates position, course, speed, giving to R O, destroys secret papers, gathers maps, celestial equipment, proceeds to radio compartment; (2) attaches rope on emergency radio equipment, signal set (if radio stored in radio compartment) to arm; (3) second to exit through radio hatch; goes to left dinghy.

TAIL GUNNER

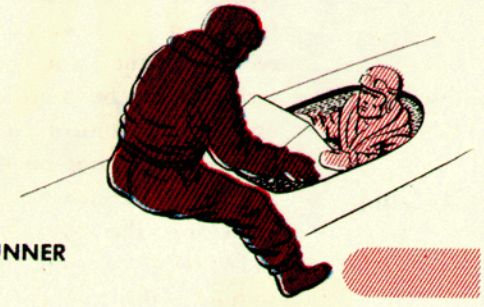
(1) Jettisons ammunition, goes forward, collecting emergency ration pack (stowed in fuselage), secures pack rope to arm, last to enter radio compartment; (2) takes position, inflates life vest partially; (3) exits first from hatch, carrying ration pack, goes to left dinghy, assists with dinghy inflation, inspects for leaks, applies stoppers.

RIGHT WAIST GUNNER

(1) Jettisons his gun, ammunition, all loose equipment; (2) closes his gun window, goes to radio compartment, attaches emergency radio and signal box to upper arm (if radio not stored in radio compartment); (3) takes position, partially inflates vest; (4) exits third from hatch, receives emergency radio from flight engineer, helps inflate right dinghy, inspects for leaks, applies stoppers if necessary.

FLIGHT ENGINEER ***(Top Turret Gunner)***

(1) Jettisons ammunition, loose equipment, turns turret guns forward, goes to radio compartment, jettisons radio hatch or lowers radio window, moving to rear of plane, jettisons loose equipment, slides back top gun; (2) makes emergency ration pack secure to arm; (3) hands radio up to r. waist gunner, exits fourth from hatch with emergency ration pack, goes right dinghy.



BALL TURRET GUNNER

(1) Turns his turret and guns aft, closes his turret tightly, and goes to the radio operator's compartment; (2) pulls both dinghy releases as soon as the aircraft comes to a complete stop; (3) exits from the hatch seventh and takes his assigned place in the right dinghy.

BOMBARDIER

(1) Jettisons bombs, closes bomb doors, destroys bomb sight, goes to radio compartment, closing forward hatch to radio compartment; (2) takes position, inflating life vest partially by pulling cord one side only; (3) directs, assists exit of men through radio hatch; eighth to exit, goes right dinghy.

14. EMERGENCY OPERATION OF RADIO EQUIPMENT.

a. PORTABLE EMERGENCY RADIO TRANSMITTER (TYPE SCR-578-A).

(1) GENERAL.

(a) A complete self-contained portable emergency transmitter is stowed on the right rear side of bulkhead 6 for operation anywhere away from the airplane. It is primarily designed for use in a small boat or life raft but may be used anywhere a kite may be flown or water found.

(b) When operated on MCW, signal is transmitted and pretuned to the international distress frequency of 500 kilocycles. A predetermined signal is automatically transmitted. Any searching party can "home" on the signal with the aid of a radio receiver.

(c) The set has no receiver.

(2) REMOVAL FROM AIRPLANE.

(a) If the airplane makes an emergency landing on water, remove the emergency set at the same time as the life raft. The set is waterproof, will float, and the only care necessary is to keep it from floating beyond reach.

(b) The emergency set can be dropped from the airplane by use of the attached parachute. The airplane should be between 300 and 500 foot altitudes when the set is dropped. Observe the following steps if the set is dropped:

1. Tie the base end of the parachute static line to any solid metal structure of the airplane.

CAUTION

Be sure the static line is in the clear and will not foul.

2 Throw the set out. The parachute will be opened by the static line.

CAUTION

Don't attach the static line to your clothing or body when throwing the equipment out.

(3) OPERATION.—Complete operating instructions are in one of the bags containing the set. They are also on the transmitter itself.

b. INTERPHONE EQUIPMENT FAILURE.—the interphone equipment fails, the audio frequency section of the command transmitter may be substituted for the regular interphone amplifier. To do this, the pilot places his command transmitter control box channel selector switch in channel 3 or 4. Set the interphone jack box selector switch on COMMAND to place the interphone equipment in operation.

NOTE

When the command transmitter control box channel selector switch is set in either the No. 3 or 4 position for emergency operation of the interphone equipment, it is not possible to establish communication with any station or any other airplane. It is possible at all times to resume normal command set operation by placing the channel selector switch of the command transmitter control box in either the No. 1 or 2 position.

c. SUBSTITUTION OF RADIO COMPASS RECEIVER FOR LOW FREQUENCY COMMAND SET RECEIVER.—If the low frequency receiver of the command set fails, the radio compass receiver may be substituted, with the pilot having *direct control* over the compass receiver. To complete this emergency hook-up, the pilot must set his interphone jack box selector switch in the "COMP" position and then place the radio compass selector switch in the "ANT" position. The radio compass can then be tuned as desired.

d. SUBSTITUTION OF LIAISON RECEIVER FOR LOW, MEDIUM, AND/OR HIGH FREQUENCY COMMAND RECEIVER.—In case of the failure of the low, medium, and/or high frequency receiver of the command radio equipment, the liaison receiver may be substituted, but the pilot will have only limited control over it. The pilot should first call the radio operator on the interphone system and tell him what frequency he desires to receive, that he is switching the interphone selector switch to the "LIAISON" position, and for him (the radio operator) to tune in this frequency and maintain the setting until further advised.

e. COMMAND SET TRANSMITTER FAILURE. In case of failure of the command set transmitter, the liaison transmitter may be substituted. The pilot should first call the radio operator on the interphone and have him adjust the liaison transmitter to the frequency

he desires to use. He should then set his interphone selector switch to the "LIAISON" position and operate his microphone button in the same manner that he did when the command set was in operation. When he is through using the liaison transmitter, the pilot should place the interphone selector switch in the "INTER" position and tell the radio operator to cut the liaison transmitter, off, so as to reduce the load on the electrical system.

Note

When substituting one receiver for another such as the compass receiver for the command receiver, the pilot must move his interphone selector switch to the "COMMAND" or "LIAISON" position, as the case may be, in order to transmit. At the end of the transmission, he must switch back to the position of the receiver being used. This will have to be done every time that the pilot desires to hold a two-way conversation.

15. EMERGENCY ICE REMOVAL FROM CARBURETORS.

a. Turn filter on if below 20,000 feet.

b. Close intercooler shutters. Do not let carburetor inlet air exceed 38°C (100.4°F.) except momentarily.

c. Below 25,000 feet, add up to 3 inches boost by retarding the throttle and increasing the turbo boost. Below 15,000 feet, more heat can be added by using full turbo boost and part throttle (do not exceed 34 inches manifold pressure at 2200 RPM). Use this for only a short time as excessive carburetor leanness results from high carburetor deck pressures.

d. Above 25,000 feet close intercooler shutters only. Do not use filters. Increase to full throttle for rated horsepower and change altitude to change outside air temperature and reduce moisture due to fog, rain, snow, or sleet.

16. LANDING WITH ONE MAIN GEAR RETRACTED.

a. Approach the runway with tail wheel and main wheel extended.

b. As soon as the extended wheel touches the ground, retract the wing flaps.

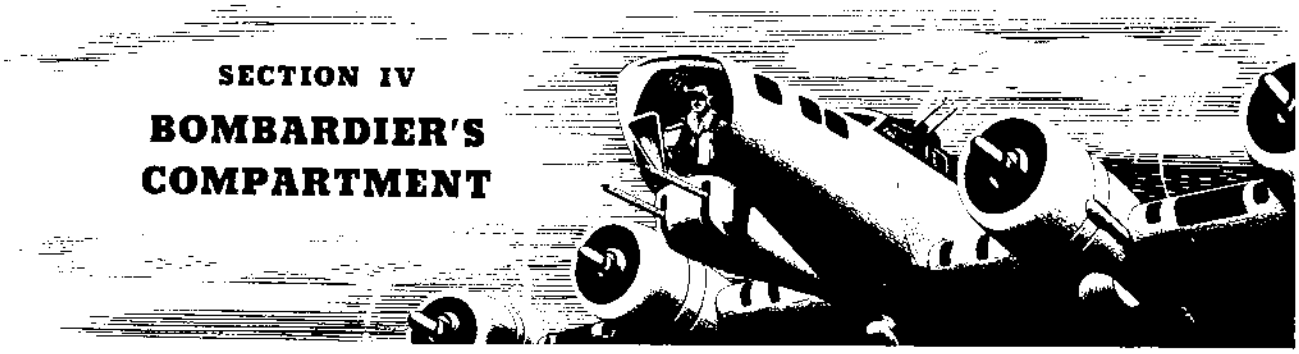
c. When the wing of the retracted wheel begins to drop, apply the brake, and continue to use the brake after the wing tip begins to drag. Braking aids in keeping the airplane straight and reduces the tendency of the airplane to groundloop in the direction of the low wing.

17. EMERGENCY BRAKING PROCEDURE.

There are two methods of obtaining pressure for emergency braking in the B-17. To raise pressure with either method, sufficient fluid must be in the reservoir and the lines must be intact.

a. Depress the brake pedals and use the hydraulic hand pump. Hydraulic fluid is sent directly to the deboost valves and brakes through the open brake metering valves. The hydraulic pressure gage will reveal exact pressure readings when the fluid is pumped with the brake pedals depressed.

b. Another method of emergency braking is slower but is satisfactory when sufficient time permits its use. Build up pressure in the accumulator before applying the brakes. There are two disadvantages of this procedure. The correct amount of pressure necessary to stop the airplane cannot be determined and all pumping after the first stroke must be done against a minimum pressure of 350 PSI, which slows the pumping process.



SECTION IV
BOMBARDIER'S COMPARTMENT

1. BOMB CONTROLS.

a. In the earlier B-17G airplanes bombs are normally released electrically but can, in emergency, be released mechanically. The electrical control releases bombs either singly (selective) or continuously at predetermined intervals (train). The mechanical controls, which include the bombardier's and the emergency release handles always drop the bombs in SALVO. There are separate bomb control handles for the external and internal bomb racks. This division makes it possible to release the external bombs without opening the bomb doors. A lug on the bomb door lever prevents movement of the internal rack control lever until the bomb doors are opened.

(1) The bomb release lever has three positions.

(a) In the LOCK position, the bombs can only be released by the emergency release handles.

(b) In the SELECTIVE position, the racks are ready for electrical release by either manual operation of the release switch or by automatic operation through the bomb sight.

(c) The SALVO position, when the bomb doors are open, releases all bombs at once and unarmed.

(2) The bombardier's release switch, on the forward end of the control panel, operates in either direction to energize the release unit solenoids through the interval release control mechanism. A hinged guard prevents accidental operation of this switch.

(3) The interval release control unit on the bottom of the bombardier's control panel may be set to provide either "SELECT" or "TRAIN" release. Four switches on the bombardier's control panel permit selection of any external or internal rack for electrical release. Two indicator lamps beside the rack selector switches correspond to the external racks. Two additional rack selector switches in the bomb bay permit elimination of either right or left bomb bay from the release circuit if bomb bay fuel tanks are carried. Bomb release sequence is given in figure 36. Any rack or combination of racks may be eliminated from the release sequence by turning off the respective selector switch on the bombardier's control panel.

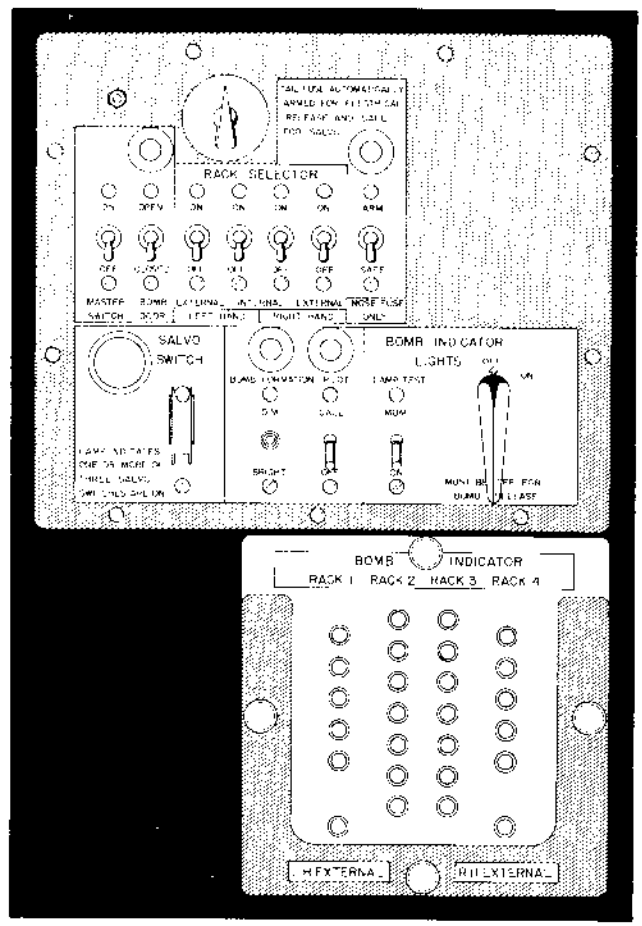
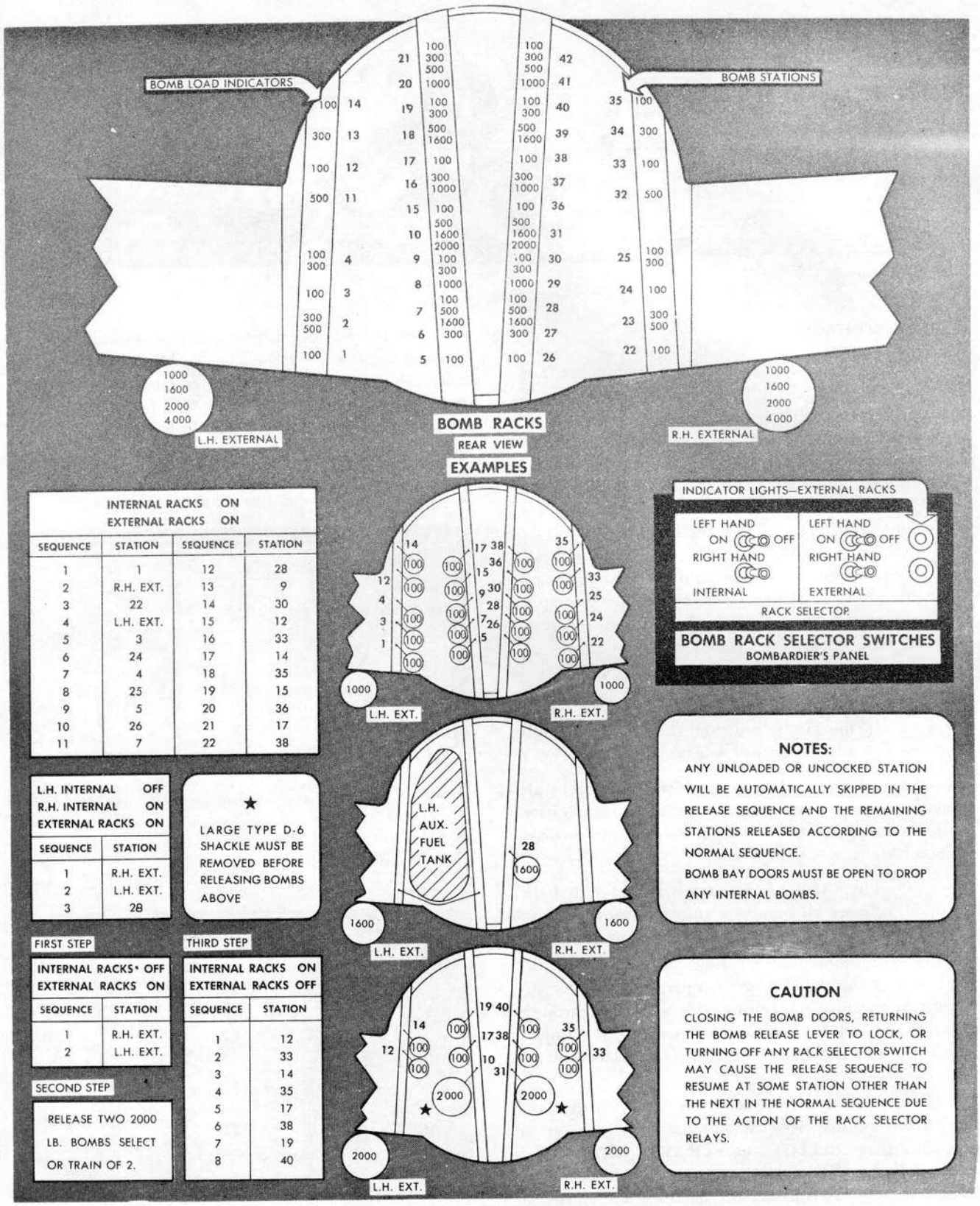


Figure 35—Bombardier's Control Panel—Electric



INTERNAL RACKS ON EXTERNAL RACKS ON			
SEQUENCE	STATION	SEQUENCE	STATION
1	1	12	28
2	R.H. EXT.	13	9
3	22	14	30
4	L.H. EXT.	15	12
5	3	16	33
6	24	17	14
7	4	18	35
8	25	19	15
9	5	20	36
10	26	21	17
11	7	22	38

L.H. INTERNAL OFF R.H. INTERNAL ON EXTERNAL RACKS ON	
SEQUENCE	STATION
1	R.H. EXT.
2	L.H. EXT.
3	28

INTERNAL RACKS* OFF EXTERNAL RACKS ON	
SEQUENCE	STATION
1	R.H. EXT.
2	L.H. EXT.

INTERNAL RACKS ON EXTERNAL RACKS OFF	
SEQUENCE	STATION
1	12
2	33
3	14
4	35
5	17
6	38
7	19
8	40

Figure 36—Bomb Release Sequence Diagram

100 LB. AN-M30

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	1 & 22	47¾	51
	3 & 24	36½	41
	4 & 25	28¼	33½
	12 & 33	22	27½
	14 & 35	17½	22¾
2 AND 3	26 & 5	56	57½
	28 & 7	42½	46½
	30 & 9	31½	36½
	36 & 15	23¾	29¼
	38 & 17	19	24
	40 & 19	15	20
	42 & 21	11¼	15¾

100 LB. AN-M39

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	1 & 22	46¼	45
	3 & 24	34½	34¾
	4 & 25	26¼	27
	12 & 33	20½	21½
	14 & 35	16	16¾
2 AND 3	26 & 5	54½	52½
	28 & 7	40¾	40¼
	30 & 9	29¾	30
	36 & 15	22	23
	38 & 17	17¼	19¼
	40 & 19	13½	14½
	42 & 21	10	10¾

100 LB. MK. 1-MK. IMI.-MK- IMII.

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	1 & 22	46¼	45
	3 & 24	34½	34¾
	4 & 25	26¼	27
	12 & 33	20½	21½
	14 & 35	16	16¾
2 AND 3	26 & 5	54½	52½
	28 & 7	40¾	40¼
	30 & 9	29¾	30
	36 & 15	22	23
	38 & 17	17¼	19¼
	40 & 19	13½	14½
	42 & 21	9¾	10¾

100 LB. M-38A2

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	1 & 22	49¾	44½
	3 & 24	40	32
	4 & 25	29½	26¾
	12 & 33	23	20¾
	14 & 35	20	15
2 AND 3	26 & 5	57½	52
	28 & 7	44¼	39¾
	30 & 9	33	29½
	36 & 15	25	22½
	38 & 17	19¾	18
	40 & 19	15½	14¼
	42 & 21	11½	10½

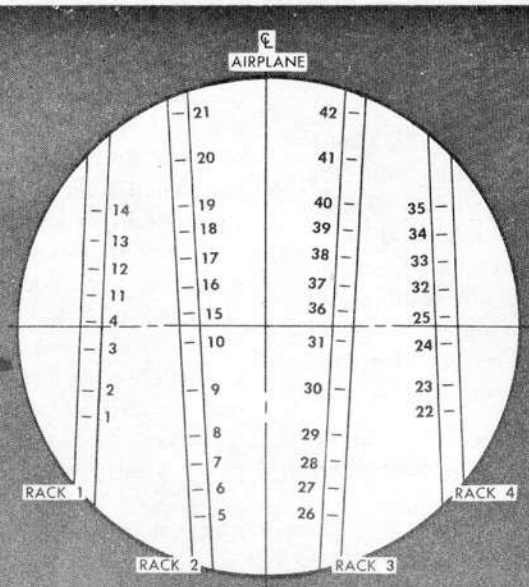


DIAGRAM-BOMB POSITIONS
REAR VIEW

WITH WHEELS AND FLAPS UP: MAXIMUM ALLOWABLE INDICATED AIR SPEED IS 305 M.P.H. SAFE GLIDE ANGLE IS 15-1/4°.

WITH WHEELS AND FLAPS DOWN: MAXIMUM ALLOWABLE INDICATED AIR SPEED IS 147 M.P.H. SAFE GLIDE ANGLE IS 13-1/2°.

NOTE: THE SAFE GLIDE ANGLES ARE BASED ON AN AIRPLANE GROSS WEIGHT OF 40,000 LBS. WITH POWER OFF AND WINDMILLING PROPELLERS.

WHILE THE MAJORITY OF BOMB STATIONS WILL PERMIT RELEASE OF BOMBS AT AN ANGLE WHICH WILL PRODUCE AN INDICATED AIR SPEED GREATER THAN THAT DESIGNATED FOR THE SAFE GLIDE ANGLE OF THE AIRPLANE, UNDER NO CONDITIONS SHALL THE MAXIMUM ALLOWABLE INDICATED AIR SPEED BE EXCEEDED.

ANGLES SHOWN ALLOW 10° FOR SAFETY. HOWEVER, UNDER PERFECTLY SMOOTH FLYING CONDITIONS, IF THE AIRPLANE COMMANDER BELIEVES THAT CONDITIONS WARRANT IT, THESE GIVEN ANGLES MAY BE EXCEEDED BY NOT MORE THAN 5°.

THE GLIDE OR CLIMB ANGLE IS THE ANGLE INCLUDED BETWEEN THE EARTH'S SURFACE AND THE FUSELAGE CENTERLINE. THE ANGLES LISTED IN THE TABULATION ARE THE MAXIMUM AT WHICH BOMBS MAY BE RELEASED WITH A 10° CLEARANCE ANGLE MAINTAINED IN THE BOMB BAY.

300 LB. M-31

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	2 & 23	38	38½
	4 & 25	24	26½
	13 & 34	16	18¾
2 AND 3	27 & 6	45	44¾
	30 & 9	27¼	29½
	37 & 16	17½	20
	40 & 19	11¾	14½
	42 & 21	8¼	10½

300 LB. MK. 1-MK. IMI

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	2 & 23	37	33¾
	4 & 25	23¾	22
	13 & 34	14¾	15
2 AND 3	27 & 6	44½	40
	30 & 9	27	25
	37 & 16	17¼	16¼
	40 & 19	11½	11¼
	42 & 21	8	8

2000 LB. AN-M34

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	31 & 10	0	0

1600 LB. AN-MK1

NO. RACK	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	7 & 28	26¼	12¾
	10 & 31	9¾	4¼
	18 & 39	1½	0

1100 LB. M-33

NO. RACK	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	29 & 8	26	15
	37 & 16	11	6½
	41 & 20	5	2

1100 LB. MK. 111

NO. RACK	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	29 & 8	23½	9
	37 & 16	10	1½
	41 & 20	4	0

1000 LB. AN-M65

NO. RACK	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	29 & 8	25	17
	37 & 16	11	8
	41 & 20	5	3

600 LB. MK. IMI–MK. IMII

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 AND 3	28 & 7	33	23
	31 & 10	18	12½
	39 & 18	9½	6½
	42 & 21	5	2½

600 LB. M-32

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	2 & 23	32½	29
2 AND 3	28 & 7	34½	29½
	31 & 10	18	17½
	39 & 18	10	10
	42 & 21	5½	6

500 LB. AN-M64

RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 AND 4	2 & 23	33	33¼
	11 & 32	17	19¼
2 AND 3	28 & 7	34¼	34
	31 & 10	18¾	21
	39 & 18	10	12½
	42 & 21	5½	8

Figure 37—Bomb Release Angles Chart

(4) A switch on the bombardier's panel controls the bomb arming solenoids in the external racks.

b. On airplanes Boeing built AAF 42-97173, Douglas AAF 42-98036, Vega AAF 44-6001 and later, the cable bomb control system is replaced with an all electric system. There are three SALVO switches and lights in this system; one on the bombardier's panel, one on the instrument panel ledge in front of the copilot, and one located in the bomb bay on the upper left hand sidewall. The bomb racks and stations are the same as before but the method of release is entirely electric.

(1) The normal release procedure for both internal and external racks is as follows: The bombardier first sets the intervalometer for the number and spacing of bombs to be released. If several bombs are to be dropped in a "stick" the SELECT-TRAIN switch is set on TRAIN. If only one bomb is to be dropped, the switch is set at SELECT. Next the bomb formation signal light is set to either BRIGHT or DIM as desired and the amber indicator light goes on, but the white tail light does not go on until the master switch is turned on. The bombardier should then turn on the P.D.I. switch and the BOMBSIGHT switch on the bombsight stabilizer, and if the AUTOPILOT is to be used, the SERVO and STABILIZER switches should be turned on. Next the master switch on the bombardier's panel is turned on. This turns on the white formation

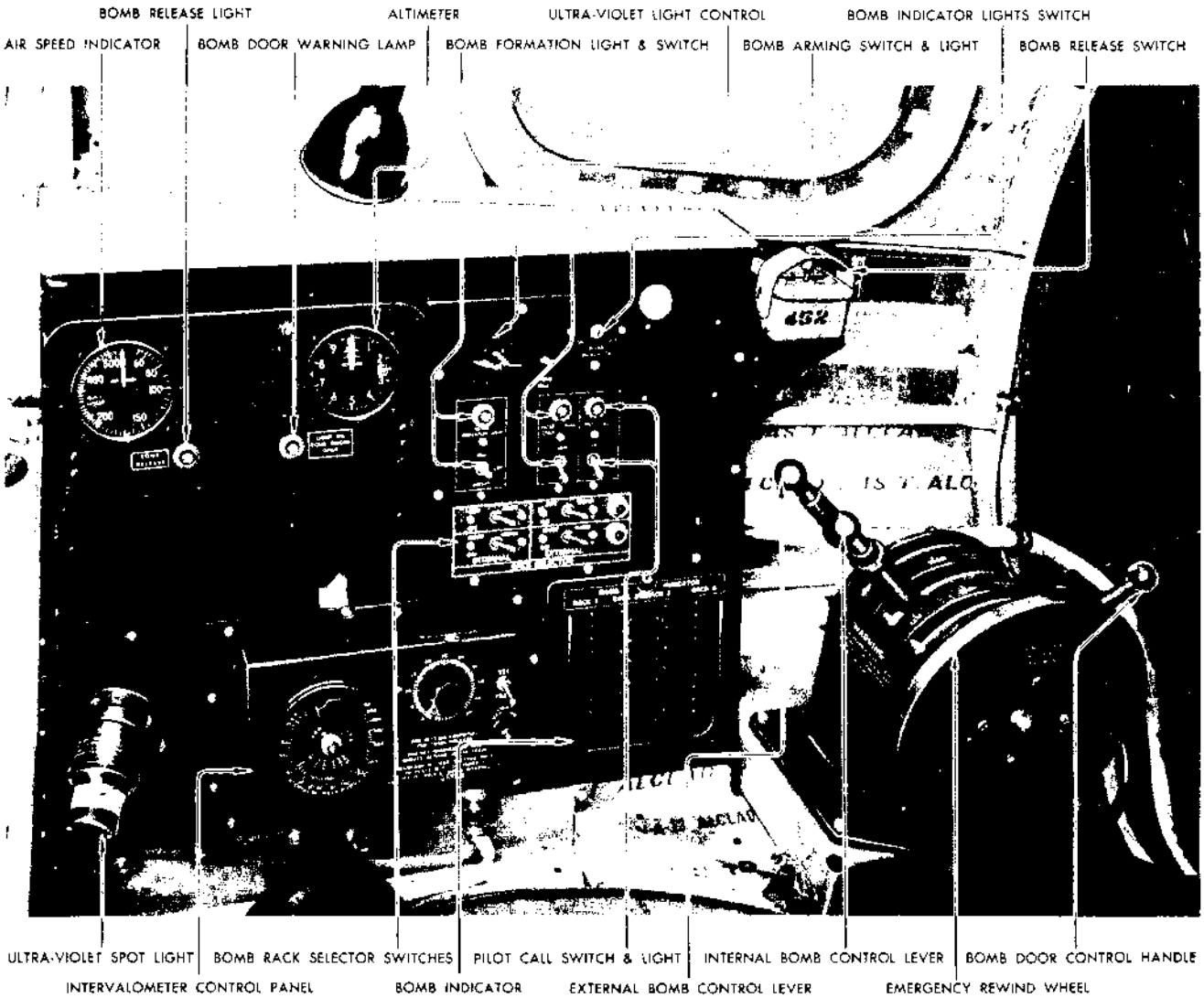


Figure 38—Bombardier's Panel and Controls

signal light at the tail and the amber indicator light on the intervalometer panel. The pilot director indicator (P.D.I.) on the pilot's panel will respond to the movement of the bombsight gyro and the stabilizer servo will run, and if the STABILIZER switch is on, the stabilizer gyro will run.

(2) The bomb door switch is held in OPEN until the red light turns on. The four RACK SELECTOR switches are turned on, energizing the rack selector relays to direct bomb release impulses to the proper racks.

NOTE

When an auxiliary fuel tank is hung in either side of the bomb bay, turn the rack selector switch for the rack on which the tank is hung to OFF to prevent accidental release. To release such a tank turn the switch ON and turn any of the SALVO switches to ON.

(3) The external racks have nose fusing solenoids so that bombs may be released either armed or unarmed. The solenoid is controlled by the NOSE FUSE ONLY switch. When the switch is set to ARM (even though there are no external bombs loaded or no external racks) a red light above the switch goes on. The tail fuse is automatically armed for normal and safe for SALVO releast

(4) The bombardier should test the bomb load indicator lights by momentarily holding the LAMP TEST switch to "MOM" to see that all bulbs illuminate, and may then turn the indicator light switch handle to ON momentarily to see which stations are loaded.

NOTE

The indicator light switch must be OFF and the test lamp switch ON during bomb release. The bombs will be salvoed unarmed as long as either switch is held in the momentary position during a train release.

(5) If the light on the intervalometer has been on for at least 60 seconds when the SELECT-TRAIN switch is on TRAIN the bomb release switch may be pressed, or the bombsight actuated to start the release sequence. The bomb release switch is protected against accidental movement by a hinged guard. The switch may be pressed in either direction to release the bombs. The bomb release switch current blinks an amber light on the pilot's panel, actuates the formation signal light to turn off the white tail light and turn on the red tail light for five seconds, and operates the rack selector relays to direct the impulses to the proper rack as determined by the bomb release sequence. These impulses energize the bomb rack release allowing both cocked arms to snap to the uncocked position. One arm locks the hook around which the bomb arming wire is looped and the other arm releases the bomb shackle hooks to drop the bomb. After the bomb is dropped a transfer switch in the release box bypasses the next impulse to the next loaded station. The transfer switch does not operate until after the bomb is released to prevent more than one bomb being dropped by each impulse. When the intervalometer is not in use, leave the switch on TRAIN and the dial set at zero to prevent pilot light and tube current drain.

(6) All internal and external bombs can be released unarmed by any one of the three salvo switches. A light beside each switch indicates that any one of the salvo switches are ON. When any one of these switches are turned ON, the bomb doors are opened by the bomb door motor. *The time required to open the doors is twelve seconds.* At the same time the indicator light circuit relay closes the circuit to the four rack salvo relays and to the salvo solenoids in the type A-4 bomb rack releases. The salvo relay extends a pin which prevents the arming lever on the type A-4 releases from snapping uncocked while the release lever snaps to the uncocked position. This allows the arming wire to pull out of the shackle when the bomb is released so the bomb falls unarmed.

(7) When a salvo switch is turned on, the external rack relays close and the bomb drops immediately. The rack selector relays transfer the release impulses from one rack to another to preserve balance. When a rack is empty or a bomb fails to fall and those above it must not be dropped, the relay automatically excludes that rack from the circuit. Any rack can be turned off by its switch on the bombardier's panel.

CAUTION

If bombs are carried above the 2000-pound bomb, they MUST NOT be released until the D-6 shackle and adapter have been removed. This definitely requires "SELECTIVE" release control for the 2000-pound bomb.

2. BOMBARDIER'S GUNS.

a. An electrically driven power chin turret mounting two .50 caliber M-2 machine guns equipped with recoil absorbing mechanism, firing solenoids, and hydraulic gun chargers is mounted under the bombardier's station and is operated by the bombardier. The gun barrels protrude through zippered fabric covered slots. The turret is faired into the fuselage to reduce wind resistance.

b. FIELD OF FIRE.

AZIMUTH (from centerline).
Right 86°.
Left 86°.

ELEVATION (from horizontal).
Up 26°.
Down 46°.

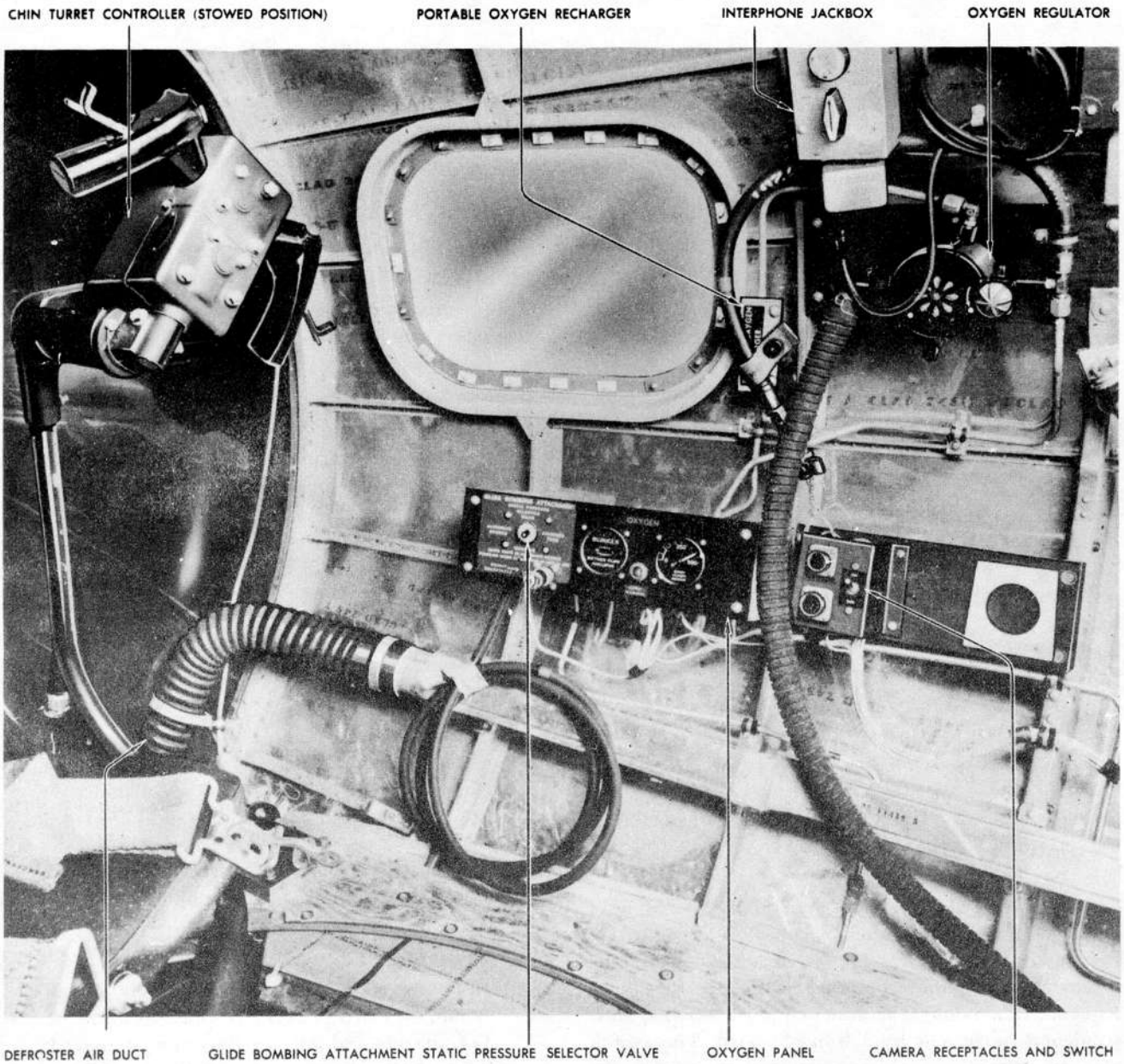


Figure 39—Bombardier's Compartment—Right Side Wall

c. CONTROLS.—The bombardier is the chin turret gunner and operates the turret from his usual position by lifting a latch and swinging the turret controller from its stowed position against the right hand side of the fuselage. A main power switch and charging button are located on the front of the controller. An open sight is suspended at eye level from the top of the airplane. The direction and speed of the guns are controlled by handle bar type levers, each equipped with a safety brake switch to stop the turret should the gunner relax his grip, a spring trigger switch for firing the guns, and a high speed switch for fast tracking speeds. The speed of the guns in azimuth and elevation can be varied from ¼° per second to 12° per second in slow speed and from¼° per second to 33° per second in high speed. The guns may be hand cranked in emergency. Depressing the charger switch on the control column hydraulically charges the guns. The type N-6 open sight is synchronized with the guns through flexible drive shafts. It is equipped with a rheostat to control the intensity of the light of the two concentric circles which project on the sight glass. The center of the field of view is marked by the center of these two circles and is the point on which the guns are trained.

d. OPERATING SEQUENCE.

(1) Unlock control column latch.

(2) Swing controller to combat position and lock.

(3) Move power switch to ON position.

(4) Adjust intensity of sight reticle.

(5) Charge guns by pressing charger switch for not more than 30 seconds.

(6) Depress either control handle safety switch to release turret. Avoid contact with trigger switches.

(7) To rotate turret in azimuth, rotate control handles about their axis. Swing of guns in elevation follows swing of control handles up or down. For high speed in azimuth or elevation, depress either high speed switch with thumb.

(8) Fire guns by depressing either trigger firing switch.

e. In addition to the chin turret two .50 caliber machine guns are installed through windows, one on each side of the nose compartment.

3. INTERPHONE.

There are two interphone jack boxes on the right side of the compartment. (For operation see Section I, paragraph 10).

4. OXYGEN.

The oxygen regulator and indicator panel are on the right wall of the compartment.

5. BOMB-SIGHT HEATING PAD.

All airplanes have an electrical bomb-sight heating pad which may be plugged into the bombardier's suit heater receptacle.

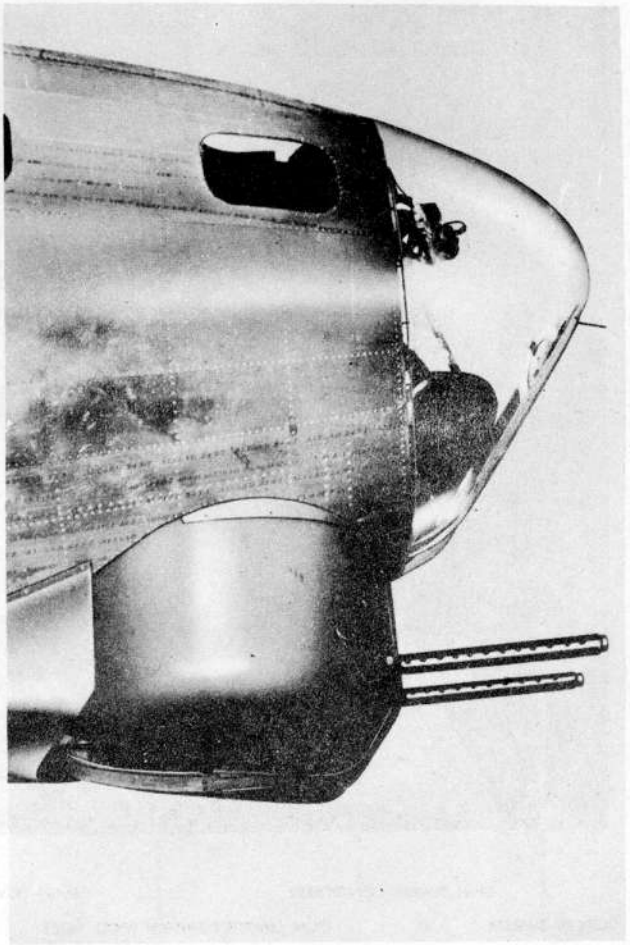


Figure 40—Chin Turret

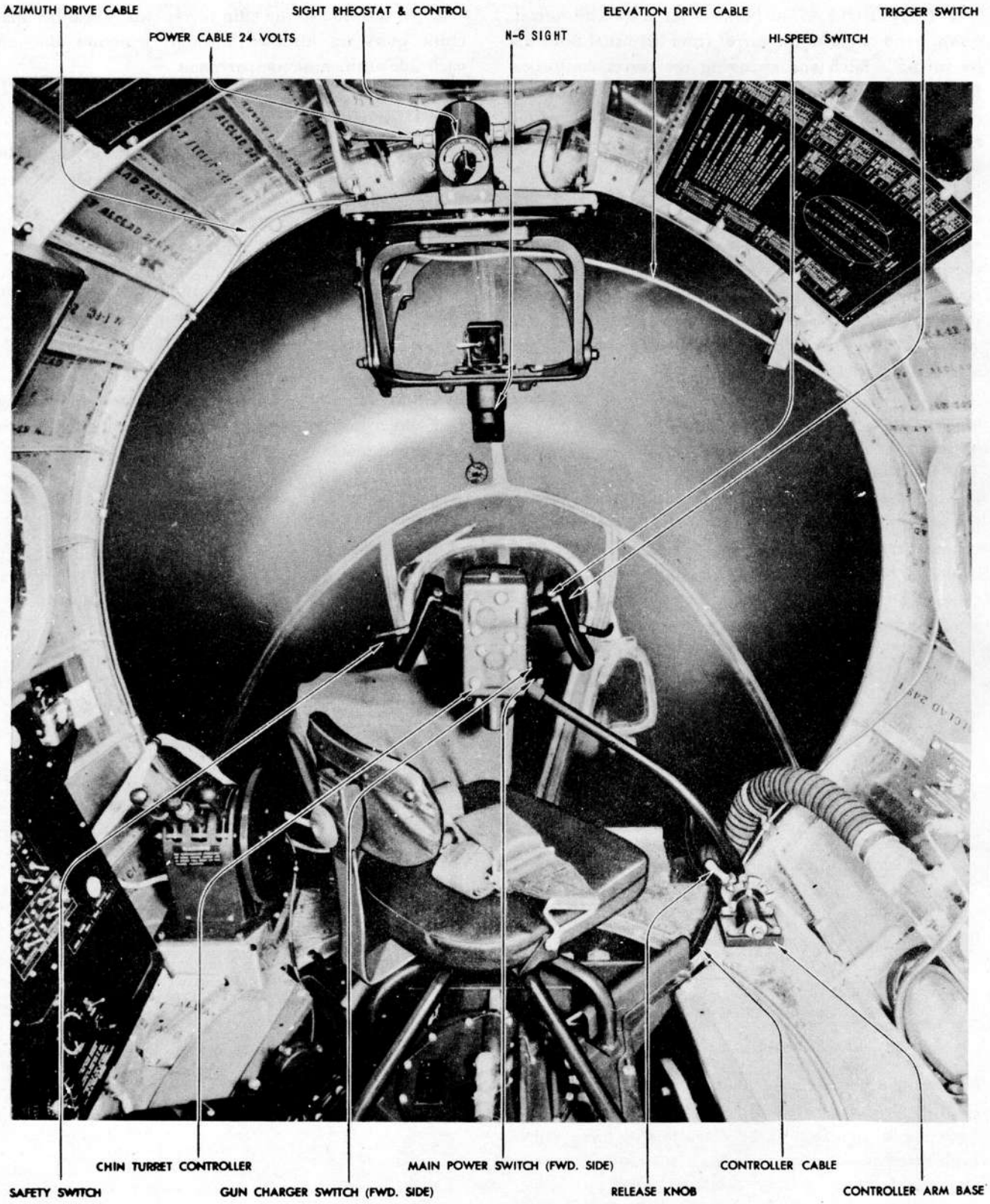
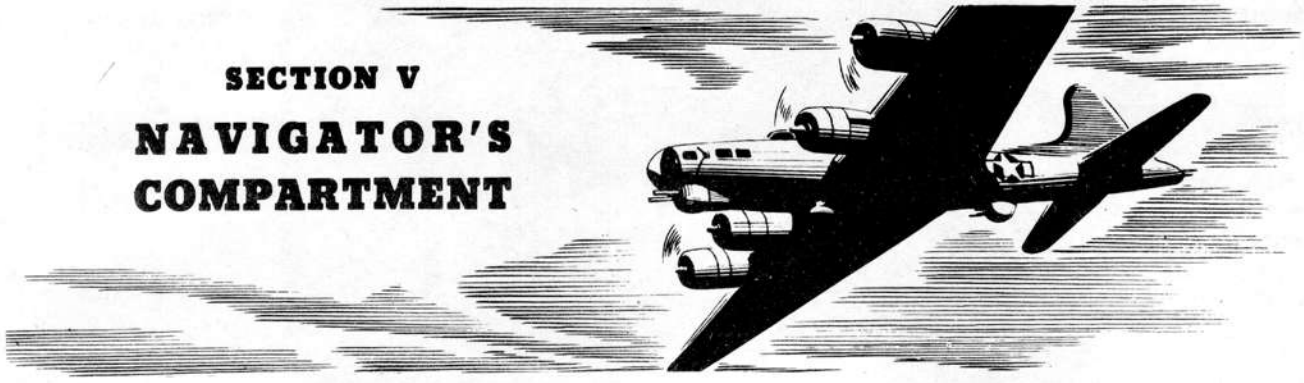


Figure 41—Chin Turret Controls

SECTION V
NAVIGATOR'S COMPARTMENT



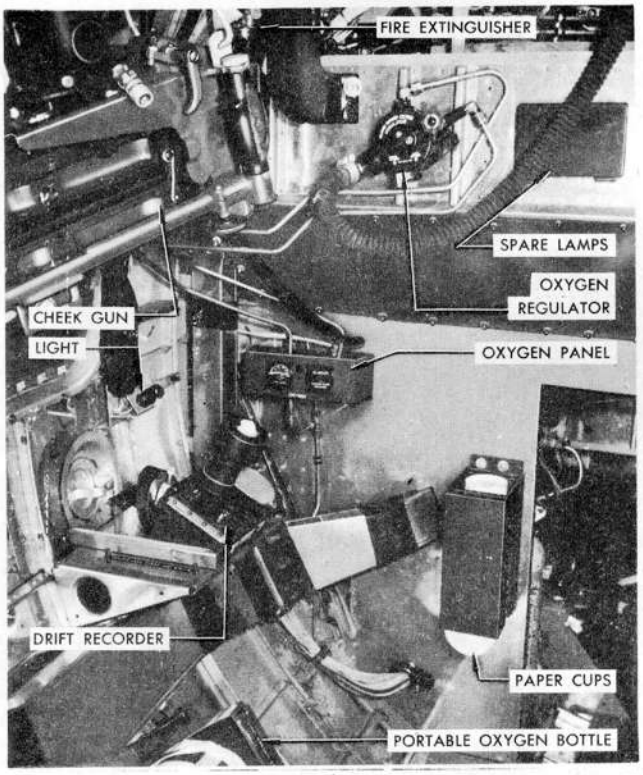


Figure 42—Navigator's Compartment—Right Side Aft

1. FIRE EXTINGUISHER.

A hand CO_2 fire extinguisher is clipped to the aft wall of the compartment above the drift recorder.

2. INTERPHONE.

The interphone jack box is on the navigation radio bracket above the table. (For operation see Section I, paragraph 10.)

3. OXYGEN.

Two oxygen regulators are on the aft bulkhead above the navigator's table. The pressure gages and blinkers are on the navigation radio bracket above the table and on the aft bulkhead. (Section I, paragraph 9.)

4. DRIFT RECORDER.

A drift recorder is in the aft right sidewall. A panel light and switch are just above.

5. RADIO COMPASS.

The navigator's radio compass control box is on the bulkhead above the navigator. The radio compass master indicator is on a panel above the navigator's table. (See Section II, paragraph 2.)

6. GYRO FLUX GATE COMPASS.

The amplifier is on a shelf below the navigator's table. The master indicator is on a panel above the navigator's table. Compensation of the compass for both variation and deviation has been incorporated in the system so that a true heading is always indicated by the master indicator and the repeater indicator on the pilot's panel.

a. A switch above the navigator's table controls a motor which operates the gyro caging mechanism. A signal light on the caging switch box lights when the gyro is caged.

b. After the power has been turned on, wait at least 5 minutes to allow the gyro to reach its normal operating speed.

(1) Using Caging Switch Box, Type CQ-1:

(a) Throw the toggle switch to the "CAGE" position and allow at least 30 seconds for completion of the caging cycle. The warning lamp will light and remain lit as long as the switch is in the "CAGE" position, even after the caging cycle has been completed.

(b) Throw the toggle switch to the "UNCAGE" position and allow at least 30 seconds for the completion of the uncaging cycle. As soon as the switch is thrown to the "UNCAGE" position, the warning lamp will go out and remain out.

Note

If the toggle switch is already in the "CAGE" position, throw the switch to the "UNCAGE" position and, after allowing time for completion of the cycle, go through a complete cage-uncage cycle as instructed above.

(2) Using Caging Switch Box, Type CQ-2.

(a) Press the momentary contact switch and hold the switch down until the warning lamp lights, then release the switch.

(b) With this type of switch box, the caging mechanism cannot be stopped in the caged position and, when once started, it will run through a complete cage-uncage at the conclusion of which the warning lamp will go out and the caging mechanism will stop in the "UNCAGED" position.

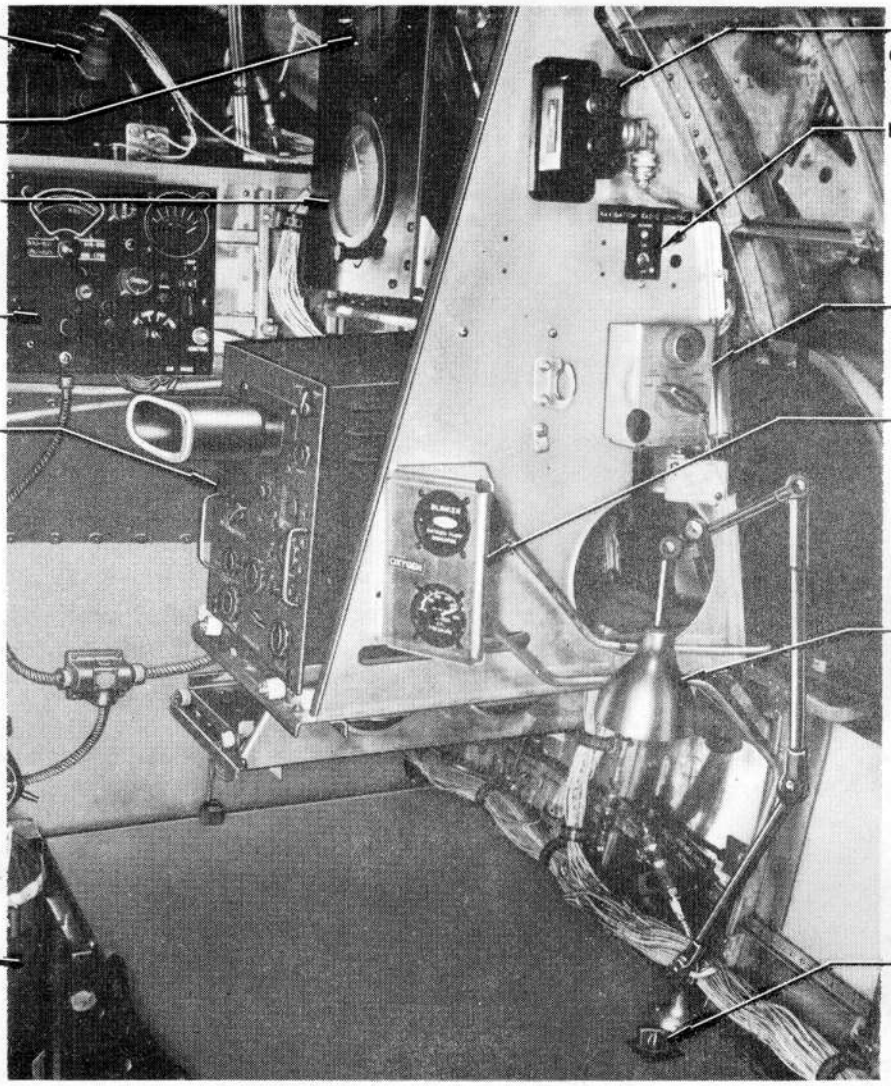


Figure 43—Navigator's Controls

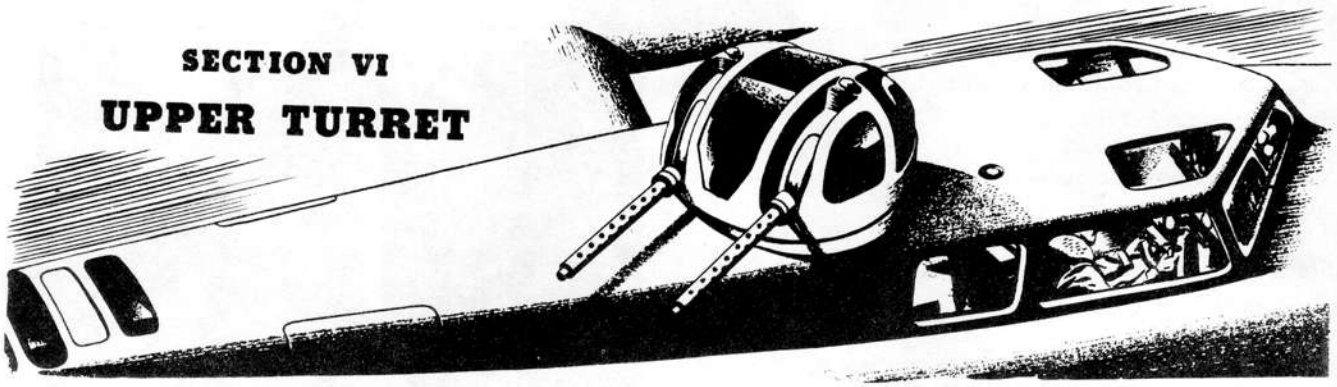
c. Compensation is performed only at the master indicator. A screw type cam compensator is designed to completely compensate compass deviation on all headings. This type of compensation does not require compass deviation correction cards.

A knob near the top of the indicator permits removal of the front bezel ring, which conceals the cam compensator adjustment screws. Compensation of this compass has been made by authorized personnel and it should not require further attention. The readings which show on the master indicator (once compensation for deviation has been introduced) are corrected compass readings which are passed on to the repeater indicator. Compensation is easier with the gyro flux gate than the magnetic compass due to the fact that the master indicator has an underdial which indicates directly the uncompensated reading, while the main pointer and dial gives the compensated reading.

Magnetic variation corrections may be made by a knob at the bottom of the master indicator. This will rotate the outer dial with reference to a variation scale graduated from 0 to 56 degrees East and West. The pointer of the master indicator will then give a true reading. The same correction is also passed on to the repeater indicator.

A gain control on the amplifier corrects for the difference in strength of the earth's magnetic field which occurs with a change of latitude. Increasing gain in northern latitudes gives better results.

SECTION VI
UPPER TURRET



1. GENERAL

a. Elevation of the guns is controlled by lifting or depressing the hand control grips, the direction corresponding to the direction of the handgrip motion about the horizontal axis.

b. The turret is rotated by turning the handgrips about the vertical axis. The range control is on the right grip. Twisting this grip controls the spread of the reticles to span the target and give the computing sight a measure of the target range.

c. A self-contained hydraulic system rotates the turret and elevates the guns.

d. There is a gun firing switch on the upper end of the left hand grip under the forefinger. This switch, or trigger, is used to fire both guns. A safety switch on the left hand grip, opens the power circuit and stops all operation whenever the gunner releases the grip.

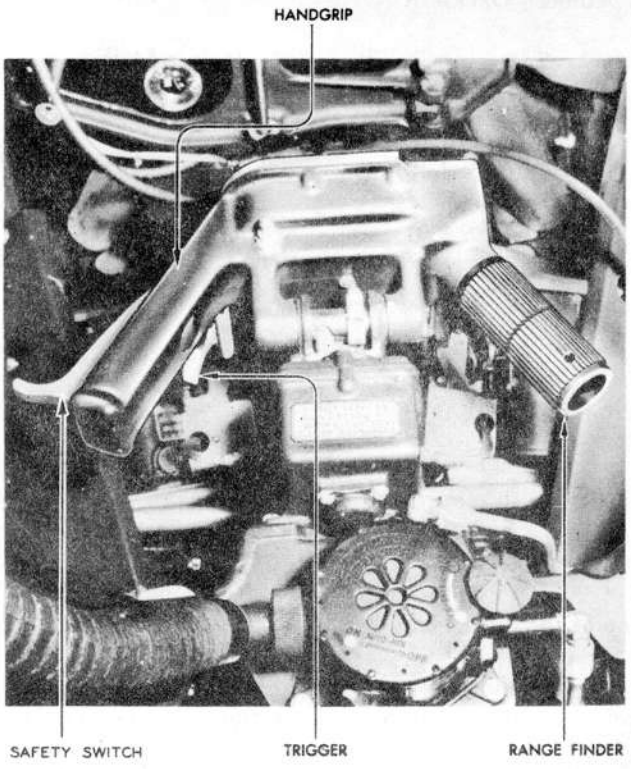


Figure 44—Upper Turret Controls

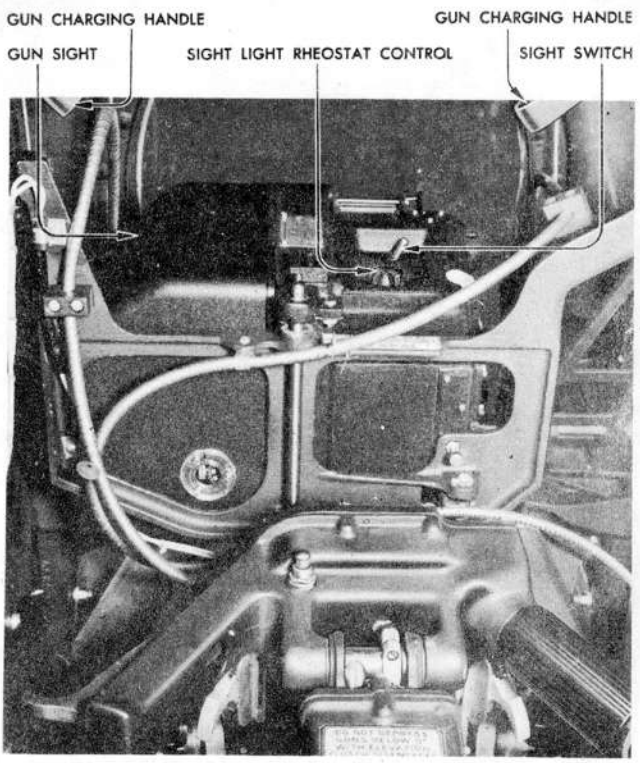


Figure 45—Inside Upper Turret

2. PREFLIGHT CHECK.

a. Allow hydraulic units and sight to warm up at least 5 minutes before take-off.

b. Engage power clutches.

c. See that hand cranks are disengaged. (Do *not* disengage until after power clutches have been engaged.)

d. Feed ammunition just up to the guns.

e. Move main power switch to "ON" position.

f. Place sight switch in "ON" position.

g. Close safety switch on handgrip.

h. Check response of azimuth and elevation mechanisms by manipulating the handgrips.

i. Turn range knob and observe that reticles move in response.

j. Adjust reticle light to approximately the desired brilliance.

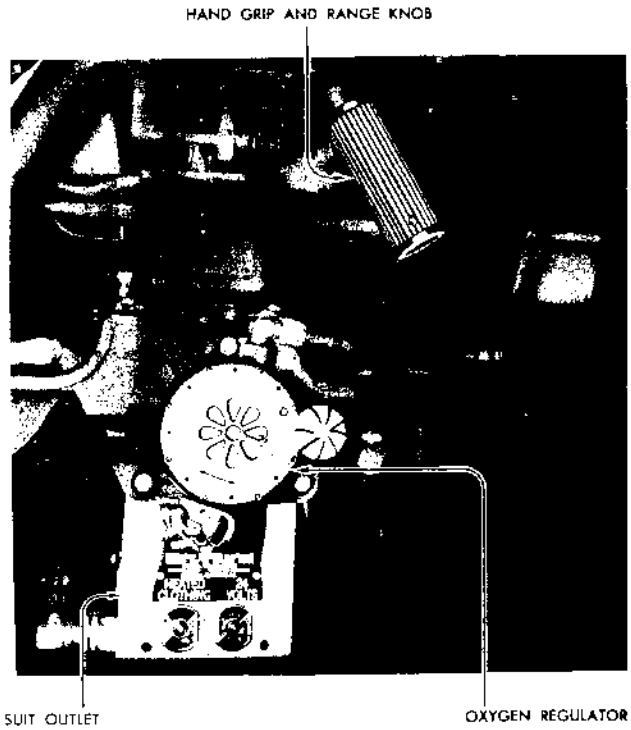


Figure 46—Upper Turret Interior

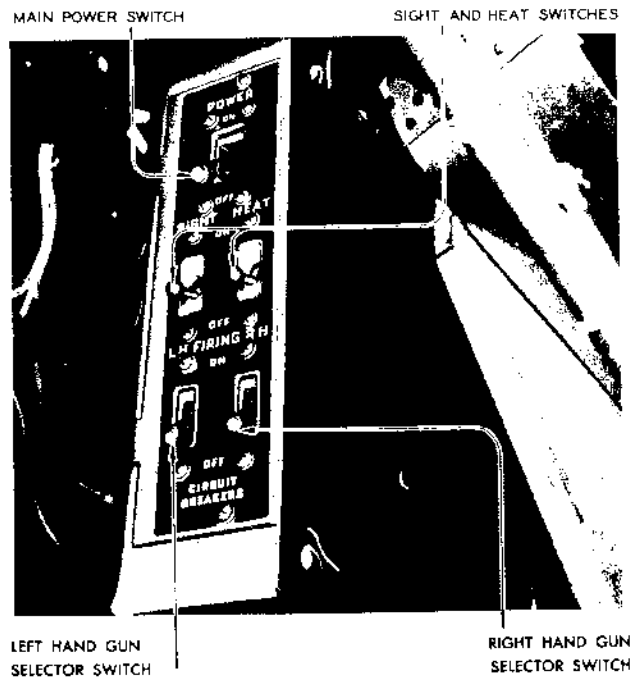


Figure 47—Upper Turret Switches

3. TURRET OPERATION.

a. Charge guns by pulling each handle twice.

b. Turn on gun selector switches.

c. When target is sighted, set in target dimension on sight.

d. Turn hand controls so that reticles frame the target.

e. Adjust range knob until reticles frame the target.

f. Press firing switch.

g. After ammunition has been used, charge guns at least twice to clear out live shells.

h. When the turret is not being used, turn it so that the guns point aft and are parallel to the center line of the airplane.

i. In event of power failure, the turret may be controlled by the azimuth and elevation hand cranks. It is not possible to track a target with the hand cranks, but they may be used for approximate positioning of the turret and guns.

f. To use the hand cranks:

(1) Engage azimuth and elevation hand cranks.

(2) Disengage power clutches.

(3) Move turret and guns into desired position.

(4) When finished, re-engage power clutches.

(5) Be sure to disengage hand cranks before operating power motor again.

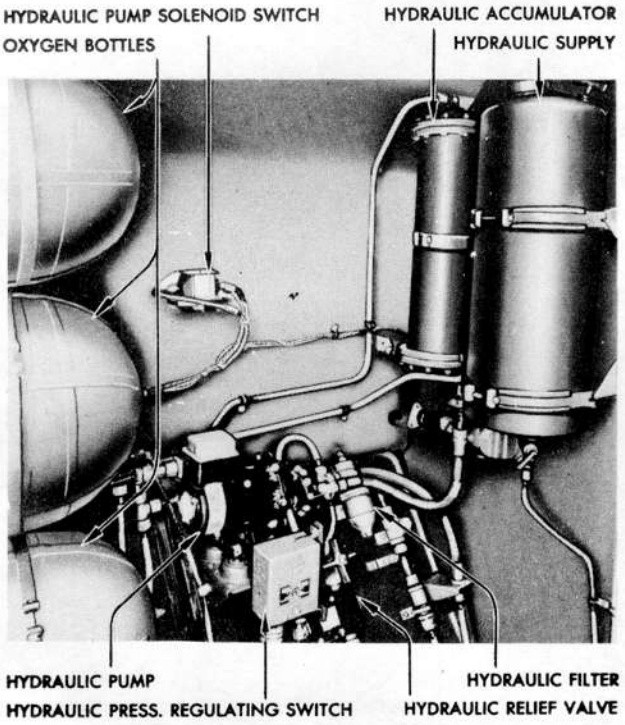


Figure 48—Hydraulic Panel Installation

4. ADJACENT EQUIPMENT.

a. LIGHTING.—A panel light and switch are on the wall of the compartment to the left of the turret. A trouble light and switch are inside the turret on the right side looking aft.

b. INTERPHONE.—An interphone jack box is on the wall of the compartment to the left of the turret. Operating instructions are given in Section I, paragraph 10.

c. OXYGEN.—The A-12 demand regulator inside the turret is part of the main oxygen system (for operation see Section I, paragraph 9).

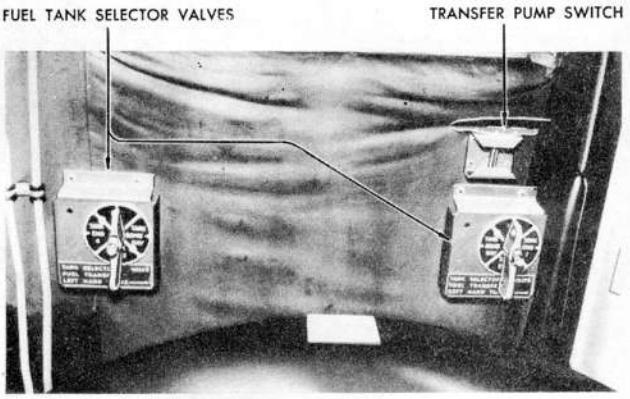


Figure 49—Fuel Transfer Controls

d. FUEL TRANSFER CONTROLS.—The two fuel transfer valves and the transfer pump switch are below the door leading to the bomb bay. (See Section I, paragraph 4 for operation.)

e. HYDRAULIC EQUIPMENT. — The hydraulic pump panel, accumulator , fluid tank, and servicing valves are at the right side of the compartment.

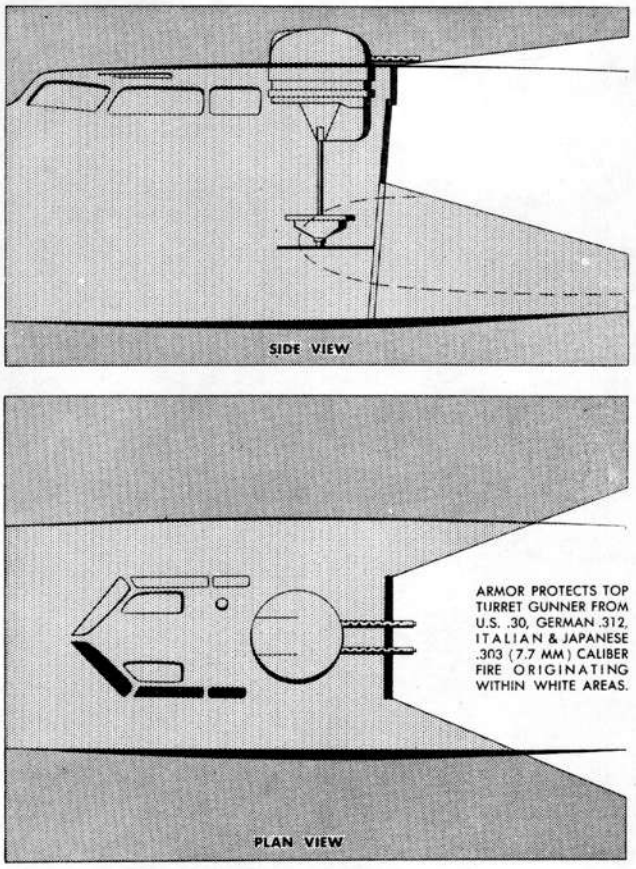
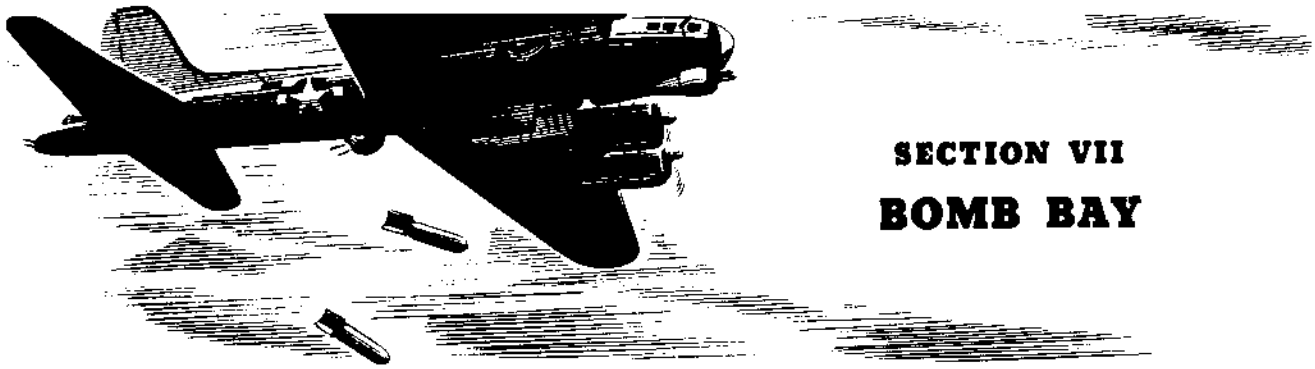


Figure 50—Top Gunner's Armor Protection



SECTION VII
BOMB BAY

1. LIGHTING.

a. On early B-17G's, a switch on the forward wall of the radio compartment and to the right of the door operates a step light at the forward end of the catwalk.

b. Switches to the right of the door on the aft bulkhead operate the dome lights on either side of the aft end of the bay.

2. OXYGEN.

There is a portable recharger to the left of the door on the aft wall of the bomb bay.

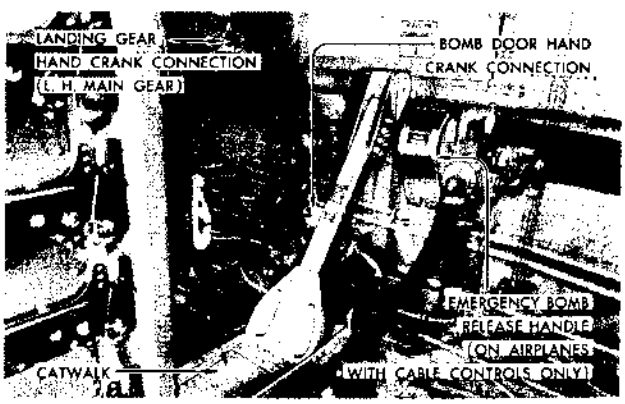


Figure 51—Forward End of Catwalk—Bomb Bay

3. EMERGENCY EQUIPMENT.

a. A hand crank connection for manual operation of each main landing wheel is on the forward wall of the bomb bay.

b. A hand crank connection for manual operation of the bomb bay doors is at the forward end of the catwalk.

c. Either an emergency bomb release handle is on the step at the forward end of the catwalk and is protected by a hinged guard or a SALVO switch is on the top of the bomb bay near the forward bulkhead.

d. For use of emeregncy equipment refer to Section IV.

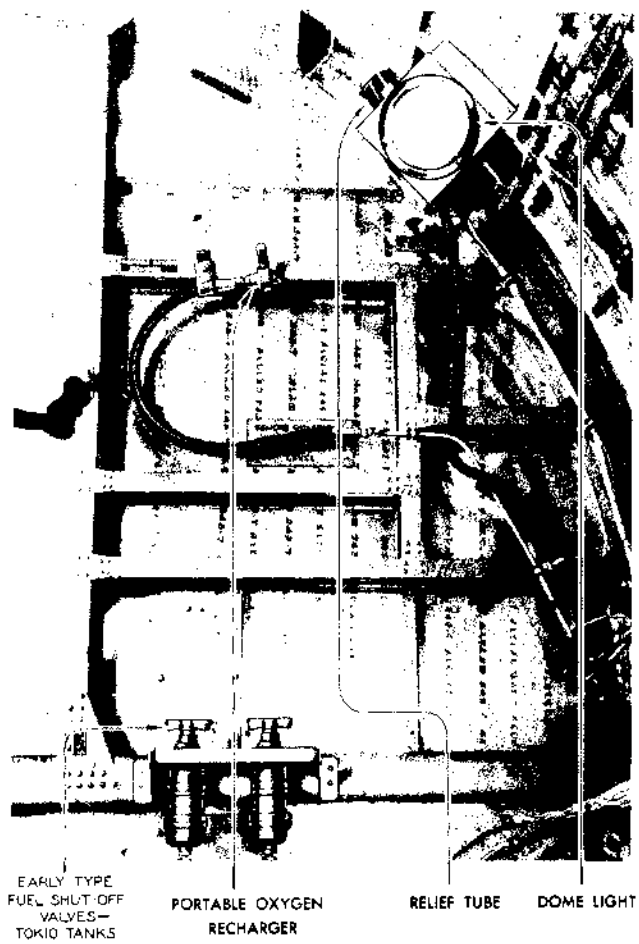


Figure 52—Bomb Bay—Left Side, Aft

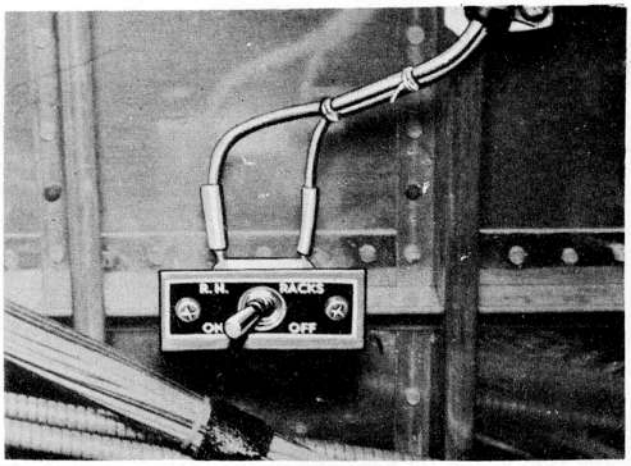


Figure 53—Bomb Rack Selector Switch—Right Side

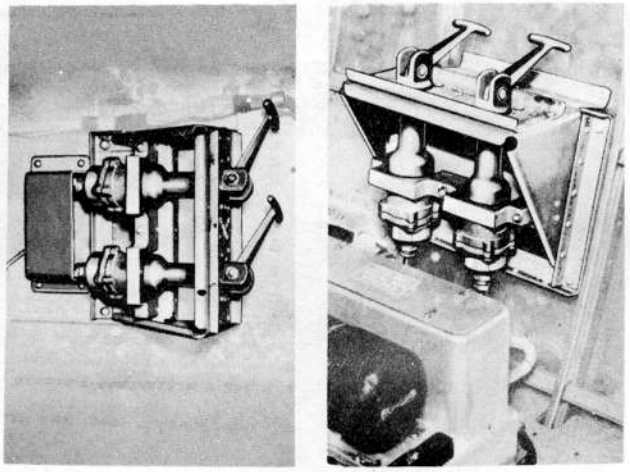


Figure 54—Tokyo Tanks Shut-off Valves (Type D-5 Valves—Late B-17G's)

4. BOMB RACK SELECTOR SWITCHES.

Two switches, one on each side of the bomb bay, are used in conjunction with the rack selector switches on the bombardier's control panel. When either switch is "OFF," electrical release of bombs or fuel tanks from that rack is impossible.

5. RELIEF TUBE.

There is a relief tube behind the dome light in the left bomb bay.

6. TOKYO TANKS SHUT-OFF VALVES.

Remote control handles, operating shut-off valves in the lines from each group of outer wing fuel tanks, are mounted below the door at the aft end of the bomb bay. Refer to Section I, paragraph 4, for operating instructions.

NOTE

In some installations these valve controls are in the radio compartment.

SECTION VIII
RADIO COMPARTMENT

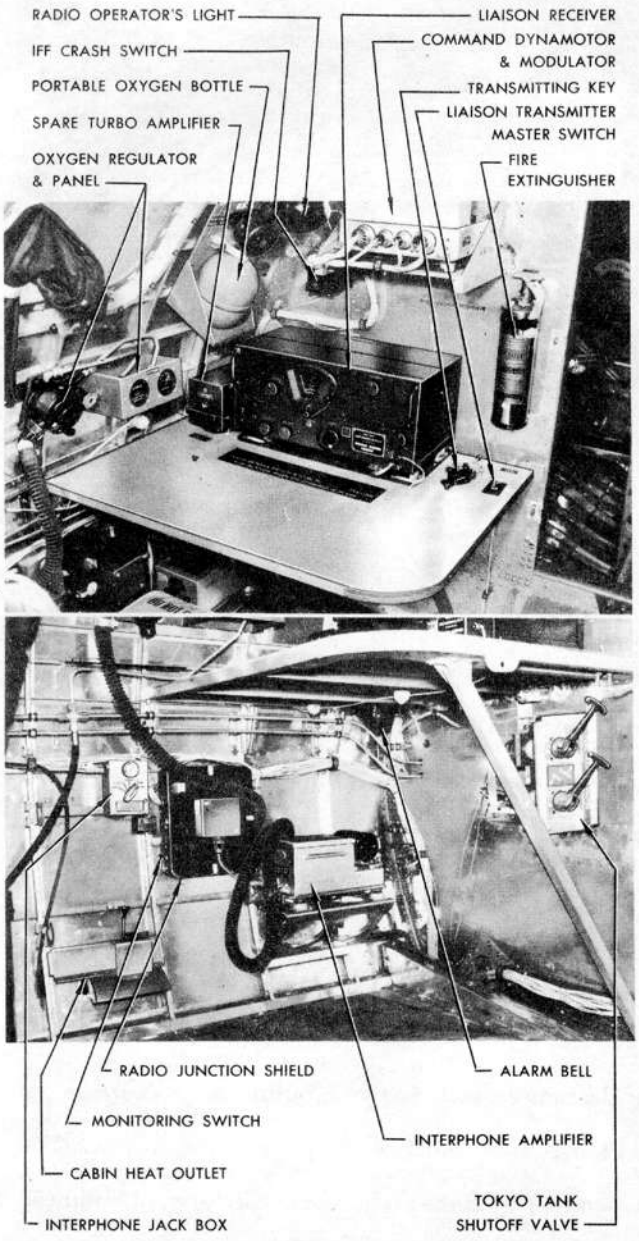


Figure 55—Radio Operator's Table and Controls

1. LIGHTING.

There is a lamp above the radio operator's table. There is a similar lamp in the aft end of the compartment above the liaison transmitter.

2. EMERGENCY EQUIPMENT.

a. There is a fire extinguisher on the forward wall of the compartment to the left of the door.

b. There are two life raft release handles on the ceiling to the right and just forward of the top hatch.

c. There are four emergency release handles along the edge of the top hatch.

d. An alarm bell is under the radio operator's table.

e. Two hand cranks and two crank extensions for manual operation of the wing flaps, bomb bay doors, landing gear, tail gear, and engine starters are clipped to the aft wall of the compartment, above the transmitter tuning units. For use of hand cranks refer to Section III.

3. OXYGEN CONTROLS.

An oxygen demand regulator outlet and a portable bottle recharger outlet are provided on the left sidewall for the radio operator. Two auxiliary oxygen demand regulator outlets and two portable bottle recharger outlets are located on the right side of the radio compartment.

4. HEATING AND VENTILATING.

a. The cabin heat controls are located on the forward bulkhead of the radio compartment to the right of the door. Three positions are provided: "OFF", "COLD" and "HOT".

b. The outlet for the compartment is located at the left side just above the floor and is controlled by a push pull knob on the outlet.

5. INTERPHONE CONTROLS.

The radio operator's jack box is on the left side-wall and the interphone amplifier is below the radio table (see Section I, paragraph 1 for operation).

6. COMMUNICATIONS EQUIPMENT.

a. The B-17G has the following communications equipment:

Command Set	SCR-274-N
VHF Command Set	SCR-522
Liaison Set	SCR-287-A
Interphone Equipment	AN/AIC-2
Radar Counter Measures	RCM
Radio Altimeters	SCR-718 & AN/APN-1
IFF Radio Set	SCR-695
Navigation Radio	AN/APN-9
Landing Approach Radio	RC-103 & AN/ARN-5
Radio Compass Receiver	AN/ARN-7
Marker Beacon Receiver	RC-43
Emergency Dinghy Radio	SCR-578

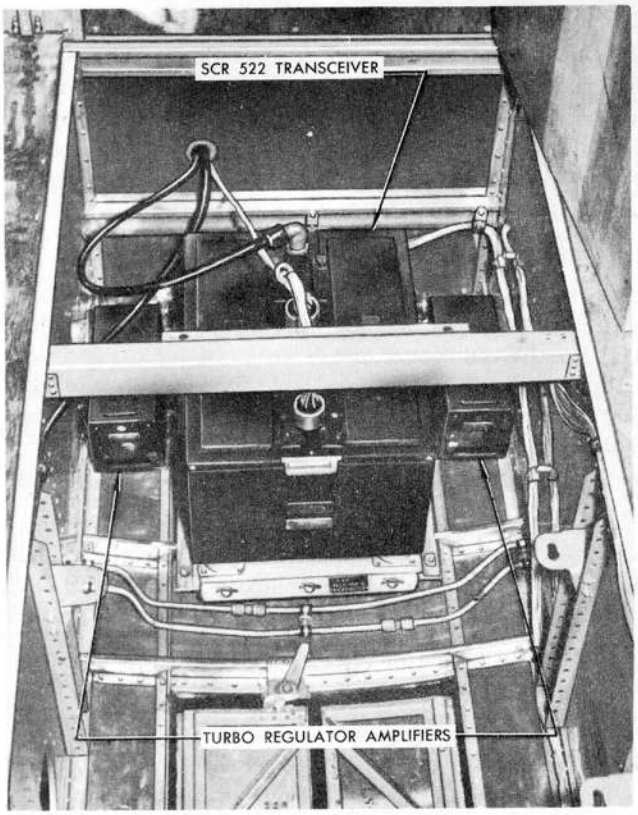


Figure 56—SCR-522 Transceiver—Camera Well

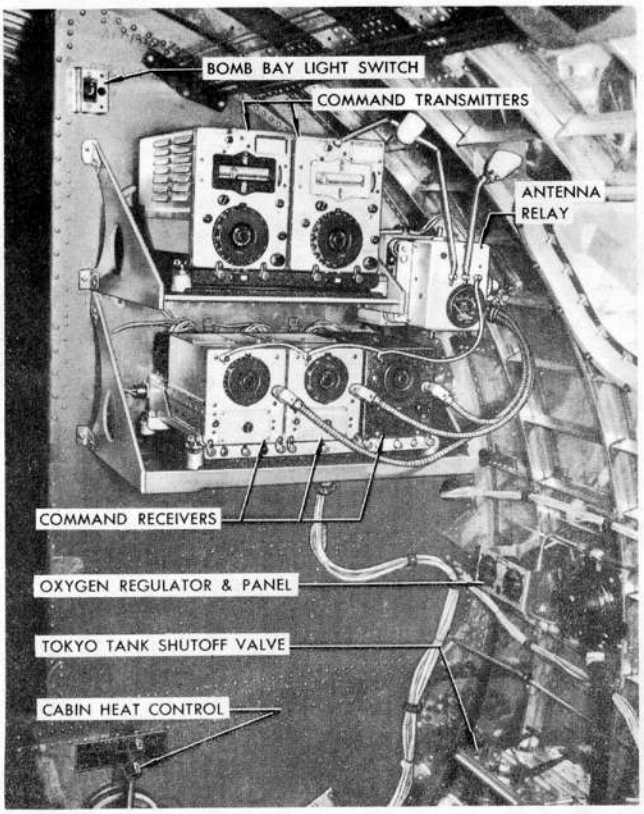


Figure 57—Radio Compartment Right Side—Forward

b. COMMAND RADIO.—There are two command transmitters, three command receivers, and an antenna relay on the right side of the forward bulkhead. The control units are on the ceiling of the pilot's compartment. The dynamotor and modulator unit is on the forward bulkhead above the radio operator's table.

c. VHF COMMAND RADIO.—The transmitter-receiver unit of the VHF comand radio is in the aft end of the camera well. The push button controls are on the central control panel in the pilot's compartment. The dynamotor is on the right side of the forward bulkhead of the waist compartment.

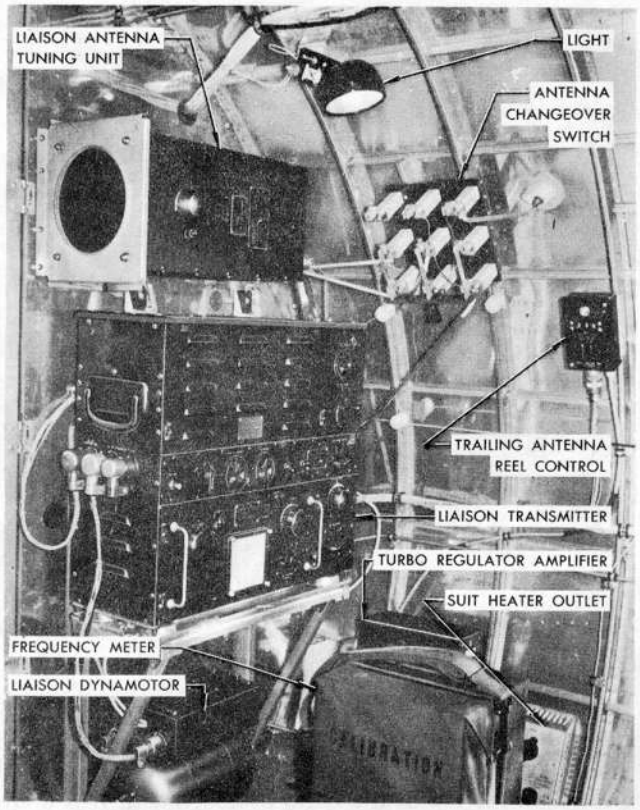


Figure 58—Radio Compartment—Left Side Aft Liaison Transmitter

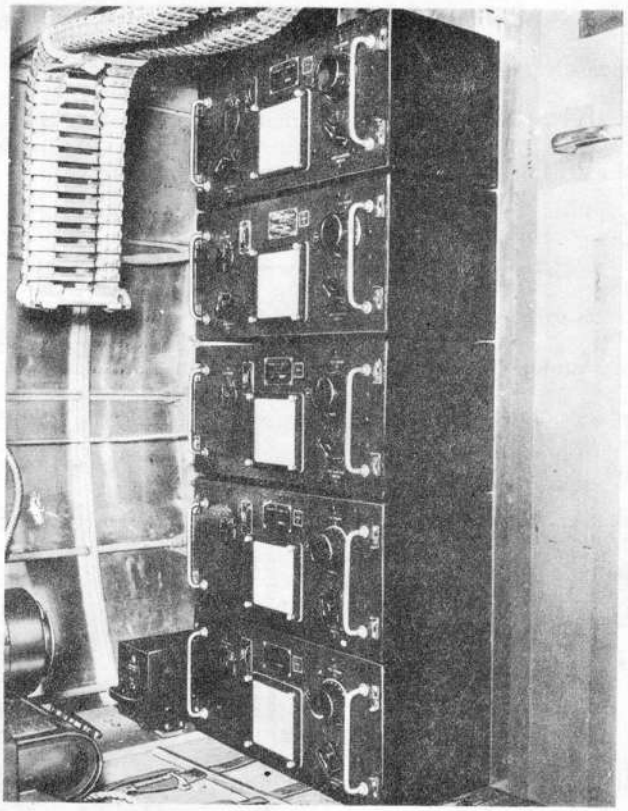


Figure 59—Radio Compartment—Right Side Aft Liaison Transmitter Tuning Units

d. LIAISON RADIO.—The liaison transmitter and antenna tuning unit are on the left side of the aft bulkhead. Spare transmitter tuning units are on the right side of the aft bulkhead. The dynamotor is on the floor below the transmitter. The liaison receiver and transmitter key are on the radio operator's table. Two antennas are available for use with the liaison set. One is a fixed wire antenna extending from a support on the left side of the fuselage outside the radio compartment to the leading edge of the fin. The other is a trailing antenna aft of the lower turret. The control box for the trailing antenna reel is left of the transmitter and shows the length of antenna out as well as providing control for reeling the antenna in and out. Both antennas connect to a three-pole, double-throw changeover switch on the left sidewall. One position puts the liaison set on the fixed antenna and the navigation radio on trailing antenna. The other position puts the liaison set on the trailing antenna and the navigation radio on the fixed antenna.

e. INTERPHONE EQUIPMENT.—The amplifier for the AN/AIC-2 interphone equipment is below the radio operator's table. A gain control knob on the amplifier adjusts the volume in the whole interphone system. Individual volume controls on the interphone jack boxes can be used to cut down the volume at any station.

f. RCM.—Some late airplanes have radar counter measure equipment mounted on a rack in the aft right corner of the radio compartment. A control box is on the aft bulkhead beside the door.

g. RADIO ALTIMETERS. – Transmitter - receiver units for the SCR-718 and AN/APN-1 radio altimeters are under the radio operator's table in some late airplanes. The control and indicator for SCR-718 is in the navigator's compartment. Controls and indicator for the AN/APN-1 are above and on the pilot's instrument panel.

7. FREQUENCY METER.

A frequency meter for checking the frequency of the liaison transmitter is on the floor behind the radio operator's chair.

8. MISCELLANEOUS EQUIPMENT.

a. TOKYO TANK FUEL VALVES.—Controls for the Tokyo tank fuel shut-off valves are on the lower forward bulkhead of the radio compartment.

b. TURBO REGULATOR AMPLIFIERS.—Amplifiers for the turbo supercharger regulator system are located in the radio compartment as follows:

Two amplifiers in the aft camera well.

One amplifier on the right aft sidewall.

One amplifier on the left aft sidewall.

One spare amplifier on the radio operator's table to the left of the liaison receiver.

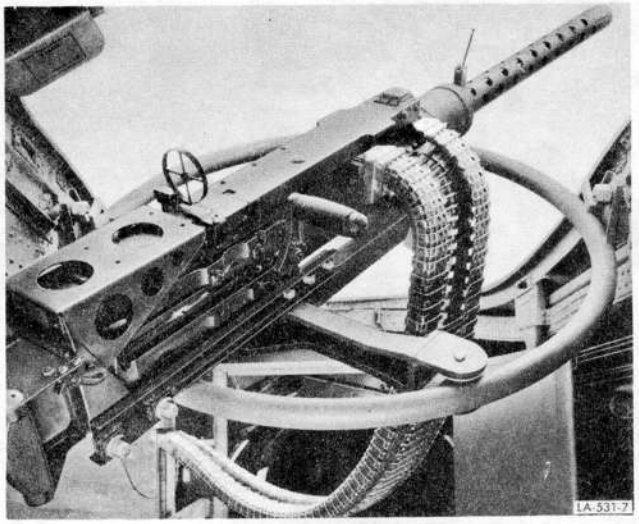


Figure 60—Radio Compartment Gun Early Airplanes

c. RADIO COMPARTMENT GUN.—Early airplanes have a .50 caliber flexible machine gun mounted on rails in the top of the radio compartment. It is fired through the open hatch in the aft position or stowed forward. Later airplanes have the gun mounted in a K-6 flexible mount in the hatch. Some airplanes have the gun removed.

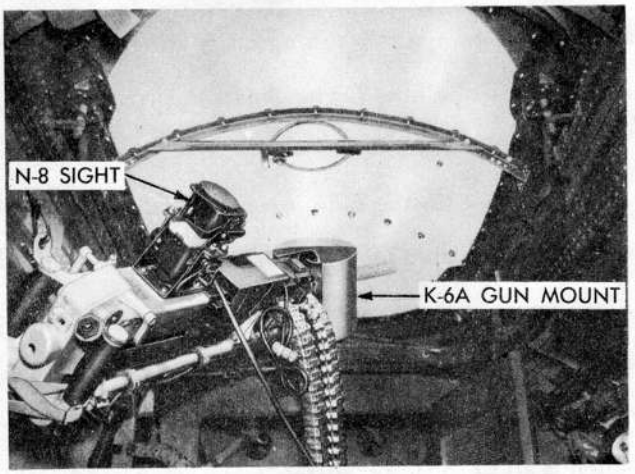


Figure 61—Radio Compartment Gun—K-6 Mount Late Airplanes

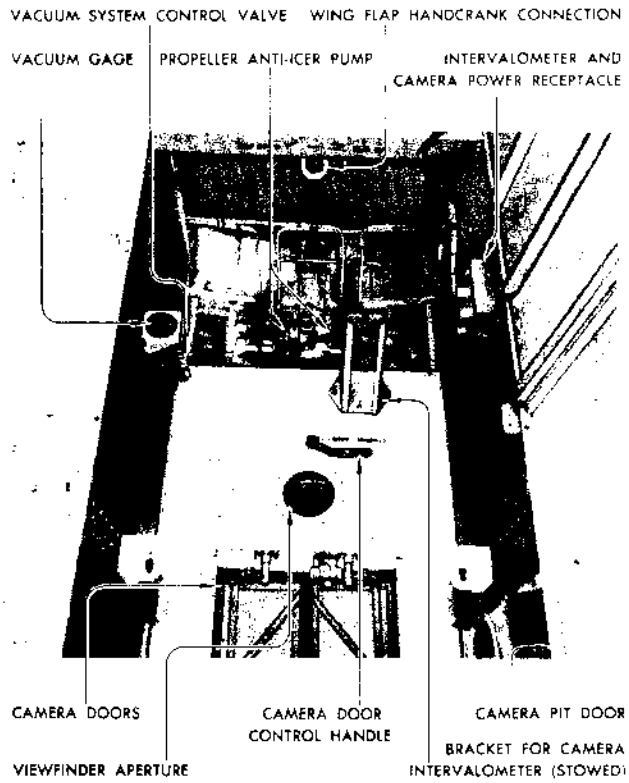


Figure 62—Camera Pit

9. CAMERA PIT.

a. The camera equipment is in a pit under the access door in the floor. Provision is made for:

K-24 or F-24 (BRITISH) Camera and accessories including B-3 Intervalometer, A-17 Camera mount, and A-2 View finder.

b. The view finder can be installed forward of the camera. The bracket assembly that supports the intervalometer and the intervalometer are stowed on the right side of the camera pit. The DC power receptacle for the intervalometer is on the right side of the pit and the vacuum connection is on the left side.

c. The double camera doors (Figure 62) and the view finder aperture in the bottom of the fuselage open outwards. They are operated at the same time by the camera door control handle. The door latches must be released by hand before using the control handle. Four supporting brackets for the camera are above the camera doors on each side of the well. The brackets are adjustable to four different heights by removable pins.

SECTION IX
BALL TURRET

1. GENERAL.

a. There is a Sperry ball type power turret, with twin .50 caliber machine guns in the bottom of the fuselage aft of the radio compartment.

b. A self-contained hydraulic unit drives the turret in azimuth and elevation.

c. The hand and limit unit controls regulate the output of the azimuth and elevation hydraulic systems. A pair of hand grips control the motion of the turret in azimuth and elevation. Each hand grip has a firing switch at the top end.

d. The switch box controls the distribution of electric power to the turret equipment. The gunners' communication system connections are on this box:

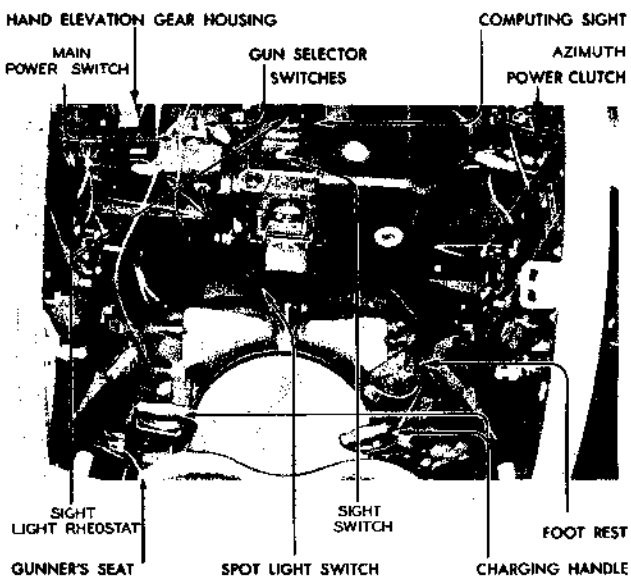


Figure 63—Interior of Ball Turret

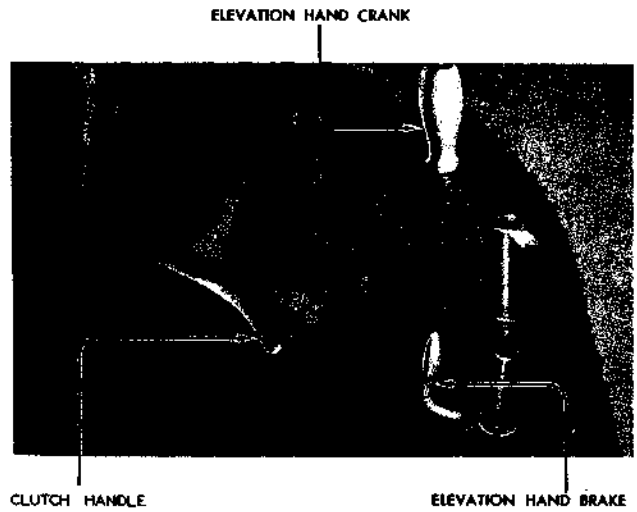


Figure 64—External Manual Controls

2. ENTERING THE TURRET.

CAUTION

Do not attempt to rotate the turret in elevation while the airplane is on the ground. No crew member shall be in the turret during landing or take-off and the guns of the turret shall be in the horizontal position pointing aft.

a. Remove ammunition box cover and load. Push ammunition down to the guns.

b. Remove elevation hand crank from its clip and attach it to shaft. Be sure that the hand brake (Figure 64) is locked.

c. Move elevation hand clutch to "IN" position. It may be necessary to loosen hand brake and rock hand crank back and forth before hand clutch can be moved to "IN" position.

d. Move elevation power clutch to "OUT" position using clutch handle; then, replace handle in its clip.

e. Loosen elevation brake slowly while holding elevation hand crank firmly.

f. Turn elevation hand crank in down direction until turret revolves to low limit of elevation (-90 degrees).

g. While holding elevation hand crank, open turret door, reach inside, and move elevation power clutch to "IN" position.

h. Move elevation hand clutch to "OUT" position, remove hand crank, and replace it in its clip.

i. Enter turret. Close door securely. Be sure door handles are pushed all the way up and that the *turret door is locked* before turning main power and sight switches "ON."

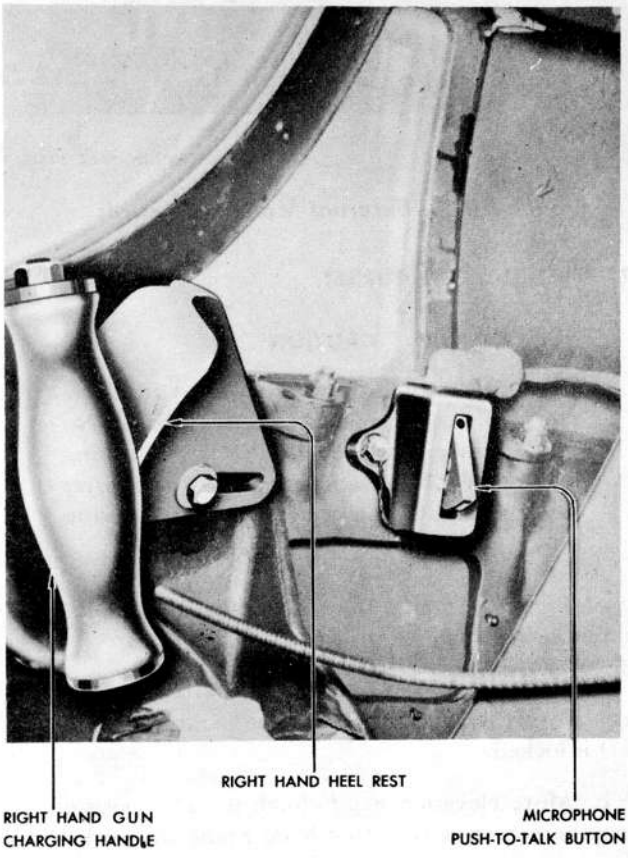


Figure 65—Inside Ball Turret

3. PREFLIGHT CHECK.

a. Turn power switch "ON."

b. Turn sight switch "ON."

c. Check response of azimuth and elevation mechanisms by manipulating the hand controls.

WARNING

Be sure that the guns are not driven down into the ground.

d. Adjust reticle light on sight to desired brilliance (approximately).

e. Work range foot pedal and observe if reticles move in response.

f. Lift each gun cover plate and pull ammunition down, feeding first shell by hand into magazine of gun; then close gun cover plates.

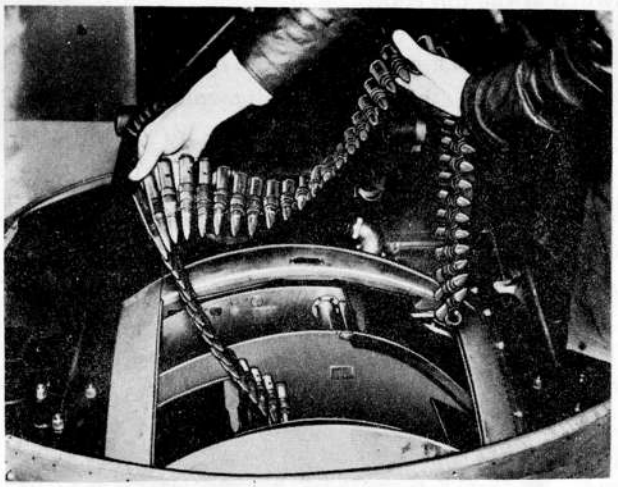


Figure 66—Loading Ball Turret Ammunition Boxes

4. OPERATION.

a. Load ammunition boxes. (See figure 66.) Enter turret.

b. Turn on power switch.

c. Turn on sight switch.

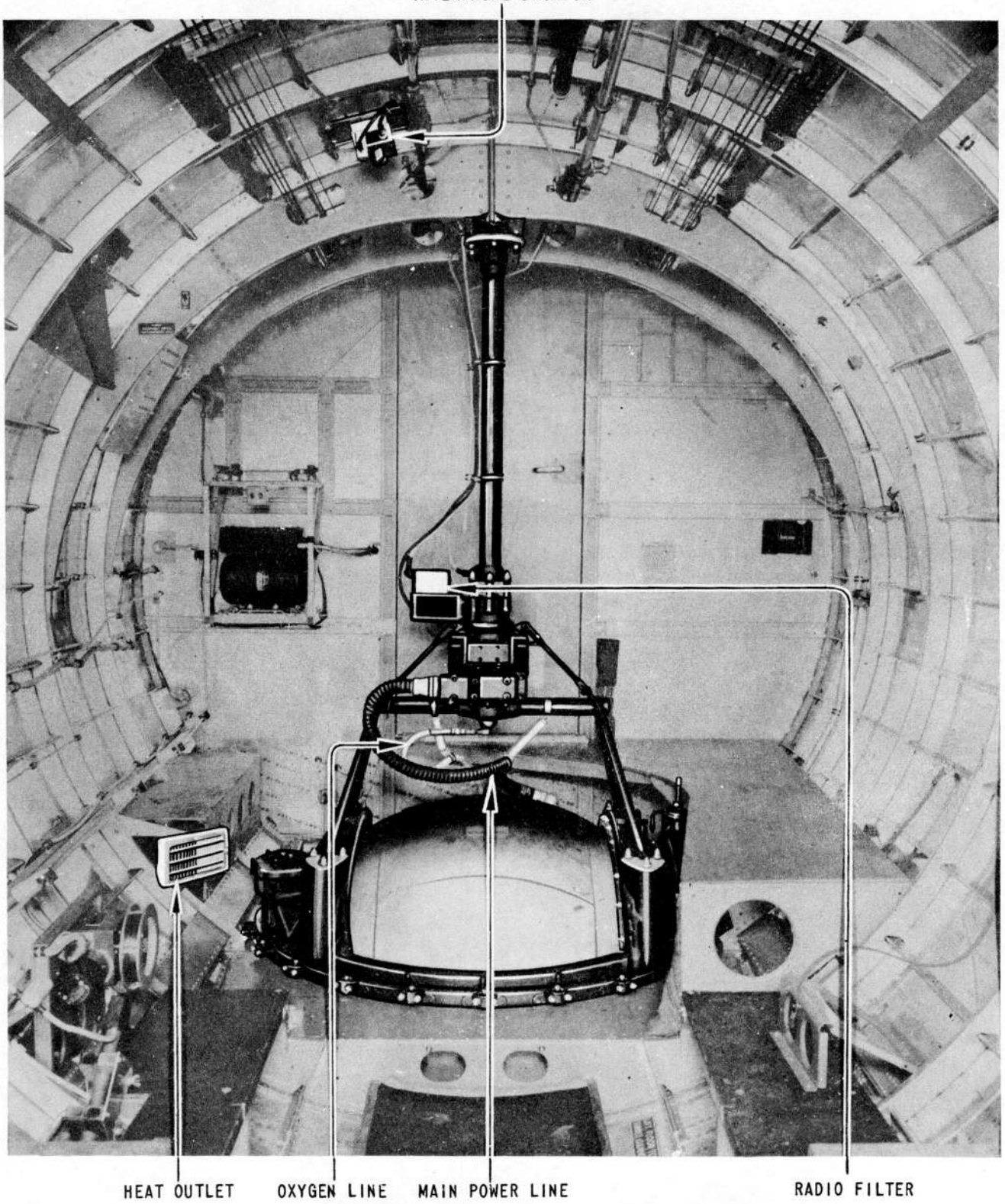


Figure 67—Ball Turret

d. Pull charging handles twice to charge guns.

e. Turn on fire selector switches.

f. Track the target with the hand controls.

g. Operate range foot pedal until reticles frame the target.

h. Close either firing key.

i. When ammunition is used up, charge guns at least twice to be sure that no live shells are left.

5. INTERPHONE.

There is a press-to-talk switch for inter-communication in front of the gunner's right foot.

6. SUIT HEATER.

There is a rheostat for use with the gunner's heated suit. It is on the under side of the seat and is adjusted to give the desired suit temperature.

7. OXYGEN.

There is an oxygen regulator on the inside of the ball turret to the right. In a few airplanes the supply comes from an auxiliary bottle above the turret and can be refilled from one of the main systems. On all others the ball turret is connected directly to one of the main systems.

8. ADJACENT EQUIPMENT.

a. LIGHTING.—A switch to the right of the door to the radio compartment lights the dome light in the ceiling aft of the turret support.

b. EMERGENCY RADIO—SCR 578.—An independent emergency radio is carried on over water flights. (For operation see Section III, paragraph 14.)

c. FIRST-AID KIT.—A first-aid kit is clipped to the bulkhead forward of the ball turret and to the left of the door.

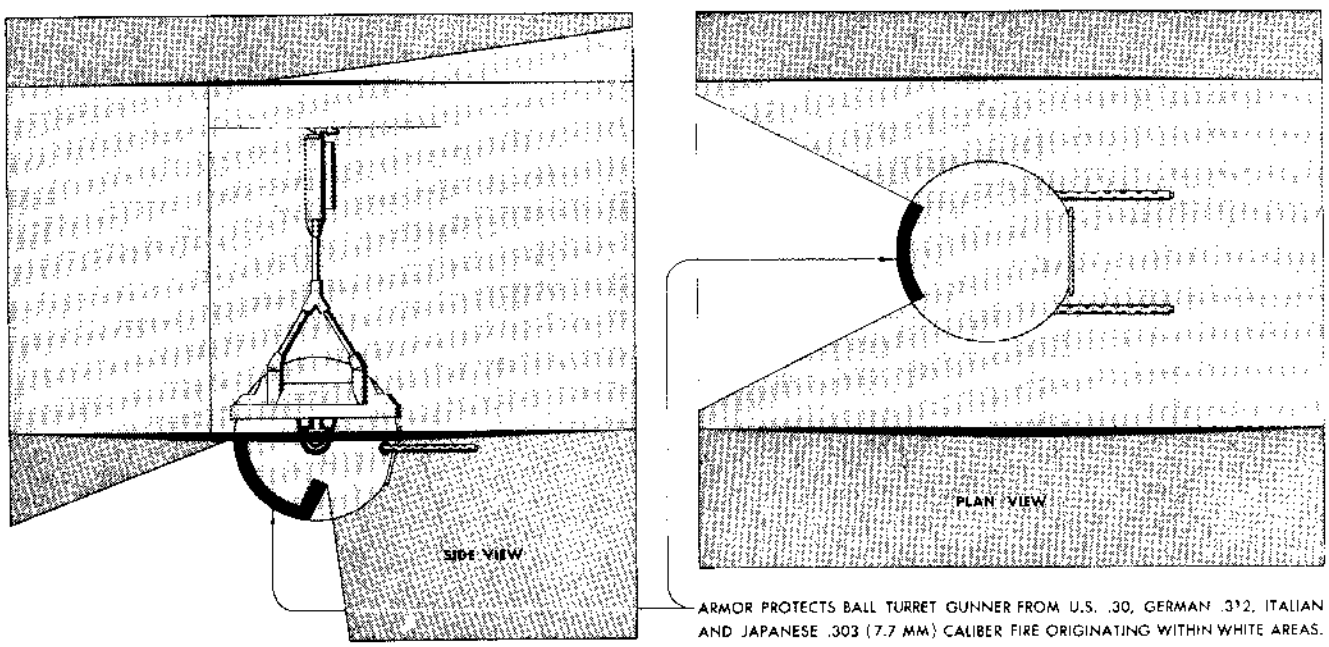


Figure 68—Ball Turret Gunner's Armor Protection

SECTION X
SIDE GUNNER'S COMPARTMENT

1. INTERPHONE CONTROLS.

The side gunners' interphone jack boxes are beside their oxygen regulators.

2. SUIT HEATER OUTLET—SIDE GUNNERS'.

Rheostats control temperature in heated suits.

3. OXYGEN.

Each side gunner has an oxygen regulator and a portable oxygen unit.

4. EMERGENCY EQUIPMENT.

On the early airplanes each side window can be opened by jerking the emergency bar forward. The side windows in the later airplanes do not open. The main entrance door has an emergency release handle.

5. GUN OPERATION.

On early airplanes open the window, loosen the strap and swing the gun into operating position. On the later airplanes unsnap the two stowage straps and the gun is free for operation.

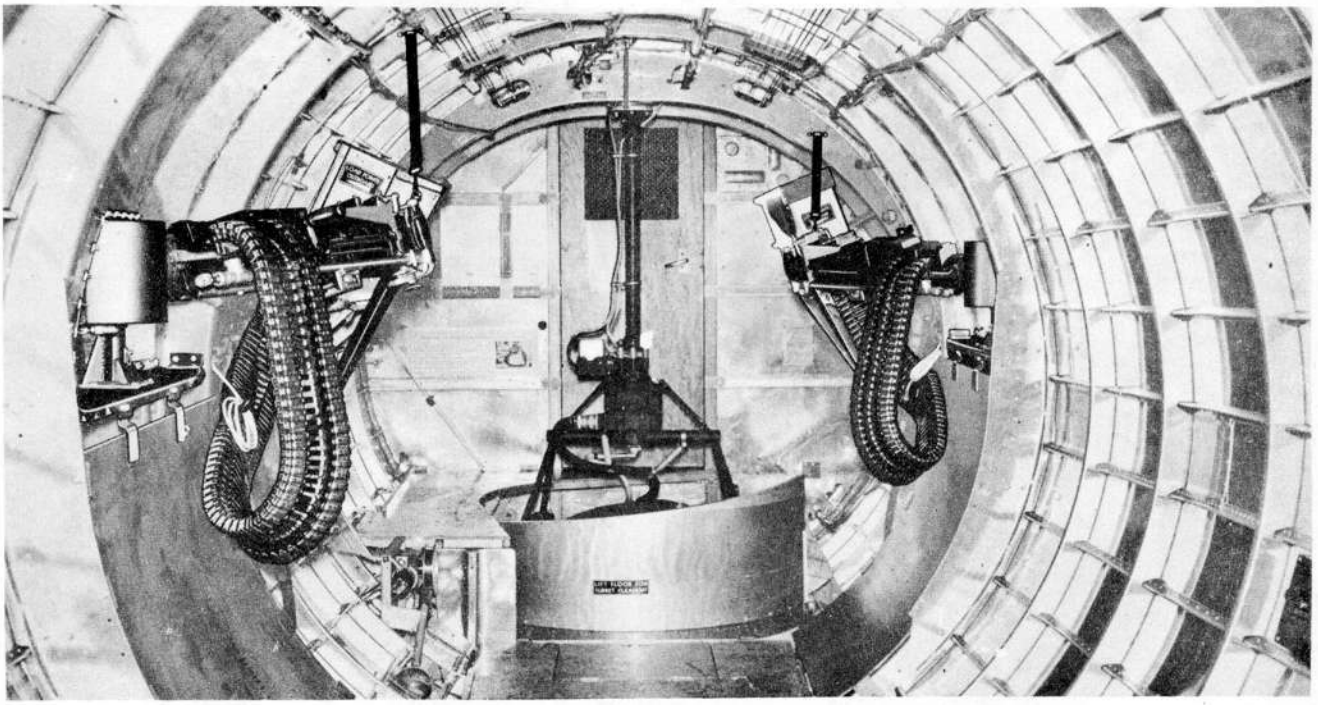
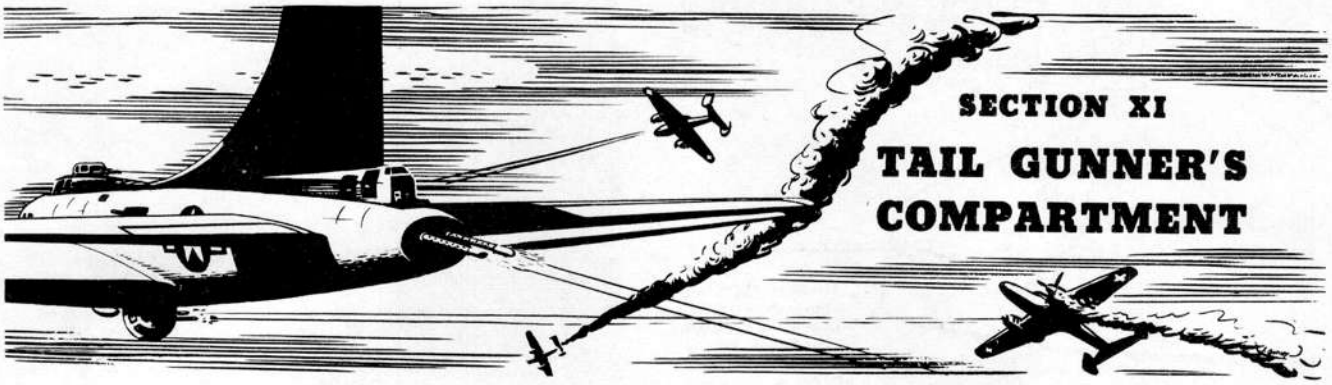


Figure 69—Side Guns Stowed
K-6 Mount (Late B-17G's)



SECTION XI
TAIL GUNNER'S COMPARTMENT

1. ENTRANCE.

The tail gunner's compartment is entered either through the tail wheel compartment, or through the side door. The side door is an emergency exit and has an emergency release handle.

2. LIGHTING.

A dome light and switch are above the gun handles behind the armor plate.

3. INTERPHONE.

The jack box is above the aft end of the ammunition box. (See Section I, paragraph 10 for operation.)

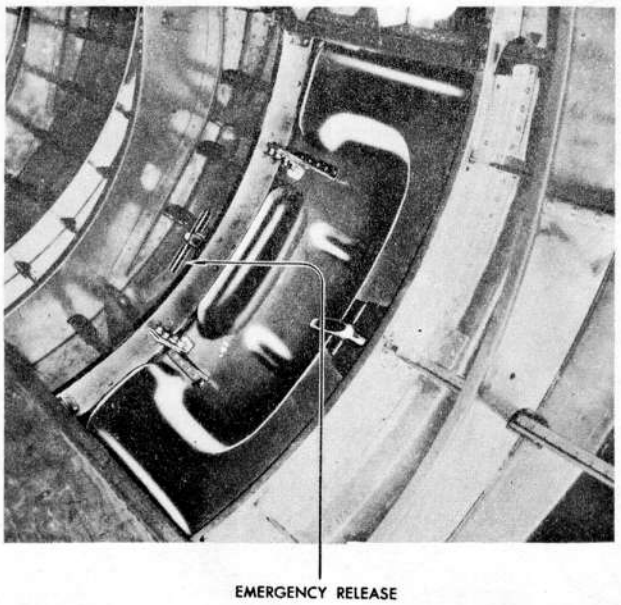


Figure 70—Tail Gunner's Compartment Door

4. OXYGEN.

There is an oxygen regulator on the side wall. (See Section I, paragraph 9 for operation.)

5. SUIT HEATER OUTLET.

A rheostat on the right side wall controls the temperature of the gunner's heated suit.

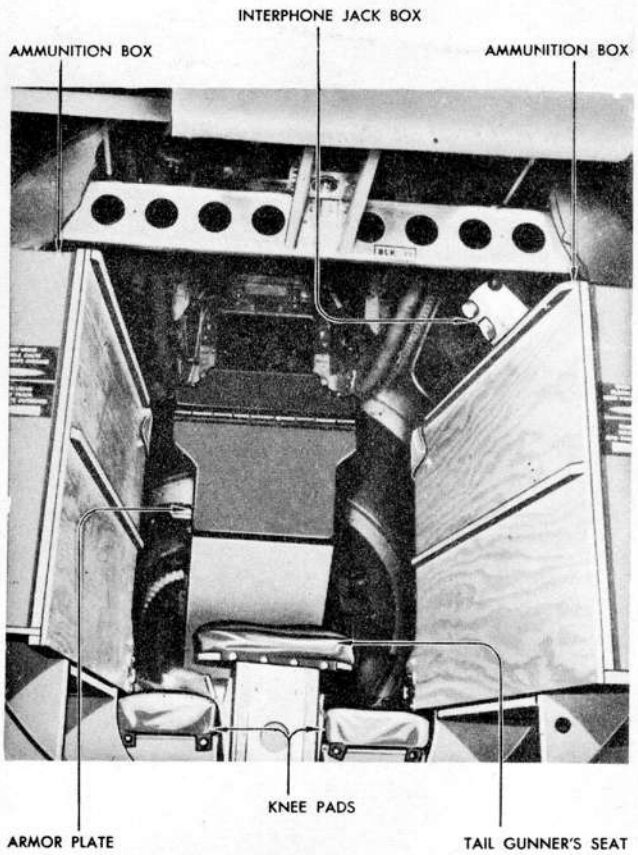


Figure 71—Tail Gunner's Compartment

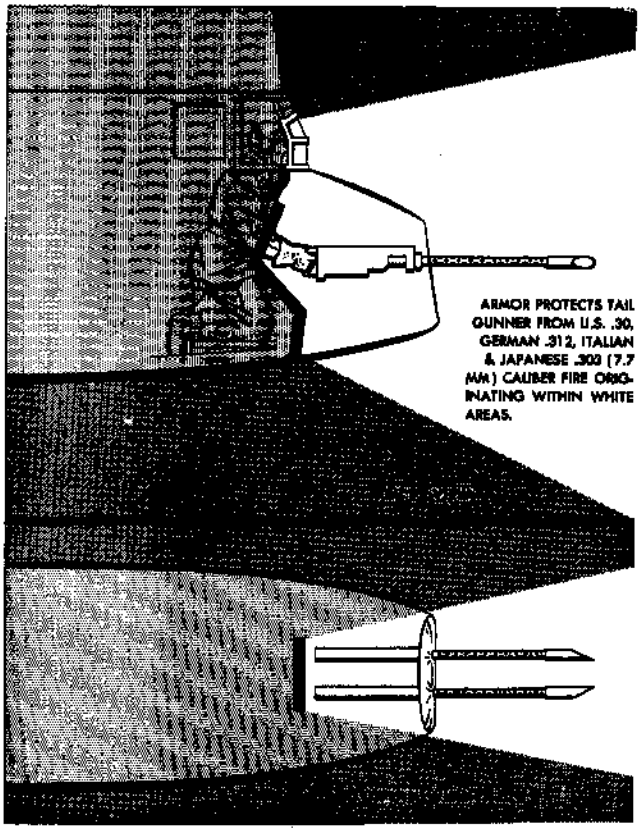


Figure 72—Tail Gunner's Armor Protection

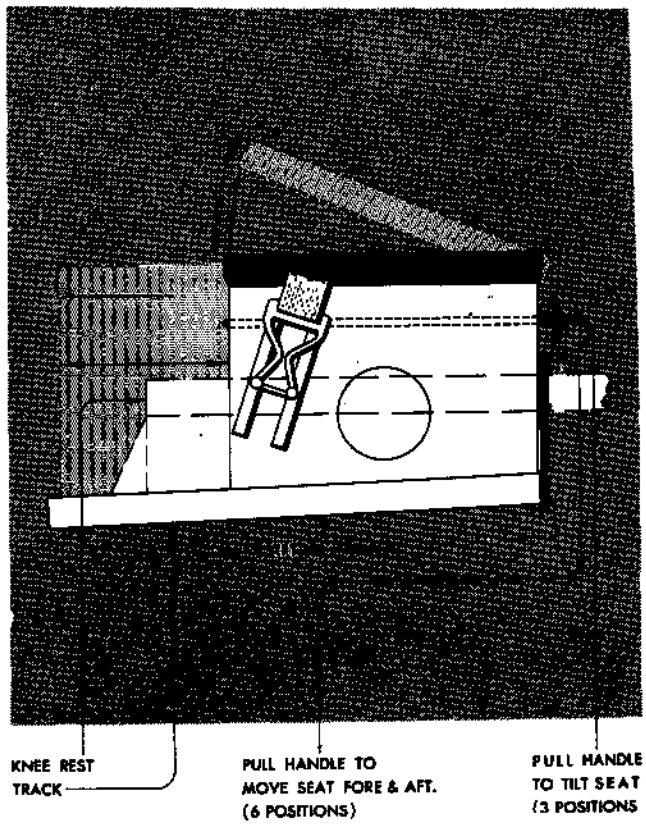


Figure 73—Tail Gunner's Seat Adjustment

APPENDIX II

PILOT'S FLIGHT OPERATING DATA

1. GENERAL.

The tabular charts in Appendix II are for pilot's use in flight planning. Although each page appears to be "crammed" with figures, a few minutes study of the tables and examples will demonstrate how easy it is to "put in the question" and "take out the answer."

2. SPECIFIC ENGINE FLIGHT CHART.

(See figure 74.)

This is a short summary of engine ratings and limits when using grade 100/130 fuel (100 octane). Fuel flows given are approximate values for critical altitude only and should not be used for long range planning. Use of Military Power is to be held to 5 consecutive minutes, if possible, but may be used at any time. War Emergency Power limits are for 5 minutes (maximum) use, but only in combat emergencies. Extensive use of War Emergency Power will materially shorten engine life and time between overhauls. For detail engine settings and fuel flows, refer to Flight Operating Instruction Charts. (See figures 76 to 88.)

3. PERFORMANCE CHARTS.

(See figure 75.)

The small charts at the top of the page show (a) pitot correction, (b) stalling speeds, (c) bomb capacities, and (d) sample loading.

The Take-Off Distance Table shows the take-off distance for varying gross weights, headwinds, and runway altitudes and surfaces. Both the ground run and the total distance to clear 50-foot obstacle are given.

The Climb Data Table shows indicated air speed mph, time and fuel used, and distance covered at best rate of climb in ft/min for single airplane, not in formation. Rated power climb is shown throughout and all figures are based on cowl flaps full open.

The Landing Distance Table indicates ground roll and total distance over 50-foot obstacle (normal use of brakes) for different runway altitudes and surfaces. Approach speeds are indicated for each weight.

4. FLIGHT OPERATING INSTRUCTION CHARTS.

(See figures 76 to 88.)

These charts are most essential in flight planning. For maximum range, the "old rule of thumb" of cruising by indicated air speed according to gross weight works fine on B-17 airplanes. Engine settings are simple; but predicting fuel flow and range is another matter, unless these charts are used.

Thirteen tables are presented to cover all gross weight brackets, and external configurations. The first thing to do is make sure you have the right chart.

After selecting the proper table for take-off weight and configuration, the next step is to subtract the fuel allowances for warm-up, take-off, and climb (fig. 75) and for wind, combat, and reserve. (See Operations Officer or "ole man Experience.") Subtracting the total allowance from the usable fuel on board gives the fuel available for cruising. Run the finger horizontally across right or left from the cruising fuel figure to the desired range figure or the next larger. Now, in the same set of columns, directly below, are the engine settings that will give the desired range with the cruising fuel. At any altitude, read off rpm, manifold pressure, mixture position and approximate values for gallons per hour and true air speed. In a given column (except column 1) range is the same and altitude may be chosen according to mission and weather. For long flights, higher altitudes mean shorter time in the air.

When 5000 pounds of fuel are burned (800 gallons) or maybe sooner, the B-17 will be in a new gross weight bracket. Turn over to the next chart, same column, and read new engine settings for original range. Keep turning over to new charts as the weight changes and the engines will keep turning over until you reach the base.

Notice two things about these tables:

(1) In columns II, III, and IV any setting in the lower half gives any range in the upper half of the same column. In general, engine power must be reduced as weight decreases, as previously described.

(2) For a given altitude, range decreases at higher speeds. All conditions in tables 76 to 88 are for higher speeds and shorter ranges than absolute maximum range conditions. For B-17G maximum range, see Flight Operating Charts, figure 90 and associated Range Table, figure 91.

On Flight Operating Chart (figure 90) select external configuration box and long range column. Slide down opposite proper gross weight bracket and altitude to read True Air Speed and the range index letter. On figure 91, select head wind condition and move down under range index letter to range opposite cruising fuel. Remember to subtract allowances as described before.

One more thing, all these range tables are about 5 percent conservative to allow for differences between airplanes and pilots. But don't count on that 5 percent. Don't throw it away unless you are sure that your carburetor and your engine and your technique are better than the test articles.

Appendix II closes with a summary of operating instructions—how to get the most out of your B-17G.

TABLE OF CONTENTS, APPENDIX II

FORM ASC-512A

AIRPLANE MODELS B-17G

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS R-1820-97

CONDITION	FUEL PRESSURE (LB/SQ. IN.)	OIL PRESSURE (LB/SQ. IN.)	OIL TEMP. °C	OIL TEMP. °F	COOLANT TEMP. °C	COOLANT TEMP. °F		
DESIRED	17	70	70	158				
MAXIMUM	18	75	88	190				
MINIMUM	16	65						
IDLING	12	25						

MAX. PERMISSIBLE DIVING RPM: 2760

CONDITION	ALLOWABLE OIL CONSUMPTION
NORMAL RATED (MAX. CONT.)	14 U.S. QT/HR 23 IMP. PT/HR
MAX. CRUISE	8 U.S. QT/HR 13 IMP. PT/HR
MIN. SPECIFIC	*5 U.S. QT/HR 8 IMP. PT/HR

OIL GRADE: (S) 1120 (W) 1100-A

SUPERCHARGER TYPE: GE TYPE B-22 TURBOSUPERCHARGER

FUEL GRADE: 100/130, Specification AN-F-48

OPERATING CONDITION	RPM	MANIFOLD PRESSURE (BOOST)	HORSE-POWER	CRITICAL ALTITUDE WITH RAM	CRITICAL ALTITUDE NO RAM	BLOWER	USE LOW BLOWER BELOW:	MIXTURE CONTROL POSITION	FUEL FLOW (GAL/HR/ENG.) U.S.	FUEL FLOW (GAL/HR/ENG.) IMP.	MAXIMUM CYL. TEMP. °C	MAXIMUM CYL. TEMP. °F	MAXIMUM DURATION (MINUTES)
TAKE-OFF	2500	47.5	1200	32,700				AUTO RICH	138*	115	260	500	5
WAR EMERGENCY	2500	54	1380	26,700				AUTO RICH	165*	140	260	500	5- (ONLY WITH CARBURETOR MODIFICATION)
MILITARY	2500	47.5	1200	32,700				AUTO RICH	138*	115	260	500	5
NORMAL RATED (MAX CONT.)	2300	41.5	1000	35,200				AUTO RICH	100	84	232 CLIMB 218	450 CLIMB 424	CONTINUOUS
MAXIMUM CRUISE	2100	31	650	OVER 35,000				AUTO LEAN	63	52	205	400	CONTINUOUS
MINIMUM SPECIFIC CONSUMPTION (HOVERING)	1400	24	370	11,000				AUTO LEAN	26	21	205	400	CONTINUOUS

REMARKS: 1. For detailed CRUISING DATA, see FLIGHT OPERATING INSTRUCTION CHARTS following. * Horsepower and Fuel Flow for 15,000 Feet Altitude

2. AIR INTAKE FILTERS MUST BE OFF ABOVE 15,000 FEET in order to obtain maximum power at altitude. NOTE: Critical Altitude is that at which Maximum Power is obtained with Full Throttle under conditions shown.

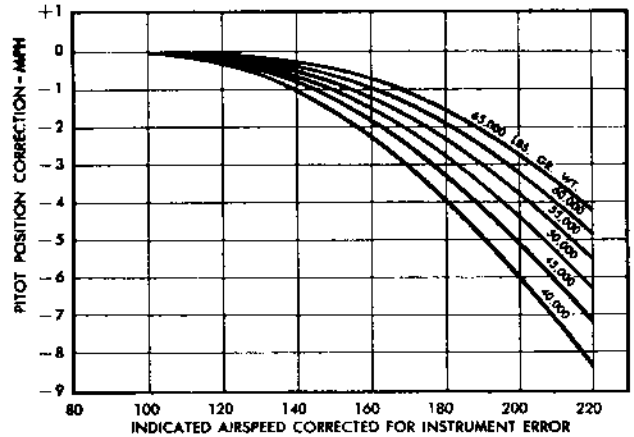
3. Do not manually lean. Auto lean gives maximum range.

4. Do use excessive part throttle above 25,000 feet because of power surge.

Figure 74—Specific Engine Flight Chart

PITOT CORRECTION

PILOT'S I.A.S. + PITOT POSITION CORRECTION = CORRECTED I.A.S.



POWER-OFF STALLING SPEEDS

INDICATED STALLING SPEEDS			
GROSS WEIGHT	FLAPS UP	FLAPS 15°	FLAPS FULL
70,000	118	114	104
60,000	110	105	97
50,000	100	96	88
40,000	89	86	79

FUEL GRADE 100/130

INTERNAL BOMB LOADING

CLASS		NUMBER	TOTAL WT.
100 LBS.		24	2400 LBS.
300		16	4800
500		12	6000
500	(SEMI A.P.)	16	8000
600	(A.P.)	16	9600
1000		6	6000
1000	(SEMI A.P.)	8	8000
1600		8	12,800
2000 & 1000		2 EACH	6000

EXTERNAL BOMB LOADING

1000 LBS.	2	2000 LBS.
1600	2	3200
2000	2	4000
4000	2	8000

ALLOW 30 TO 80 GALLONS FOR WARM-UP AND TAKE-OFF

*I.A.S. = INDICATED AIRSPEED

TAKE-OFF, CLIMB & LANDING CHART

TAKE-OFF DISTANCE (3 POINT WITH 1/3 FLAPS)

GROSS WEIGHT (LBS.)	HEAD WIND (MPH)	HARD SURFACE RUNWAY						SOD-TURF RUNWAY						SOFT SURFACE RUNWAY					
		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.	
		Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.	Ground Run	To Clear 50' Obj.
HEAVY WT. 65,000 LBS.	0	3350	4400	3900	5050	4575	5800	4350	5400	5050	6200	6975	8200	8950	10000				
	20	2200	3150	2750	3700	3275	4300	2950	3900	3700	4650	5375	6400	6750	7700				
	40	1375	2050	1750	2500	2050	2900	2025	2700	2550	3300	3950	4800	5325	6000				
AV. WT. 55,000 Lbs.	0	2050	2800	2300	3100	2775	3600	2450	3200	2800	3600	3525	4350	3650	4500	4500	5300	6175	7000
	20	1400	2000	1550	2200	1925	2550	1700	2300	1850	2500	2525	3150	2650	3250	3150	3800	4625	5300
	40	850	1300	950	1400	1150	1650	1050	1500	1200	1650	1600	2100	1750	2200	2150	2600	3250	3750
LIGHT WT. 45,000 LBS.	0	1225	1800	1350	1950	1575	2200	1325	1900	1550	2150	1825	2450	1725	2300	2050	2650	2575	3200
	20	800	1250	975	1450	1125	1550	850	1300	1025	1500	1225	1750	1150	1500	1375	1850	1725	2250
	40	400	750	500	850	600	1000	500	850	600	950	700	1100	700	1050	850	1200	1050	1450

NOTE: INCREASE DISTANCE 10% FOR EACH 10° C. (18° F.) ABOVE 10° C. (50° F.)

ENGINE LIMITS FOR TAKE-OFF 2500 RPM & 46 INCHES MERCURY

COMBAT MISSIONS USE 2300 RPM & 38 INCHES MERCURY

CLIMB DATA

FERRY MISSIONS USE 2300 RPM & 38 INCHES MERCURY

GROSS WEIGHT (LBS.)	TYPE OF CLIMB	S.L. TO 5000 FT. ALT.				10,000 FT. ALT.					15,000 FT. ALT.					25,000 FT. ALT.					30,000 FT. ALT.				
		Best IAS*	Ft. Min.	Time From S.L.	Dist. From S.L.	Fuel From S.L.	Best IAS*	Ft. / Min.	Time From S.L.	Dist. From S.L.	Fuel From S.L.	Best IAS*	Ft. / Min.	Time From S.L.	Dist. From S.L.	Fuel From S.L.	Best IAS*	Ft. / Min.	Time From S.L.	Dist. From S.L.	Fuel From S.L.	Best IAS*	Ft. / Min.	Time From S.L.	Dist. From S.L.	Fuel From S.L.
				Min.	Mi.	Gals			Min.	Mi.	Gals			Min.	Mi.	Gals			Min.	Mi.	Gals			Min.	Mi.	Gals
HEAVY WT. 65,000 LBS.	Combat	135	290	36	100		135	230	34	83	220	135	145	58	155	375										
	Ferry																									
AV. WT. 55,000 LBS.	Combat	135	620	18	45		135	580	16	37	100	135	500	26	66	165	135	210	54	151	340					
	Ferry																									
LIGHT WT. 45,000 LBS.	Combat	135	980	11	35		135	940	10	24	75	135	870	15	37	95	135	580	27	78	165	135	320	38	113	240
	Ferry																									

COWL FLAPS FULL OPEN

LANDING DISTANCE

GROSS WEIGHT (LBS.)	BEST I.A.S. for Approach	HARD DRY SURFACE						FIRM, DRY SOD						SLIPPERY					
		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.		AT SEA LEVEL		AT 3000 FT.		AT 6000 FT.	
		To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll	To Clear 50' Obj.	Ground Roll
LIGHT WT. 50,000 LBS.	110	2900	1350	3150	1500	3400	1650	3550	2000	3850	2200	4200	2450	4850	3350	5300	3650	5750	4000

SAMPLE LOADING CHART

TACTICAL EMPTY WEIGHT INCLUDES: *BASIC WEIGHT 37,194 LBS.
(INCLUDES 13-50 CAL. GUN INST. — 1043 LBS.)

10 MAN CREW @ 200 LBS. EACH 2,000 LBS.

FULL OIL TANKS — 144 GALS. 1,080 LBS.

EXTERNAL BOMB RACKS 284 LBS.

TOTAL TACTICAL EMPTY WT. 40,558 LBS.
(LESS EXPENDABLE LOAD)

*SEE WT. & BALANCE HANDBOOK FOR LATEST BASIC WT.

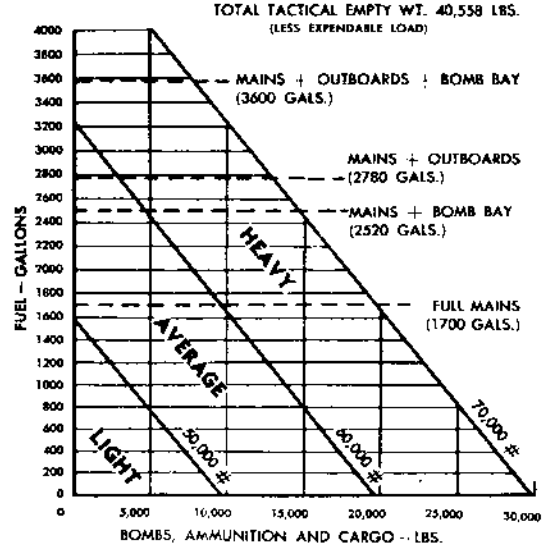


Figure 75—Performance Charts

AAFNC-529 6-1-44

AIRCRAFT MODEL(S) B-17G

ENGINE(S): R-1820-65 & 97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS NONE

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7

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 (2)		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
		3600	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						3600		
1940	1680	3400	2000	1740	2150	1880	2520	2180	3400		
1820	1580	3200	1880	1630	2030	1760	2370	2060	3200		
1710	1480	3000	1770	1540	1900	1650	2220	1920	3000		
1600	1390	2800	1650	1430	1780	1550	2080	1800	2800	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
1480	1280	2600	1530	1330	1650	1430	1920	1660	2600		
1370	1190	2400	1410	1220	1520	1320	1780	1540	2400		
1250	1080	2200	1290	1120	1400	1210	1630	1410	2200		
1140	990	2000	1180	1020	1270	1100	1480	1280	2000		
1020	880	1800	1060	920	1140	990	1330	1150	1800		
910	790	1600	940	810	1010	870	1180	1020	1600		

MAXIMUM CONTINUOUS						PRESS	(.59 STAT. (.51 NAUT.) MI./GAL.)						(.84 STAT. (.55 NAUT.) MI./GAL.)						(.73 STAT. (.63 NAUT.) MI./GAL.)						PRESS	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	ALT. FEET	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] 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		SEE NOTE ABOVE				
2300	38	A.R.	423	240	208	25000	--	--	--	--	--	--													25000						
2300	38	A.R.	422	237	206	20000	2250	36	A.R.	387	228	198	--	--	--	--	--	--							20000						
2300	38	A.R.	420	230	200	15000	2250	35	A.R.	388	218	189	2150	32	A.R.	309	198	172	--	--	--	--	--	--	15000						
2300	38	A.R.	416	224	194	10000	2200	34	A.R.	358	211	183	2150	32	A.R.	308	198	172	2400	30	A.L.	245	179	156	10000						
2300	38	A.R.	408	213	185	5000	2200	34	A.R.	334	197	171	2150	32	A.R.	291	186	161	2400	30	A.L.	237	173	150	5000						
2300	38	A.R.	393	202	175	S.L.	2200	34	A.R.	317	187	162	2150	32	A.R.	277	177	153	2400	31	A.L.	226	165	143	S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 75) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY

(3) FUEL FLOW (G.P.H.) ARE 5% CONSERVATIVE

EXAMPLE

AT 65000 LB. GROSS WEIGHT WITH 3200 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 400 GAL.) TO FLY 2000 STAT. AIRMILES AT 10,000 FT. ALTITUDE MAINTAIN 2150 RPM AND 32 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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 7-1-44 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 76—Flight Operating Instructions

AAFRC-528 8-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & 97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: NONE

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	48	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 71

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		2780		SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]					2780		
1540	1330	2600	1680	1460	1970	1710	2170	1880	2600		
1420	1230	2400	1550	1340	1820	1580	2000	1730	2400		
1300	1130	2200	1420	1230	1670	1450	1840	1600	2200		
1180	1020	2000	1290	1120	1520	1320	1670	1450	2000		
1060	920	1800	1160	1000	1360	1180	1500	1300	1800	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
940	810	1600	1030	890	1210	1050	1340	1160	1600		
830	720	1400	900	780	1060	920	1170	1010	1400		
710	610	1200	770	670	910	790	1000	870	1200		
590	510	1000	640	550	760	660	830	720	1000		
470	400	800	510	440	600	520	670	580	800		
350	300	600	380	330	450	390	500	430	600		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	PRESS ALT. FEET	(.65 STAT. (.56 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	(.78 STAT. (.68 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	(.84 STAT. (.73 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.
--	--	--	--	--	--	40000																				40000							
--	--	--	--	--	--	35000																				35000							
2300	38	A.R.	420	248	215	30000	--	--	--	--	--	--														30000		SEE NOTE ABOVE					
2300	38	A.R.	423	252	219	25000	2200	34	A.R.	357	232	202	--	--	--	--	--	--								25000							
2300	38	A.R.	422	247	214	20000	2200	34	A.R.	354	230	200	2100	30	A.L.	267	203	176								20000							
2300	38	A.R.	420	238	206	15000	2200	33	A.R.	339	220	191	2100	31	A.L.	267	203	176	--	--	--	--	--	--		15000							
2300	38	A.R.	416	234	203	10000	2150	32	A.R.	324	211	183	2100	31	A.L.	261	198	172	2050	30	A.L.	221	186	161		10000							
2300	38	A.R.	408	217	188	5000	2150	32	A.R.	303	197	171	2100	31	A.L.	243	185	161	2050	30	A.L.	205	172	149		5000							
2300	38	A.R.	393	206	179	S.L.	2150	32	A.R.	283	184	160	2100	31	A.L.	225	172	149	2050	30	A.L.	193	162	141		S.L.							

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 75) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) RANGES IN THIS COLUMN ARE FOR 25 000 FT. ALT. ONLY
(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE.

EXAMPLE

AT 60,000 LB. GROSS WEIGHT WITH 2600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 180 GAL.) TO FLY 1,970 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2100 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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

FUEL GRADE 100/130

DATA AS OF 7-1-44 BASED ON: FLIGHT TEST

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

Figure 77—Flight Operating Instructions

AAFMC-528 4-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & 97

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55,000 TO 50,000 POUNDS

EXTERNAL LOAD ITEMS: NONE

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		2520	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						2520		
1470	1270	2400	1600	1380	1890	1640	2160	1880	2400		
1350	1170	2200	1460	1270	1740	1500	1900	1720	2200		
1230	1060	2000	1330	1150	1580	1370	1800	1570	2000	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
1100	960	1800	1200	1040	1420	1230	1620	1410	1800		
980	850	1600	1060	920	1260	1090	1440	1250	1600		
860	740	1400	930	810	1100	960	1260	1100	1400		
740	640	1200	800	690	950	820	1080	940	1200		
610	530	1000	670	570	790	680	900	780	1000		
490	430	800	530	460	630	550	720	630	800		
370	320	600	400	350	470	410	540	470	600		
250	210	400	270	230	310	270	360	310	400		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.66 STAT. (.57 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.79 STAT. (.68 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.90 STAT. (.78 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																				40000						
--	--	--	--	--	--	35000	--	--	--	--	--	--														35000						
2300	38	A.R.	420	267	232	30000	2250	36	A.R.	383	258	224	--	--	--	--	--	--								30000						
2300	38	A.R.	423	260	226	25000	2200	34	A.R.	364	242	210	2100	31	A.L.	281	222	191	--	--	--	--	--	--	25000								
2300	38	A.R.	422	252	219	20000	2200	34	A.R.	356	237	206	2100	31	A.L.	281	222	191	2050	29	A.L.	232	209	182	20000	SEE NOTE ABOVE						
2300	38	A.R.	420	242	210	15000	2200	33	A.R.	346	230	200	2100	31	A.L.	268	212	184	2050	29	A.L.	226	203	176	15000							
2300	38	A.R.	416	232	202	10000	2150	33	A.R.	315	209	182	2100	31	A.L.	256	202	175	2050	28	A.L.	214	193	168	10000							
2300	38	A.R.	408	221	192	5000	2150	33	A.R.	296	197	171	2100	31	A.L.	243	192	167	2050	28	A.L.	201	181	157	5000							
2300	38	A.R.	393	210	182	S.L.	2150	33	A.R.	280	186	161	2100	31	A.L.	226	179	165	2050	28	A.L.	187	168	146	S.L.							

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 79) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ONLY.

(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE.

EXAMPLE

AT 55000 LB. GROSS WEIGHT WITH 1400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 120 GAL.) TO FLY 930 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2150 RPM AND 33 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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 7-1-44 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 78—Flight Operating Instructions

AAFMC-528 6-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: NONE

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 1 V

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		1700		SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]					1700		
1010	870	1600	1140	990	1370	1180	1640	1420	1600		
880	760	1400	1000	860	1200	1040	1430	1240	1400		
750	650	1200	850	740	1020	890	1230	1070	1200	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
630	550	1000	710	620	850	740	1020	890	1000		
500	440	800	570	490	680	590	820	710	800		
380	330	600	420	370	510	440	610	530	600		
250	220	400	280	240	340	390	410	350	400		
120	110	200	140	120	170	140	200	170	200		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.71 STAT. (.61 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	(.85 STAT. (.74 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	(1.03 STAT. (.89 NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	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.
--	--	--	--	--	--	40000	--	--	--	--	--	--														40000							
2300	38	A.R.	410	279	242	35000	2250	36	A.R.	380	270	234	--	--	--	--	--	--								35000							
2300	38	A.R.	420	277	240	30000	2250	35	A.R.	372	264	229	2100	31	A.L.	284	241	209	--	--	--	--	--	--		30000							
2300	38	A.R.	423	268	232	25000	2200	34	A.R.	356	253	219	2100	31	A.L.	279	237	205	2000	28	A.L.	226	233	202	25000		SEE NOTE ABOVE						
2300	38	A.R.	422	259	225	20000	2200	34	A.R.	340	241	210	2100	30	A.L.	270	225	198	2000	28	A.L.	206	212	184	20000							
2300	38	A.R.	420	247	214	15000	2150	33	A.R.	321	228	198	2100	30	A.L.	255	217	188	1950	28	A.L.	194	200	173	15000							
2300	38	A.R.	416	235	205	10000	2150	32	A.R.	301	214	185	2100	30	A.L.	240	204	177	1900	28	A.L.	180	185	160	10000							
2300	38	A.R.	408	226	196	5000	2150	32	A.R.	285	202	175	2100	30	A.L.	226	194	168	1900	28	A.L.	168	173	150	5000							
2300	38	A.R.	393	212	184	S.L.	2150	32	A.R.	265	188	163	2100	30	A.L.	212	180	156	1900	28	A.L.	156	160	139	S.L.							

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7 5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ONLY.

(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE.

EXAMPLE

AT 50000 LB. GROSS WEIGHT WITH 1600 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 100 GAL.) TO FLY 1100 STAT. AIRMILES AT 10000 FT. ALTITUDE MAINTAIN 2150 RPM AND 32 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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

FUEL GRADE 100/130

DATA AS OF 7-1-44 BASED ON: FLIGHT TESTS

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

Figure 79—Flight Operating Instructions (Sheet 4 of 4 sheets)

AAFRC-528 R-1-46

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & 97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: NONE

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7

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 (2)		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
		1000			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]				1000		
510	450	800	670	570	750	650	840	730	800		
380	340	600	500	430	560	490	630	550	600		
250	220	400	330	290	380	330	420	360	400	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
120	110	200	170	140	190	160	210	180	200		

MAXIMUM CONTINUOUS						PRESS ALT. FEET	(.82 STAT. (.71 NAUT.) MI./GAL.)						(.94 STAT. (.82 NAUT.) MI./GAL.)						(1.05 STAT. (.91 NAUT.) MI./GAL.)						PRESS ALT. FEET	MAXIMUM AIR RANGE					
R.P.M.	M.P. INCHES	MIX-TURE	APPROX. TOT[3] 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[3] 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[3] 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[3] 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.
--	--	--	--	--	--	40000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40000						
2200	38	A.R.	408	290	251	35000	2150	38	A.R.	320	254	229	2100	31	A.L.	289	258	219	--	--	--	--	--	--	35000						
2300	38	A.R.	420	285	247	30000	2150	32	A.R.	314	250	226	2100	30	A.L.	287	251	218	2000	28	A.L.	267	228	198	30000	SEE NOTE ABOVE					
2300	38	A.R.	423	273	237	25000	2100	31	A.L.	298	245	214	2050	30	A.L.	255	240	208	2000	28	A.L.	246	227	197	25000						
2300	38	A.R.	422	263	228	20000	2100	31	A.L.	287	287	205	2050	30	A.L.	246	230	199	2000	28	A.L.	209	219	190	20000						
2300	38	A.R.	420	251	218	15000	2100	31	A.L.	274	226	196	2050	30	A.L.	232	216	189	2000	28	A.L.	200	210	182	15000						
2300	38	A.R.	416	240	208	10000	2100	31	A.L.	260	214	188	2050	30	A.L.	218	205	178	1950	28	A.L.	186	195	169	10000						
2300	38	A.R.	408	227	197	5000	2100	31	A.L.	248	201	174	2050	29	A.L.	202	190	160	1950	28	A.L.	171	179	155	5000						
2300	38	A.R.	392	215	187	S.L.	2100	31	A.L.	226	187	162	2050	29	A.L.	189	178	154	1950	28	A.L.	158	168	144	S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7 5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGE VALUES IN THIS COLUMN APPLY ONLY AT 25,000 FT. ALT.

(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE

EXAMPLE

AT 45000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 665 STAT. AIRMILES AT 25000 FT. ALTITUDE MAINTAIN 2100 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L.

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 7-1-46 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 80—Flight Operating Instructions

AAFMC-528 4-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55000 TO 50000 POUNDS

EXTERNAL LOAD ITEMS: ONE PROPELLER FEATHERED

NUMBER OF ENGINES OPERATING. 3

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	---
MILITARY POWER	2500	46	--	A.R.	5	260°	416

FOR DETAILS SEE POWER PLANT CHART FIG. 7.4

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		2520		SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
1550	1350	2400	1700	1480							
1420	1240	2200	1560	1350							
1290	1120	2000	1420	1230						REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
1160	1010	1800	1280	1110							
1030	900	1600	1140	980							
910	780	1400	990	860							
780	670	1200	850	740							
640	560	1000	710	620							
520	450	800	570	480							
390	340	600	430	370							
260	220	400	280	250							

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.7 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000		SEE NOTE ABOVE				
--	--	--	--	--	--	25000																				25000						
2300	38	A.R.	317	205		20000																				20000						
2300	38	A.R.	315	204		15000	--	--	--	--	--	--														15000						
2300	38	A.R.	312	197		10000	2200	34	A.R.	256	182															10000						
2300	38	A.R.	307	189		5000	2200	34	A.R.	242	171															5000						
2300	38	A.R.	294	180		S.L.	2200	34	A.R.	228	162															S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7.5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.
(2) RANGES IN THIS COLUMN ARE FOR 20,000 FT. ALT. ONLY
(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE.

EXAMPLE

AT 55,000 LB. GROSS WEIGHT WITH 1800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 0 GAL.) TO FLY 1280 STAT. AIRMILES AT 5000 FT. ALTITUDE MAINTAIN 2200 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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 7-14-44 BASED ON: FLIGHT TEST

FUEL GRADE 100/130

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

Figure 81—Flight Operating Instructions

AAFMC-528 6-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & 97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: ONE PROPELLER FEATHERED

NUMBER OF ENGINES OPERATING: 3

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	416

FOR DETAILS SEE POWER PLANT CHART FIG. 7.N

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
1110	960	1700	1200	1040	1360	1180	1520	1320	1700		
970	840	1600	1050	960	1190	1030	1330	1150	1600		
		1400							1400		
830	720	1200	900	780	1020	880	1140	990	1200	REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
690	600	1000	750	650	850	740	950	820	1000		
550	480	800	600	520	680	590	760	660	800		
420	360	600	450	390	510	440	570	490	600		
280	240	400	300	260	340	290	380	330	400		
140	120	200	150	130	170	150	190	160	200		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.75 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	(.85 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.G. MPH	APPROX. T.A.G. KTS.	(.95 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	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.
--	--	--	--	--	--	40000																				40000						
						35000																				35000						
						30000																				30000						
																											SEE NOTE ABOVE					
2300	38	A.R.	317	220		25000	--	--	--	--	--	--														25000						
2300	38	A.R.	317	219		20000	2200	34	A.R.	268	201		--	--	--	--	--	--								20000						
2300	38	A.R.	315	212		15000	2200	34	A.R.	262	198		2100	31	A.L.	206	175		--	--	--	--	--	--		15000						
2300	38	A.R.	312	204		10000	2200	33	A.R.	258	194		2100	31	A.L.	201	171		2050	29	A.L.	171	162			10000						
2300	38	A.R.	307	195		5000	2200	33	A.R.	238	178		2100	31	A.L.	182	163		2050	29	A.L.	165	157			5000						
2300	38	A.R.	294	184		S.L.	2200	33	A.R.	225	169		2100	31	A.L.	180	153		2050	30	A.L.	151	143			S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7.5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY.

(3) FUEL FLOWS (GPH) ARE 5% CONSERVATIVE

EXAMPLE

AT 50000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 0 GAL.) TO FLY 550 STAT. AIRMILES AT 25000 FT. ALTITUDE MAINTAIN 2300 RPM AND 38 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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 7-14-44 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 82—Flight Operating Instructions

AAFHC-623 5-1-46

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: ONE PROPELLER FEATHERED

NUMBER OF ENGINES OPERATING: 3

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	416

FOR DETAILS SEE POWER PLANT CHART FIG. 7-4

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
		1000	SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]						1000		
590	510	800	650	560	750	650	880	760	800		
440	380	600	490	420	560	490	660	570	600		
300	250	400	320	280	380	330	440	380	400	REFER TO FLIGHT OPERATIONS CHARTS FIG. 80 & 81	
150	130	200	160	140	190	160	220	190	200		

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.81 STAT. (NAUT.) MI./BAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.94 STAT. (NAUT.) MI./BAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(1.10 STAT. (NAUT.) MI./BAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	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.
--	--	--	--	--	--	40000																				40000						
2300	38	A.R.	315	238		35000																				35000						
						30000	--	--	--	--	--	--														30000						
																											SEE NOTE ABOVE					
2300	38	A.R.	317	234		25000	2200	34	A.R.	268	217		--	--	--	--	--	--								25000						
2300	38	A.R.	317	227		20000	2200	33	A.R.	262	212		2100	31	A.L.	210	198		--	--	--	--	--	-		20000						
2300	38	A.R.	315	218		15000	2200	33	A.R.	247	200		2100	31	A.L.	202	180		2000	28	A.L.	156	171			15000						
2300	38	A.R.	312	209		10000	2150	33	A.R.	228	185		2100	31	A.L.	190	176		2000	28	A.L.	145	160			10000						
2300	38	A.R.	307	198		5000	2150	32	A.R.	215	175		2100	31	A.L.	181	170		2000	28	A.L.	142	156			5000						
2300	38	A.R.	294	189		S.L.	2150	32	A.R.	205	165		2100	31	A.L.	168	158		2000	27	A.L.	126	139			S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7-5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY.

(3) FUEL FLOWS (G.P.H.) ARE 5% CONSERVATIVE

EXAMPLE

AT 45,000 LB. GROSS WEIGHT WITH 400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 0 GAL.) TO FLY 480 STAT. AIRMILES AT 25000 FT. ALTITUDE MAINTAIN 2260 RPM AND 33 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R.

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 7-14-44 BASED ON: FLIGHT TEST

FUEL GRADE 100/130

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

Figure 83—Flight Operating Instructions

AN-HC-528 6-1-48

AIRCRAFT MODEL(S) B-17G

ENGINE(S): R-1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS 2 - 2,000 LB. EXT. BOMBS

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7 N

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 RANGE IN AIRMILES (2) STATUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
				SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]							
1460	1270	2600	1770	1530							
1350	1170	2400	1630	1420							
1240	1070	2200	1500	1300							
1120	970	2000	1360	1180							
1010	880	1800	1220	1060							
900	780	1600	1090	940						REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
790	680	1400	950	830							
680	580	1200	820	710							
560	490	1000	680	650							
450	390	800	540	470							
340	290	600	410	350							

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	PRESS ALT. FEET	(.68 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. K.T.S.
--	--	--	--	--	--	40000																			40000						
--	--	--	--	--	--	35000																			35000						
--	--	--	--	--	--	30000																			30000						
2300	38	A.R.	423	238		25000																			25000						
2300	38	A.R.	422	232		20000	--	--	--	--	--	--													20000						
2300	38	A.R.	420	225		15000	2100	31	A.L.	279	189														15000						
2300	38	A.R.	416	214		10000	2100	31	A.L.	268	182														10000						
2300	38	A.R.	408	205		5000	2100	31	A.L.	256	174														5000						
2300	38	A.R.	393	194		S.L.	2100	31	A.L.	240	163														S.L.						

SEE NOTE ABOVE

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7 S) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY

(3) FUEL FLOWS (GPH) ARE 5% CONSERVATIVE

EXAMPLE

AT 60000 LB. GROSS WEIGHT WITH 1400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 950 STAT. AIRMILES AT 5,000 FT. ALTITUDE MAINTAIN 2100 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L. (When bombs are dropped, change charts).

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 7-14-44 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 84—Flight Operating Instructions

AAFMC-528 4-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55,000 TO 50,000 POUNDS

EXTERNAL LOAD ITEMS: 2 - 2000 LB. EXT. BOMBS

NUMBER OF ENGINES OPERATING: 4

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7-6

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 RANGE IN AIRMILES[2] STAUTE	COLUMN I RANGE IN AIRMILES[2] NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
930	810	1700	1020	880	1190	1030	1370	1190			
820	710	1600	890	770	1040	900	1200	1040			
700	610	1200	760	660	890	770	1030	890			
580	500	1000	630	550	740	640	850	740		REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
460	400	800	510	440	590	510	680	590			
350	300	600	380	330	440	380	510	440			
230	200	400	250	220	290	250	340	290			
110	100	200	120	110	148	130	170	150			

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.63 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.74 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.85 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	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.
•						40000																				40000						
--	--	--	--	-	--	35000																				35000						
2300	38	A.R.	420	248		30000																				30000	SEE NOTE ABOVE					
2300	38	A.R.	423	247		25000	2200	34	A.R.	357	227															25000						
2300	38	A.R.	422	240		20000	2200	34	A.R.	351	223		2100	31	A.L.	278	206									20000						
2300	38	A.R.	420	229		15000	2200	34	A.R.	332	211		2100	31	A.L.	268	199		2050	28	A.L.	217	186			15000						
2300	38	A.R.	416	219		10000	2150	33	A.R.	313	199		2100	31	A.L.	259	192		2000	26	A.L.	200	171			10000						
2300	38	A.R.	408	207		5000	2150	33	A.R.	294	187		2100	31	A.L.	244	181		2000	28	A.L.	188	161			5000						
2300	38	A.R.	392	198		S.L.	2150	33	A.R.	278	177		2100	31	A.L.	228	169		2000	28	A.L.	173	148			S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7-5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY

(3) FUEL MILEAGES (GPH) ARE 5% CONSERVATIVE.

EXAMPLE

AT 55000 LB. GROSS WEIGHT WITH 1400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 1040 STAT. AIRMILES AT 15000 FT. ALTITUDE MAINTAIN 2100 RPM AND 31 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.L. (When bombs are dropped, change charts).

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 7-14-44 BASED ON: FLIGHT TEST

FUEL GRADE 100/130

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

Figure 85—Flight Operating Instructions

AAFMC-528 4-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: 2 - 2,000 LB. EXT. BOMBS

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN. HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 74

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
600	520	1000	650	570	770	670	912	790			
480	410	800	530	460	610	530	730	630			
360	310	600	400	340	460	400	540	470			
240	210	400	260	230	310	270	360	310		REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
120	100	200	130	110	150	130	180	150			

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.65 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.77 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	(.91 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH.	APPROX. T.A.S. MPH.	APPROX. T.A.S. KTS.	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.
--	--	--	--	--	--	40000	--	--	--		--		--	--	--		--		--	--	--		--		40000						
2300	38	A.R.	410	260		35000	--	--	--		--		--	--	--		--		--	--	--		--		35000						
2300	38	A.R.	420	260		30000	2250	36	A.R.	382	252		--	--	--		--		--	--	--		--		30000		SEE NOTE ABOVE				
2300	38	A.R.	423	253		25000	2200	34	A.R.	361	238		2100	31	A.L.	290	223		2050	29	A.L.	228	208		25000						
2300	38	A.R.	422	245		20000	2200	34	A.R.	350	231		2100	31	A.L.	281	216		2050	29	A.L.	226	206		20000						
2300	38	A.R.	420	234		15000	2150	31	A.R.	329	217		2100	31	A.L.	269	207		2050	29	A.L.	208	190		15000						
2300	38	A.R.	416	224		10000	2150	31	A.R.	312	206		2100	31	A.L.	256	197		2000	28	A.L.	200	182		10000						
2300	38	A.R.	408	212		5000	2150	32	A.R.	292	193		2100	31	A.L.	242	186		2000	28	A.L.	186	170		5000						
2300	38	A.R.	393	200		S.L.	2150	32	A.R.	274	181		2100	31	A.L.	226	174		2000	28	A.L.	173	157		S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 75) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY.

(3) FUEL FLOWS (GPH) ARE 5% CONSERVATIVE.

EXAMPLE

AT 50,000 LB. GROSS WEIGHT WITH 800 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 530 STAT. AIRMILES AT 30,000 FT. ALTITUDE MAINTAIN 2250 RPM AND 36 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R. *(When bombs are dropped, change charts).*

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.J. : FULL THROTTLE

DATA AS OF 7-13-44 BASED ON: FLIGHT TESTS

FUEL GRADE 100/130

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

Figure 86—Flight Operating Instructions

AAFAC-528 8-1-44

AIRCRAFT MODEL(S): B-17G

ENGINE(S): R-1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

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

EXTERNAL LOAD ITEMS: 2 - 4000 LB. BOMBS

NUMBER OF ENGINES OPERATING: 4

LIMITS	RPM.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7 *

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
970	840	2000	1100	950							
870	750	1800	990	860							
770	670	1600	880	760							
680	590	1400	770	670						REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
580	500	1200	660	570							
480	420	1000	550	480							
390	340	800	440	380							
290	250	600	330	290							
190	160	400	220	190							
90	80	200	110	90							

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(.55 STAT. (= NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.	PRESS ALT. FEET	MAXIMUM AIR RANGE R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. G.P.H.	APPROX. T.A.S. M.P.H.	APPROX. T.A.S. KTS.
						40000																				40000						
						35000																				35000						
						30000																				30000						
--	--	--	--	--	--	25000																				25000						
2300	38	A. R.	422	204		20000	--	--	--	--	--	--														20000						
2300	38	A.R.	420	198		15000	2200	34	A.R.	360	198															15000						
2300	38	A.R.	416	205		10000	2200	34	A.R.	348	191															10000						
2300	38	A.R.	408	197		5000	2200	34	A.R.	332	183															5000						
2300	38	A.R.	393	186		S.L.	2200	34	A.R.	309	170															S.L.						

SEE NOTE ABOVE

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG 7.5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 20,000 FT. ALT. ONLY.

(3) FUEL FLOWS (GPH) ARE 5% CONSERVATIVE

EXAMPLE

AT 60000 LB. GROSS WEIGHT WITH 1400 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 400 GAL.) TO FLY 770 STAT. AIRMILES AT 20000 FT. ALTITUDE MAINTAIN 2200 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R. *(When bombs are dropped, change charts).*

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 7-17-44 BASED ON: FLIGHT TEST

FUEL GRADE 100/130

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

Figure 87—Flight Operating Instructions

AAFNC-528 4-1-44

AIRCRAFT MODEL(S): B-176

ENGINE(S): R1820-65 & -97

FLIGHT OPERATION INSTRUCTION CHART

CHART WEIGHT LIMITS: 55,000 TO 50,000 POUNDS

EXTERNAL LOAD ITEMS: 2 - 4000# LB. BOMBS

NUMBER OF ENGINES OPERATING: 4

LIMITS	R.P.M.	M.P. IN.HG.	BLOWER POSITION	MIXTURE POSITION	TIME LIMIT	CYL. TEMP.	TOTAL G.P.H.
WAR EMERG.	2500	51	--	A.R.	5	--	--
MILITARY POWER	2500	46	--	A.R.	5	260°	555

FOR DETAILS SEE POWER PLANT CHART FIG. 7-4

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 RANGE IN AIRMILES (2) STAUTE	COLUMN I RANGE IN AIRMILES (2) NAUTICAL	FUEL U.S. GAL.	COLUMN II RANGE IN AIRMILES STATUTE	COLUMN II RANGE IN AIRMILES NAUTICAL	COLUMN III RANGE IN AIRMILES STATUTE	COLUMN III RANGE IN AIRMILES NAUTICAL	COLUMN IV RANGE IN AIRMILES STATUTE	COLUMN IV RANGE IN AIRMILES NAUTICAL	FUEL U.S. GAL.	COLUMN V RANGE IN AIRMILES STATUTE	COLUMN V RANGE IN AIRMILES NAUTICAL
			SUBTRACT FUEL ALLOWANCES NOT AVAILABLE FOR CRUISING[1]								
650	570	1200	720	680	830	720					
550	470	1000	600	520	690	600					
440	380	800	480	420	550	480					
330	280	600	360	310	410	360				REFER TO FLIGHT OPERATIONS CHARTS FIG. 90 & 91	
220	190	400	240	210	270	240					
110	90	200	120	100	140	120					

MAXIMUM CONTINUOUS R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	PRESS ALT. FEET	(-60 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	(69 STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT.[3] GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	(STAT. (NAUT.) MI./GAL.) R.P.M.	M.P. INCHES	MIXTURE	APPROX. TOT. GPH	APPROX. T.A.S. MPH	APPROX. T.A.S. KTS.	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.
--	--	--	--	--	--	40000 35000 30000																				40000 35000 30000			SEE NOTE ABOVE			
2300	38	A.R.	423	231		25000	--	--	--	--	--	--														25000						
2300	38	A.R.	422	228		20000	2200	34	A.R.	354	212															20000						
2300	38	A.R.	420	220		15000	2200	33	A.R.	346	207		--	--	--	--	--	--								15000						
2300	38	A.R.	416	211		10000	2200	33	A.R.	325	195		2100	31	A.L.	264	182									10000						
2300	38	A.R.	408	200		5000	2200	32	A.R.	304	182		2100	31	A.L.	248	171									5000						
2300	38	A.R.	393	190		S.L.	2200	32	A.R.	286	172		2100	31	A.L.	232	160									S.L.						

SPECIAL NOTES

(1) MAKE ALLOWANCE FOR WARM-UP, TAKE-OFF & CLIMB (SEE FIG. 7-5) PLUS ALLOWANCE FOR WIND, RESERVE AND COMBAT AS REQUIRED.

(2) RANGES IN THIS COLUMN ARE FOR 25,000 FT. ALT. ONLY.

(3) FUEL FLOWS (GPH) ARE 5% CONSERVATIVE

EXAMPLE

AT 35,000 LB. GROSS WEIGHT WITH 1000 GAL. OF FUEL (AFTER DEDUCTING TOTAL ALLOWANCES OF 200 GAL.) TO FLY 600 STAT. AIRMILES AT 20000 FT. ALTITUDE MAINTAIN 2200 RPM AND 34 IN. MANIFOLD PRESSURE WITH MIXTURE SET: A.R. (When bombs are dropped, change charts).

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 7-17-44 BASED ON: FLIGHT TEST

FUEL GRADE 100/130

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

Figure 88—Flight Operating Instructions

NOTE: This book contains no Figure 89

B-17G FLIGHT OPERATIONS CHARTS

1. USE THESE CHARTS TO DETERMINE RANGE, OPERATING CONDITIONS, AND AVERAGE AIRSPEED.

2. ENTER RANGE CHART AT GALLONS OF FUEL AVAILABLE AND GO TO COLUMN CONTAINING RANGE DESIRED. READ LETTER AT TOP OF THIS COLUMN OPPOSITE HEADWIND CONDITION.

3. NOTE WEIGHT OF AIRPLANE AND CONDITION (CLEAN, EXTERNAL BOMBS, ENGINES OUT, ETC.) AND ENTER OPERATION CHART. DESIRED RANGE CAN BE ACCOMPLISHED BY OPERATING WITH POWER CONDITION INDICATED WHEREVER RANGE LETTER APPEARS. IF DESIRED RANGE LETTER DOES NOT APPEAR, USE NEXT LETTER IN ALPHABETICAL ORDER IF OPERATION IS BETWEEN "A" AND "M." LETTERS "R" THROUGH "W" ARE FOR SPECIAL CASES OF LONG RANGE CRUISING.

4. ENGINE OPERATING CONDITIONS NECESSARY TO ACHIEVE SPECIFIED RESULT ARE INDICATED AT TOP OF EACH COLUMN OF OPERATION CHART.

5. "X" IN SPACE ON OPERATION CHART INDICATES POWER CONDITION NOT SUFFICIENT FOR FLIGHT AT SPECIFIED WEIGHT AND ALTITUDE.

OPERATION CHART

NO EXTERNAL BOMBS — ALL ENGINES OPERATING

	R.P.M.	MANIFOLD PRESSURE	MIXTURE	APPROX. GAL. PER HR.	MAX. CYL. TEMP.—°C.	MILITARY POWER	CLIMB & HIGH POWER CRUISE	CRUISE	CRUISE	CRUISE	LONG RANGE	
											AS REQ.	
	2500	47.5"	AUTO RICH	555	260°							
	2388	38"	AUTO RICH	480	232° CLIMB							
	2200	34"	AUTO RICH	335	218°							
	2100	31"	AUTO LEAN	255	218°							
	2000	28"	AUTO LEAN	190	218°							
	AS REQ.	28" BELOW 2100 R.P.M.	AUTO LEAN		218°							
						T.A.S.	218° LEVEL	T.A.S.	T.A.S.	T.A.S.	T.A.S.	PILOT'S IND.
HEAVY WEIGHT ABOVE 60,000 LBS.	SEA LEVEL					B 228	D 202	F 186	X	X	U 154	
	5,000'					B 235	E 214	F 198	X	X	U 166	
	10,000'					B 249	E 223	F 206	X	X	U 179	
	15,000'					C 257	E 232	F 210	X	X	T 194	155
	20,000'					C 264	E 238	X	X	X	T 211	
	25,000'					D 271	X	X	X	X	S 229	
	30,000'					X	X	X	X	X	X	
	35,000'					X	X	X	X	X	X	
AVERAGE WEIGHT 50,000-60,000 LBS.	SEA LEVEL					B 233	E 209	F 195	I 179	K 160	W 148	
	5,000'					B 243	E 222	F 208	I 193	X	W 158	
	10,000'					C 256	E 234	G 219	I 204	X	W 170	
	15,000'					C 265	F 244	G 228	I 212	X	W 184	
	20,000'					D 276	F 254	G 238	I 220	X	W 200	
	25,000'					D 286	F 261	H 243	X	X	V 218	155 TO TARGET 140 RETURN
	30,000'					E 294	G 266	X	X	X	U 238	
	35,000'					F 283	X	X	X	X	T 282	
LIGHT WEIGHT BELOW 50,000 LBS.	SEA LEVEL					B 238	F 214	G 201	J 187	L 171	M 139	
	5,000'					B 248	E 227	G 215	J 202	L 186	M 150	
	10,000'					C 261	F 239	G 227	I 214	L 198	M 161	
	15,000'					D 271	F 251	G 239	I 225	L 209	M 175	
	20,000'					D 283	G 264	H 251	J 237	M 218	M 190	
	25,000'					E 295	G 274	H 260	K 246	M 226	M 207	
	30,000'					E 307	G 284	I 267	K 253	X	M 227	
	35,000'					F 306	H 290	J 269	X	X	L 248	140

NO EXTERNAL BOMBS — 1 ENGINE OUT

	R.P.M.	MANIFOLD PRESSURE	MIXTURE	APPROX. GAL. PER HR.	MAX. CYL. TEMP.—°C.	MILITARY POWER	CLIMB & HIGH POWER CRUISE	CRUISE	CRUISE	LONG RANGE	
										AS REQ.	
	2500	47.5"	AUTO RICH	415	260°						
	2300	38"	AUTO RICH	300	232° CLIMB						
	2200	34"	AUTO RICH	250	218°						
	2100	31"	AUTO LEAN	190	218°						
	AS REQ.	28" BELOW 2100 R.P.M.	AUTO LEAN		218°						
						T.A.S.	218° LEVEL	T.A.S.	T.A.S.	T.A.S.	PILOT'S IND.
HEAVY WEIGHT ABOVE 60,000 LBS.	SEA LEVEL					C 197	X	X	X	S 164	
	5,000'					D 204	X	X	X	S 166	
	10,000'					D 210	X	X	X	R 178	
	15,000'					D 210	X	X	X	R 194	155
	20,000'					X	X	X	X	X	
	25,000'					X	X	X	X	X	
	30,000'					X	X	X	X	X	
	35,000'					X	X	X	X	X	
AVERAGE WEIGHT 50,000-60,000 LBS.	SEA LEVEL					D 205	F 180	H 163	X	V 148	
	5,000'					D 214	G 189	H 172	X	V 158	
	10,000'					D 222	G 197	X	X	V 170	
	15,000'					F 228	G 204	X	X	U 184	
	20,000'					F 234	X	X	X	U 200	
	25,000'					X	X	X	X	X	155 TO TARGET 140 RETURN
	30,000'					X	X	X	X	X	
	35,000'					X	X	X	X	X	
LIGHT WEIGHT BELOW 50,000 LBS.	SEA LEVEL					D 210	G 189	H 176	J 159	M 139	
	5,000'					D 219	G 199	I 188	K 171	M 150	
	10,000'					E 230	G 209	I 194	K 180	M 161	
	15,000'					E 238	H 219	I 203	K 188	M 176	
	20,000'					E 248	H 228	I 211	X	L 180	
	25,000'					F 258	H 233	X	X	W 207	
	30,000'					F 268	X	X	X	W 227	
	35,000'					X	X	X	X	X	140

NO EXTERNAL BOMBS — 2 ENGINES OUT

	R.P.M.	MANIFOLD PRESSURE	MIXTURE	APPROX. GAL. PER HR.	MAX. CYL. TEMP.—°C.	MILITARY POWER	CLIMB & HIGH POWER CRUISE	LONG RANGE	
								AS REQ.	
	2500	47.5"	AUTO RICH	275	260°				
	2300	38"	AUTO RICH	200	232° CLIMB				
	BELOW 2100 R.P.M.	28"	AUTO LEAN		218°				
						T.A.S.	218° LEVEL	T.A.S.	PILOT'S IND.
HEAVY WEIGHT ABOVE 60,000 LBS.	SEA LEVEL					X	X	X	
	5,000'					X	X	X	
	10,000'					X	X	X	
	15,000'					X	X	X	155
	20,000'					X	X	X	
	25,000'					X	X	X	
	30,000'					X	X	X	
	35,000'					X	X	X	
AVERAGE WEIGHT 50,000-60,000 LBS.	SEA LEVEL					X	X	X	
	5,000'					X	X	X	
	10,000'					X	X	X	
	15,000'					X	X	X	155 TO TARGET 140 RETURN
	20,000'					X	X	X	
	25,000'					X	X	X	
	30,000'					X	X	X	
	35,000'					X	X	X	
LIGHT WEIGHT BELOW 50,000 LBS.	SEA LEVEL					F 170	X	I 138	
	5,000'					G 178	X	H 150	
	10,000'					G 183	X	H 161	
	15,000'					G 189	X	G 176	
	20,000'					X	X	X	
	25,000'					X	X	X	
	30,000'					X	X	X	
	35,000'					X	X	X	140

2-2000 LB. EXTERNAL BOMBS — ALL ENGINES OPERATING

	R.P.M.	MANIFOLD PRESSURE	MIXTURE	APPROX. GAL. PER HR.	MAX. CYL. TEMP.—°C.	MILITARY POWER	CLIMB & HIGH POWER CRUISE	CRUISE	CRUISE	CRUISE	LONG RANGE	
											AS REQ.	
	2500	47.5"	AUTO RICH	555	260°							
	2300	38"	AUTO RICH	400	232° CLIMB							
	2200	34"	AUTO RICH	335	218°							
	2100	31"	AUTO LEAN	255	218°							
	2000	28"	AUTO LEAN	190	218°							
	AS REQ.	28" BELOW 2100 R.P.M.	AUTO LEAN		218°							
						T.A.S.	218° LEVEL	T.A.S.	T.A.S.	T.A.S.	T.A.S.	PILOT'S IND.
HEAVY WEIGHT ABOVE 60,000 LBS.	SEA LEVEL					A 218	D 190	E 175	X	X	T 164	
	5,000'					B 226	D 201	E 184	X	X	T 166	
	10,000'					B 236	D 210	E 191	X	X	S 179	
	15,000'					B 243	E 218	X	X	X	S 194	155
	20,000'					C 249	E 222	X	X	X	S 211	
	25,000'					D 264	X	X	X	X	R 229	
	30,000'					X	X	X	X	X	X	
	35,000'					X	X	X	X	X	X	
AVERAGE WEIGHT 50,000-60,000 LBS.	SEA LEVEL					A 221	D 198	F 186	H 169	X	K 148	
	5,000'					B 232	D 210	F 198	H 181	X	K 158	
	10,000'					B 242	E 220	F 208	H 192	X	K 170	
	15,000'					C 252	E 230	F 217	I 200	X	V 184	
	20,000'					C 260	F 239	G 223	X	X	V 200	
	25,000'					D 269	F 245	G 228	X	X	U 218	155 TO TARGET 140 RETURN
	30,000'					D 276	F 246	X	X	X	T 238	
	35,000'					X	X	X	X	X	X	
LIGHT WEIGHT BELOW 50,000 LBS.	SEA LEVEL					A 224	D 203	F 191	I 178	K 163	M 139	
	5,000'					B 236	E 216	G 203	I 192	K 176	M 150	
	10,000'					C 247	E 227	G 214	I 203	K 187	M 161	
	15,000'					C 257	F 238	G 228	I 214	L 198	M 175	
	20,000'					D 268	F 249	G 237	J 224	L 206	M 190	
	25,000'					D 279	F 260	H 246	J 233	X	L 207	
	30,000'					E 291	G 270	H 255	J 237	X	K 227	
	35,000'					F 289	G 273	X	X	X	V 248	140

2-4000 LB. EXTERNAL BOMBS — ALL ENGINES OPERATING

	R.P.M.	MANIFOLD PRESSURE	MIXTURE	APPROX. GAL. PER HR.	MAX. CYL. TEMP.—°C.	MILITARY POWER	CLIMB & HIGH POWER CRUISE	CRUISE	CRUISE	CRUISE	LONG RANGE	
											AS REQ.	
	2500	47.5"	AUTO RICH	555	260°							
	2300	38"	AUTO RICH	400	232° CLIMB							
	2200	34"	AUTO RICH	335	218°							
	2100	31"	AUTO LEAN	255	218°							
	2000	28"	AUTO LEAN	190	218°							
	AS REQ.	28" BELOW 2100 R.P.M.	AUTO LEAN		218°							
						T.A.S.	218° LEVEL	T.A.S.	T.A.S.	T.A.S.	T.A.S.	PILOT'S IND.
HEAVY WEIGHT ABOVE 60,000 LBS.	SEA LEVEL					A 208	C 182	E 165	X	X	S 154	
	5,000'					A 216	C 191	X	X	X	S 166	
	10,000'					A 226	D 199	X	X	X	R 179	
	15,000'					B 232	X	X	X	X	R 194	155
	20,000'					B 238	X	X	X	X	R 211	
	25,000'					X	X	X	X	X	X	
	30,000'					X	X	X	X	X	X	
	35,000'					X	X	X	X	X	X	
AVERAGE WEIGHT 50,000-60,000 LBS.	SEA LEVEL					A 211	D 190	F 167	H 161	X	V 146	
	5,000'					A 222	D 200	F 188	H 173	X	V 158	
	10,000'					B 233	D 211	F 198	X	X	U 170	
	15,000'					B 241	E 220	F 206	X	X	U 184	
	20,000'					C 251	E 228	X	X	X	U 200	
	25,000'					C 257	X	X	X	X	T 218	155 TO TARGET 140 RETURN
	30,000'					C 262	X	X	X	X	S 238	
	35,000'					X	X	X	X	X	X	
LIGHT WEIGHT BELOW 50,000 LBS.	SEA LEVEL					A 215	D 195	F 183	I 169	K 155	L 139	
	5,000'					B 226	D 206	F 196	I 183	K 168	L 160	
	10,000'					B 238	E 218	F 206	I 193	K 170	L 181	
	15,000'					C 248	E 228	G 216	I 203	X	L 175	
	20,000'					C 257	F 240	G 226	I 214	X	L 190	
	25,000'					D 268	F 248	G 236	I 221	X	K 207	
	30,000'					D 278	F 258	H 240	X	X	V 227	
	35,000'					E 276	X	X	X	X	G 248	140

WARNING! 1. MILITARY POWER IS LIMITED TO 5 MINUTES UNDER NORMAL CONDITIONS. USE FOR LONGER PERIODS IN EMERGENCY ONLY.

Figure 90—Flight Operating Chart

RANGE TABLE

FUEL QUANTITIES ARE IN U. S. GALLONS (12 U. S. GALLONS = 10 IMPERIAL GALLONS)

RANGES ARE APPROXIMATELY 5% CONSERVATIVE

NO HEADWIND	A	B	C	D	E	F	G	H	I	J	K	L	M	R	S	T	U	V	W	NO HEADWIND
HEADWIND 10% OF T. A. S.	B	C	D	E	F	G	H	I	J	K	L	M		S	T	U	V	W		HEADWIND 10% OF T. A. S.
HEADWIND 20% OF T. A. S.	C	D	E	F	G	H	I	J	K	L	M			T	U	V	W			HEADWIND 20% OF T. A. S.
HEADWIND 30% OF T. A. S.	D	E	F	G	H	I	J	K	L	M				U	V	W				HEADWIND 30% OF T. A. S.
HEADWIND 40% OF T. A. S.	E	F	G	H	I	J	K	L	M					V	W					HEADWIND 40% OF T. A. S.
200	70	75	85	95	105	115	125	135	145	160	175	190	210	90	100	110	120	140	160	200
400	145	155	170	190	210	230	250	275	300	330	360	390	430	180	200	220	250	280	320	400
600	220	240	265	290	315	345	380	415	455	495	540	590	645	280	310	340	380	430	490	600
800	295	320	350	385	425	450	515	560	615	670	730	800	870	380	420	470	520	590	670	800
1000	370	405	440	485	535	585	645	705	770	850	920	1010	1095	480	530	590	660	750	860	1000
1200	445	490	535	590	650	710	780	855	935	1025	1115	1220	1330	580	640	720	820	930	1060	1200
1400	520	570	625	685	760	830	915	1005	1095	1205	1310	1430	1560	690	770	860	970	1110	1270	1400
1600	600	655	720	790	870	955	1050	1150	1260	1380	1505	1650	1800	800	890	1000	1130	1290	1480	1600
1800	675	740	810	895	985	1080	1185	1300	1425	1565	1700			920	1020	1150	1300	1490	1700	1800
2000	750	825	905	995	1095	1205	1320	1445	1585	1740	1900			1030	1160	1300	1480	1690	1920	2000
2200	830	910	1000	1100	1210	1330	1460	1600	1750	1930	2100			1160	1300	1470	1670	1900	2150	2200
2400	910	1000	1090	1210	1330	1450	1600	1750	1920	2110	2300			1300	1450	1640	1870	2120	2400	2400
2600	990	1090	1200	1310	1440	1580	1740	1910	2090	2300	2510			1440	1620	1830	2080	2350	2650	2600
2800	1070	1170	1290	1420	1550	1700	1870	2050	2250	2470	2700			1590	1790	2030	2300	2590	2910	2800
3000	1150	1260	1380	1520	1670	1830	2010	2210	2420	2660	2910			1750	1970	2220	2520	2830	3170	3000
3200	1230	1350	1480	1630	1790	1960	2150	2360	2590	2850	3120			1920	2170	2450	2760	3090	3460	3200
3400	1300	1430	1570	1730	1900	2090								2110	2370	2670	3000			3400
3600	1380	1520	1670	1840	2020	2220								2310	2590	2900	3250			3600
3800	1460	1610	1770	1950	2140	2340								2510	2810	3140	3510			3800
4000	1540	1700	1870	2050	2250	2470								2730	3040	3390	3770			4000

FUEL AVAILABLE . . . GALLONS

MAINS + BOMB BAY (2500 GALS.)

MAINS + OUTBOARDS + BOMB BAY (3600 GALS.)

FULL MAINS (1700 GALS.)

MAINS + OUTBOARDS 2780 GALS.

EXAMPLE I—COMPLETE MISSION

RANGE DESIRED (ALL ENGINES OPERATING) 1,000 MILES — FUEL 1,600 GALS.

FLIGHT ALTITUDE 10,000 FT. AVERAGE WEIGHT APPROX. 60,000 LBS. — NO HEADWIND

FROM CLIMB CHART OBTAIN 145 GALS. REQUIRED FOR CLIMB. ALLOW 40 GALS. FOR WARMUP AND TAKEOFF. FUEL AVAILABLE FOR FLIGHT IS THUS 1,415 GALS. ENTER RANGE CHART AND NOTE RANGE OF 1,005 MILES CAN BE ACCOMPLISHED WITH 1,400 GALS. AT CONDITION "H." ON OPERATION CHART OPPOSITE AVERAGE WEIGHT AND 10,000 FT. CONDITION "H" DOES NOT APPEAR BUT THE NEXT HIGHER LETTER "I" APPEARS UNDER POWER SETTING—2100 RPM AND 31 INCHES MANIFOLD PRESSURE, AVERAGE TRUE AIRSPEED 204 MPH. THIS IS MAXIMUM SPEED AND POWER AT WHICH THIS MISSION CAN BE ACCOMPLISHED.

EXAMPLE II—TYPICAL RETURN TRIP

RANGE DESIRED 350 MILES — FUEL REMAINING 600 GALS.

FLIGHT ALTITUDE 20,000 FT.

ALL ENGINES OPERATING OBJECTIVE REACHED AND BOMBS DROPPED. AIRPLANE WEIGHT ESTIMATED AT 50,000 LBS. HEADWIND—25 MPH—ESTIMATED 10% OF DESIRED TRUE AIRSPEED. ON RANGE CHART OPPOSITE 600 GALS. READ 380 MILES AT CONDITION "H" WHEN 10% HEADWIND EXISTS. CONDITION "H" APPEARS UNDER 2,200 RPM AND 34 INCHES MANIFOLD PRESSURE. TRUE AIRSPEED—251 MPH. THIS IS MAXIMUM SPEED AND POWER AT WHICH THIS RETURN TRIP CAN BE MADE.

Figure 91—Range Table

B-17G OPERATING INSTRUCTIONS—SUMMARY

TAKEOFF

On runup at full throttle, set turbo boost selector at position 8 for 47.5 inches. Takeoff at 47.5 inches and 2500 RPM. For shortest takeoff use one-third flaps and hold three-point position until airplane leaves ground.

CLIMB

For best climb performance, climb at 38 inches, 2300 RPM, auto-rich, cowl flaps open, and 135 MPH pilot's indicated airspeed. Never climb below 135 MPH. On instrument climbs below 20,000 feet, climb at 160 MPH pilot's I.A.S. Use full throttle and set power with turbo regulator.

LEVEL FLIGHT

Use full throttle when possible and set power with turbo regulator. Cowl flaps closed or set to proper cylinder temperature. Mixture auto-rich above 2100 RPM, 31 inches manifold pressure.

LONG RANGE CRUISING

For long range cruising fly to target at 155 I.A.S. and return at 140 MPH pilot's I.A.S. Hold speed constant and adjust power to maintain altitude. Set power by adjusting RPM while holding the manifold pressure at 28 inches. If speed cannot be obtained with 2000 RPM and 28 inches, use higher RPM's and recommended manifold pressures. Use auto-lean mixture when at or below 2100 RPM. Close cowl flaps. For long range climb, use above climb instructions.

MAXIMUM ENDURANCE

Fly at 130 MPH, pilot's I.A.S. above 50,000 lbs. gross weight and 120 MPH below 50,000 lbs. *Hold speed constant* and adjust power to maintain altitude. Use 1400 RPM or higher as required to maintain altitude without exceeding 28 inches manifold pressure. For maximum endurance fly at low altitude.

FOR FORMATION FLYING ONLY

Lead Plane use recommended engine operating conditions. *Wing Plane* set 100 RPM higher than lead plane. With full throttle set power with turbo at 3" above recommended manifold pressure. Reduce power immediately with throttle. Maintain formation with throttle only.

LANDING

Move turbo boost selector to position 8 and propeller controls to 2100 RPM. Land three point with full flaps.

EMERGENCY OPERATION AT HIGH ALTITUDES

Always use 2500 RPM.—Manifold pressure 47.5 inches.

ENGINE FAILURE

When one or more engines fail on TAKEOFF or when a GO-AROUND must be made on 3 engines:

1. Retract flaps and landing gear immediately.
2. Feather propeller and close cowl flaps on dead engine.
3. *Do not* try to climb or hold altitude at any speed below 120 MPH I.A.S. If at lower speed, dive (even when near ground) to reach 120 I.A.S. as soon as possible.

Never attempt a go-around on two engines.
See Long Range Cruising for level flight procedure on three or two engines.

CARBURETOR ICING

In the event of suspected icing:

1. Move intercooler controls to full hot position, temperature not to exceed 38°C.
2. Turn air filters "on".
3. Increase power to 2300 RPM and 38" if possible.
4. Use full turbo boost and part throttle to original manifold pressure.
5. Climb out of icing conditions.

CAUTION

1. Carburetor air filters must be "off" above 15,000 feet in order to obtain maxium power at altitude.
2. Full throttle must be used above 15,000 feet to obtain maximum power.
3. Do not manually lean. Auto-lean gives maximum range.
4. When flying in heavy weight condition, do not exceed placard airspeeds. Avoid violent maneuvers or turbulent air. Limit load factor at 65,000 lbs. is 2G.

APPENDIX III

ENGINEERING FLIGHT DATA

1. GENERAL—IMPORTANT—PLEASE NOTE.

Appendix III of this handbook is designed for use by engineering personnel and persons with qualified engineering background. These precise, but complex curves contain a wealth of information, if properly used. Misused, they can give false and dangerous solutions to problems. Moreover, these curves contain no allowances or safety factor. They are prepared for aerodynamic analysis and theoretical range calculations. Do not use these charts unless thoroughly familiar with them. For pilots, practical operating data, Appendix II is recommended.

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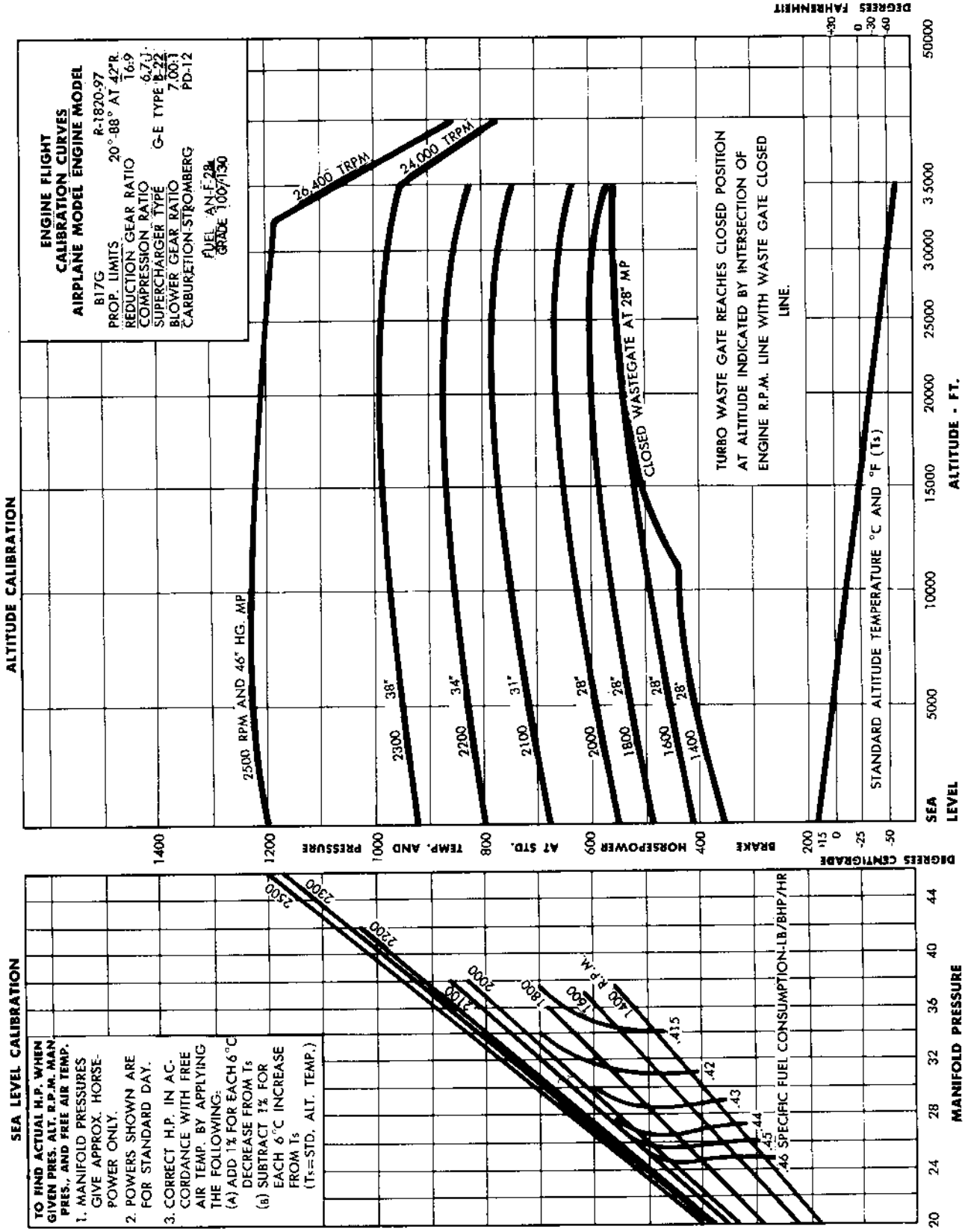


Figure 92—Engine Flight Calibration Curve

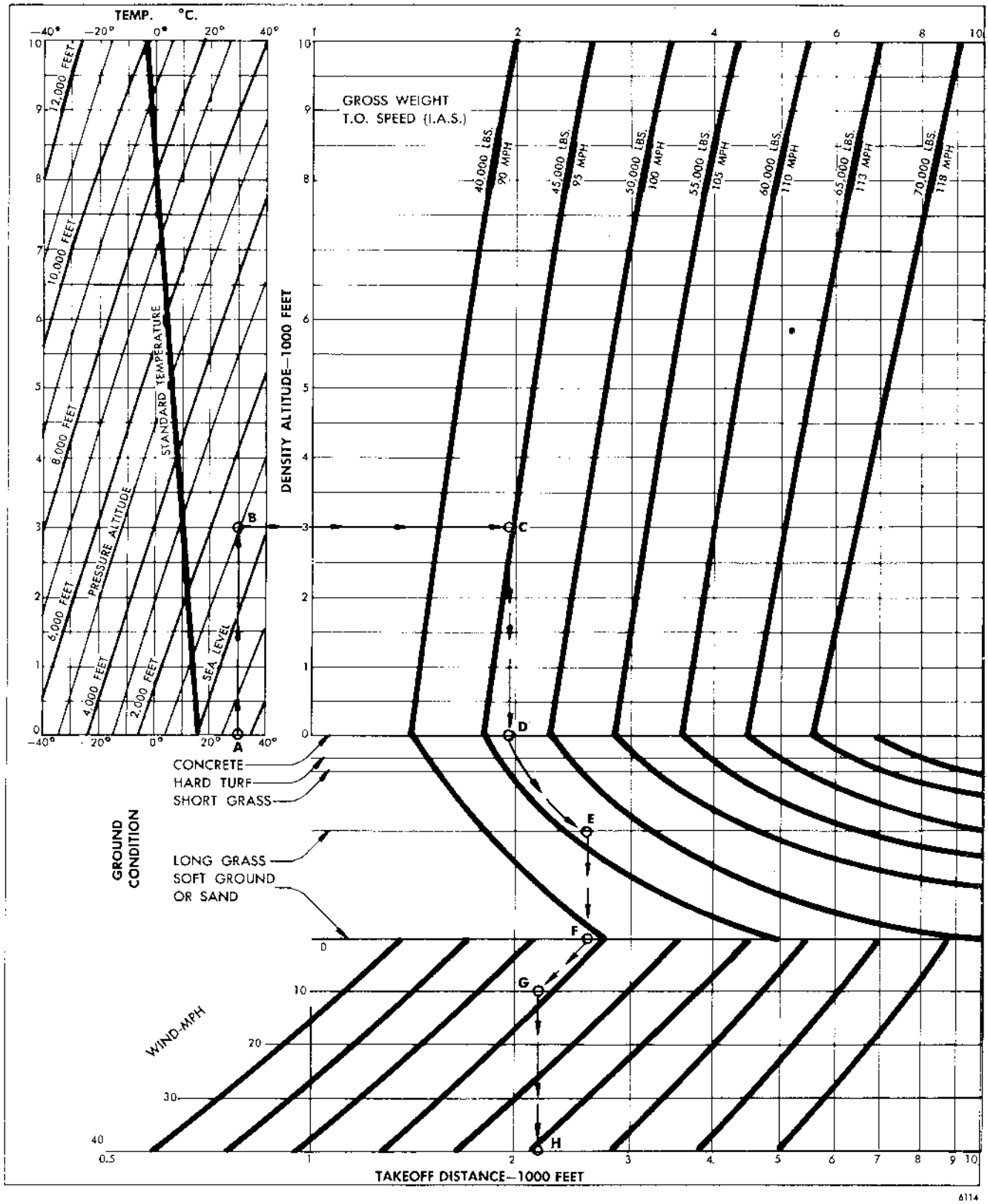
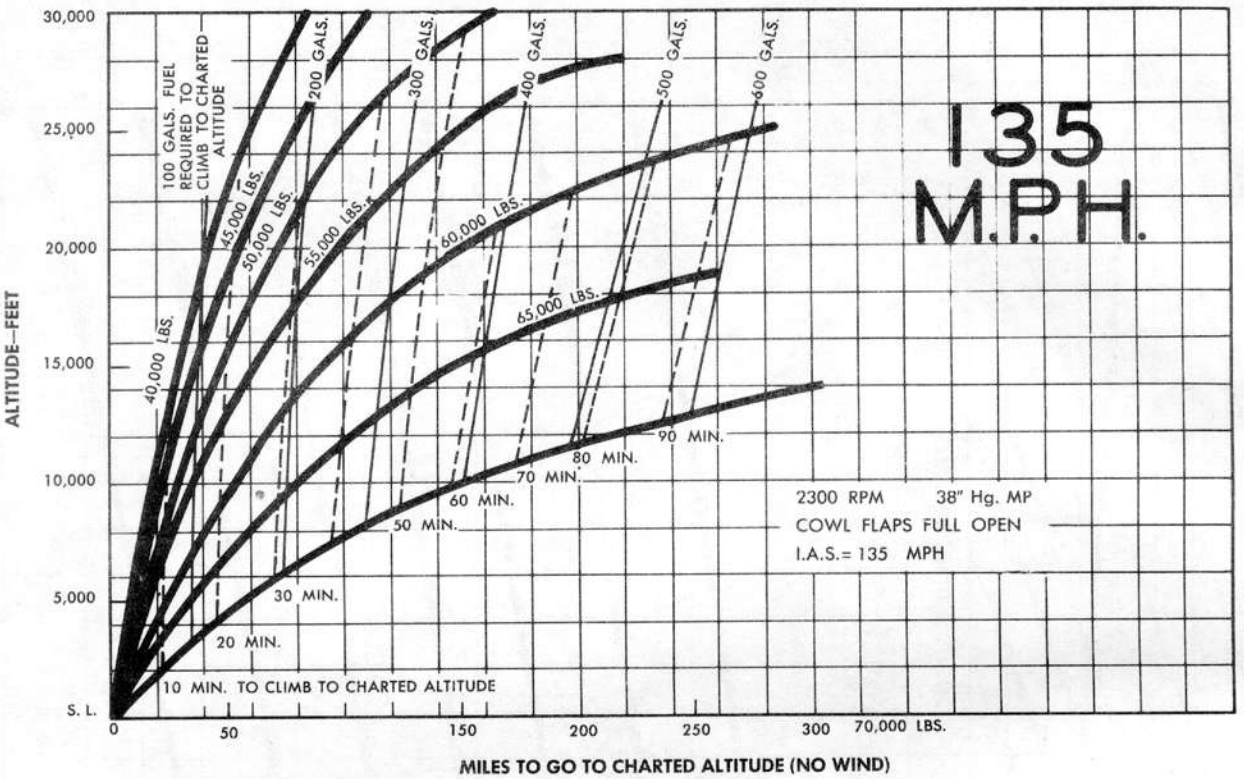


Figure 93—Take-off Control Chart



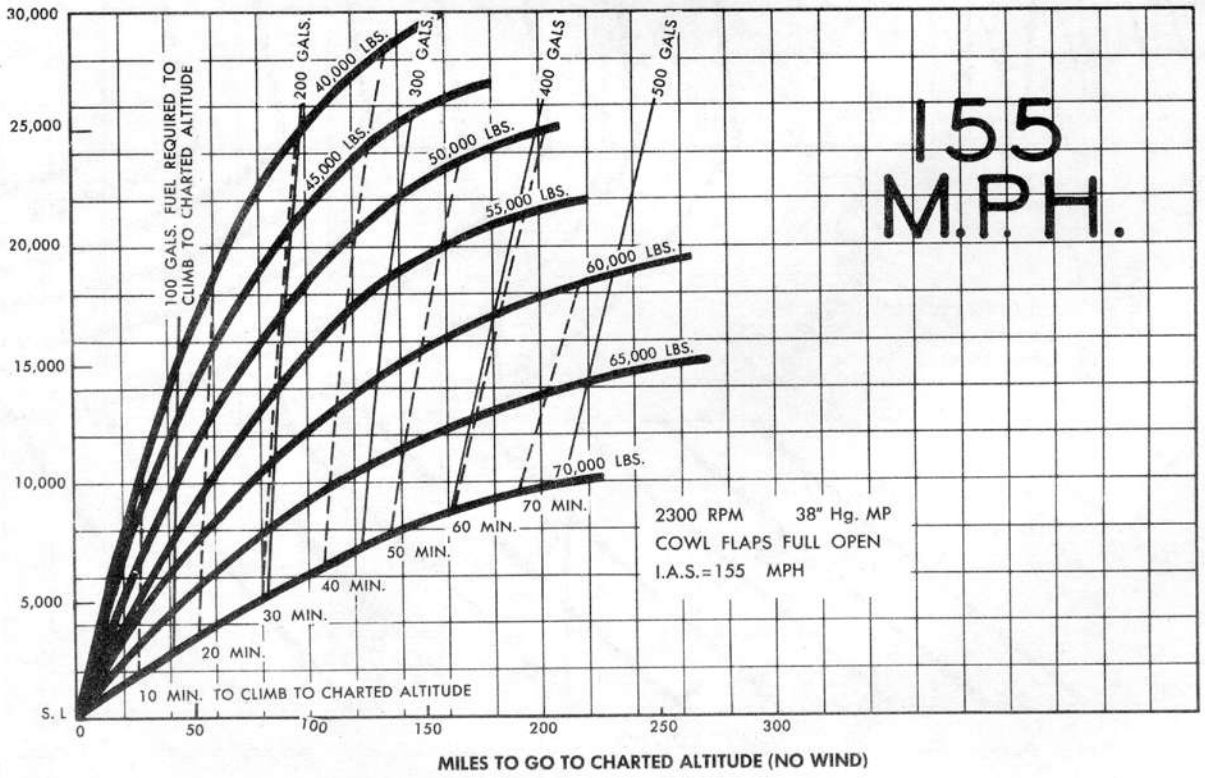


Figure 94—Climb Control Charts

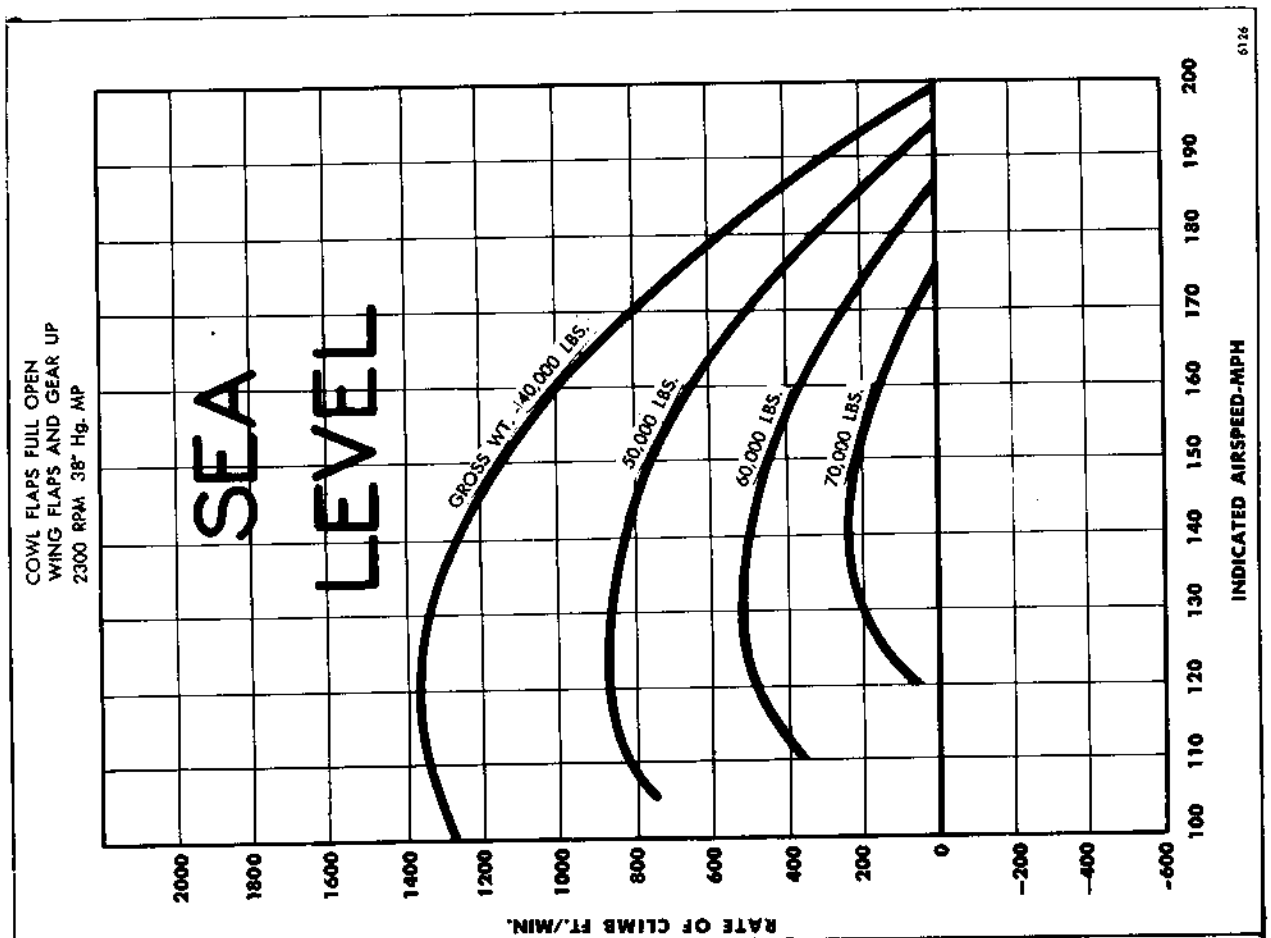


Figure 96—Rate of Climb vs. I.A.S.—Four Engines, Sea Level

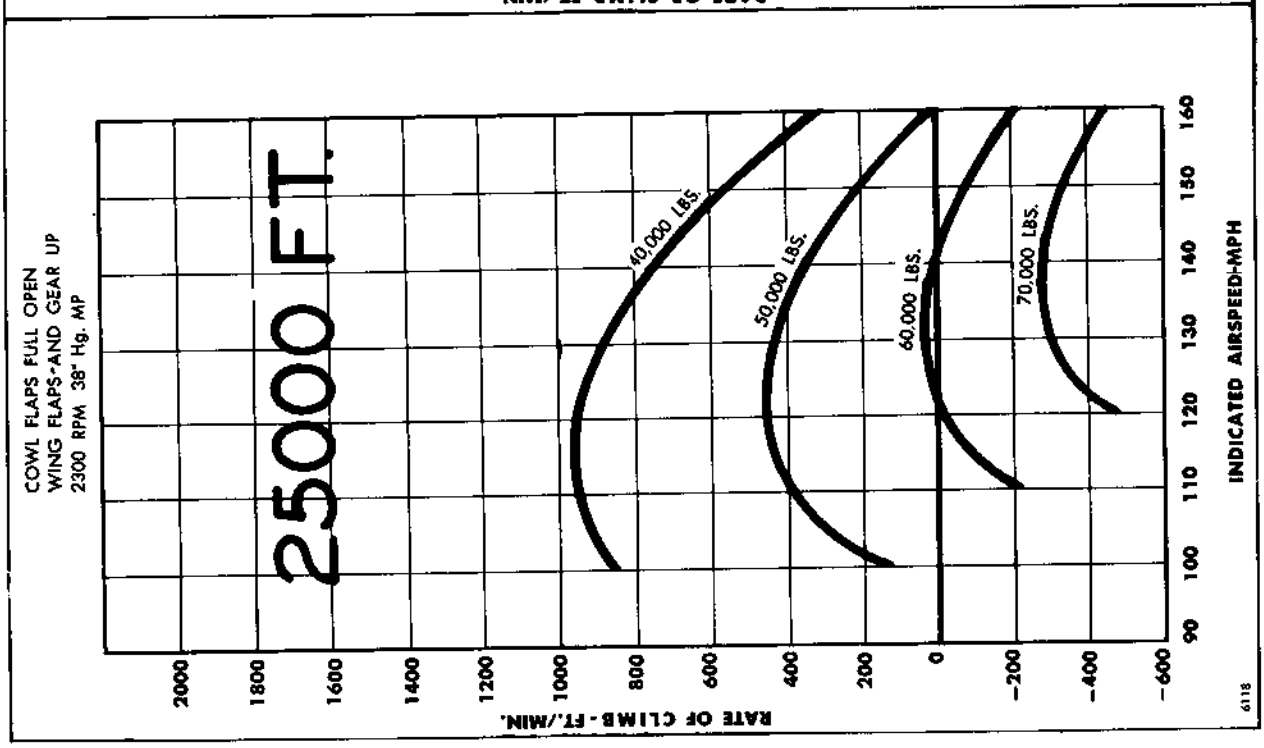


Figure 95—Rate of Climb vs. I.A.S.—Four Engines, 25,000 Ft.

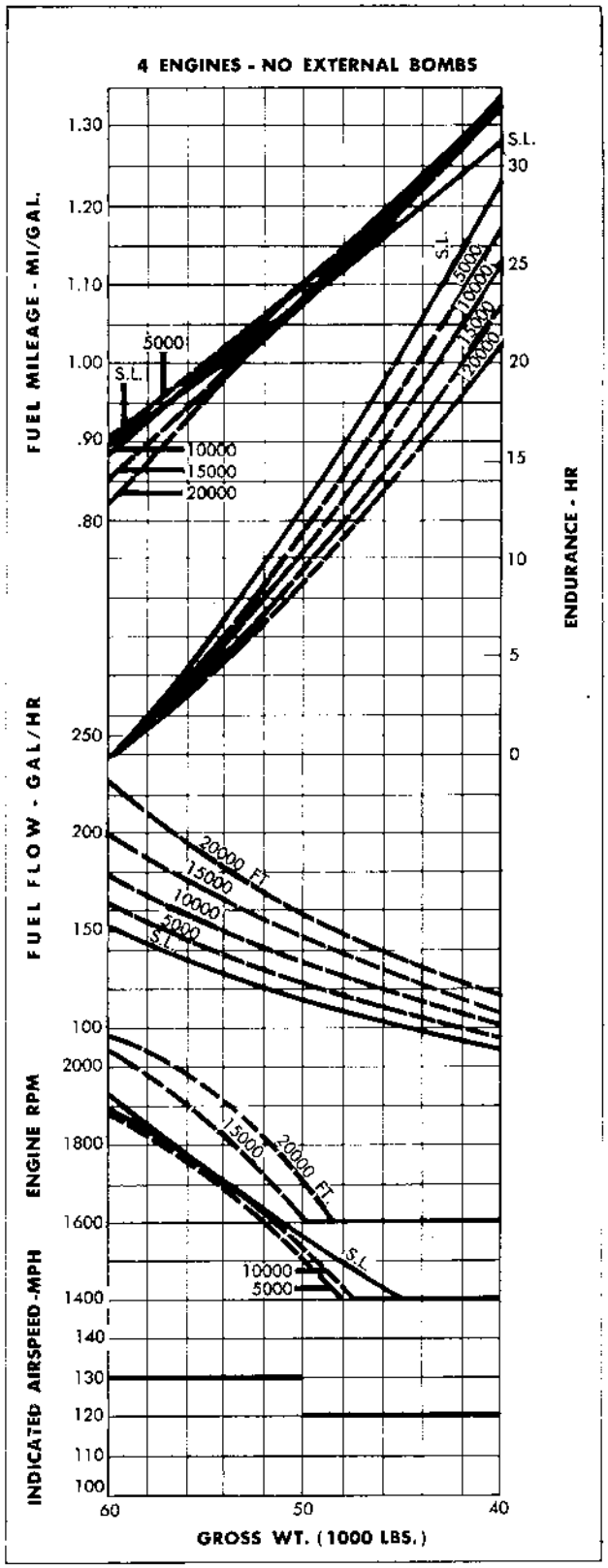


Figure 97—Endurance Control Chart—Four Engines, No External Bombs

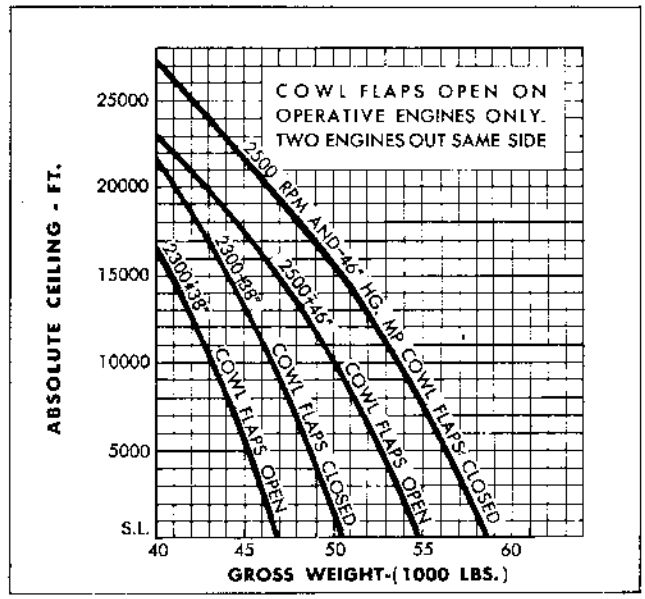


Figure 98—Absolute Ceiling vs. Gross Weight—Two Engines Military and Rated Power, Cowl Flaps Open and Closed

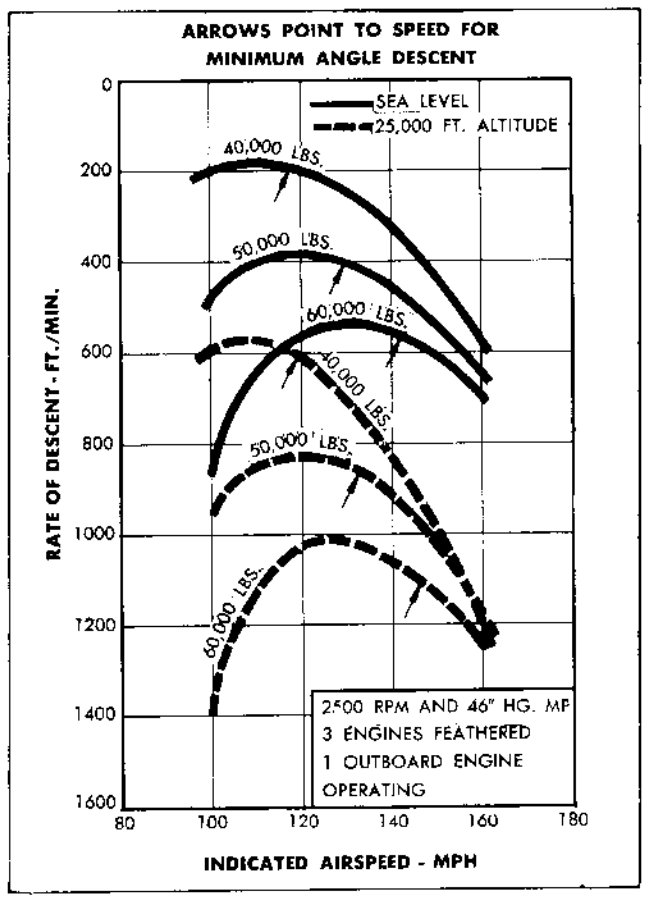


Figure 99—Rate of Descent vs I.A.S.—One Outboard Engine Operating

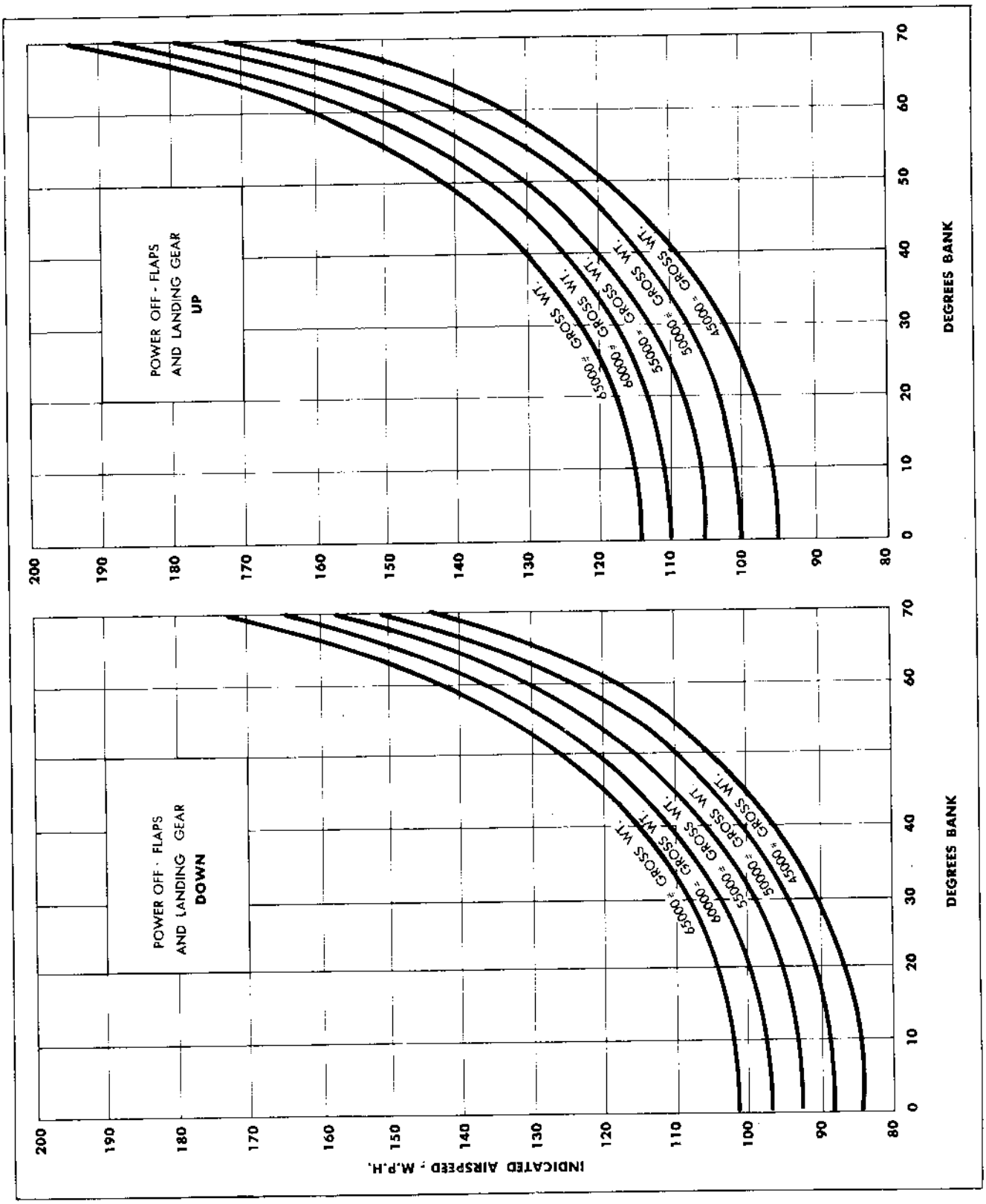


Figure 100—Stalling Speed vs. Degree Bank

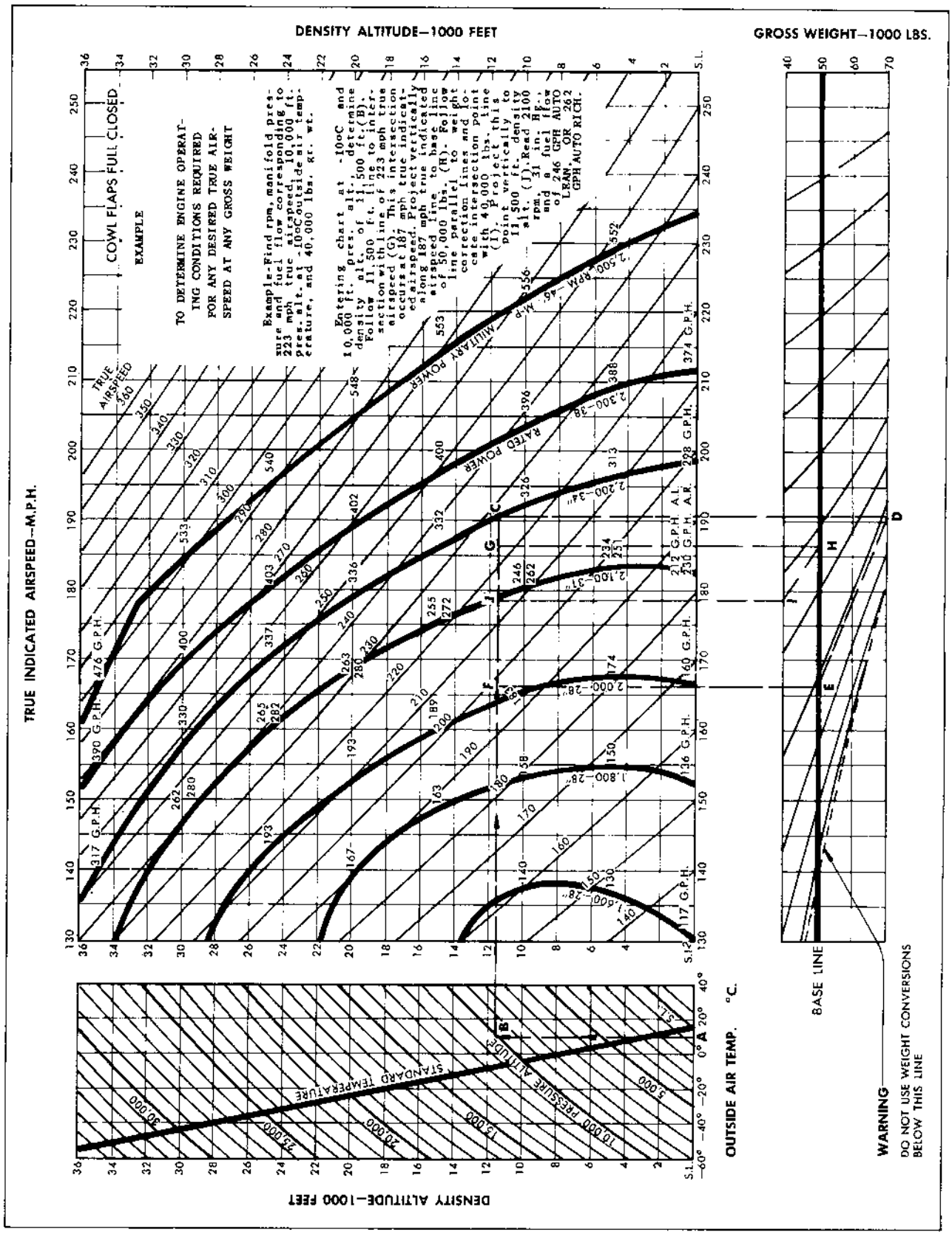
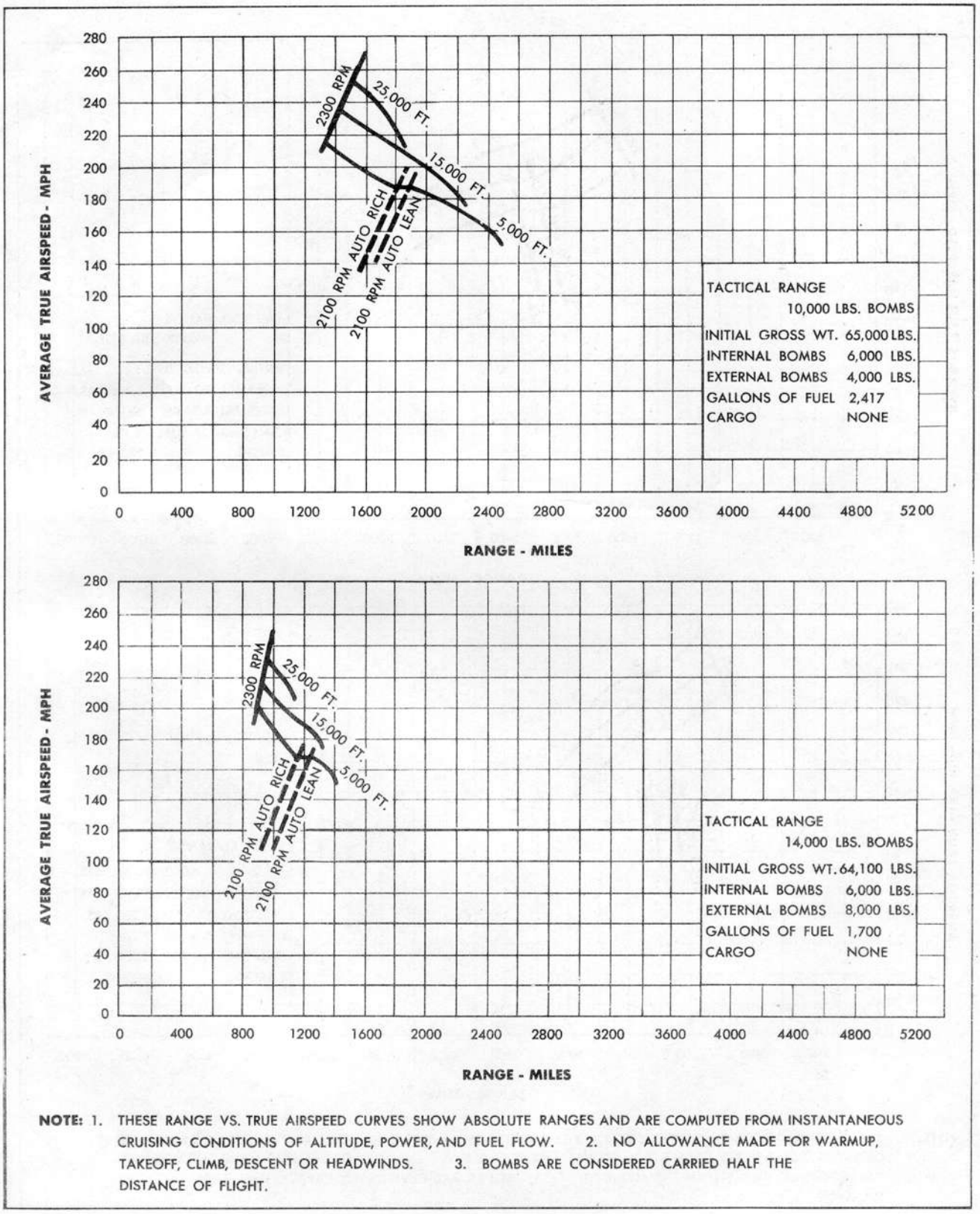
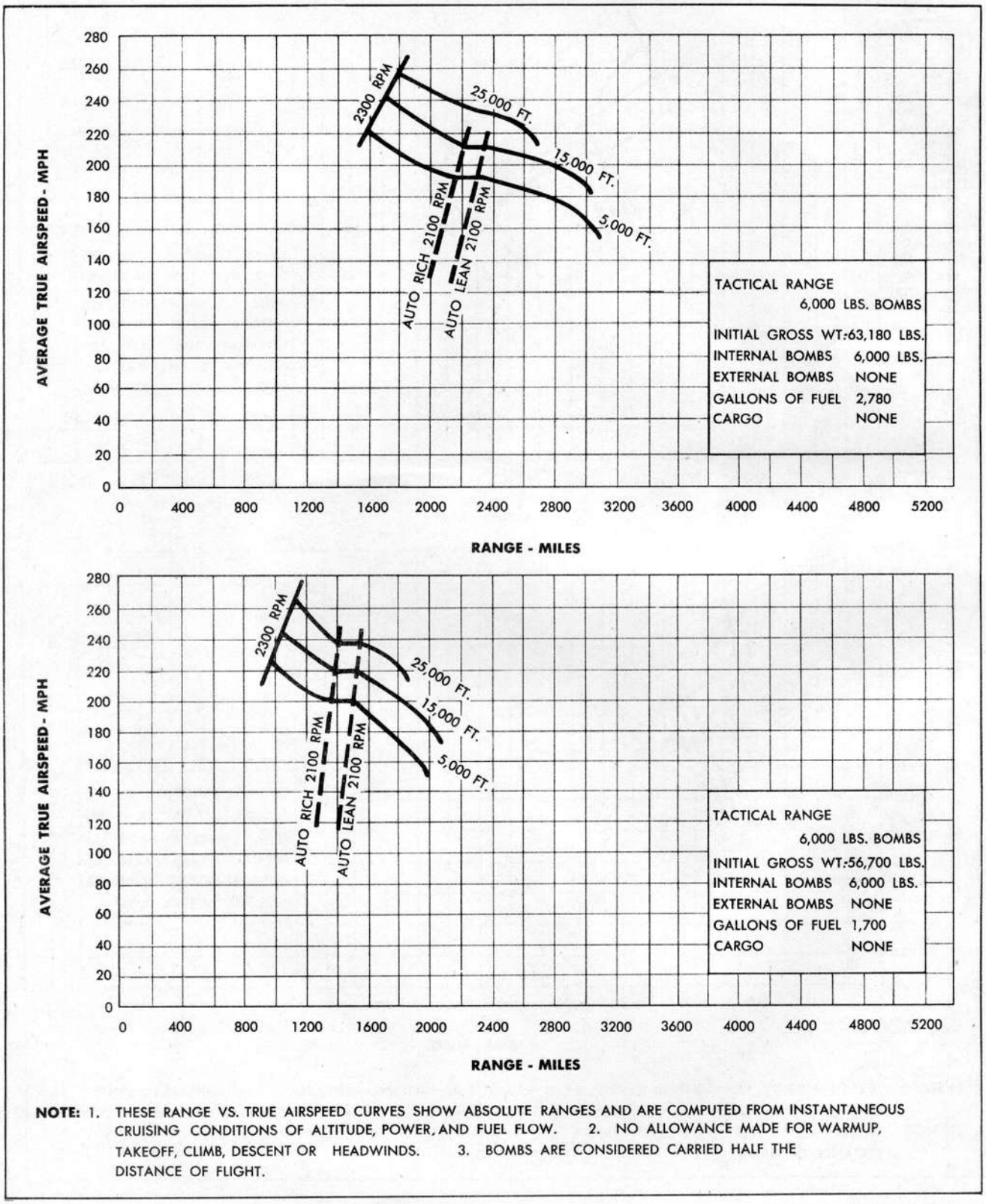


Figure 101—Composite Cruising Control Chart



NOTE: 1. THESE RANGE VS. TRUE AIRSPEED CURVES SHOW ABSOLUTE RANGES AND ARE COMPUTED FROM INSTANTANEOUS CRUISING CONDITIONS OF ALTITUDE, POWER, AND FUEL FLOW. 2. NO ALLOWANCE MADE FOR WARMUP, TAKEOFF, CLIMB, DESCENT OR HEADWINDS. 3. BOMBS ARE CONSIDERED CARRIED HALF THE DISTANCE OF FLIGHT.

Figure 102—Tactical Range Charts



NOTE: 1. THESE RANGE VS. TRUE AIRSPEED CURVES SHOW ABSOLUTE RANGES AND ARE COMPUTED FROM INSTANTANEOUS CRUISING CONDITIONS OF ALTITUDE, POWER, AND FUEL FLOW. 2. NO ALLOWANCE MADE FOR WARMUP, TAKEOFF, CLIMB, DESCENT OR HEADWINDS. 3. BOMBS ARE CONSIDERED CARRIED HALF THE DISTANCE OF FLIGHT.

Figure 103—Tactical Range Charts

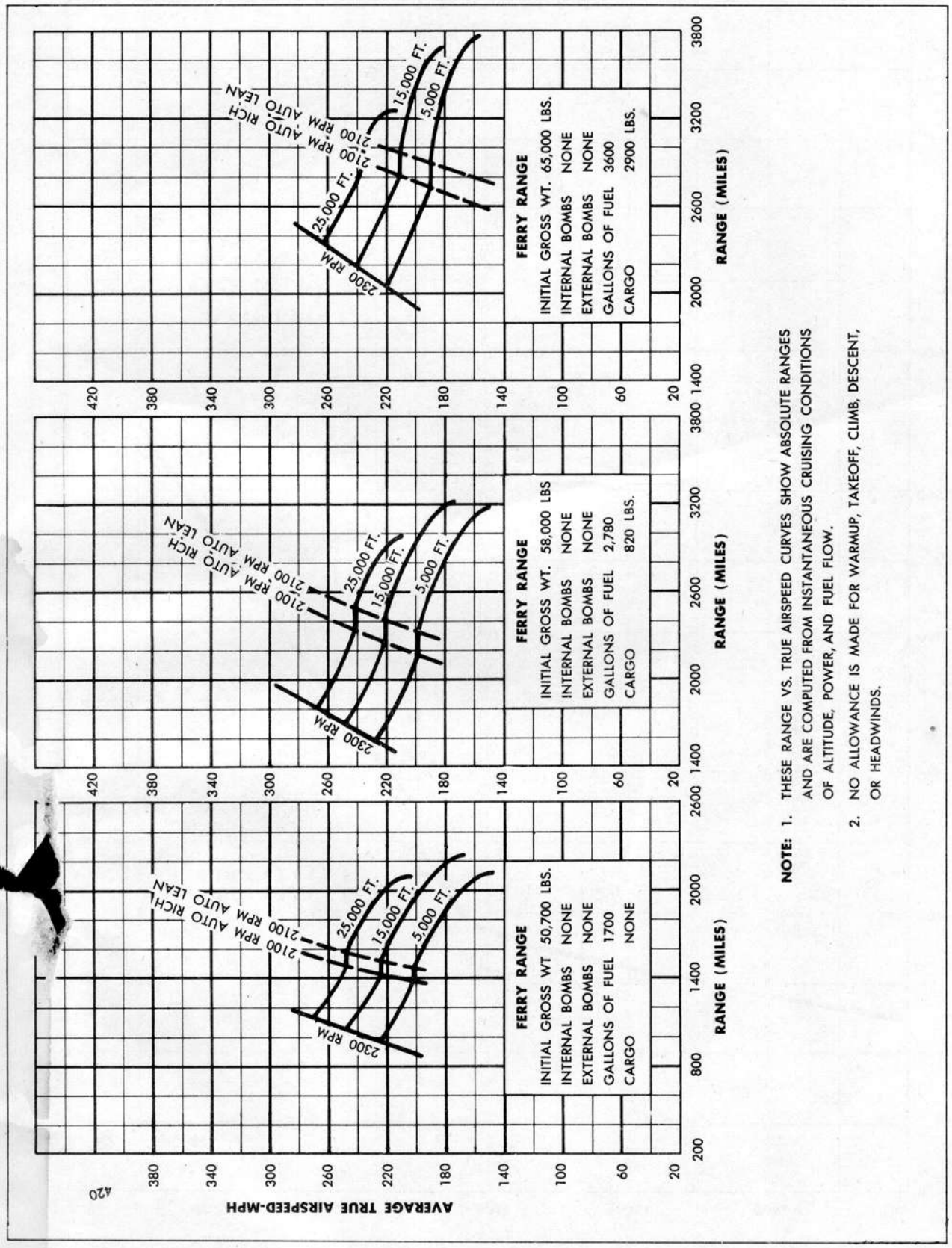


Figure 104—Ferry Range Charts

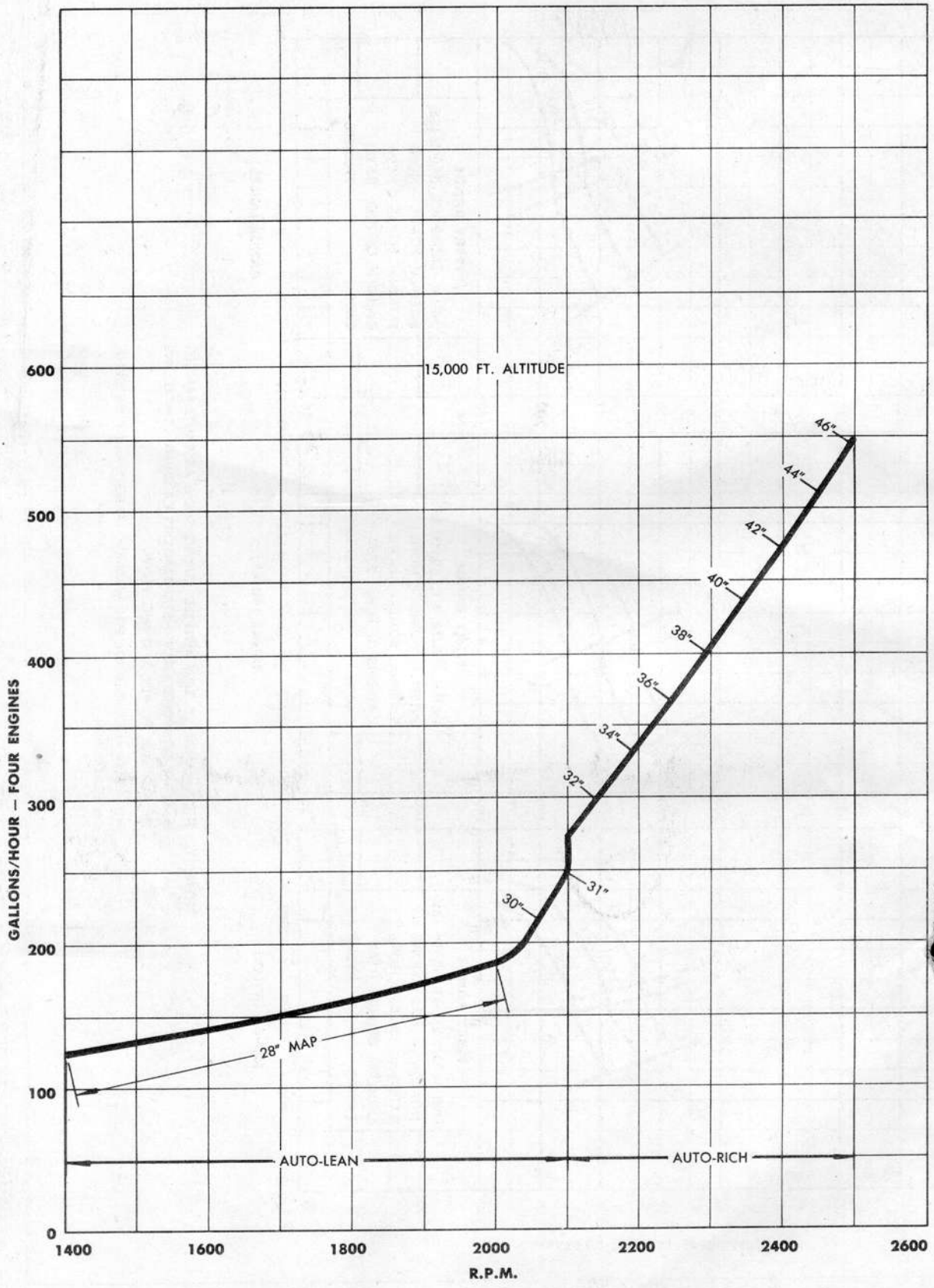


Figure 105—Fuel Consumption Chart—Four Engines Operating