

AIRPLANE MODELS

B-25 C & B-25 D

WITH TORPEDO OR 8 WING BOMBS

TAKE-OFF, CLIMB & LANDING CHART

(SHEET 2 OF 3 SHEETS)

ENGINE MODELS

R-2600-13

TAKE-OFF DISTANCE (IN FEET)

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

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C (50°F) ABOVE 0°C (32°F)

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

COMBAT MISSIONS USE	2400	RPM &	38.0	IN. HG	CLIMB DATA	FERRY MISSIONS USE	2100	RPM &	31.5	IN. HG
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GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	S.L. TO 3000		FT. ALT. 6000		FT. ALT. 9000		FT. ALT. 12,000		FT. ALT. 15,000		BLOWER CHANGE									
		BEST I.A.S.	FT./MIN.	TIME FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.		FUEL FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.				
36,000	COMBAT FERRY	145	1050	3:5	145	1020	5:5	40	145	830	9:0	60	145	650	13:0	80	140	500	18:0	115	11,000
		145	420	7:0	145	430	14:0	55	145	430	21:0	80	145	180	31:0	110	140	50	59:5	200	13,000
32,000	COMBAT FERRY	150	1180	3:0	150	1170	5:0	40	150	960	8:0	55	150	790	11:0	75	145	640	15:5	100	11,000
		145	660	4:5	145	670	9:0	40	145	680	13:5	55	145	400	19:0	75	140	280	28:0	100	13,000
28,000	COMBAT FERRY	155	1310	2:5	155	1300	4:5	35	155	1100	7:5	50	155	930	10:5	65	150	790	14:0	85	11,000
		145	940	3:5	145	960	6:5	30	145	980	9:5	40	145	680	13:5	55	140	560	18:0	70	13,000

NOTE: INCREASED ELAPSED CLIMBING TIME 10% FOR EACH 10°C (50°F) ABOVE 0°C (32°F) FREE AIR TEMPERATURE.

FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT (IN LBS.)	BEST I. A. S. Approach	HARD DRY SURFACE						FIRM DRY SOD						WET OR SLIPPERY					
		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.	
		TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL
34,000	120	3900	1900	4100	2100	4400	2300	4200	2200	4400	2400	4800	2600	9300	7400	10,200	8200	11,100	8900
31,000	120	3600	1700	3800	1900	4100	2100	3900	2000	4100	2200	4400	2400	8700	6800	9,400	7500	10,200	8200
25,000	110	3100	1400	3300	1500	3500	1700	3000	1600	3500	1800	3800	1900	7200	5500	7,800	6000	8,400	6600

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

REMARKS

LEGEND

I. A. S.: Indicated Air Speed  
 NOTE: All distances are average, and subject to considerable variations because of differences in pilot technique, load, C.G., etc.  
 RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

RESTRICTED

T. O. No. 01-60GB-1

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RESTRICTED

RESTRICTED

T. O. No. 01-60GB-1

**AIRPLANE MODELS**

B-25 C & B-25 D

WITH TORPEDO AND 8 WING BOMBS

**TAKE-OFF, CLIMB & LANDING CHART**

(SHEET 3 OF 3 SHEETS)

**ENGINE MODELS**

R-2600-13

**TAKE-OFF DISTANCE (IN FEET)**

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

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C (50°F) ABOVE 0°C (32°F)

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

COMBAT MISSIONS USE 2400 RPM & 38 IN. HG

**CLIMB DATA**

FERRY MISSIONS USE 2100 RPM & 31.5 IN. HG

GROSS WEIGHT (IN LBS.)	TYPE OF CLIMB	3000 FT. ALT.		6000 FT. ALT.				9000 FT. ALT.				12,000 FT. ALT.				15,000 FT. ALT.				BLOWER CHANGE	
		BEST I.A.S.	FT./MIN.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.	FT./MIN.	TIME FROM S.L.	FUEL FROM S.L.		
		36,000	COMBAT FERRY	145 140	760 320	4:0 9:5	145 140	730 320	8:0 19:0	55 70	145 140	550 320	13:0 28:5	80 105	145 140	390 60	19:0 47:5	120 160	140 -		240 -
32,000	COMBAT FERRY	150 140	890 540	3:5 5:5	150 140	870 550	6:5 11:0	50 45	150 140	680 560	10:5 16:5	70 65	150 140	530 250	15:5 24:5	100 95	145 135	390 130	22:0 42:0	140 135	11,000 13,000
28,000	COMBAT FERRY	155 140	1020 830	3:0 4:0	155 140	1010 850	6:0 7:5	45 35	155 140	810 860	9:0 11:0	60 45	155 140	660 550	13:0 15:5	85 60	150 135	540 410	18:0 21:0	115 80	11,000 13,000

NOTE: INCREASED ELAPSED CLIMBING TIME 10% FOR EACH 10°C (50°F) ABOVE 0°C (32°F) FREE AIR TEMPERATURE.

FUEL INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE

**LANDING DISTANCE (IN FEET)**

GROSS WEIGHT (IN LBS.)	BEST I.A.S. Approach	HARD DRY SURFACE						FIRM DRY SOD						WET OR SLIPPERY					
		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT.	
		TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL	TO CLEAR 50' OBJ.	GROUND ROLL
34,000	120	3900	1900	4100	2100	4400	2300	4200	2200	4400	2400	4800	2600	9300	7400	10,200	8200	11,100	8900
31,000	120	3600	1700	3800	1900	4100	2100	3900	2000	4100	2200	4400	2400	8700	6800	9,400	7500	10,200	8200
25,000	110	3100	1400	3300	1500	3500	1700	3000	1600	3500	1800	3800	1900	7200	5500	7,800	6000	8,400	6600

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

REMARKS

**LEGEND**

I. A. S.: Indicated Air Speed  
 NOTE: All distances are average, and subject to considerable variations because of differences in pilot technique, load, C.G., etc.  
 RED FIGURES HAVE NOT BEEN FLIGHT CHECKED.

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RESTRICTED

5-1-42

## AIRPLANE MODELS

B-25 C

B-25 D

SPECIFIC ENGINE  
FLIGHT CHART

## ENGINE MODELS

R-2600-13

R-2600-13

CONDITION	FUEL PRESSURE LB./SQ. IN.	OIL PRESSURE LB./SQ. IN.	OIL TEMP. °C	COOLANT TEMP. °C	MAX. PERMISSIBLE DIVING R.P.M.		
					CONDITION	ALLOWABLE	OIL CONSUMPTION
DESIRED	6-7	80-85		50-70	"MAX CONTINUOUS"	46.6 IMP. PT./HR.	28 U.S. QT./HR.
MAXIMUM	7	90		85 95 (Climb)	"ECONOMICAL MAX."	25 IMP. PT./HR.	15 U.S. QT./HR.
MINIMUM	6	75			"MIN. SPECIFIC"	IMP. PT./HR.	U.S. QT./HR.
IDLING	6-7	25			OIL GRADE: (S)		(W)

SUPERCHARGER TYPE: TWO SPEED

FUEL OCTANE 100

OPERATING CONDITION	R. P.M.	MANIF. PRESS. (BOOST.)	HORSE POWER	CRITICAL ALTITUDE (FEET)	BLOWER	USE LOW BLOWER BELOW	MIXTURE CONTROL POSITION	FUEL FLOW (GAL./HR./ENG.)		MAXIMUM CYL. TEMP.		MAXIMUM DURATION (MINUTES)	REMARKS
								U. S.	IMP.	°C	°F		
TAKE-OFF	2600	44.0	1700	SEA LEVEL	L	ALWAYS FT. ALT.	FULL RICH	215	179	260	500	5	
EMERGENCY MAXIMUM	2600	42	1700	4,500	L	10,500	FULL RICH	215	179	260	500	5	
		41	1700	12,000	H	FT. ALT.		196	163	260	500		
MAXIMUM CONTINUOUS	2400	38	1500	6,700	L	11,000	FULL RICH	180	150	218	420		
		39	1350	15,000	H	FT. ALT.		205	171	205	400		
ECONOMICAL MAXIMUM	2100	31.5	1125	6,700	L	13,500	FULL RICH	115	96	205	400		
		31.5	1012	15,000	H	FT. ALT.		115	96	205	400		
MINIMUM SPECIFIC CONSUMPTION	2100	29.5	1005	6,700	L	15,500	CRUISING	90	75	205	400		
		29.0	905	15,000	H	FT. ALT.	LEAN	100	83	205	400		
MINIMUM CRUISING	2000	27.0	900	6,700	L	16,500	CRUISING	75	63	205	400		
		27.0	810	15,000	H	FT. ALT.	LEAN	80	67	205	400		
CONDITIONS TO AVOID	1600	20.9	390	S. L.	L		CRUISING	31	26	205	400		Minimum Specific Fuel Flow
	1600	19.5	420	5,000	L			33	27.5	205	400		
	1600	18.5	450	10,000	L		LEAN	35	29	205	400		
	1600	18.0	490	15,000	L			37	31	205	400		

NOTE: CRITICAL ALTITUDE IS THAT AT WHICH MAXIMUM POWER IS OBTAINED WITH FULL THROTTLE UNDER CONDITIONS SHOWN.

## SECTION IV

NAVIGATOR'S COMPARTMENT1. GENERAL DESCRIPTION.

The navigator's compartment is located just aft of the pilot and copilot's seats. There is no bulkhead separating this compartment from the pilot's compartment. All the instruments and equipment necessary for the successful navigation of the airplane in flight are located in this compartment. In addition to the conventional equipment, the emergency nose wheel operating crank, pawl control and uplatch release are located at the forward right side of the compartment. The emergency bomb bay door control is also located in this compartment. The relief tube for the use of the bombardier, pilot and copilot is in this compartment. The front entrance hatch (figure 48) to be used by the bombardier, pilot, copilot and navigator is provided.

2. OPERATIONAL EQUIPMENT.a. The Emergency Nose Wheel Control Operation.

(1) Ascertain from the pilot that the landing gear control handle (figure 21-192) is "DOWN."

(2) Pull nose gear emergency lock release (figure 25-238).

(3) Check with pilot or use drift meter to see that auxiliary gear is partially lowered before using lowering mechanism.

(4) Remove safety pin (figure 25-237) and turn pawl (figure 25-239) to "ON."

(5) Place crank (figure 25-241) on shaft and turn clockwise when facing until gear indicator registers (down and locked). If these instructions are violated the cables will break and the airplane will end in the repair shop.

**CAUTION:** Do not lower nose gear mechanically above an indicated air speed of 150 mph (130 knots). Do not return pawl to "OFF" until airplane is safely on the ground.

b. Emergency Bomb Bay Door Control (figure 22-204) Operation.

**NOTE:** Mechanical operation to be used only in the event of complete hydraulic pressure failure.

(1) Coordinate with the bombardier for correct position of his door operating and bomb release handle.

(2) Instruct bombardier to move bomb release handle (figure 35-314) to the doors "OPEN-RACK LOCK POSITION" or the "DOORS CLOSED" position as desired.

(3) Install bomb bay door operating crank on shaft in aft end of compartment. (Crank is stowed on lower right longeron opposite the crankshaft.) Install

the crank handle positioned downward. Turn crank clockwise to close doors and counterclockwise to open doors.

c. Fuel Transfer System Controls.

(1) To transfer fuel from fuel tanks on one side of airplane to forward wing fuel tanks on opposite side or to bomb bay droppable tank, or from the droppable tank to either of the forward wing fuel tanks, first connect the tanks desired by operating fuel transfer valves (figure 23-221). After setting the fuel transfer valves, move fuel flow direction switch (figure 23-229) in direction of desired flow and set transfer pump switch (figure 23-216) to "ON."

(2) The emergency fuel shut-off valves (figure 23-227) are located in the rear of the compartment.

d. Heating and Ventilating Control. - The air temperature control (figure 26-244) operates the heater and regulates its output.

e. Electrical Controls. - The generator main line switches (figure 23-223-226) and the generator voltage switch (figure 23-225) are to be turned to "OFF" in the event of a forced landing.

f. Navigator Controls.

(1) The radio compass control unit (figure 24-234) is located forward and below left window.

(2) The drift meter (figure 22-207) is located on right forward wall of compartment.

(3) Drift Meter Controls. - The electrically driven gyro must always be caged during take-off or landing, during turns when the incline is over 20 degrees from vertical when not in use, and before switching off the current. If the turn is started with the gyro uncaged, do not attempt to cage the gyro during the turn. Wait until the turn is completed and then cage the gyro. If the airplane inclines more than twenty degrees from the vertical in any direction during maneuvers, the gyro will strike its limit stops. This will cause the gyro to be moved from the vertical and will render all drift meter indications erroneous for several minutes after resuming level flight until the gyro has had time to erect itself. After an appreciable change of course, the gyro is apt to be slightly displaced from the vertical and a few minutes should be allowed for it to settle before taking observations.

(a) Starting Operations.

To start the electrically driven gyro of the drift meter turn on either of the battery disconnect switches and the gyro starting switch on the gyro housing.

(b) Allow the gyro to gain speed for at least 3 minutes.

(c) With the airplane in normal straight flight, uncage the gyro by pulling out the caging knob and moving it as far as it will go in the direction marked "UNCAGE." Make sure that caging knob snaps in place in the uncage position.

(d) Allow the gyro to run uncaged for at least ten minutes before attempting to take any readings.

(e) Turn the reticule light rheostat knob clockwise until the desired intensity of the grid lines is obtained.

g. Automatic Flight Controls. - A precessing switch is located below the right side window.

h. Oxygen System. - A type A-9A oxygen regulator (figure 22-205) is located on the right wall. To operate, attach hose to bayonet fitting and adjust regulator.

i. Interphone System.

(1) A jack box (figure 24-233) is located on the forward left wall. To operate, plug in ear phone cord and set switch to "CALL."

(2) An interphone amplifier is provided.

j. Fluorescent Lighting System.

(1) An inverter active and spare change over switch (figure 23-224) are located on the rear wall. If the active inverter fails, place the dual switches in the "SPARE" position.

NOTE: For normal operation, the switches will be kept in the "ACTIVE" position.

(2) A dome light switch (figure 27-247) and an extension light switch (figure 27-248) are provided and are operated conventionally.

k. Fire Extinguisher.

(1) One CO<sub>2</sub> fire extinguisher is located on the right side of the compartment.

(2) To operate, swing horn up, discharge close to base of fire and control with the trigger.

l. Additional Equipment.

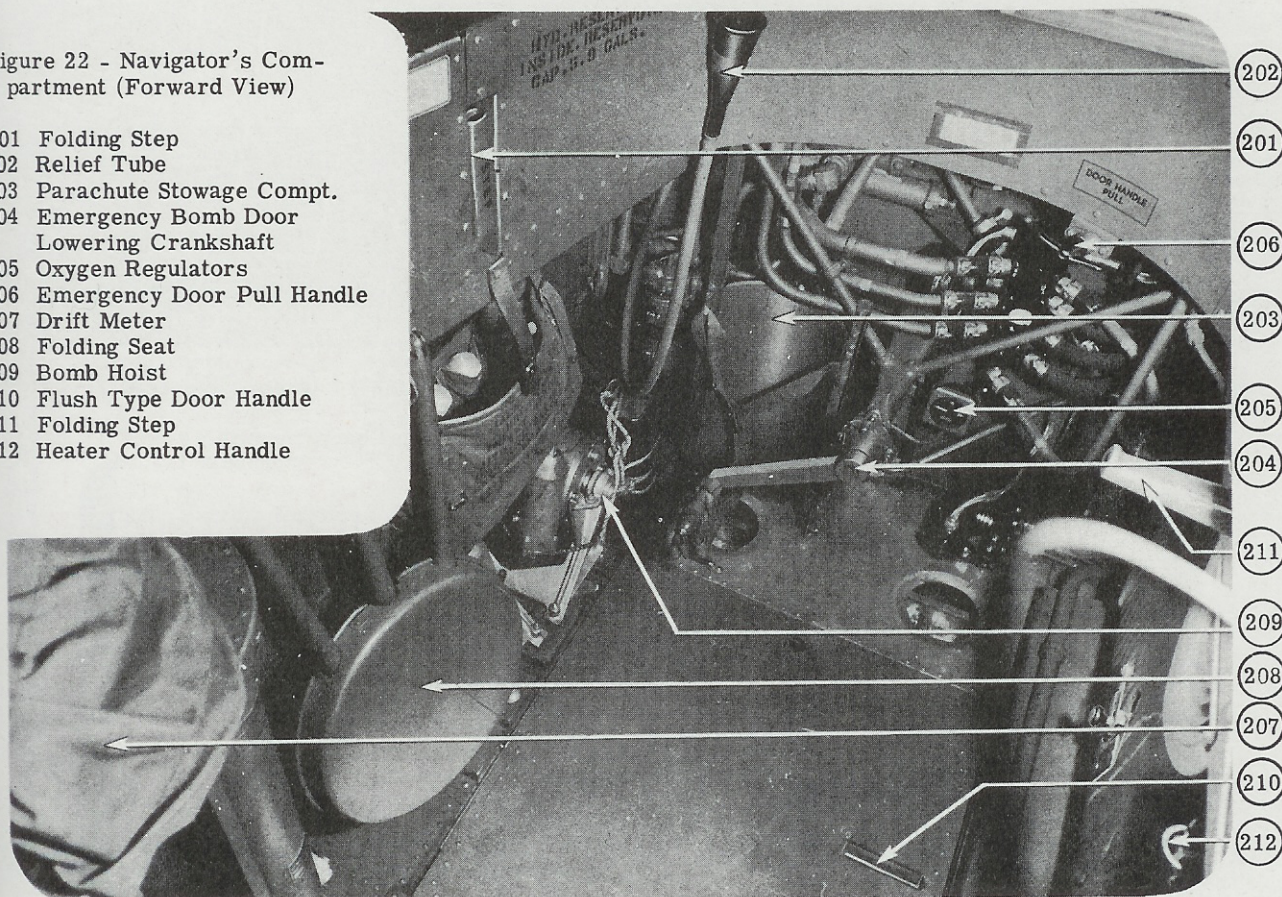
(1) An anti-icer supply tank valve is located beneath tank in rear of the compartment.

(2) An oil strainer is located in lower right rear corner of the compartment.

(3) A drinking water container and cup holder is located at the left side of the compartment.

Figure 22 - Navigator's Compartment (Forward View)

- 201 Folding Step
- 202 Relief Tube
- 203 Parachute Stowage Compt.
- 204 Emergency Bomb Door Lowering Crankshaft
- 205 Oxygen Regulators
- 206 Emergency Door Pull Handle
- 207 Drift Meter
- 208 Folding Seat
- 209 Bomb Hoist
- 210 Flush Type Door Handle
- 211 Folding Step
- 212 Heater Control Handle



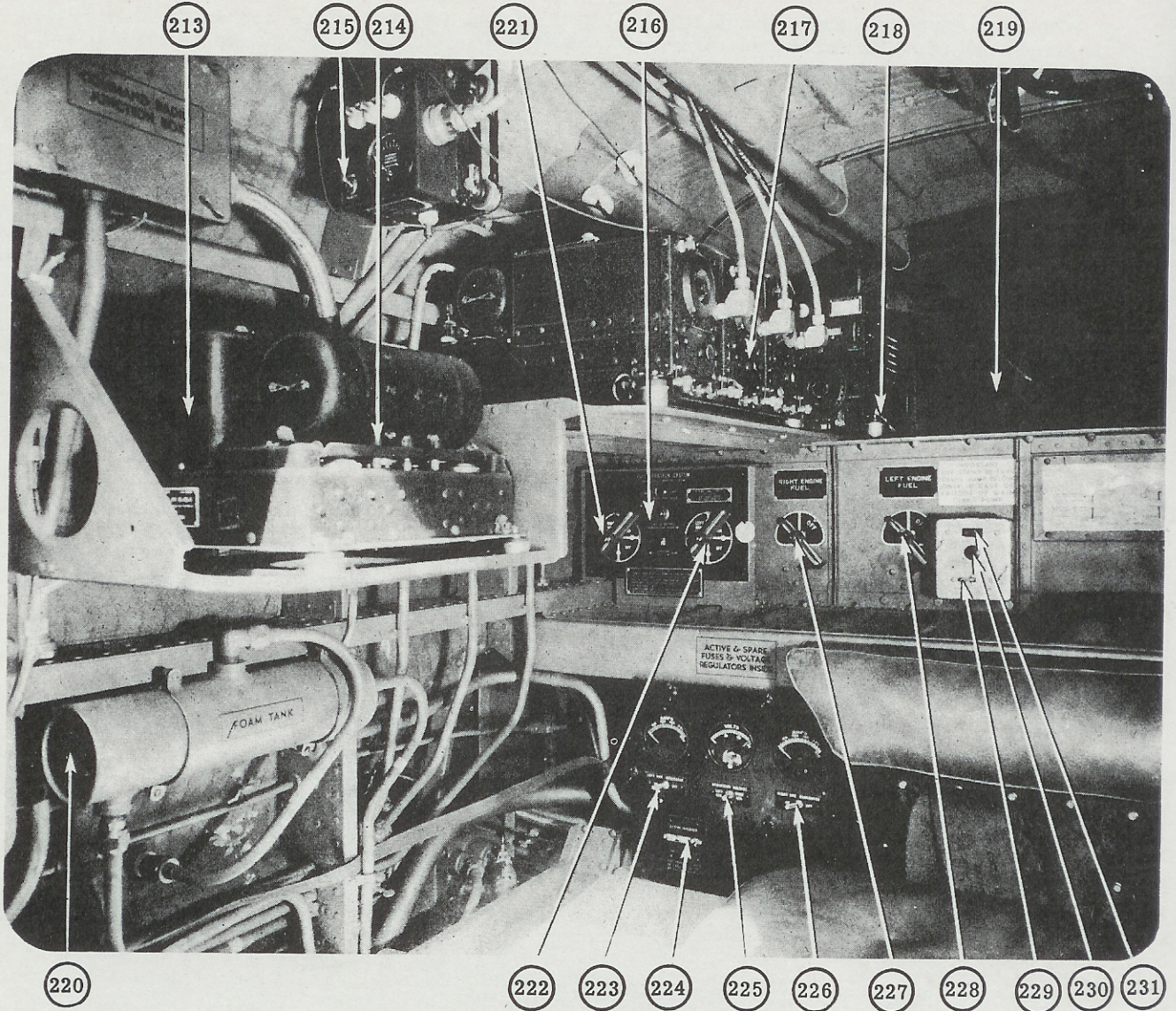


Figure 23 - Navigator's Compartment (Aft View)

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>213 Command Set Modulator</li> <li>214 Dynamotor</li> <li>215 Command Set Antenna Switching Relay</li> <li>★ 216 Fuel Transfer Pump Switch</li> <li>★ 217 Command Set Receiver</li> <li>★ 218 Command Set Transmitter</li> <li>219 Passageway Over Bomb Bay</li> <li>220 Hydraulic System Foam Tank</li> <li>221 Fuel Transfer Valve</li> <li>222 Fuel Transfer Valve</li> </ul> | <ul style="list-style-type: none"> <li>223 Left Engine Generator Switch</li> <li>224 Active Inverter Switch</li> <li>225 Generator Voltage Switch</li> <li>226 Right Engine Generator Switch</li> <li>★ 227 Emergency Fuel Shut-Off Valve</li> <li>★ 228 Emergency Spring Catch on Emergency Shut-Off Valve</li> <li>★ 229 Fuel Flow Direction Switch</li> <li>★ 230 Transfer Pump Indicator Light</li> <li>★ 231 Emergency Fuel Transfer Pump Switch</li> </ul> |
|---|--|

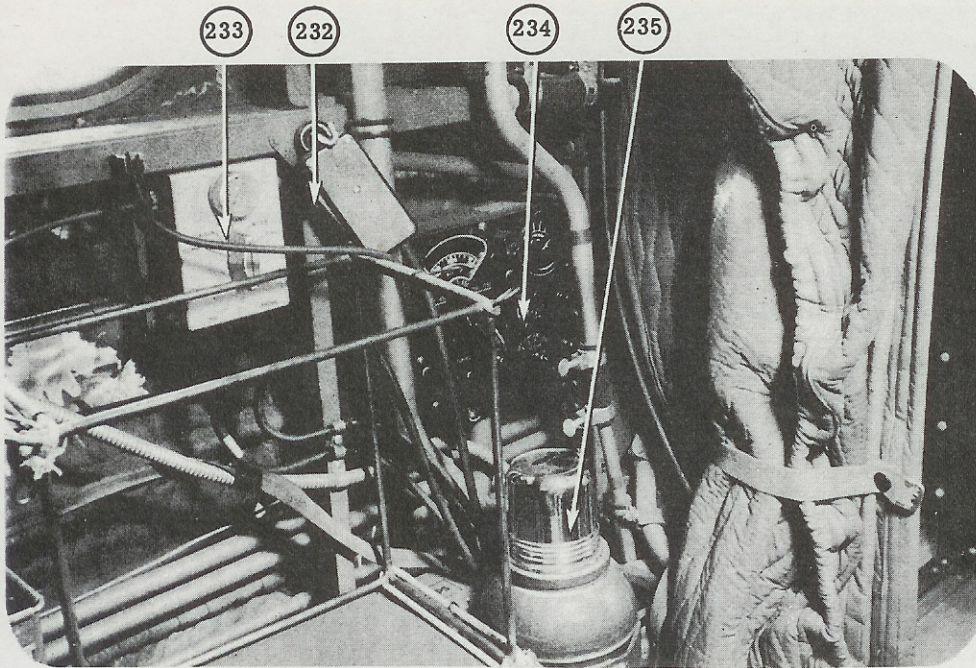


Figure 24 - Navigator's Compartment (Additional Equipment)



- 232 Push-To-Talk Switch
- 233 Jack Box
- 234 Radio Compass Control
- 235 Thermos Bottle

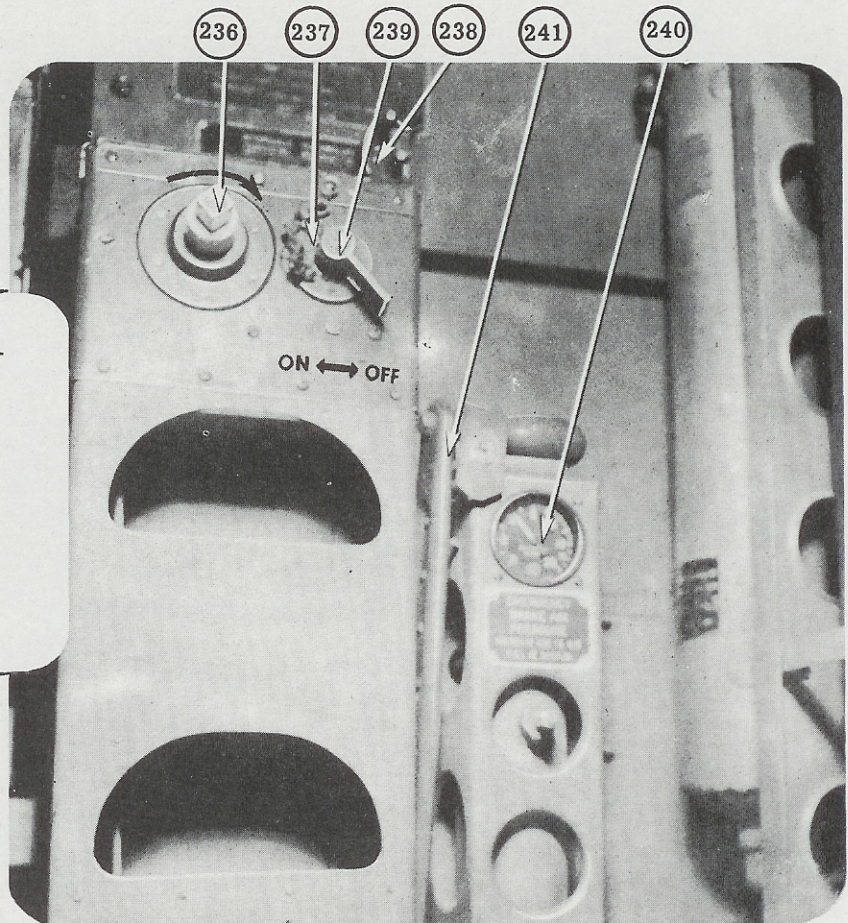


Figure 25 - Navigator's Compartment (Emergency Nose Wheel Controls)

- ★
- ★
- ★
- 236 Emergency Nose Gear Crankshaft
- 237 Safety Pin
- 238 Uplatch Release
- 239 Pawl Control
- 240 Emergency Air Brake Pressure Gage
- 241 Crank

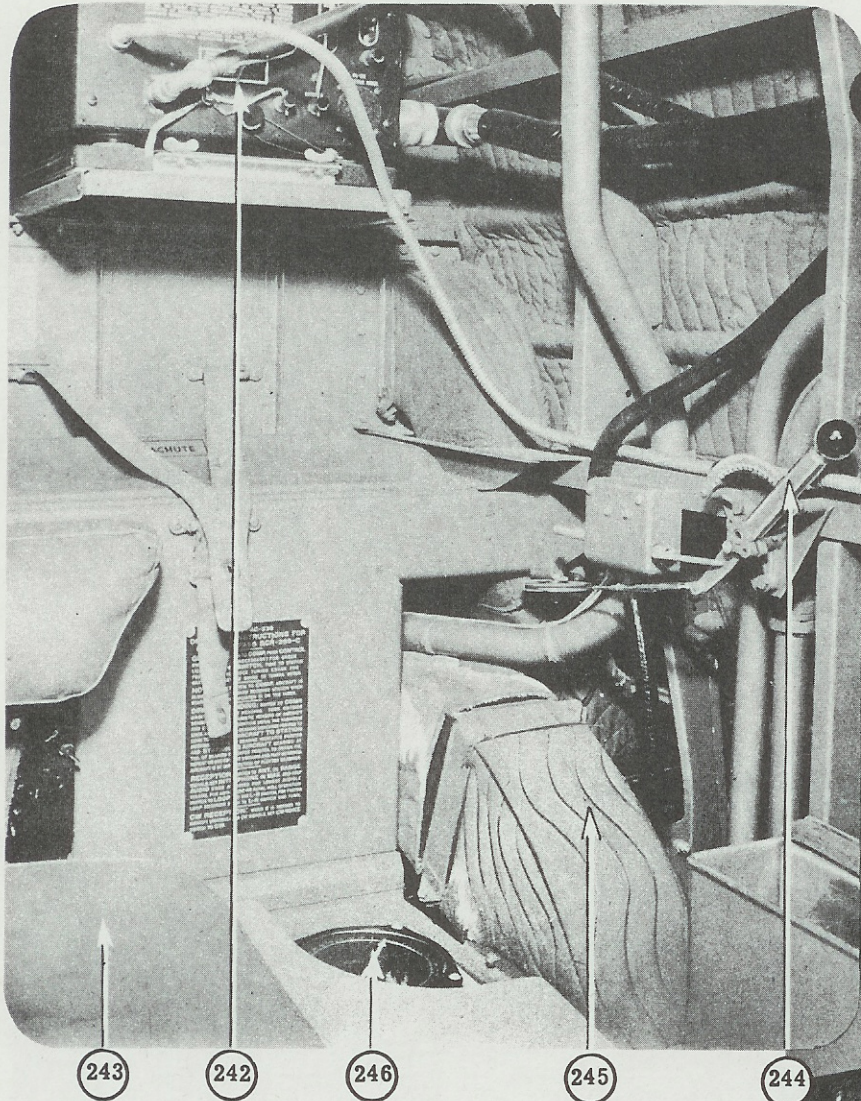


Figure 26 - Navigator's Compartment (Additional Equipment)



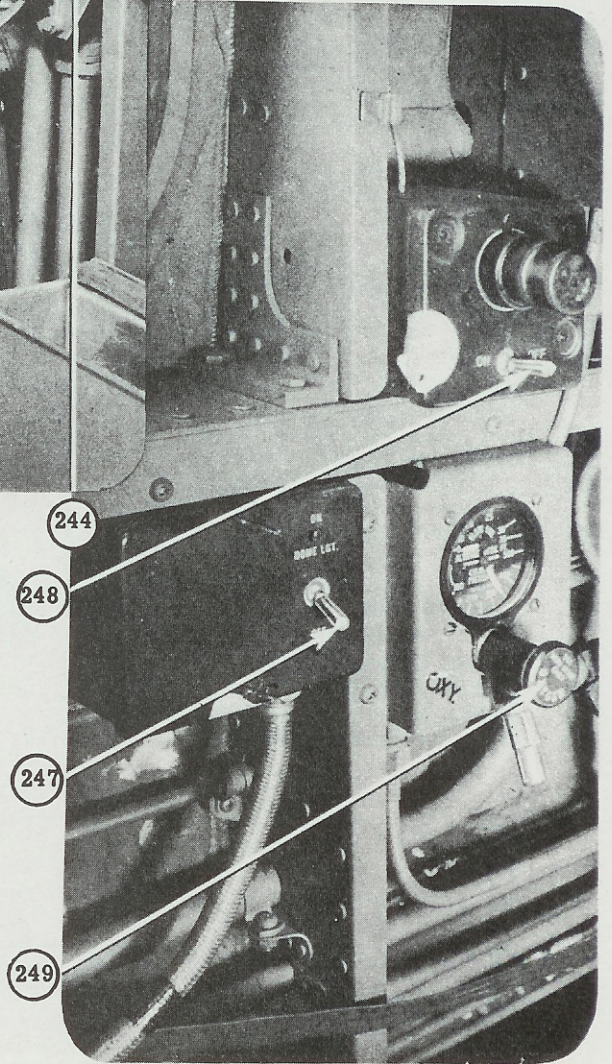
- 242 Radio Compass Receiver
- 243 Navigator's Seat
- 244 Cabin Heater Control
- 245 Warm Air Duct
- 246 Radio Compass Azimuth Indicator

(243) (242) (246) (245) (244)

Figure 27 - Navigator's Compartment (Oxygen Regulator and Light Switches)

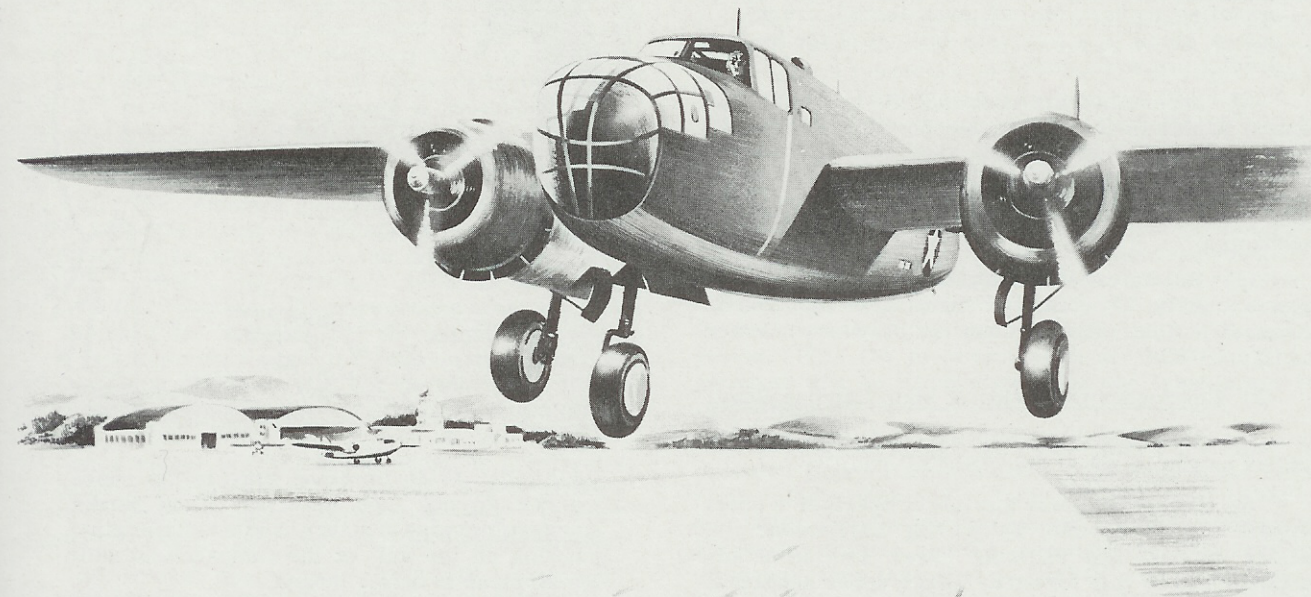
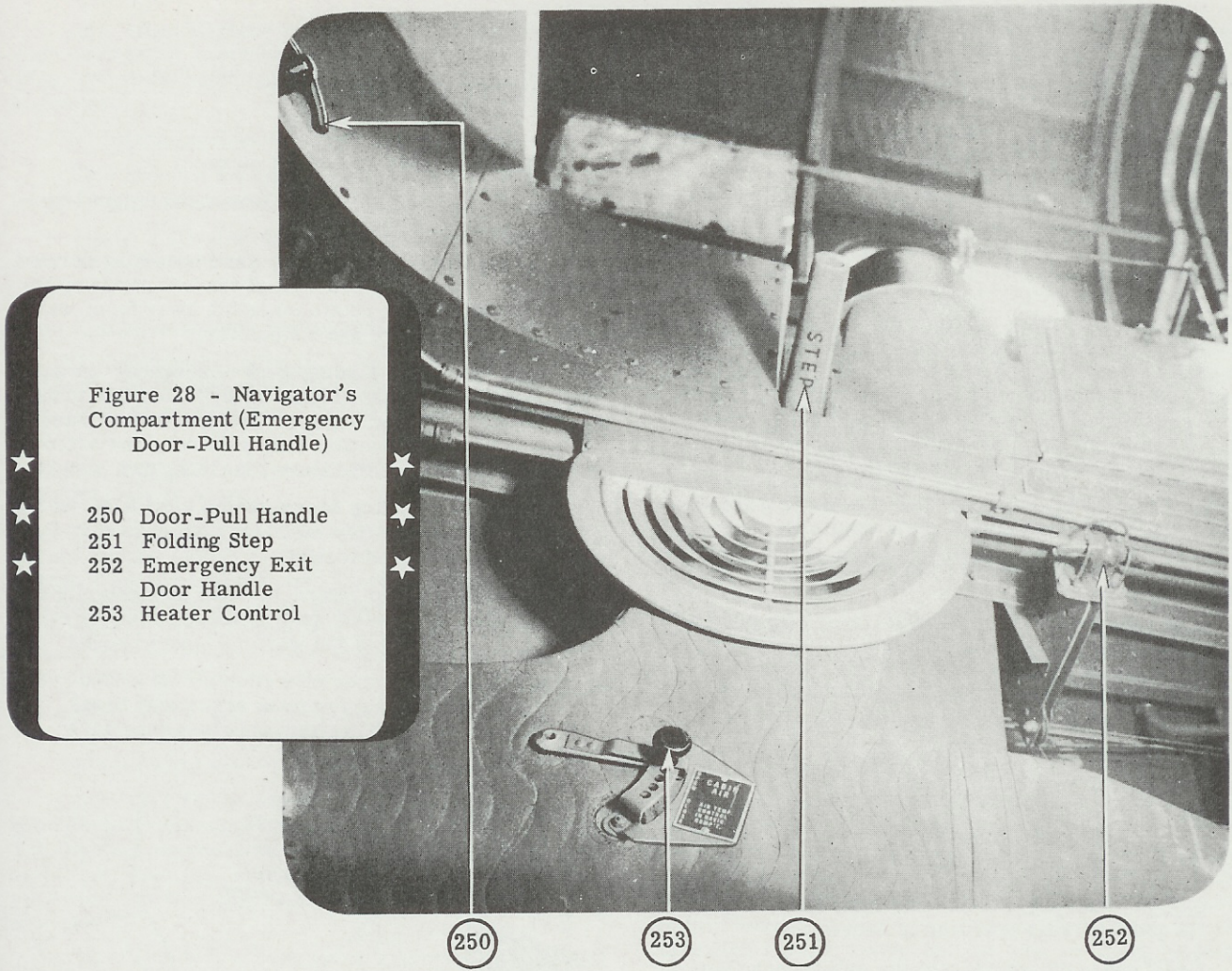


- 247 Dome Light Switch
- 248 Extension Light
- 249 Oxygen Regulator



(248)  
(247)  
(249)





## SECTION V

RADIO OPERATOR AND LOWER GUN TURRET COMPARTMENT1. GENERAL DESCRIPTION.

a. The compartment containing the radio equipment and the lower gun turret is located aft of the bomb bay and is just forward of the upper gun turret. It contains not only the radio transmitter and receiving sets, but also the lower model "J" gun turret. Provisions are made in this compartment for the emergency operation of the wing flaps and main landing gear. It is equipped with a data case, folding table, and a relief tube located below the operator's table. The relief tube is used by crew members stationed aft of the bomb bay. A side escape hatch (figure 14) is on the right side of the compartment.

b. The radio equipment and the lower gun turret are usually operated by the same man.

c. The communication equipment consists of the following units:

Command Set	SCR-274-N
Liaison Set, Medium Range	SCR-287-A
Radio Compass	SCR-269-A
Interphone Equipment	RC-36
Marker Beacon Receiving Equipment	RC-43

2. OPERATIONAL EQUIPMENT - RADIO OPERATOR'S COMPARTMENT.a. Emergency Equipment.(1) Emergency Wing Flap Operation.

**NOTE:** Interphone communication between pilot and the radio operator is necessary.

**CAUTION:** Do not operate the emergency flap operating system (do not even install crank) unless there is a complete failure of the hydraulic pressure system.

(a) Ascertain from pilot that his hydraulic flap control handle is at the extreme position for the desired movement of the flaps.

(b) Open hinged cover (figure 29-264) and install crank (figure 29-265) on shaft of flap operating mechanism.

(c) Rotate crank clockwise to raise the flaps (approximately 27 complete turns are required in either direction). Rotate counterclockwise to lower the flaps.

(2) Emergency Operation of Main Landing Gear.

(a) Ascertain that pilot's hydraulic landing gear control handle is set at the "DOWN" position.

(b) Disengage lower gun turret operator's chest support (figure 33-296) by pulling adjustment pin, raising support and allowing lower section of adjustment rod to fall forward. Hinge upper section of

adjustment rod and lower chest support.

(c) Lower radio operator's table (figure 29-262) to useful position.

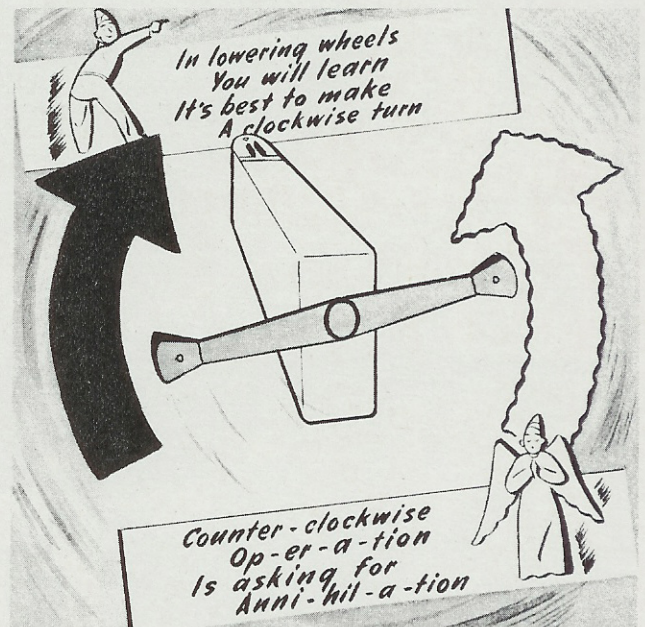
(d) Release main landing gear operating screw assembly (held to forward wall of the compartment by finger-type fastener), rotate assembly away from wall until it locks in a fore and aft position.

(e) Pull main landing gear emergency up-position lock pin release (figure 29-267), located to the right of the lowering screw. This control releases the main gear up-position lock pins only and allows the main gear to partially lower, due to its own weight.

(f) Turn lowering screw handle clockwise until advised by pilot that his indicator registers that the main gear is down and locked.

(g) Ask pilot to retard throttle momentarily to ascertain that the landing gear is locked down as evidenced by the failure of the warning horn to sound.

**WARNING:** Improper operation of main landing gear emergency lowering screw may break cables and prove dangerous and cause expensive repair.



**CAUTION:** After lowering gear in the above manner, do not turn lowering screw handle counterclockwise to return handle to its original position on the wall of the compartment until the airplane is safely landed.

(h) After airplane is landed, turn main landing gear emergency lowering screw handle counterclockwise, returning handle to its original position and stow assembly.

(3) Miscellaneous Emergency Equipment.

(a) The side escape hatch is located on the right wall of the compartment.

(b) A CO<sub>2</sub> fire extinguisher is clipped to the right side wall of the compartment just aft of the escape hatch.

b. Communications Equipment.

(1) Interphone Controls. - An interphone jackbox is located at the aft end of the radio operator's table. The selector control has five selective positions as follows:

(a) "COMP". - The audio output of the compass receiver only is heard.

(b) "LIAISON". - The output of the liaison receiver and the sidetone of the liaison transmitter are heard. The microphone push-to-talk switch operates the transmit receive relay located within the liaison transmitter. The microphone will modulate the liaison transmitter when the switch is closed and the transmitter is in "VOICE" position.

NOTE: From the "LIAISON" position, voice transmission is effective only at the pilot's, copilot's and radio operator's station.

(c) "INTER". - At this position, all jack boxes provide intercommunication between crew members. The microphone connects to the input of the interphone amplifier, and the headphones to the output of the amplifier. In this position the volume control is not effective.

(d) "CALL". - This is an emergency call position in which all of the positions in all boxes are placed in parallel across the output of the amplifier. In an emergency any crew member desiring to call a station which is in use, may do so by switching to the "CALL" position. This position is effective on all stations.

(2) Command Set.

(a) The command receivers and transmitters of the SCR-274-N set are independently controlled. There are three markings on the transmitter switch: "VOICE", "CW", and "TONE." With the switch at the "VOICE" position, the microphone from any jack box switched to "COMMAND" is operative and the voice is transmitted when the push-to-talk button at that station is pressed. With the switch at the "CW" position, a continuous wave or an unmodulated signal is transmitted. With the switch at the "TONE" position, a signal is transmitted which is practically 100 percent modulated at 1000 cycles. For long range communication through interference "CW" is most effective, "TONE" next and "VOICE" least effective.

(b) At both the "CW" and "TONE" positions, the microphone is inoperative by voice, and signalling

by code is accomplished by a key located on the top of the transmitter control box. An external or separate key may be used by plugging it into the jack marked "KEY." The push-to-talk button on the microphone may be used as a key for transmitting code when the control box switch is turned to the "CW" or "TONE" position. A microphone plugged into the jack marked "MIC" permits the operator to transmit voice over the command set only, instead of through the interphone system.

(3) Receiver. - The receiver control box is divided into three identical sections, each controlling the particular receiver to which it is electrically and mechanically connected. To receive a signal of specific frequency, use the section of the receiver control box which controls the particular receiver involved. The desired receiver is turned "ON" and "OFF" by a switch located in the upper right-hand corner of the control box section used. In addition to an "OFF" position, the switch has two selective positions marked "CW" and "MCW", each of which is an "ON" position and indicates the type of signal to be received.

(4) Liaison Set Transmitter.

(a) The "OFF"- "ON" switch of the liaison transmitter is located on the face of the transmitter case.

(b) With the transmitter turned "ON", the filament voltage, as indicated on the meter marked "FIL. VOLTAGE" must be within close limits of the line on the face of the meter at 10 volts. The "CW" and modulator filament voltages are checked individually by a switch adjacent to the "OFF"- "ON" switch. Each tuning unit contains tuned circuits to allow a transmitter output variable within the frequency limits specified on the tuning unit in use. A chart located on the face of each tuning unit indicates the dial settings for desired frequencies. It is possible with the monitor switch to tune the transmitter output frequency to match the frequency of any station coming in over the receiver. With the monitor switch at "MONITOR", the sidetone of the transmitter is automatically cut off and the receiver may be turned on with the "CW" switch and adjusted to a desired frequency as indicated on the dial, or to an incoming signal of a station which it is desired to contact. Then press the transmitter key and adjust the transmitter oscillator frequency dial until the transmitter frequency is heard in the receiver. This adjusts the transmitter and it will stand by ready for the break-in on the station to which it has been adjusted. With the monitor switch at "NORMAL" the receiver will be inoperative while the transmitter is operating.

(5) Liaison Receiver. - The liaison receiver is operated by a switch located on the front of the case and has three positions: "OFF", "MVC" and "AVC", the latter two designating manual volume control and automatic volume control, respectively. To tune in or search, turn the switch to "MVC" and upon obtaining the desired signal, change to "AVC." Operation

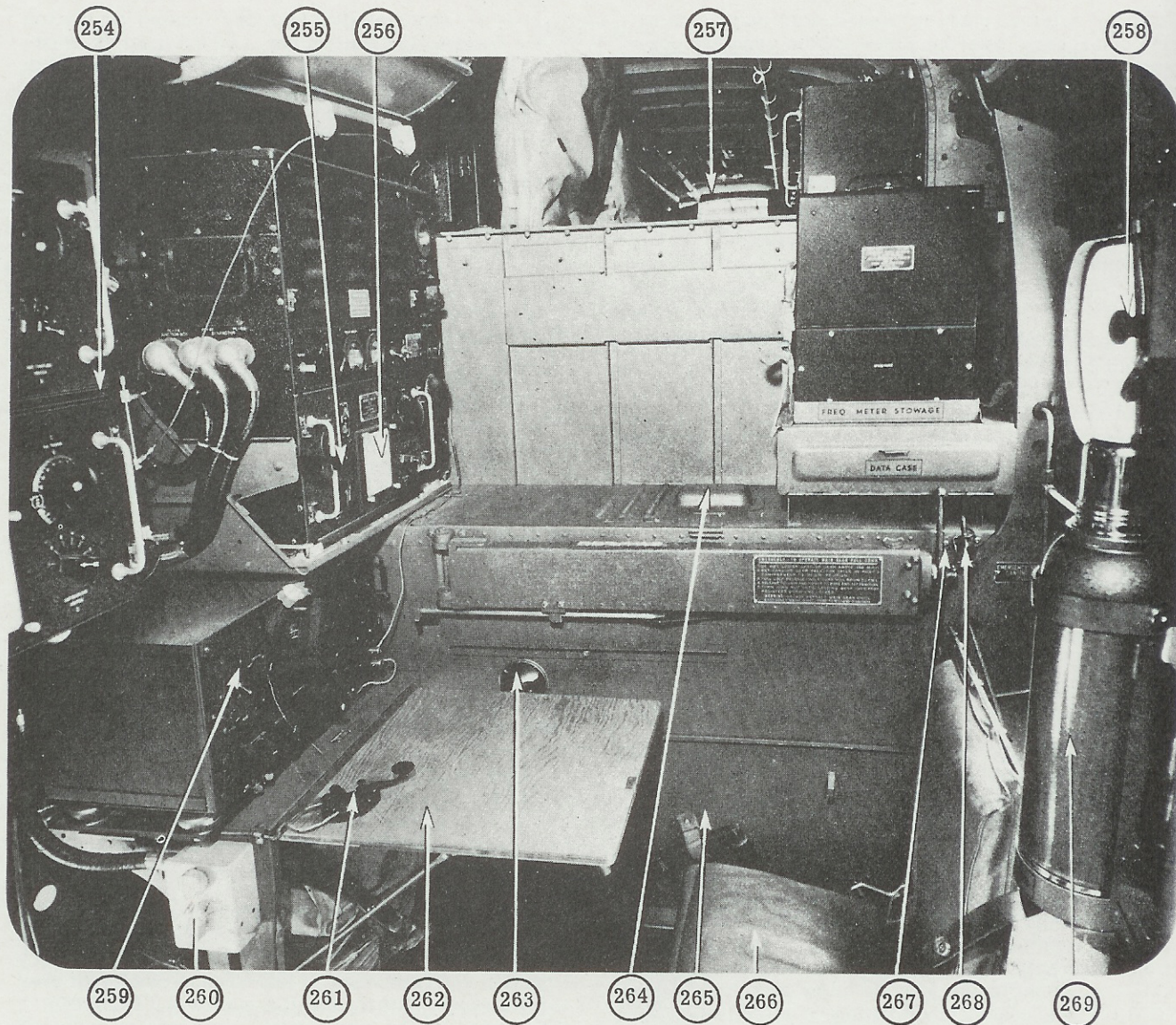


Figure 29 - Radio Operator's Compartment (Forward View)

- |   |  |  |
|---|--|--|
| ★ | 254 Replaceable Transmitter Tuning Units                       | 263 Ash Receiver   |
| ★ | 255 Hook for Holding Radio Operator's Table in Stowed Position | 264 Hinged Cover for Crankshaft for Emergency Flap Operation |
| ★ | 256 Transmitter  | 265 Crank for Emergency Flap Operation                       |
|   | 257 Passageway Over Bomb Bay                                   | 266 Radio Operator's Seat                                    |
|   | 258 Oxygen Regulator   | 267 Emergency Main Landing Gear Operating Screw              |
|   | 259 Receiver   | 268 Up Position Lock Release for Main Landing Gear           |
|   | 260 Jack Box   | 269 Thermos Bottle   |
|   | 261 Transmitting Key   |  |
|   | 262 Radio Operator's Table                                     |  |

of the "BAND SWITCH" knob located on the face of the receiver case controls the selection of the frequency band. Dial calibrations, corresponding to the band selected, are revealed by the dial mask.

**CAUTION:** Do not make any adjustments within the command or liaison transmitter while high voltage supply is on. Do not remove or replace any tubes within any of the equipment while the equipment is turned on. Do not remove covers from any of the dynamotors or replace any fuses while dynamotors are operating.

(6) Trailing Antenna Control. - A reel control box (figure 41-352) is located on a bracket on the left-hand side of the radio operator's compartment immediately aft of the liaison receiver. The control knob may be turned from its central "OFF" position, right to "OUT", or left to "IN", in order to extend or retract the weighted trailing antenna. A three-digit visible counter indicates the number of turns made by the antenna in extending and reversing during retraction.

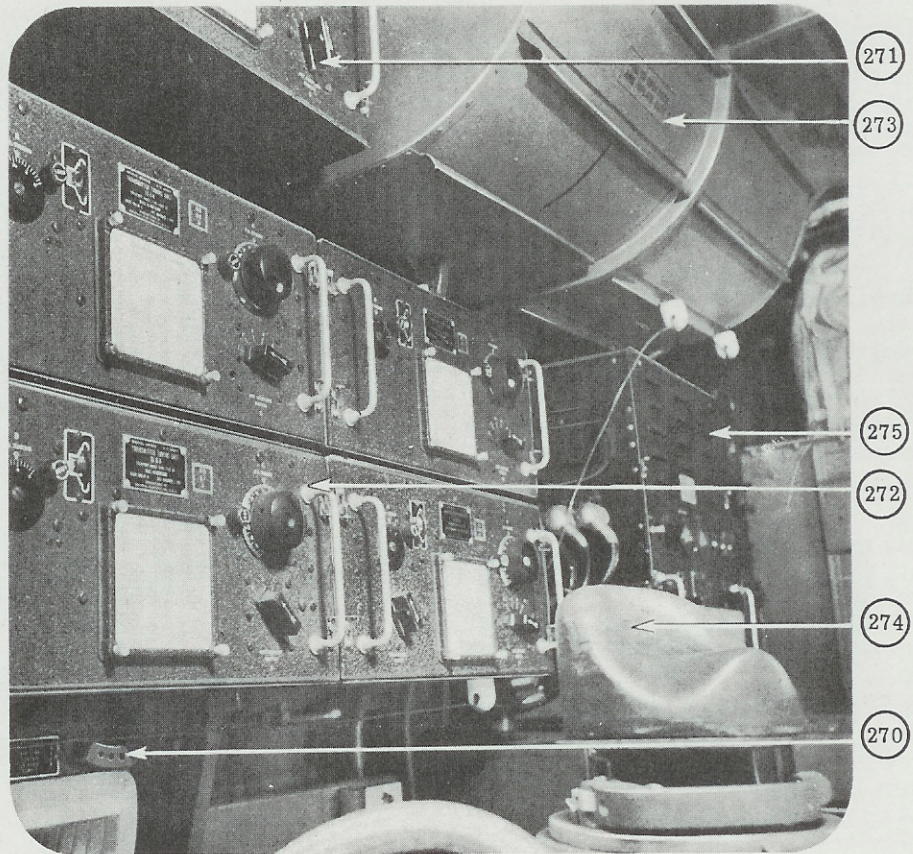
**NOTE:** An amber signal light above the counter will warn of an unsatisfactory landing con-



*Turn power off when replacing tubes*

Figure 30 - Radio Operator's Compartment (Left Side)

- 270 Heater Control
- 271 Replaceable Transmitter Tuning Units
- 272 Replaceable Transmitter Tuning Units
- 273 Life Raft Stowage Compartment
- 274 Gun Sight Eye Cushion
- 275 Transmitter



dition if the trailing antenna is left in an extended position as the main landing gear starts to descend. Do not use the trailing antenna while on the ground.

(7) Radio Compass.

(a) The radio compass can be operated from either of the two control boxes, but not from both at the same time. The equipment is manually tuned from either remote control box, and electrical control is established at the desired control box by depressing the button marked "CONTROL" in the lower right-hand corner of the control box. When control is established at the desired remote control unit, a green indicating light will appear on the face of the unit.

(b) The radio compass performs 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 uni-directional left-right indication of an incoming signal. 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 marked thereon, has three other positions marked "COMP", "ANT", and "LOOP." With the switch turned to the position marked "COMP", both the rotatable loop and the fixed antenna are in use. In the "ANT" position, only the fixed antenna is in use and with the switch turned to "LOOP", only the rotatable loop is in use. Frequency band selection is accomplished by rotating the band switch handle to one of its three marked positions.

(8) Marker Beacon. - The operation of the marker beacon equipment is fully automatic. As the airplane passes over a fixed point from which a marker signal is being transmitted, the signal is picked up by the receiver, the output of which actuates a built-in relay. This relay in turn causes the indicator to flash on, thus indicating to the pilot that he has passed over a marker beacon.

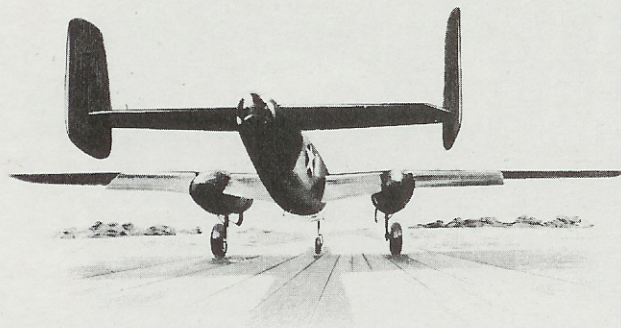
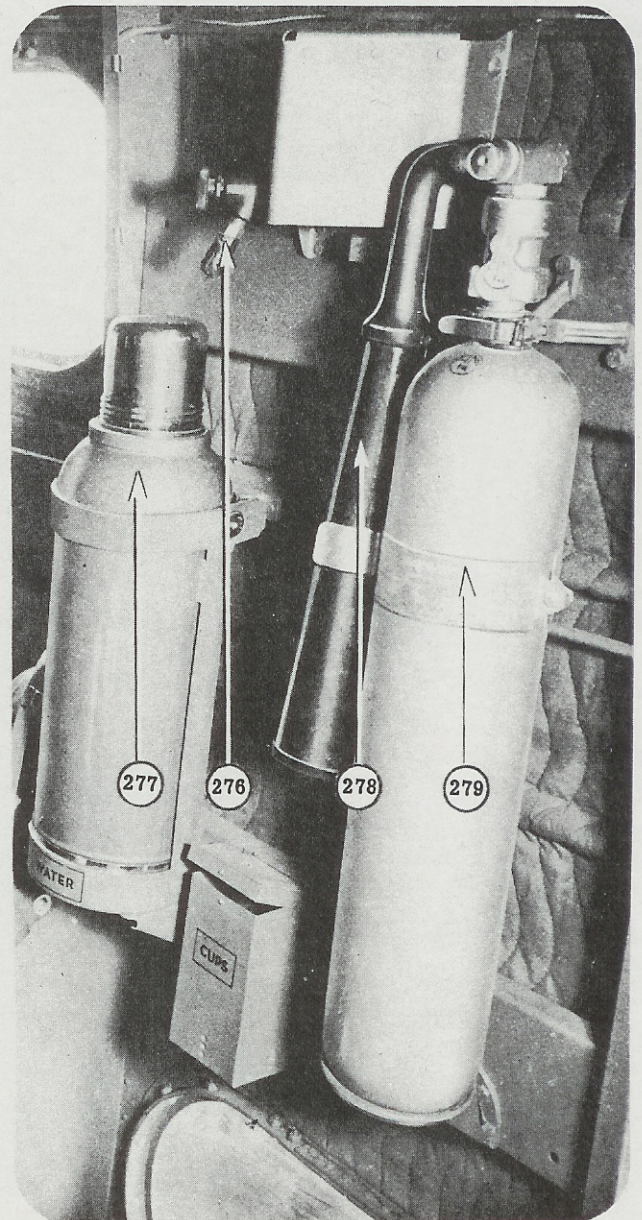


Figure 31 - Radio Operator's Compartment (Oxygen Regulator and Fire Extinguisher)

- 276 Oxygen Regulator
- 277 Thermos Bottle
- 278 Horn of Fire Extinguisher
- 279 Fire Extinguisher (CO<sub>2</sub>)



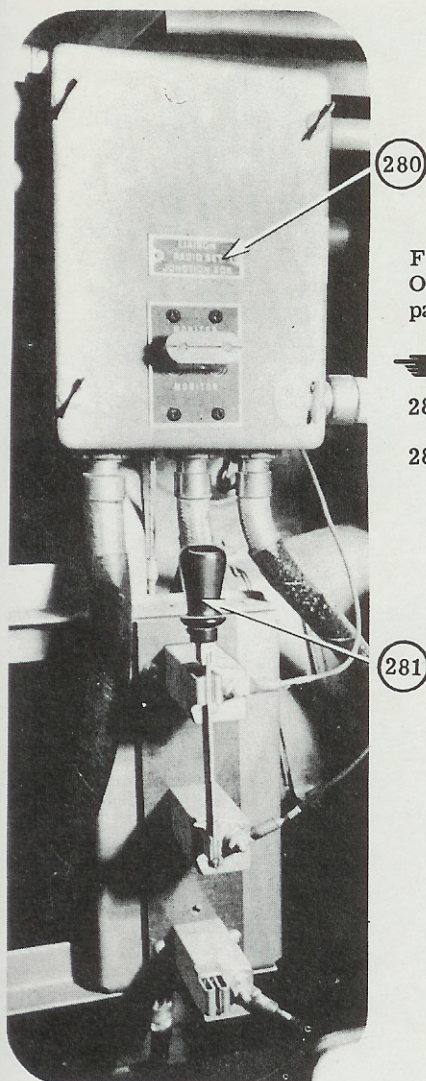


Figure 32 - Radio Operator's Compartment (Monitor Switch)

280 Liaison Set Junction Box  
281 Monitor Switch

### 3. OPERATIONAL EQUIPMENT - LOWER GUN TURRET.

#### a. Gun Turret Operation.

**CAUTION:** Do not operate turret without adequate power supply. Damage to the turret or airplane may result if supply voltage at the turret is less than 20 volts.

##### (1) Extension to Combat Position.

(a) Firmly grasp control handle (figure 33-288) with right hand to depress master switch, but do not depress trigger switch.

(b) Turn control handle counterclockwise about vertical axis a few degrees for slow speed and maximum rotation for full speed.

**CAUTION:** As turret approaches extended position, use slow speed until indexing key auto-

matically engages and turret starts to rotate counterclockwise. Guns can be fired as soon as extended position is reached.

##### (2) Charging the Guns.

(a) To charge guns for combat or to remove faulty cartridge, depress control valve with knob rotated clockwise against stop (after depression, knob is automatically released at end of charging stroke, thereby positioning valve for next charging stroke).

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

##### (3) Combat Operation.

(a) Lower the padded knee support well forward of turret.

(b) Adjust chest support as required by means of spring-loaded pin in chest support rod.

(c) To adjust focus of sight, pull up on knurled collar below sight cushion and rotate until desired focus is obtained. Then push collar down, engaging it in closest locking notch.

(d) Take kneeling position with right hand on control handle, left hand on steady grip and eye on sight eye cushion. (See figure 33-284.)

(e) Neutral position of control handle is halfway between vertical and horizontal rotation stops.

(f) To elevate the guns, rotate control handle vertically about its axis. The guns will move in same relative direction as handle, at a speed proportional to the degree of control handle rotation.

(g) To rotate turret in azimuth, rotate control handle horizontally about its vertical axis. Turret will move in same relative direction as handle, at a speed proportional to the degree of control handle rotation.

(h) Turn on windage indicator switch and rotate rheostat control to indicated air speed of aircraft determined from pilot. Microphone switch button is in the end of the steady grip.

(i) To fire guns, depress trigger firing switch in the control handle.

(j) Power is cut off by releasing grip on the control handle.

##### (4) Retraction to Stowed Position.

(a) Rotate turret slowly in clockwise direction with guns positioned approximately 12 degrees below horizontal. As guns approach aft position, firmly depress retraction lever, which will cause the turret to stop.

(b) Slowly raise guns in elevation, keeping control handle set for slow azimuth speed in clockwise direction, and retraction lever depressed. When guns

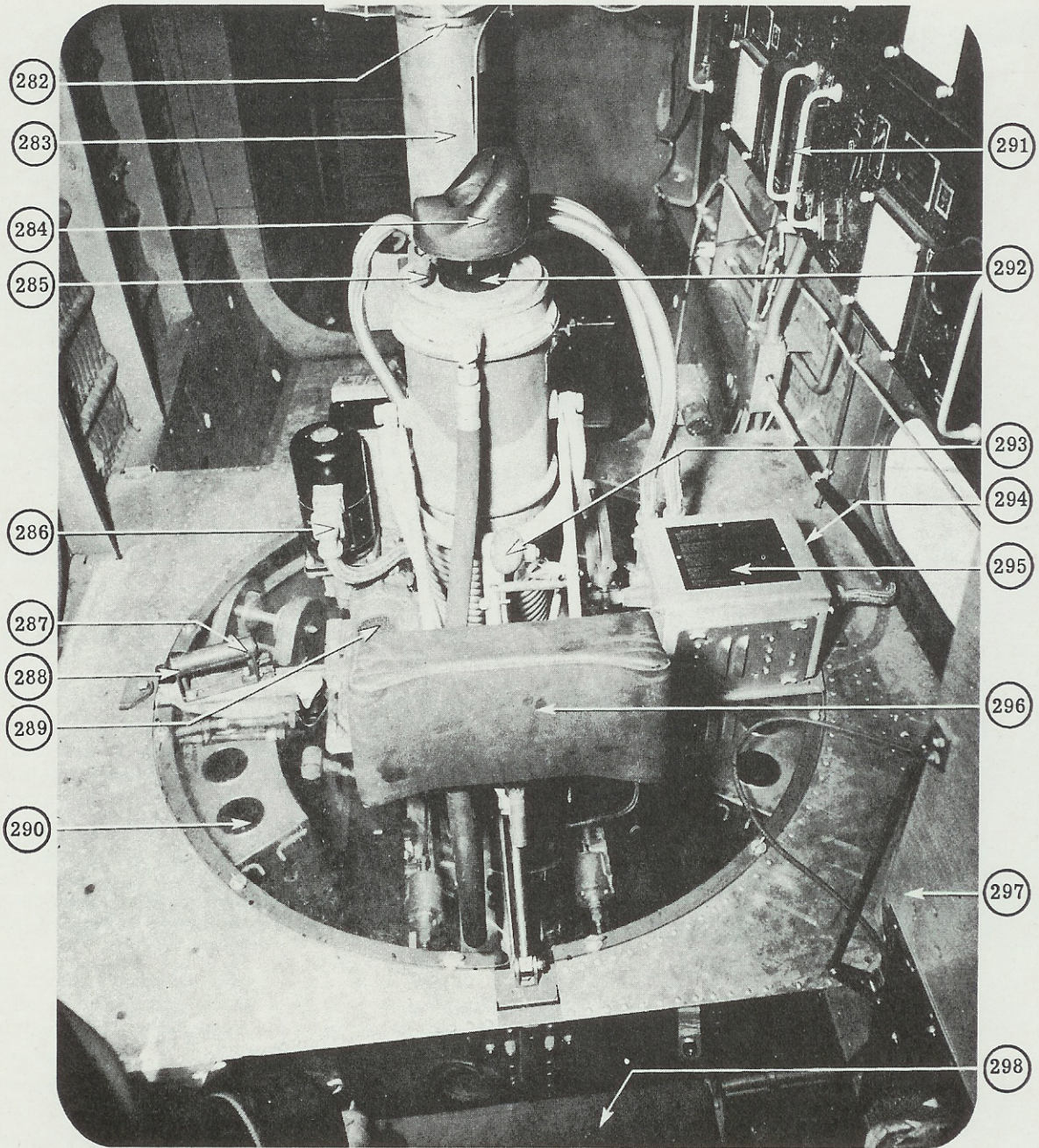


Figure 33 - Lower Gun Turret (Interior View)

- |  |   |                                     |
|--|---|-------------------------------------|
| 282 Foot Support Adjustment                        | 288 Steady Grip                                       | ret Control                         |
| 283 Upper Turret Shaft                             | 289 Manual Turret Control Shifter Shaft               | 294 Turret Disconnect Switch        |
| 284 Gun Sight Eye Cushion                          | 290 Ammunition Box                                    | 295 Controller Box                  |
| 285 Retract Lever                                  | 291 Spare Insert Tuning Units for Liaison Transmitter | 296 Turret Operator's Chest Support |
| 286 Turret Rotation and Retraction Motor           | 292 Gun Sight Adjustment Collar                       | 297 Radio Operator's Table          |
| 287 Interphone Button - Inboard End of Steady Grip | 293 Crank Handle for Manual Tur-                      | 298 Turret Operator's Kneeling Pad  |



enter index zone (2 to 6 degrees below horizontal), turret will again turn clockwise, index and start retracting.

**CAUTION:** Control handle must be kept at slow speed until turret begins to retract.

(c) After turret has retracted approximately one inch, release retracting lever (figure 33-285) and continue retraction at any desired speed to stowed position.

**b. Emergency Turret Operation.**

**WARNING:** Firing restrictor cams, turret control cams and gun control cams which are used to electrically stop the gunfire, turret rotation, and the gun elevation at predetermined positions, are also disengaged when operating turret mechanically. Therefore, prior to attempting to fire guns while operating turret mechanically, mechanically rotating turret or moving guns in elevation, make sure guns will not fire on airplane or strike fuselage.

(1) Remove required transparent sections on turret deck.

(2) Engage handcrank (figure 33-293) in manual gun control shaft and rotate crank as required to position the guns approximately 2 to 6 degrees below horizontal.

(3) Engage handcrank in manual turret control shaft (figure 33-289) pull shaft forward to disengage clutch from reduction gear mechanism.

(4) Rotate turret until guns are slightly to left of aft position. Firmly depress retraction lever and rotate turret clockwise.

(5) When aft position is reached, turret will begin to retract. Hold retraction lever depressed until turret has retracted approximately one inch, and then release lever. Retract turret to stowed position.

**CAUTION:** Do not raise turret beyond the point where the aft turret support brace contacts the retract-position limit switch located below the aft leg of the spider, as damage to the turret will result.

(6) Replace sections of transparent fairing on turret deck.

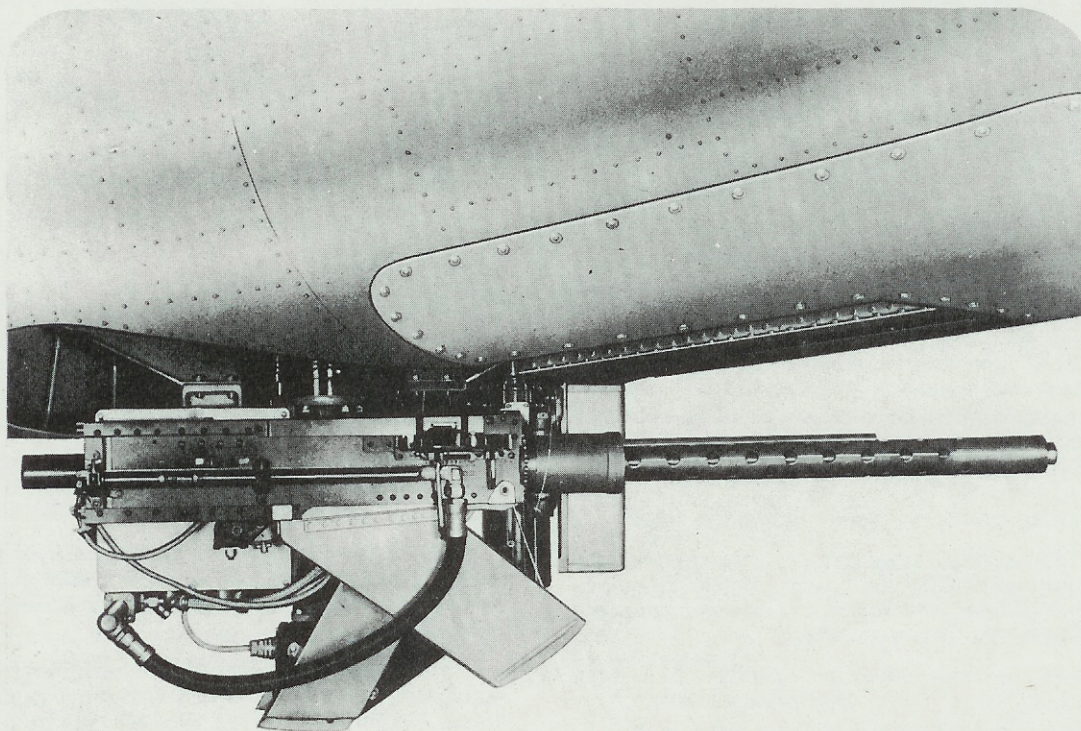


Figure 34 - Lower Gun Turret (Exterior View)

## SECTION VI

## BOMBARDIER'S COMPARTMENT

1. GENERAL DESCRIPTION.

The bombardier's compartment is located forward of and lower than the pilot's compartment. In the compartment, provision is made for the installation of the Norden M series, Estoppey D-8 or the British Mark IX bomb sights. The bomb controls provide for the "ARMED", "SAFE", "SELECTIVE", "TRAIN", "SALVO", and "EMERGENCY" releases. Ball and socket mounts (figure 36-322) for a .30 caliber machine gun are provided in the panels of the nose of this compartment. Stowage for the machine gun is by means of a socket and bracket at the right side of the compartment. Provision is also made for the installation of a type G-4 camera gun. In addition to the conventional equipment such as the interphone, ventilating and lighting systems this compartment has a side escape hatch (figure 14) to be used when the airplane is on the ground only. Armor plate on the seat and back of the bombardier's riding seat is the protection afforded in this compartment.

2. OPERATIONAL EQUIPMENT.a. Bomb-Controls Operation.

(1) The bomb release handle cannot be removed from one setting to another until the plunger knob at the top of handle is pressed down. In order to move the bomb release handle from "SELECTIVE" to the "SALVO" position a mechanical safety guard must be hinged upward.

(2) When not in use, bomb controls shall be positioned as follows: bomb bay door control (figure 35-314) at the "DOORS CLOSED" position with anti-salvo guard in place; selective-train switches on "SELECTIVE" and the momentary contact bomb release switch with mechanical safety guard in place. After releasing bombs the controls shall be returned to the above positions to prevent accidental release of the remaining bombs.

(3) Setting controls prior to releasing bombs.

(a) In electrical selective or train release, the bombs are automatically electrically armed. In emergency salvo release, the bombs are always released automatically in the safe condition.

(b) Set the train selective switches to the desired position.

(c) If electrical train release of the bombs is desired, set the desired spacing on bomb release interval control. Do not move control while motor is running.

(d) To open bomb bay doors, move bomb release handle to "DOORS OPEN-RACK LOCK" position.

**CAUTION:** Do not open or close bomb bay doors on the ground without first verifying that all personnel are clear.



*Be sure area under plane is clear before you open or close bomb doors!*

(e) When door position indicator light illuminates, move bomb release handle to "SELECTIVE" position, if electrical train or selective release is desired.

(f) To close bomb bay doors return bomb release handle to "DOORS CLOSED" position.

(4) Selective Release. - Hinge bomb release switch safety guard (figure 35-317) upward and press release switch once for each bomb to be released.

(5) Train Release. - Hinge bomb release switch safety guard upward, and press and hold down release switch until the desired number of bombs has been released.

(6) Salvo Release. - Hinge anti-salvo guard upward and move bomb release handle (figure 35-314) to the extreme forward, "SALVO" position.

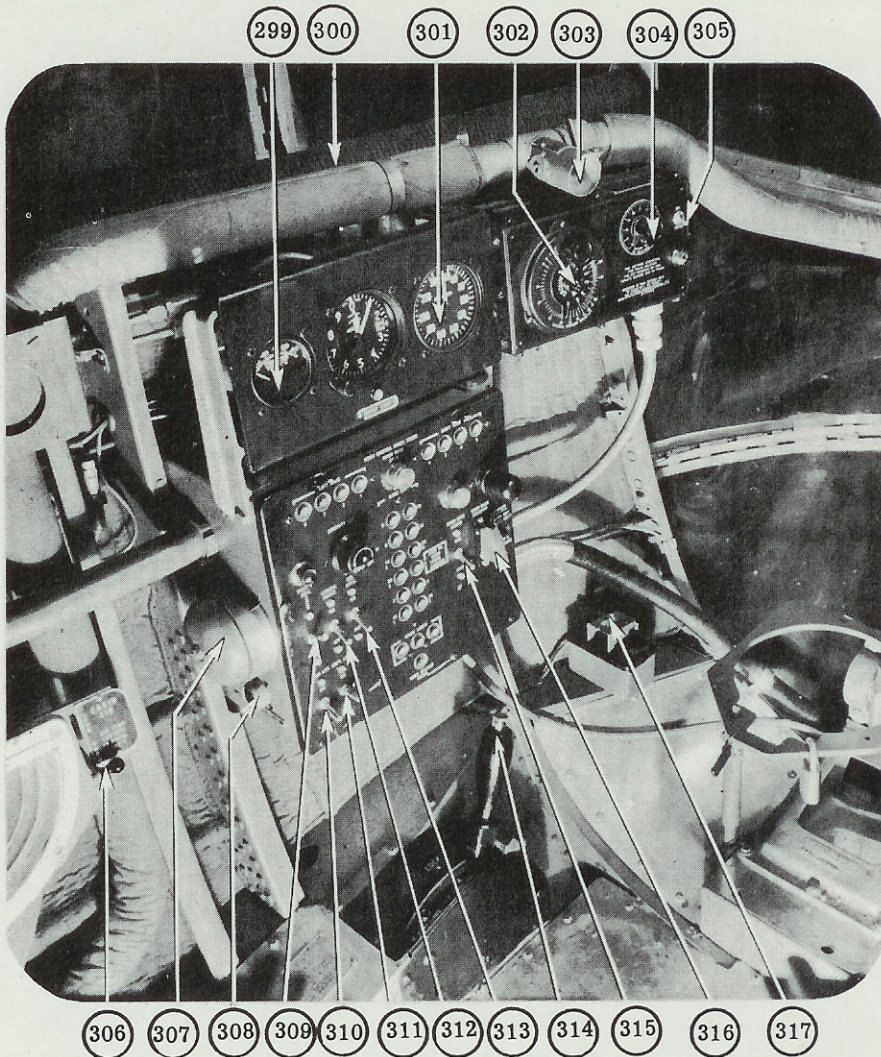
(7) Emergency Release by Pilot. - In the event the pilot has released the bombs or the droppable tank in an emergency, the bombardier performs the following operation.

(a) Move bomb release handle to the extreme forward end of the quadrant, past the "SALVO" po-

Figure 35 - Bombardier's Com-  
partment (Left Side)



- 299 Free Air Temperature Gage
- 300 Bomb Sight Defroster Tube Stowed
- 301 Air-Speed Gage
- 302 Interval Control
- 303 Bomb Sight Defroster Tee
- 304 Interval Control
- 305 Selector Train Switch
- 306 Heater Control
- 307 Warning Kell
- 308 Warning Light
- 309 Pilot's Call Switch
- 310 Dome Light Switch
- 311 Cockpit Light Switch
- 312 Camera Power Switch
- 313 Identification Lights Switch
- 314 Bomb Release Handle
- 315 Salvo Switch
- 316 Bomb Rack Selector Switch
- 317 Bomb Release Switch



sition and then return handle to "DOORS CLOSED" position. This will cock the pilot's emergency release unit and close doors.

(b) The bombardier can also release the bombs or the bomb bay droppable tank in an emergency by using operation for "SALVO" release.

**CAUTION:** If the hydraulic system has failed, to release bombs from either the bombardier's or pilot's compartment, the bomb bay doors are to be cranked open from the navigator's compartment. However, the bombardier's door operating and bomb release handle must be positioned.

(8) Bombardier's Emergency Release. - Move bomb release handle (figure 35-314) to the extreme forward end of the quadrant, past the "SALVO" position and then return handle to the "SALVO" position. If handle was in "SALVO" return handle to the "SE-

LECTIVE" position and then forward past "SALVO" position in order to release bombs.

**b. Oxygen System.**

(1) Two type A-9A oxygen regulators are provided; one at bomb sight and one at riding seat.

(2) To operate, attach hose to bayonet fitting and adjust regulator.

**c. Interphone System.**

(1) A jack box (figure 37-336) is located at the right side of the compartment.

(2) To operate, plug in earphone cord and set switch to desired point. A throat microphone switch cord is also provided.

**d. Heating and Ventilating Equipment.**

(1) A controllable cold air scoop is provided on

the right side of the compartment.

(2) A valve equipped heat outlet (figure 36-324) is located on the left side of the compartment.

**CAUTION:** Do not open escape hatch during flight for ventilation.

e. Defrosting System.

(1) The bomb sight window receives heat whenever heater is on.

(2) A defroster tube (figure 35-303) for use on the bomb sight is provided. When not in use the tube may be stowed.

f. Automatic flight control equipment and pilot's call switch (figure 35-309) is located on bomb control panel.

g. Lighting System.

(1) A dome light switch (figure 35-310) is provided.

(2) An extension light switch (figure 36-319) is provided.

(3) Both of the above are operated conventionally.

h. Escape Hatch.

(1) A side escape hatch is located on the left side of the compartment.

(2) This hatch releases inboard.

**CAUTION:** This hatch is to be used when airplane is on the ground only and when motors are not running.

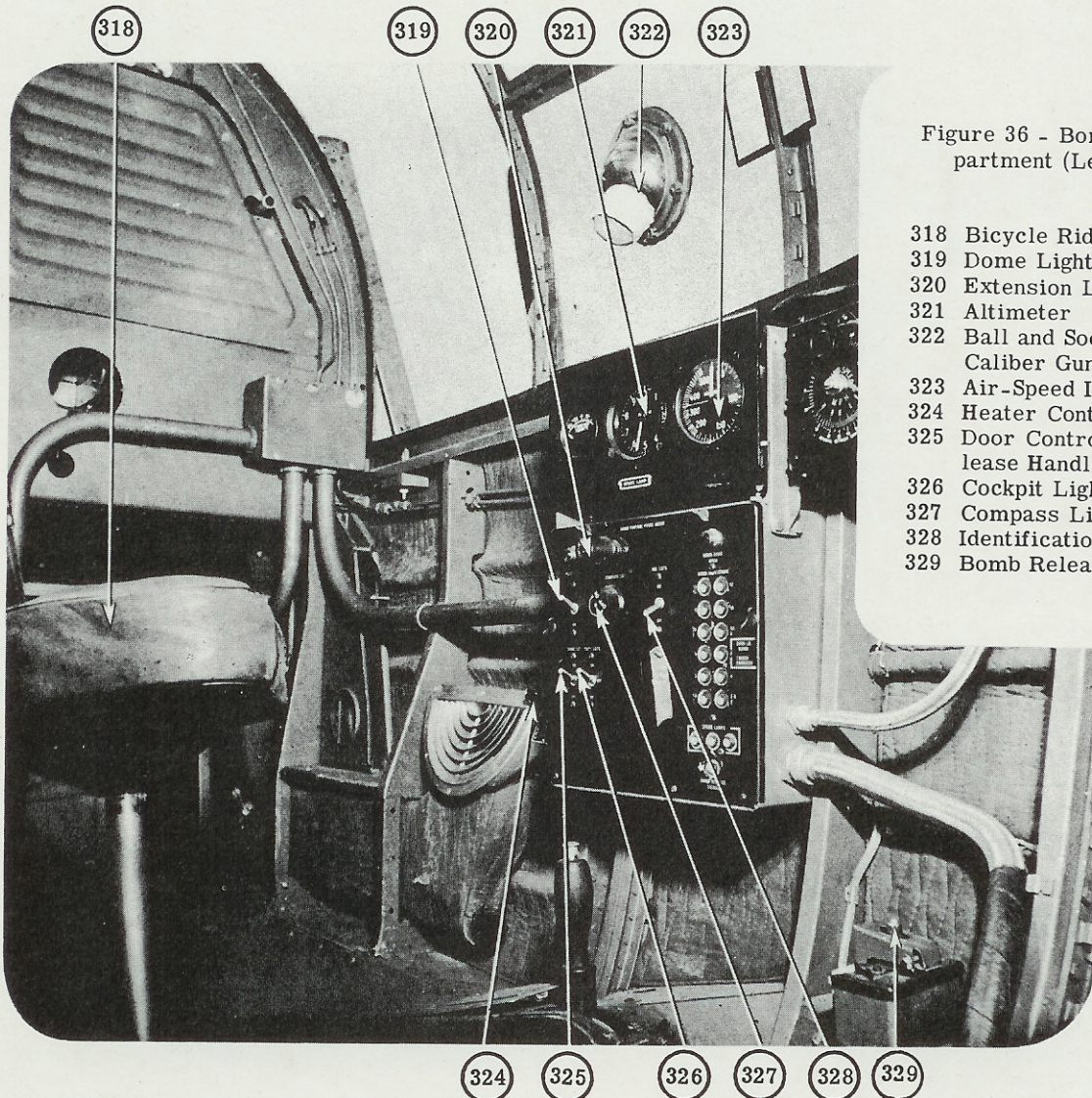


Figure 36 - Bombardier's Compartment (Left Rear View)

- 318 Bicycle Riding Seat
- 319 Dome Light Switch
- 320 Extension Light
- 321 Altimeter
- 322 Ball and Socket Mount for .30 Caliber Gun
- 323 Air-Speed Indicator
- 324 Heater Control
- 325 Door Control and Bomb Release Handle
- 326 Cockpit Light Switch
- 327 Compass Light
- 328 Identification Lights
- 329 Bomb Release Switch