

(2) 1600-POUND BOMBS. -Some B-17 Fairplanes do not have a complete set of B-10 bomb shackles. 1600-pound bombs may be carried on the B-7 bomb shackle with these restrictions: If an airplane returns to base with 1600-pound bombs remaining on the racks,

they shall be released, in the safe condition, over water or the safest available area. The maximum permissible gross weight of the airplane will not be exceeded when carrying 1600-pound bombs. The pilot will guard against any severe maneuvering of airplane.

#### s. APPROACH AND LANDING.

##### PILOT

- (1) Check center of gravity location for landing by means of the load adjuster.
- (2) Set altimeter to airport pressure altitude.
- (3) Notify radio operator to retract trailing antenna.
- (4) Turn automatic flight control equipment switches "OFF."
- (5) Direct copilot to adjust carburetor air to "FILTERS ON."
- (6) Move supercharger controls to full "ON," and propeller controls to "MAX. CRUISE," (2100 rpm).
- (7) Shut off de-icer system, if operating.
- (8) Order copilot to extend landing gear.
- (9) Check position of ball turret. Guns should be horizontal and pointing rearward.
- (10) Check hydraulic pressure; it should be 600 to 800 pounds per square inch on both gages.
- (11) Operate brakes. Hydraulic pressure should remain above 600 pounds per square inch. If main brakes are inoperative, prepare for emergency landing.
- (13) After speed has dropped below 147 mph, order copilot to lower wing flaps.
- (14) Adjust trim tabs as required.
- (15) Order copilot to call off air speed as required.

##### COPILOT

- (1) SELECTIVE CHECK VALVE MUST BE IN "NORMAL" position.
- (2) Set mixture controls in "AUTOMATIC RICH."
- (3) Set intercooler controls in "COLD," unless icing conditions exist.
- (4) Radio control tower or landing clearance.
- (5) When directed by pilot, throw carburetor air filter switch to "FILTER ON."
- (7) Check instruments.
- (8) Extend landing gear when directed by pilot (green signal light on).
- (9) Tail wheel should be locked (warning light off), locking lever flush with floor.
- (12) Check cowl flap valves. They must be in "LOCKED" position to guard against loss of oil supply through leaks in cowl flap actuating mechanisms.
- (13) Lower wing flaps when directed by pilot.
- (15) Call off air speeds when directed by pilot.

#### t. EMERGENCY TAKE-OFF IF LANDING IS NOT COMPLETED.

- (1) Open throttle wide.

##### CAUTION

Do not exceed 46 inches Hg manifold pressure.



## PILOT

- (2) Increase propeller speed to 2500 rpm.
- (3) Order copilot to raise landing gear and proceed with a normal take-off.
- (4) Order copilot to raise wing flaps after 500 feet altitude has been reached.

### u. AFTER LANDING.

- (1) Move supercharger controls to "OFF" position.
- (2) Generator switches "OFF."
- (3) Order tail wheel unlocked after taxi speed has dropped below 30 mph.

### v. STOPPING OF ENGINES.

- (1) If parking brakes are set, do not permit them to remain so for very long if the brake drums are hot.
- (2) Idle engines at approximately 800 rpm until cylinder temperature gages show temperatures are 170°C (338°F).
- (3) If the airplane is to remain outside overnight, or if an engine start is anticipated in temperatures below 0°C (32°F), order copilot to dilute oil for 4 minutes maximum: During oil dilution period, operate supercharger controls continuously full open to fully closed in cycles of approximately 10 seconds, to dilute oil in supercharger regulator system.
- (4) Set propeller controls in "HIGH RPM."
- (5) Before stopping engines, run at 1200 rpm for 30 seconds. Direct copilot to stop engines with mixture control.

### w. BEFORE LEAVING THE PILOT'S COMPARTMENT.

Cut off all radio, de-icer, compartment, central control panel, and pilot's side control panel switches.

## COPILOT

- (3) Raise landing gear when directed by pilot.
- (4) Raise wing flaps when directed by pilot.

- (1) Raise wing flaps.

- (2) Check cowl flaps "OPEN."

- (3) Unlock tail wheel when directed by pilot (lever as nearly vertical as possible).

- (3) Close oil dilution switches when ordered by pilot.

- (5) When directed by pilot, stop engines by moving mixture controls to "ENGINE OFF."

### Complete Form 1.

Moor the airplane with the nose into the wind, set the parking brakes and lock the rudder and elevators. When attaching the mooring lines at the rope wells in the wings, allow approximately 16 inches slack in the line. This will prevent damage to the structure or loss of mooring control in case a tire goes flat with result and elevation of the opposite wing. Rudder and elevator locks will withstand gust loads from any direction up to 60 mph velocity.



## SECTION III

# EMERGENCY INSTRUCTIONS

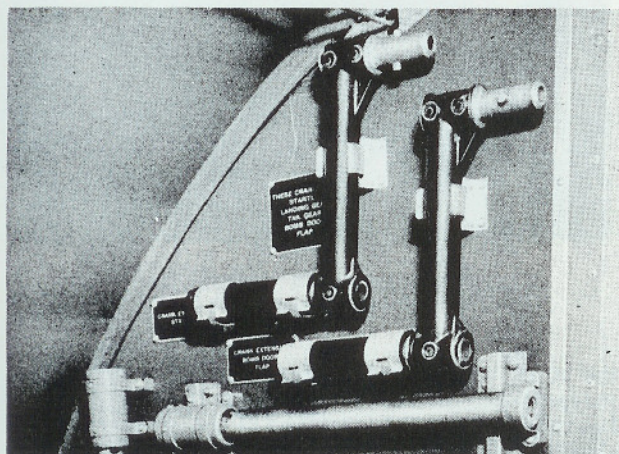
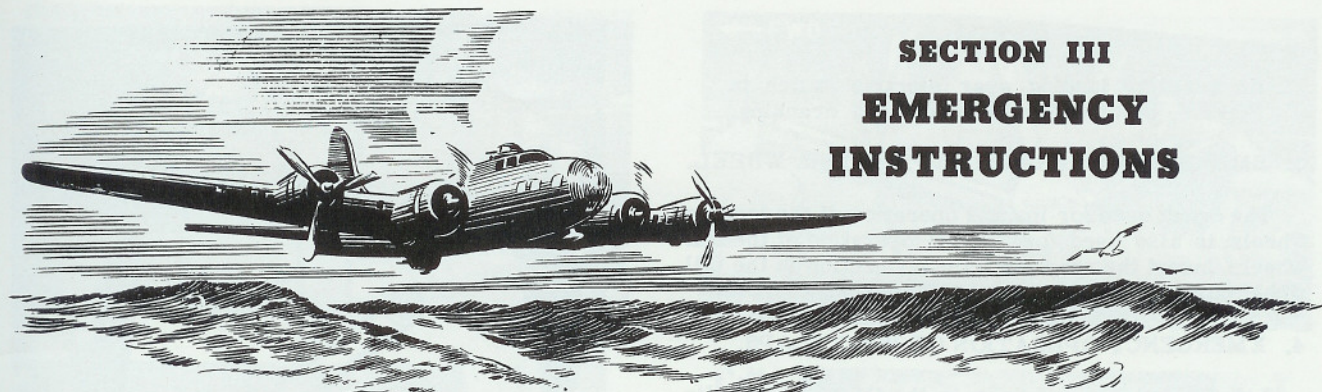


Figure 30 - Hand Cranks Stowed

### 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 may be operated separately by means of a hand crank connection in the bomb bay, one to the left of the door in the forward bulkhead, and one to the right. To raise one of the landing wheels, insert the crank into the connection and rotate clockwise. Turn the crank counterclockwise to lower the wheel.

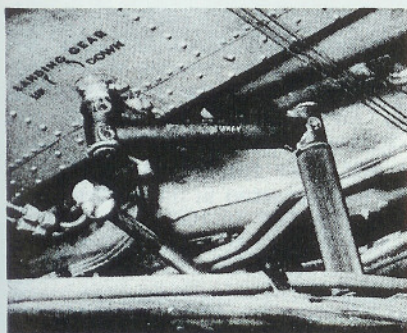
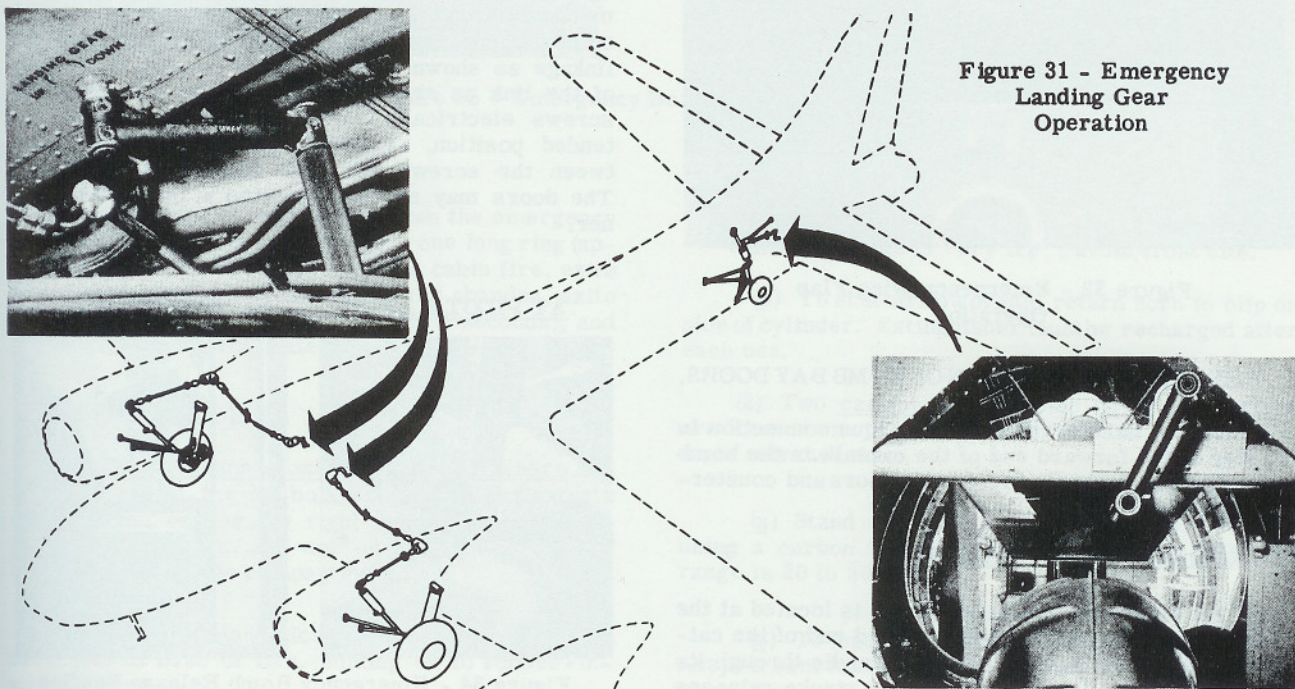


Figure 31 - Emergency Landing Gear Operation





### DANGER

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

#### 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.

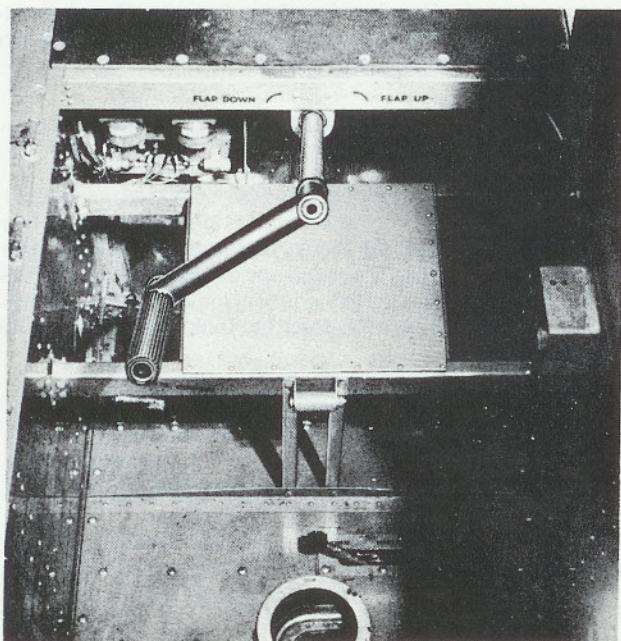


Figure 32 - Emergency Wing Flap Operation

#### 5. EMERGENCY OPERATION OF BOMB BAY 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. An emergency release handle is located at the pilot's left and another at the forward end of the catwalk in the bomb bay. Pull either handle through its full travel. The first portion of the stroke releases

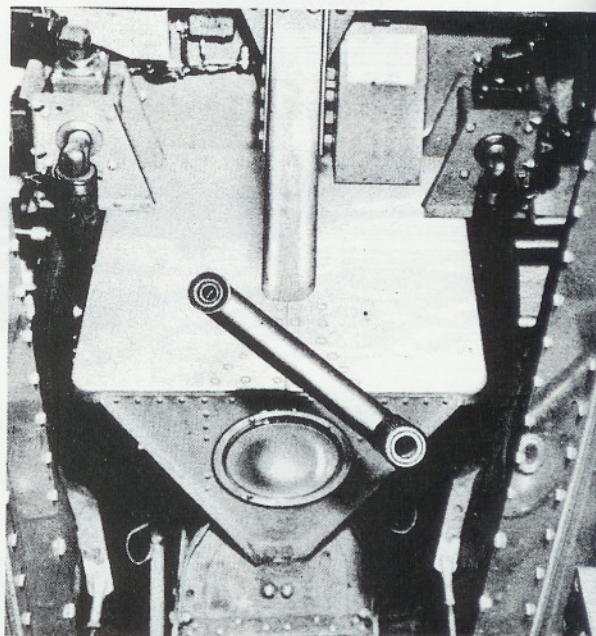


Figure 33 - Emergency Bomb Bay Door Operation

the bomb door latches, permitting the doors to open independently of the retracting screw, as shown in figure A. The latter portion of the stroke releases all external and internal bombs salvo and unarmed.

b. DOOR RETRACTION AFTER EMERGENCY RELEASE. - If the spring in the emergency release mechanism under the hinged door beneath the pilot's compartment floor has not entirely retrieved the linkage as shown in B, reset by pushing at the hinge of the link as shown in C. Operate the retracting screws electrically (or manually) to the fully extended position. This will engage the latches between the screws and door fittings as shown in D. The doors may now be retracted in the normal manner.

#### AT PILOT'S LEFT

#### IN BOMB BAY

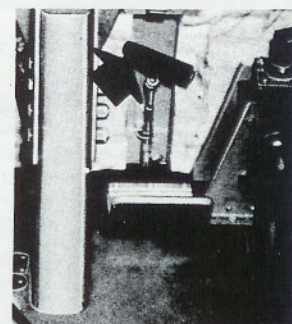
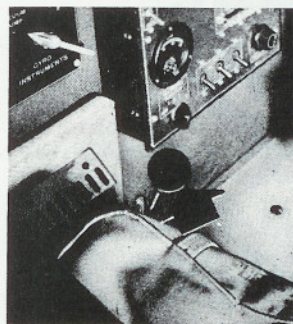


Figure 34 - Emergency Bomb Release Handles



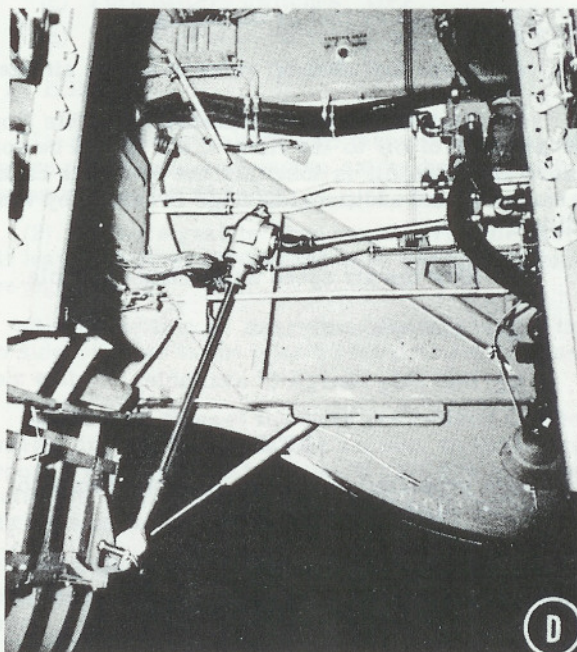
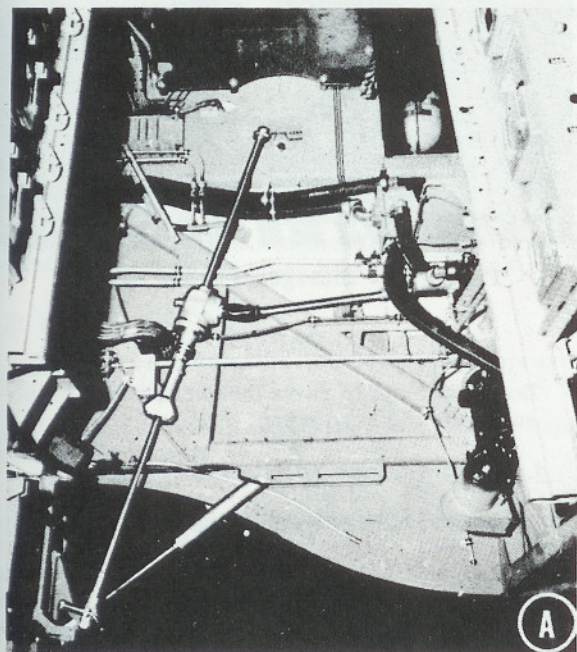
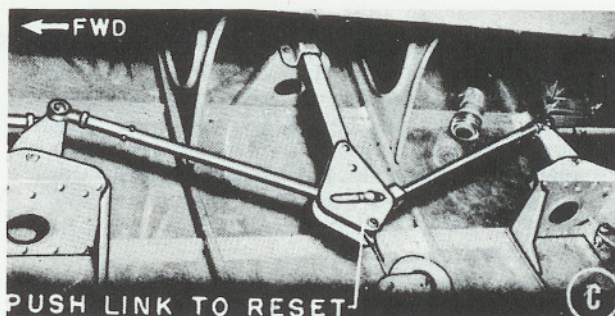
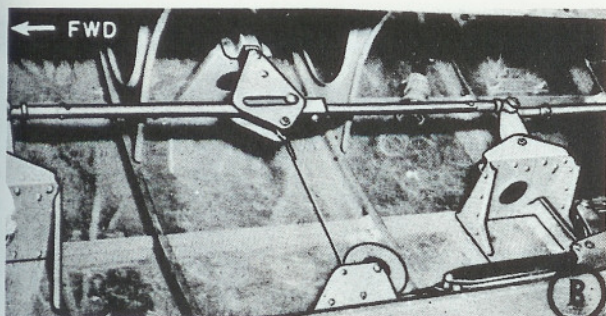


Figure 35 - Emergency Bomb Release Procedure

## 7. FIRE IN FLIGHT.

In case of engine or wing fires, open the emergency exits; signal stand by to abandon: one long ring (approximately 6 seconds). In case of a cabin fire, exits should NOT be open; signal stand by to abandon, exits closed: one long ring (approximately 6 seconds), and one short ring (approximately 2 seconds).

### a. FUSELAGE FIRES.

(1) Three carbon dioxide fire extinguishers are located, one on the aft bulkhead of the navigator's compartment, one on the right rear bulkhead of the pilots' compartment, and one on the forward face of bulkhead of the radio compartment.

(a) To use; stand close to fire, raise horn, and direct gas to base of fire, holding on to rubber-insulated tubing.

## WARNING

Do not grasp metal horn on top of cylinder. White discharge is "dry ice"; avoid frost bite.

(b) To shut off flow of gas, return horn to clip on side of cylinder. Extinguisher must be recharged after each use.

(2) Two carbon tetrachloride fire extinguishers are located one at the copilot's left, and one aft of the main entrance door.

(a) Stand as far as possible from the fire when using a carbon tetrachloride extinguisher; effective range is 20 to 30 feet.

(b) To operate, turn handle and pump plunger. Keep stream full and steady. To shut off, push handle in and turn until sealing plunger is depressed.



### WARNING

When sprayed on a fire, carbon tetrachloride produces phosgene, an extremely poisonous gas, which can be harmful even in small amounts; and if inhaled in excessive quantities may prove fatal. Do not use in a confined area and do not stand near fire. OPEN WINDOWS AND VENTILATORS immediately after fire is extinguished.

#### b. ENGINE FIRES DURING FLIGHT.

(1) If caused by fuel or oil leakage:

(a) Close fuel shut-off valve of engine affected.

(b) Feather propeller immediately. This stops the pumping of oil to the flames, and should be done before so much oil is lost that the propeller cannot be feathered and additional damage is caused by wind-milling.

(c) Slow the air speed as much as possible.

(d) Close the cowl flaps.

(e) Pull CO<sub>2</sub> charge (if available).

### CAUTION

Leave propeller feathered. Do not attempt to restart engine while hot.

(2) Fire in exhaust due to overrich mixture:

(a) Move mixture control to lean.

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

(c) Close cowl flaps.

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

(e) Pull CO<sub>2</sub> charge (if available).

#### 8. EMERGENCY BRAKE OPERATION.

The emergency system operates the brake only. Pressure is applied through two hand-operated metering valves on the pilots' compartment ceiling; the left lever controls the left wheel, and the right lever controls the right wheel. If it is impossible to rebuild the pressure in the service system, use of the following procedure is recommended:

a. Manual shut-off valve "CLOSED."

b. Selective check valve "NORMAL."

c. Check pressure in emergency accumulator: 650 to 800 pounds.

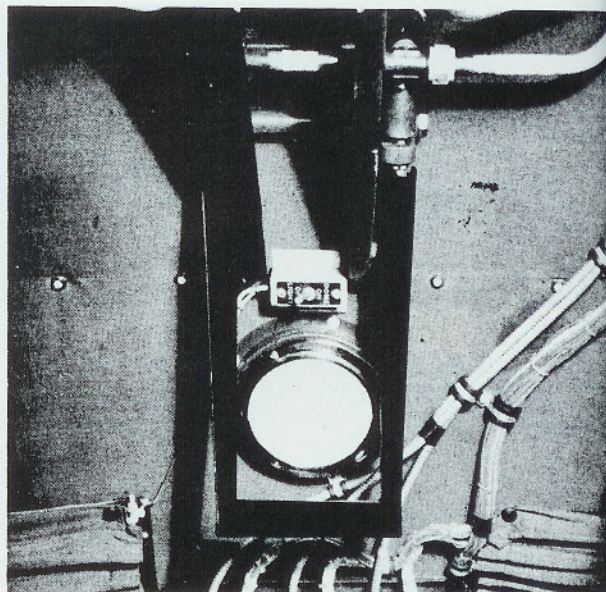


Figure 36 - Emergency Brake Handles

### CAUTION

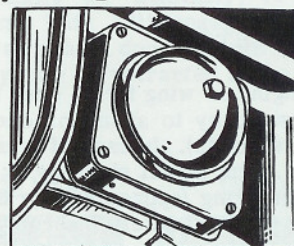
Do not attempt to raise the accumulator pressure with the hand pump.

d. Pilot: Operate throttle and rudder.

e. Copilot: Operate emergency brake control.

### WARNING

DO NOT "PUMP" EMERGENCY BRAKES. The pressure supply is limited and repeated applications may result in complete loss of emergency braking control.



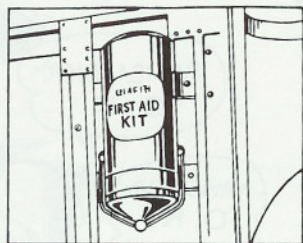
#### 9. WARNING SIGNALS.

The pilot can communicate with the crew by means of the interphone system, phone call lamps, and the alarm bell system. For emergency purposes, the alarm bell should be used according to prearranged signals which are thoroughly understood by the crew. A toggle switch on the pilot's electrical control panel operates three bells located, one under the navigator's table, one on the wall above the radio operator's table, and one in the tail compartment above the tail wheel boot.



## 10. FIRST-AID KITS.

First-aid kits are located 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.



## 11. ABANDONING AIRPLANE IN FLIGHT.

**a. ESCAPE DOORS AND HATCHES.** - All doors and hatches are quickly releasable. The side gunner's windows slide forward to open. Bomb doors may be opened by either of two emergency release handles, one at the left of the pilot and the other at the forward end of the catwalk in the bomb bay.

### b. SIGNAL.

(1) Stand by to abandon: one long ring (approximately 6 seconds).

(2) Abandon airplane: three short rings (approximately 2 seconds each).

**c. SWITCHES.** - The situation will determine whether fuel and electrical systems should be turned off prior to abandoning the airplane. Under normal conditions outside of combat zones, the master ignition switch battery switches and fuel shut-off valve switches should be turned off.

## 12. CRASH LANDING.

### a. SIGNAL.

(1) Stand by for crash landing; by interphone.

(2) Abandon: four short rings (approximately 1/2 second each).

(3) Pilot should:

- Cut engines.
- Turn master switch "OFF."
- Turn battery switches "OFF."
- Turn fuel shut-off valve switches "OFF."

### b. EGRESS.

(1) All crew members will take proper stations, remove parachutes, and fasten safety belts upon receiving interphone warning.

(2) At the signal to abandon, all crew members will leave the plane through the most practicable exit. (See figure 37.)

(3) In addition to the seven standard exits, the two side windows in the pilot's compartment are possible exits.

(4) In case some of the exits are blocked by fire, damage, or congestion, it may be best to make exit through a rupture in the fuselage, if any have occurred. Caution is required in this process to avoid fatal cuts from metal or broken glass.

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

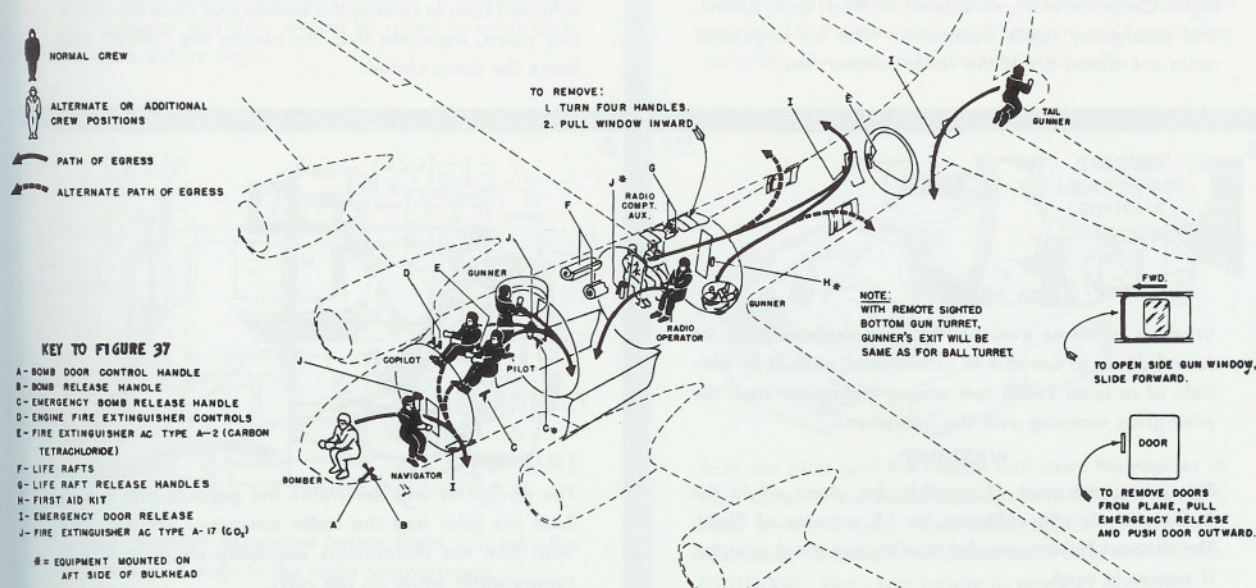
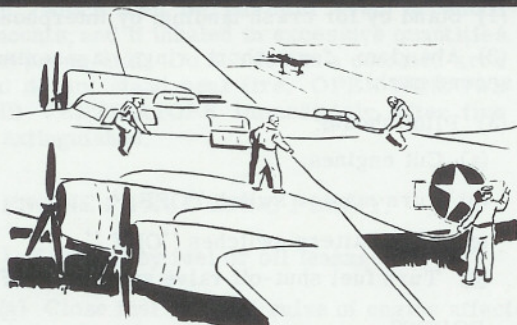


Figure 37 - Emergency Escape Routes



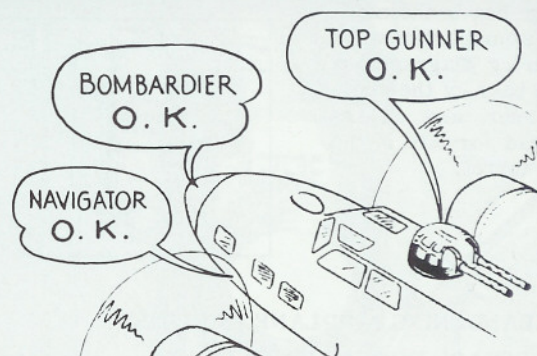
### 13. FORCED DESCENT AT SEA

1



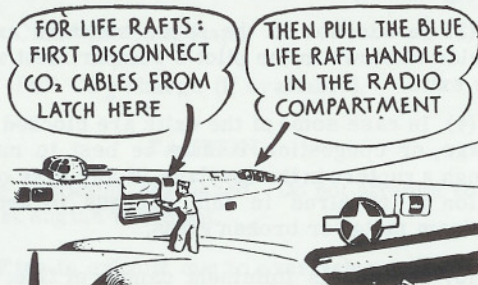
As complete evacuation of the airplane should not take over 30 seconds, preflight practice drills should be participated in by all crews who are to make a flight over water, or whose operations are generally over water.

4



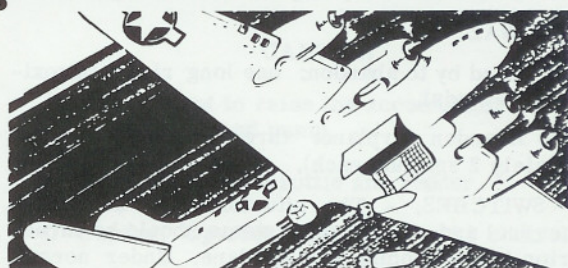
Each crew member will acknowledge the command over the interphone.

2



A complete and careful inspection of emergency equipment should be made before each long over water flight. Check life rafts, emergency kit bags (provisions), and emergency radio equipment. The kit bags and radio are stored aft of the radio compartment.

5



The bombardier after acknowledging the command, will jettison bombs, or bomb bay tanks if more than half full, and close the bomb bay doors. If there is not sufficient time to release the bombs and close the bomb bay doors, ascertain that the bombs are "SAFE" and leave the doors closed.

3

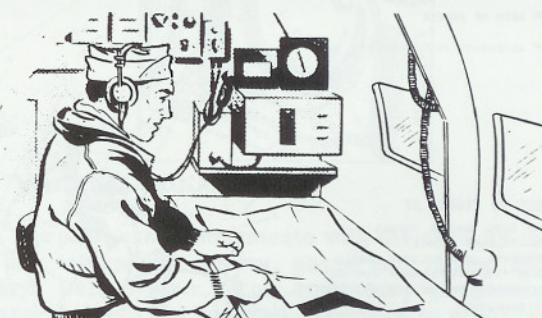


When it becomes evident that the airplane is to be forced down at sea due to lack of fuel, or that an altitude of at least 1,000 feet cannot be maintained, the pilot gives warning over the interphone.

#### WARNING!

This command must, if possible, be given while the fuel supply is still sufficient for 15 minutes of flight. The chances for a successful landing are much greater, if power is used.

6

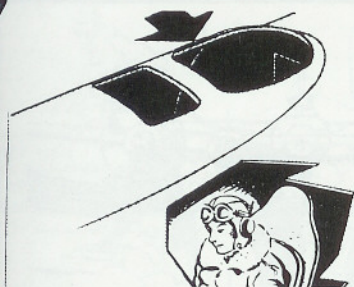


The navigator will determine the position and inform both the pilot and the radio operator. He will take with him the instruments necessary to make simple computation while on life rafts.



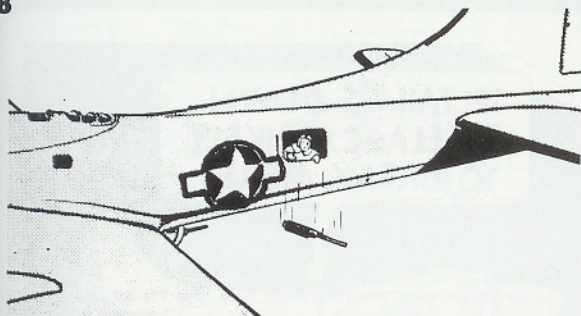
## FORCED DESCENT AT SEA

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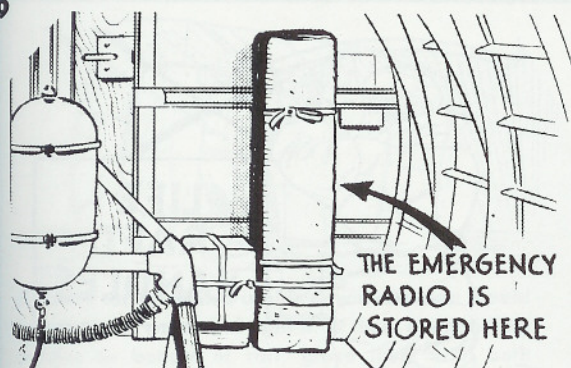
The radio operator will jettison the hatch cover. Then, when directed by the pilot, he will send an appropriate distress signal and position. After completing this duty, he will bring the emergency radio set into the radio compartment.

8



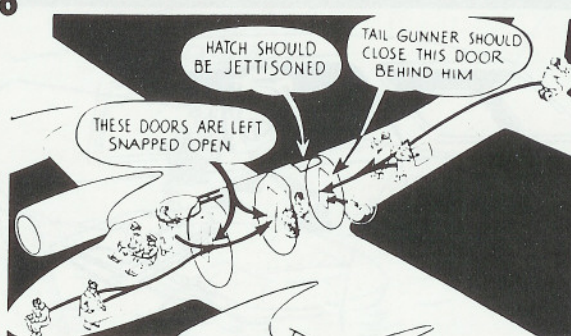
The side gunners will jettison the side guns as they make very dangerous battering rams. If there are no side gunners, this duty should be given to other crew members before flight.

9



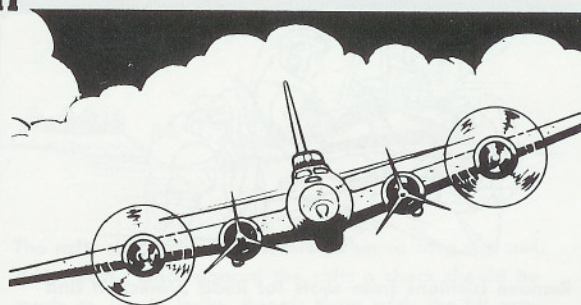
A crew member appointed before flight will take the emergency kit bags to the radio compartment.

10



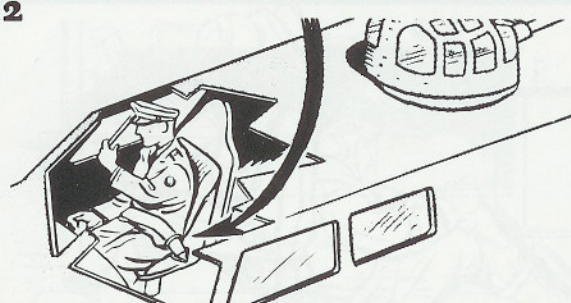
After completing his individual duties, each member goes to the radio compartment which is the crash station for all but the pilot and copilot.

11



The pilot will direct the copilot to cut the two inboard engines, if the two outboard engines are functioning satisfactorily, and to feather their propellers.

12

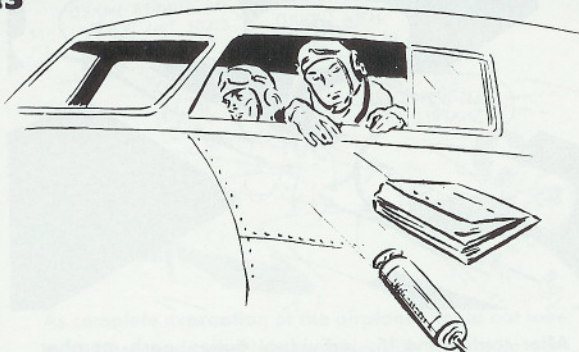


Both the pilot and the copilot will strap themselves in their seats. If the side windows are to be used as exits, slide windows open, then close, insuring freedom of operation. Leave them closed until after the impact. **CAUTION!** Place axe handy in event of jamming.



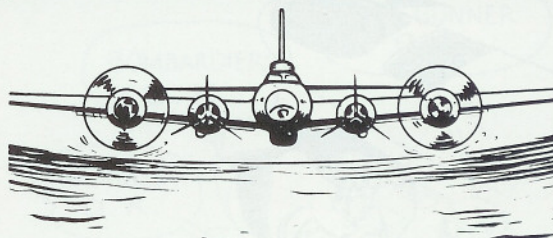
## FORCED DESCENT AT SEA

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Be sure all emergency equipment is in the radio compartment. Throw overboard any equipment that might come loose.

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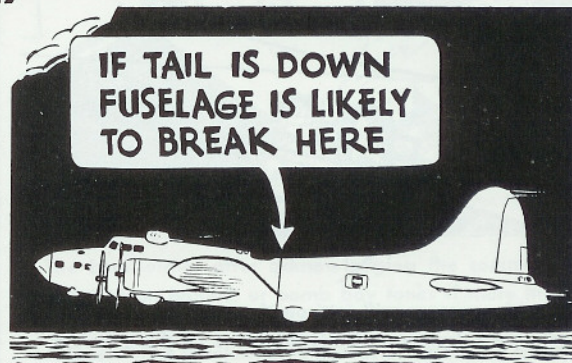
The pilot should attempt to set the airplane down in a trough, which is usually cross wind. The two out-board engines are used for control and to flatten the approach. The landing gear should be up, the flaps lowered medium, and the ignition switches cut a foot or so above the water.

14



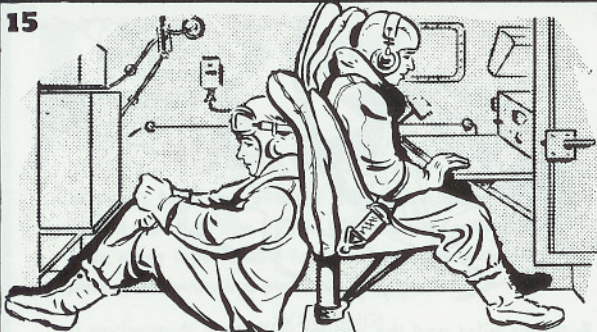
Remove cushions from seats for head protection and take crash positions. Do not take a position in the center of the compartment as ball turret upper structure makes this unsafe. Brace head against solid structure, if possible. Do not leave these positions until plane has come to rest as there will probably be more than one shock.

17



The water should be touched at about 90 mph. Come in as level as possible.

15



All members should have life vests on, parachutes removed, and should have on all extra clothing to be worn on rafts. At night, turn off all bright internal lights and use only the amber lamps.

18



As soon as the airplane has come to rest the predesignated member will pull the life raft handles.



#### 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, and is provided for operation anywhere away from the airplane. It is primarily designed for use in a small boat or life raft, but it may be placed in operation anywhere a kite can be flown or where water may be found.

(b) When operated, the transmitter emits an MCW signal and is pretuned to the international distress frequency of 500 kilocycles. Automatic transmission of a predetermined signal is provided. Any searching party can "home" on the signal with the aid of a radio compass.

(c) No receiver is provided.

###### (2) REMOVAL FROM AIRPLANE.

(a) If the airplane has made an emergency landing on water, the emergency set should be removed at the same time that the life raft is removed. The set is waterproof and will float, and it is not necessary to take any precautions in keeping the equipment out of the water; however, be sure that it does not float out of reach.

(b) The emergency set may be dropped from the airplane by use of the parachute attached. The altitude of the airplane when dropping the equipment should be between 300 and 500 feet. To drop the equipment, the following steps should be observed:

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

##### CAUTION

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

2. Throw the emergency set out through a convenient opening in the airplane. Parachute will be opened by the static line.

##### CAUTION

Do not attach static line to any part of one's clothing or body when throwing the equipment through the opening.

(3) OPERATION. - Complete operating instructions are contained in one of the bags which contain the equipment. Complete instructions for the use of the transmitter are also located on the transmitter itself.

b. INTERPHONE EQUIPMENT FAILURE. - In the event of interphone equipment failure, the audio frequency section of the command transmitter may be substituted for the regular interphone amplifier. To make this connection, the pilot should place his command transmitter control box channel selector switch in either channel No. 3 or 4 position. Set the interphone jack-box selector switch on the "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.



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#### NOTE

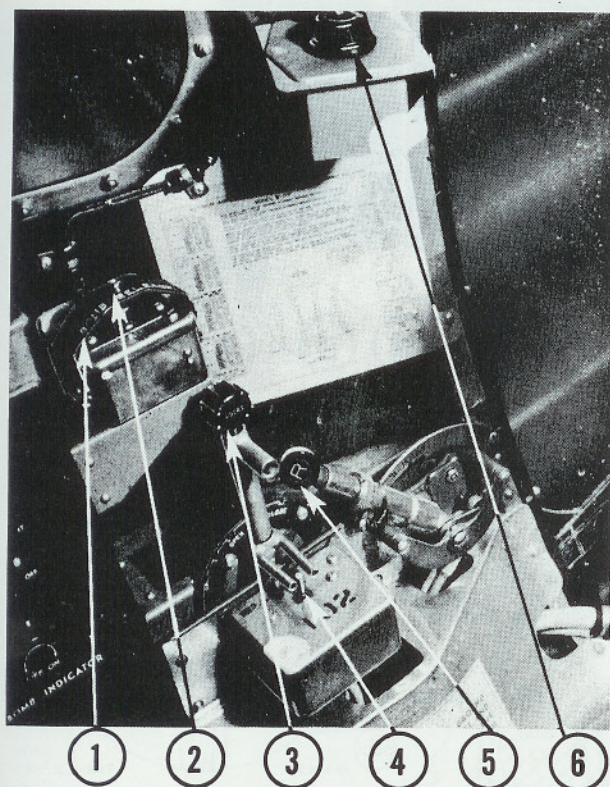
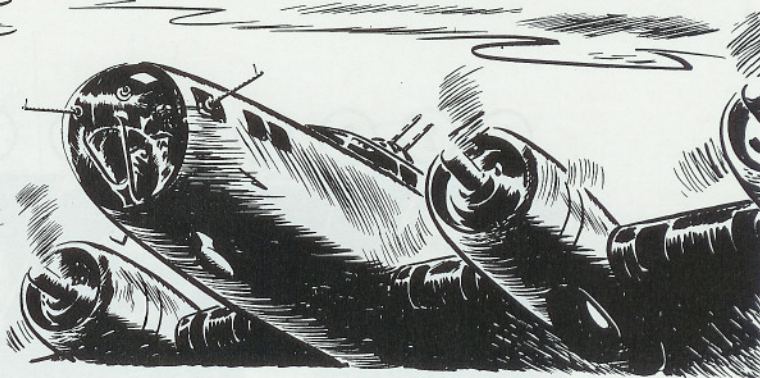
When substituting one receiver for another, such as the compass receiver for the command receiver, the pilot must move his interphone selector switch to the "COMMAND" or "LIAISON" position, as the case may be, in order to transmit. At the end of the transmission, he must switch back to the position of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







## SECTION IV BOMBARDIER'S COMPARTMENT



KEY TO FIGURE 38

1. BOMB RELEASE SWITCH GUARD
2. BOMB RELEASE SWITCH
3. BOMB DOOR CONTROL HANDLE
4. BOMB DOOR SWITCH
5. BOMB RELEASE HANDLE
6. BOMBARDIER'S LIGHT SWITCH

Figure 38 - Bomb Controls

### 1. BOMB CONTROLS.

a. Bombs are normally released electrically, but can be released mechanically in an emergency. Electrical control provides for individual release of bombs either singly (selective) or continuously at predetermined intervals (train). Mechanical control is always in "SALVO," by operation of the bombardier's release handle or by operation of the emergency release handles. The bomb release handle has three positions.

(1) In the "LOCK" position the bomb racks are locked against any release of bombs except by means of the emergency release handles.

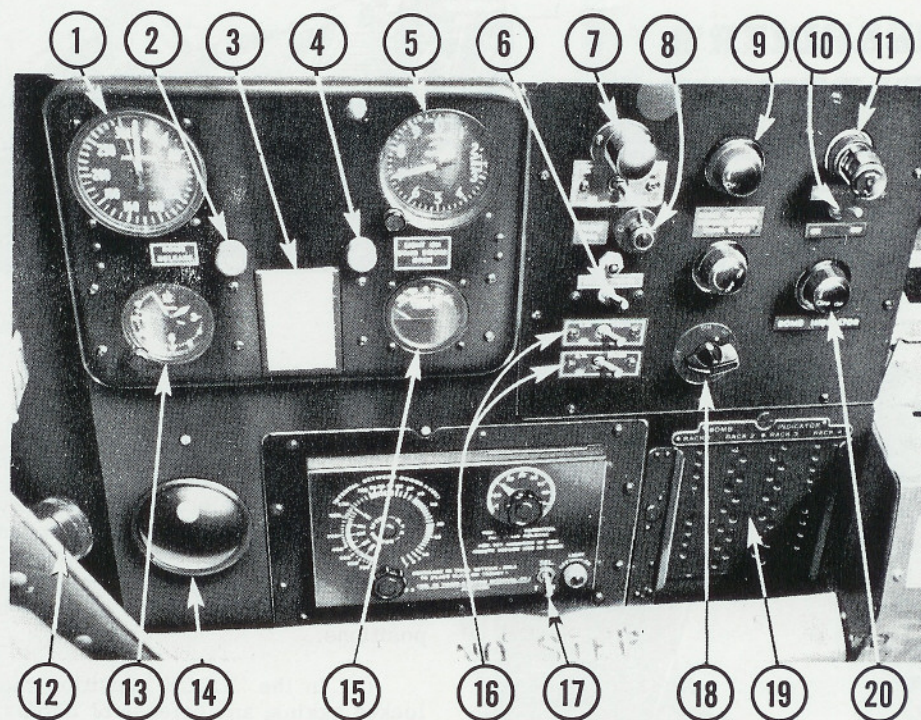
(2) In the "SELECTIVE" position the bomb racks are prepared for electrical release by manual operation of the release switch, or by automatic operation through the bomb sight.

(3) The "SALVO" position, when the bomb doors are open, mechanically releases all bombs simultaneously and unarmed.

b. The bombardier's release switch, mounted 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.

c. The interval release control unit is mounted at the bottom of the bombardier's control panel and may be set to provide either "SELECT" or "TRAIN" release. On airplanes serial Nos. 42-5050 and on, 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 40. Any rack or combination of racks may be eliminated from the release sequence by turning off





KEY TO FIGURE 39

- |                               |                            |                                 |   |
|-------------------------------|----------------------------|---------------------------------|---|
| 1. AIR SPEED INDICATOR        | 6. PILOT CALL SWITCH       | 12. ULTRA-VIOLET SPOT LIGHT     | 17. BOMB INTERVAL SWITCH                  |
| 2. BOMB RELEASE WARNING LAMP  | 7. PANEL LIGHT             | 13. CLOCK                       | 18. ULTRA-VIOLET SPOTLIGHT CONTROL SWITCH |
| 3. ALTIMETER SCALE ERROR CARD | 8. PHONE CALL LAMP         | 14. ASH RECEIVER                | 19. BOMB INDICATOR                        |
| 4. BOMB DOOR WARNING LAMP     | 9. WARNING LAMP RHEOSTAT   | 15. FREE AIR THERMOMETER        | 20. BOMB INDICATOR CONTROL KNOB           |
| 5. ALTIMETER                  | 10. EXTENSION LIGHT SWITCH | 16. BOMB RACK SELECTOR SWITCHES |   |
|                               | 11. EXTENSION LIGHT        |                                 |   |

Figure 39 - Bombardier's Control Panel

the respective selector switch on the bombardier's control panel.

d. A bomb arming solenoid in each external rack is controlled by a switch on the bombardier's panel. A red indicator lamp beside the switch is on when the bombs are armed.

#### NOTE

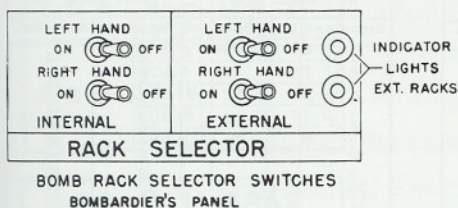
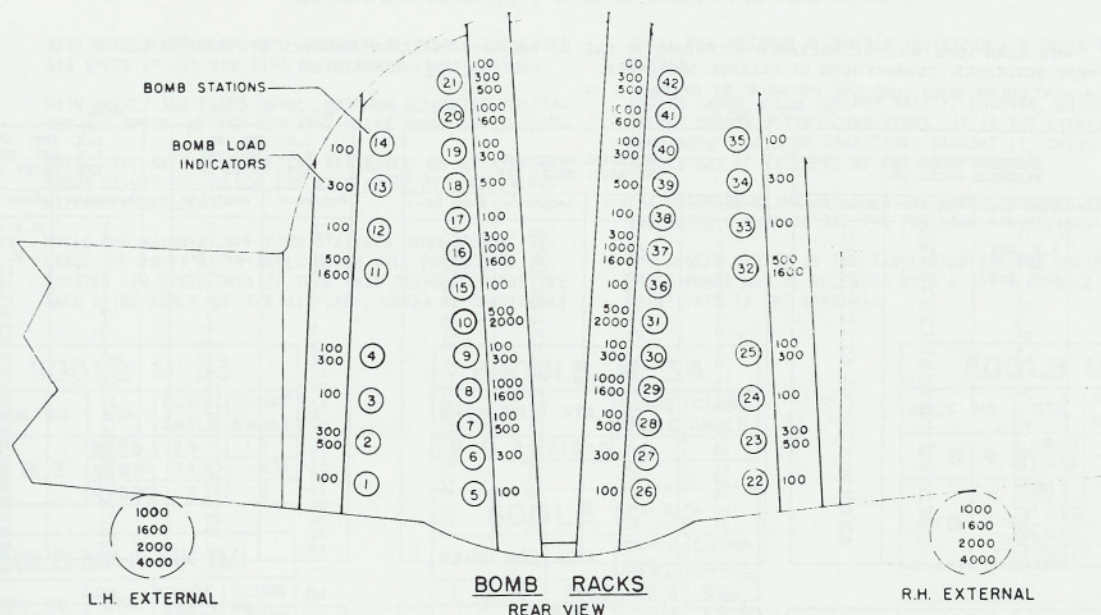
Some B-17F airplanes not equipped for external racks have only two rack selector switches and no bomb arming switch on the bombardier's panel. A few airplanes have no rack selector switches on the bombardier's panel but have a three-position switch in the bomb bay to turn off either internal rack.

e. The bomb door control handle is at the left of the bombardier, forward of the control panel, and operates a double-throw toggle switch controlling the solenoid switches for the bomb door retracting motor. A lug on the side of the handle is located so that when the door handle is in the "CLOSED" position, the bomb release lever cannot be moved out of the "LOCK" position.

#### 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.



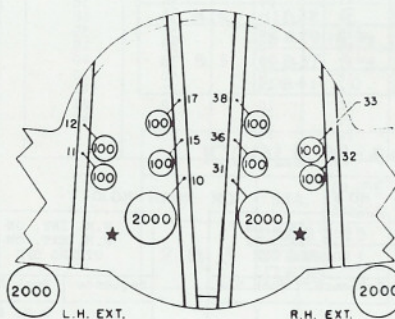
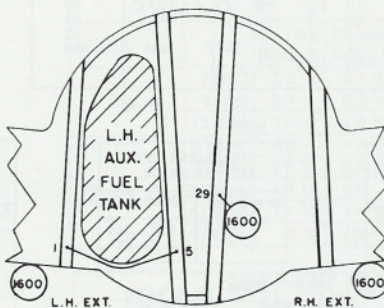
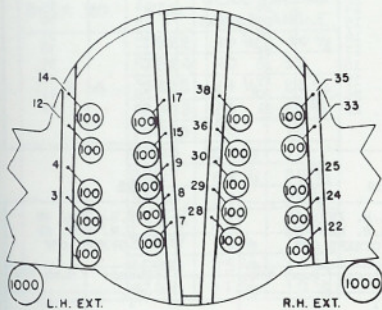


**NOTE:** ANY UNLOADED OR UNCOCKED STATION WILL BE AUTOMATICALLY SKIPPED IN THE RELEASE SEQUENCE AND THE REMAINING STATIONS RELEASED ACCORDING TO THE NORMAL SEQUENCE.

BOMB BAY DOORS MUST BE OPEN TO DROP ANY BOMBS.

**CAUTION:** CLOSING THE BOMB DOORS, RETURNING THE BOMB RELEASE LEVER TO LOCK, OR TURNING OFF ANY RACK SELECTOR SWITCH MAY CAUSE THE RELEASE SEQUENCE TO RESUME AT SOME STATION OTHER THAN THE NEXT IN THE NORMAL SEQUENCE DUE TO THE ACTION OF THE RACK SELECTOR RELAYS.

### EXAMPLES



NO. 1

INTERNAL RACKS ON EXTERNAL RACKS ON			
SEQ.	STA.	SEQ.	STA.
1	1	12	29
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	7	20	36
10	28	21	17
11	8	22	38

NO. 4

L.H. INT. OFF	
R.H. INT. ON	
EXT. RACKS ON	
SEQ.	STA.
1	R.H. EXT.
2	L.H. EXT.
3	29

NO. II

INT. RACKS OFF EXT. RACKS ON	
SEQ.	STA.
1	R.H. EXT.
2	L.H. EXT.

II RELEASE TWO 2000LB BOMBS SELECT OR TRAIN OF 2.

★ LARGE TYPE D-6 SHACKLE MUST BE REMOVED BEFORE RELEASING BOMBS ABOVE.

NO. 2

INT. RACKS ON EXT. RACKS OFF	
SEQ.	STA.
1	11
2	32
3	12
4	33
5	15
6	36
7	17
8	38

Figure 40 - Bomb Release Sequence Diagram (Sheet 1)



ANY BOMB LOAD WILL BE RELEASED ACCORDING TO ONE OF THESE SEQUENCES. COMBINATIONS OF RELEASE SEQUENCES FOR A PARTICULAR BOMB LOAD ARE POSSIBLE BY OPERATION OF

THE RACK SELECTOR SWITCHES BETWEEN "STICKS." (SEE CAUTION ON SHEET NO.1)

NO.1				NO.2				NO.3		NO.4	
INTERNAL RACKS ON EXTERNAL RACKS ON				INTERNAL RACKS ON EXTERNAL RACKS OFF				L.H. INT. ON R.H. INT. OFF EXT. RACKS ON		L.H. INT. OFF R.H. INT. ON EXT. RACKS ON	
Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.
1	1	23	11	1	1	22	32	1	1	1	R.H. Ext.
2	R.H. Ext.	24	32	2	22	23	12	2	R.H. Ext.	2	22
3	22	25	12	3	2	24	33	3	L.H. Ext.	3	L.H. Ext.
4	L.H. Ext.	26	33	4	23	25	13	4	2	4	23
5	2	27	13	5	3	26	34	5	3	5	24
6	23	28	34	6	24	27	14	6	4	6	25
7	2	29	14	7	4	28	35	7	5	7	26
8	24	30	35	8	25	29	15	8	6	8	27
9	4	31	15	9	5	30	36	9	7	9	28
10	25	32	36	10	26	31	16	10	8	10	29
11	5	33	16	11	6	32	37	11	9	11	30
12	26	34	37	12	27	33	17	12	10	12	31
13	6	35	17	13	7	34	38	13	11	13	32
14	27	36	38	14	28	35	18	14	12	14	33
15	7	37	18	15	8	36	39	15	13	15	34
16	28	38	39	16	29	37	40	16	14	16	35
17	8	39	19	17	30	38	41	17	15	17	36
18	29	40	20	18	31	39	42	18	16	18	37
19	9	41	21	19	10	40	41	19	17	19	38
20	30	42	41	20	31	41	21	20	18	20	39
21	10	43	21	21	11	42	42	21	19	21	40
22	31	44	42					22	20	22	41
								23	21	23	42

NO.5				NO.6				NO.7		NO.8	
BOTH INTERNAL RACKS ON L.H. EXT. RACK OFF R.H. EXT. RACK ON				BOTH INTERNAL RACKS ON L.H. EXT. RACK ON R.H. EXT. RACK OFF				L.H. INT. ON R.H. INT. OFF EXT. RACKS OFF		L.H. INT. OFF R.H. INT. ON EXT. RACKS OFF	
Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.
1	1	23	32	1	1	23	32	1	1	1	22
2	R.H. Ext.	24	12	2	22	24	12	2	2	2	23
3	22	25	33	3	L.H. Ext.	25	33	3	3	3	24
4	2	26	13	4	2	26	13	4	4	4	25
5	23	27	34	5	23	27	14	5	5	5	26
6	3	28	14	6	3	28	14	6	6	6	27
7	24	29	35	7	24	29	35	7	7	7	28
8	4	30	15	8	4	30	15	8	8	8	29
9	25	31	36	9	25	31	36	9	9	9	30
10	5	32	16	10	5	32	16	10	10	10	31
11	26	33	37	11	26	33	37	11	11	11	32
12	6	34	17	12	6	34	17	12	12	12	33
13	27	35	38	13	27	35	38	13	13	13	34
14	7	36	18	14	28	36	18	14	14	14	35
15	28	37	39	15	28	37	39	15	15	15	36
16	8	38	19	16	29	38	40	16	16	16	37
17	29	39	20	17	30	39	41	17	17	17	38
18	9	40	21	18	31	40	21	18	18	18	39
19	30	41	41	19	30	41	41	19	19	19	40
20	10	42	21	20	10	42	21	20	20	20	41
21	31	43	42	21	31	43	42	21	21	21	42
22	11			22	11						

NO.9		NO.10		NO.11		NO.14		NO.15	
L.H. INT. ON L.H. EXT. ON OTHERS OFF		R.H. INT. ON R.H. EXT. ON OTHERS OFF		INT. RACKS OFF EXT. RACKS ON		L.H. INT. ON R.H. EXT. ON OTHERS OFF		R.H. INT. ON L.H. EXT. ON OTHERS OFF	
Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.	Sequence	Bomb Sta.
1	1	1	R.H. Ext.	1	R.H. Ext.	1	1	1	22
2	L.H. Ext.	2	22	2	L.H. Ext.	2	R.H. Ext.	2	L.H. Ext.
3	2	3	23			3	2	3	23
4	3	4	24	NO.12		4	3	4	24
5	4	5	25	INT. RACKS OFF L.H. EXT. ON R.H. EXT. OFF		5	4	5	25
6	5	6	26	Sequence Bomb Sta.		6	5	6	26
7	6	7	27	1 L.H. Ext.		7	6	7	27
8	7	8	28	NO.13		8	7	8	28
9	8	9	29	INT. RACKS OFF L.H. EXT. OFF R.H. EXT. ON		9	8	9	29
10	9	10	30	Sequence Bomb Sta.		10	9	10	30
11	10	11	31	1 R.H. Ext.		11	10	11	31
12	11	12	32			12	11	12	32
13	12	13	33			13	12	13	33
14	13	14	34			14	13	14	34
15	14	15	35			15	14	15	35
16	15	16	36			16	15	16	36
17	16	17	37			17	16	17	37
18	17	18	38			18	17	18	38
19	18	19	39			19	18	19	39
20	19	20	40			20	19	20	40
21	20	21	41			21	20	21	41
22	21	22	42			22	21	22	42

Figure 40 - Bomb Release Sequence Diagram (Sheet 2)



# MAXIMUM AIRPLANE GLIDE & CLIMB ANGLES FOR BOMB RELEASE

WITH WHEELS AND FLAPS UP: MAXIMUM ALLOWABLE INDICATED AIR SPEED 1° 270 MPH SAFE GLIDE ANGLE IS 15-1/4°.

WITH WHEELS AND FLAPS DOWN: MAXIMUM ALLOWABLE INDICATED AIR SPEED IS 147 MPH 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 WIND-MILLING 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 IN THE AIRPLANE COMMANDER'S OPINION 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.

1100LB. M-33			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 & 3	2988	26	15
	37816	11	6 1/2
	41820	5	2

300LB. MK.I- MK.IMI			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	2823	37	33 3/4
	4825	23 3/4	22
	13834	14 3/4	15
	2786	44 1/2	40
2 & 3	3089	27	25
	37816	17 1/4	16 1/4
	40819	11 1/2	11 1/4
	42821	8	8

100LB. M-38A2			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	1822	49 3/4	44 1/2
	3824	40	32
	4825	29 1/2	26 3/4
	12833	23	20 3/4
	14835	20	15
2 & 3	2685	57 1/2	52
	2887	44 1/4	39 3/4
	3089	33	29 1/2
	36815	25	22 1/2
	38817	19 3/4	18
	40819	15 1/2	14 1/4
	42821	11 1/2	10 1/2

100LB. M-30			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	1822	47 3/4	51
	3824	36 1/2	41
	4825	28 1/4	33 1/2
	12833	22	27 1/2
	14835	17 1/2	22 3/4
2 & 3	2685	56	57 1/2
	2887	42 1/2	46 1/2
	3089	31 1/2	36 1/2
	36815	23 3/4	29 1/4
	38817	19	24
	40819	15	20
	42821	11 1/4	15 3/4

2000LB. M-34			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 & 3	31810	0	0

600LB. M-32			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	2823	32 1/2	29
2 & 3	2887	34 1/2	29 1/2
	31810	18	17 1/2
	39818	10	10
	42821	5 1/2	6

600LB. MK.IMI-MK.IMII			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 & 3	2887	33	23
	31810	18	12 1/2
	39818	9 1/2	6 1/2
	42821	5	2 1/2

300LB. M-31			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	2823	38	38 1/2
	4825	24	26 1/2
	13834	16	18 3/4
2 & 3	2786	45	44 3/4
	3089	27 1/4	29 1/2
	37816	17 1/2	20
	40819	11 3/4	14 1/2
	42821	8 1/4	10 1/2

100LB. MK.I-MK.IMI MK.IMII			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	1822	46 1/4	45
	3824	34 1/2	34 3/4
	4825	26 1/4	27
	12833	20 1/2	21 1/2
	14835	16	16 3/4
2 & 3	2685	54 1/2	52 1/2
	2887	40 3/4	40 1/4
	3089	29 3/4	30
	36815	22	23
	38817	17 1/4	19 1/4
	40819	13 1/2	14 1/2
	42821	9 3/4	10 3/4

500LB. M-43			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	2823	33	33 1/4
	11832	17	19 1/4
2 & 3	2887	34 1/4	34
	31810	18 3/4	21
	39818	10	12 1/2
	42821	5 1/2	8

1100LB. MK. III			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 & 3	2988	23 1/2	9
	37816	10	1 1/2
	41820	4	0

1600 LB. AN-MKI			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	11832	7	1 1/2
2 & 3	8829	16 1/2	6 1/2
	16837	4 1/2	0
	20841	0	0

1000LB. M-44			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
2 & 3	2988	25	17
	37816	11	8
	41820	5	3

100LB. M-39			
RACK NO.	STA.	GLIDE ANGLE	CLIMB ANGLE
1 & 4	1822	46 1/4	45
	3824	34 1/2	34 3/4
	4825	26 1/4	27
	12833	20 1/2	21 1/2
	14835	16	16 3/4
2 & 3	2685	54 1/2	52 1/2
	2887	40 3/4	40 1/4
	3089	29 3/4	30
	36815	22	23
	38817	17 1/4	19 1/4
	40819	13 1/2	14 1/2
	42821	10	10 3/4

Figure 41 - Bomb Release Angles Chart



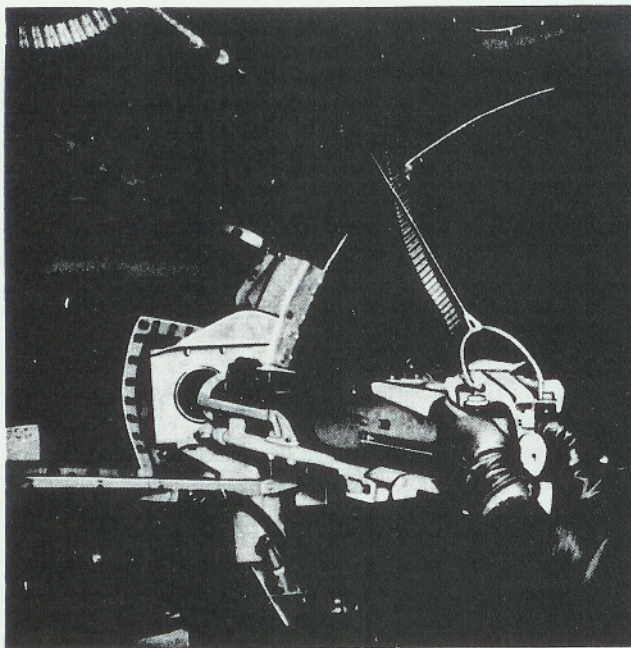


Figure 42 - Bombardier's Gun - Left Side

## 2. BOMBARDIER'S GUNS.

a. Most airplanes have two .50-caliber machine gun installations, one mounted through a window on either side of the bombardier's compartment. A .50-caliber gun is also mounted in the center Plexiglas nose of some airplanes. In some airplanes ball and socket mounts are incorporated in the nose, side, and top windows for insertion of a .30-caliber machine gun.

b. On B-17G airplanes a type A-16 chin turret with two .50 calibre machine guns is mounted below, and is remotely controlled from, the bombardier's compartment.

## 3. INTERPHONE.

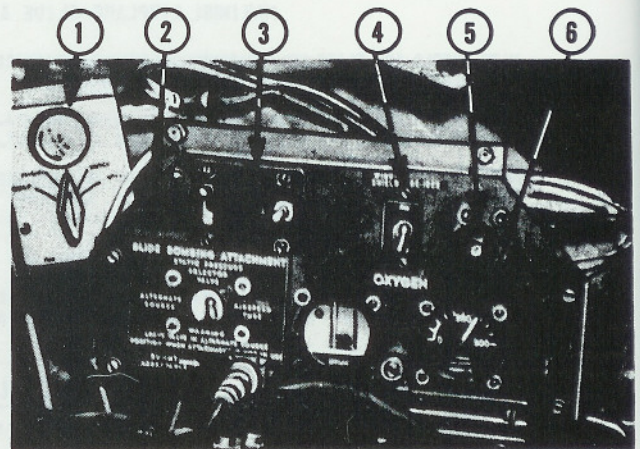
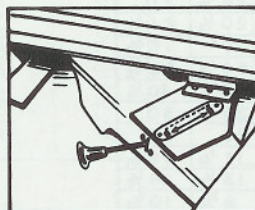
Two interphone jack boxes are on the right side of the compartment. Operating instructions are given in section I, paragraph 10.

## 4. OXYGEN.

The oxygen regulator and indicator panel are on the right wall of the compartment. Operating instructions are given in section I, paragraph 9.

## 5. BOMB-SIGHT WINDOW DEFROSTER.

A control knob in the floor in front of the bombardier's seat controls the flow of air to the bomb-sight window. Push forward to shut off the flow of air; pull aft to allow air to reach the bomb-sight window. Selection of hot and cold air is made by the pilot.



KEY TO FIGURE 43

- |   |                                     |
|---|-------------------------------------|
| 1. INTERPHONE JACKBOX                                       | 4. WINDSHIELD ANTI-ICER PUMP SWITCH |
| 2. GLIDE BOMBING ATTACHMENT STATIC PRESSURE SELECTOR SWITCH | 5. ANTI-ICER ALCOHOL FLOW VALVE     |
| 3. WINDSHIELD WIPER CONTROLS                                | 6. OXYGEN INDICATORS                |

Figure 43 - Bombardier's Compartment - Right Side

## 6. WINDSHIELD WIPER AND ANTI-ICER.

Anti-icer and wiper controls for the bomb-sight window are on a panel at the bombardier's right.

a. A toggle switch regulates the wiper motor "OFF," "SLOW," or "FAST." A circuit breaker protects the circuit in case of an overload.

b. An "ON-OFF" switch controls the alcohol and flow is regulated by a needle valve.

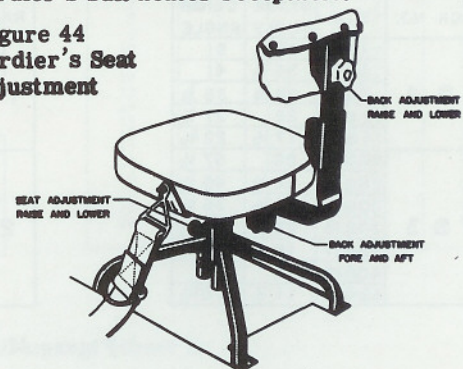
## CAUTION

Do not operate the wiper on dry glass.

## 7. BOMB-SIGHT HEATING PAD.

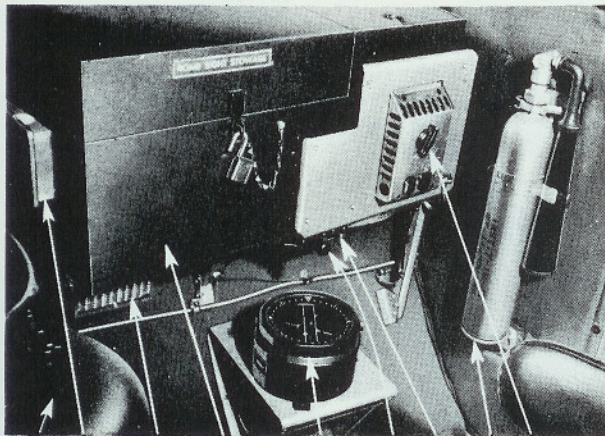
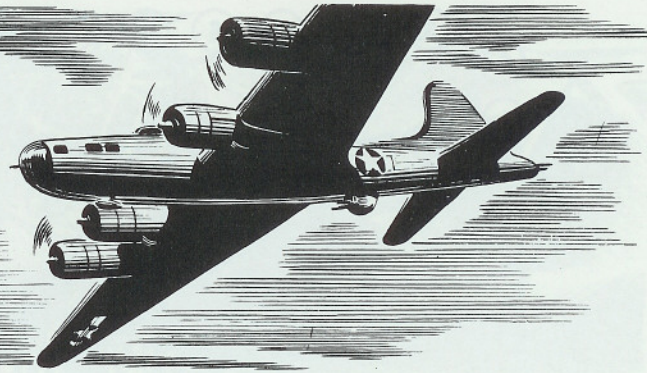
Most airplanes are equipped with an electrical bomb-sight heating pad which may be plugged into the bombardier's suit heater receptacle.

Figure 44  
Bombardier's Seat Adjustment





## SECTION V NAVIGATOR'S COMPARTMENT



KEY TO FIGURE 45

- |                                   |                       |
|-----------------------------------|-----------------------|
| 1. DRIFT METER                    | 5. APERIODIC COMPASS  |
| 2. FUSE BOX                       | 6. PANEL LIGHT        |
| 3. HEATING AND VENTILATING OUTLET | 7. PANEL LIGHT SWITCH |
| 4. BOMB SIGHT STOWAGE BOX         | 8. FIRE EXTINGUISHER  |
|                                   | 9. SUIT HEATER OUTLET |

Figure 45 - Navigator's Compartment  
Right Rear Corner

### 1. LIGHTING.

A dome light and switch are in the ceiling of the compartment. A panel light and switch are above the navigator's table on the aft wall. The navigator's light is on the wall directly over his table; the switch is on the base of the lamp.

### 2. FIRE EXTINGUISHER.

A hand CO<sub>2</sub> fire extinguisher is clipped to the aft wall of the compartment to the right of the door.

### 3. INTERPHONE.

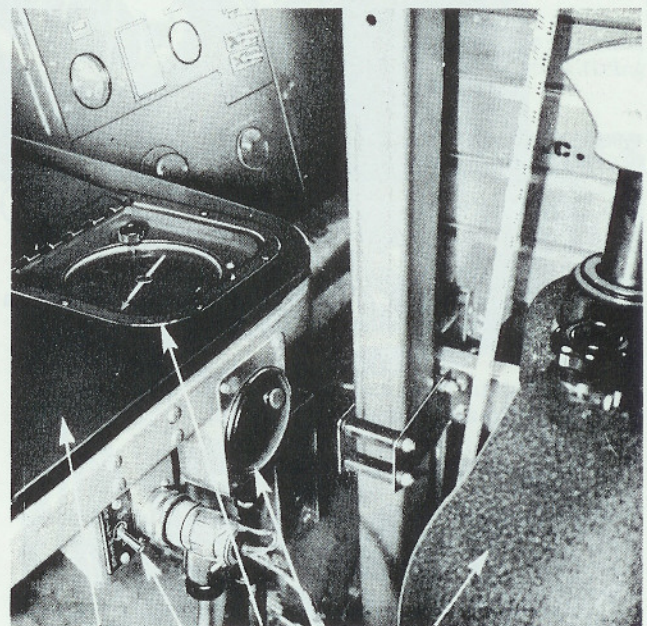
The interphone jack box is between the radio compass control box and the map case. Operating instructions are given in section I, paragraph 10.

### 4. OXYGEN.

The oxygen regulator is on the wall above the navigator's table. Refer to section I, paragraph 9.

### 5. HEATING AND VENTILATING INLET.

The inlet beneath the bomb-sight storage box is equipped with a push-pull knob for regulating the flow

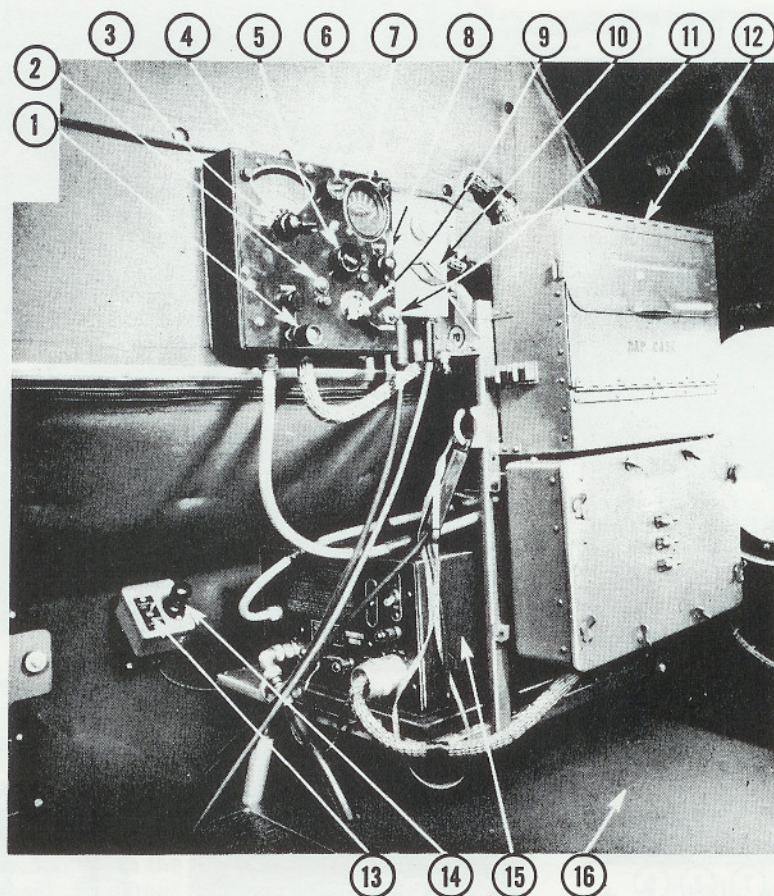


KEY TO FIGURE 46

- |                              |
|------------------------------|
| 1. NAVIGATOR'S TABLE         |
| 2. DRIFT METER MASTER SWITCH |
| 3. RADIO COMPASS INDICATOR   |
| 4. ASH RECEIVER              |
| 5. DRIFT METER               |

Figure 46 - Navigator's Equipment





KEY TO  
FIGURE 47

1. TUNING CRANK
2. CONTROL INDICATOR LAMP
3. BAND SELECTOR SWITCH
4. RADIO COMPASS CONTROL UNIT
5. VOLUME CONTROL
6. LIGHT CONTROL SWITCH
7. TUNING METER
8. LOOP CONTROL SWITCH
9. RADIO COMPASS POWER SWITCH
10. INTERPHONE JACKBOX
11. CONTROL PUSH BUTTON
12. MAP CASE
13. PANEL LIGHT SWITCH
14. PANEL LIGHT
15. RADIO COMPASS RECEIVER
16. NAVIGATOR'S TABLE

Figure 47 - Navigator's Communications Controls

of air. Push to open and pull to close. The selection of hot or cold air is made by the pilot.

#### 6. DRIFT METER MASTER SWITCH.

A master switch for the drift meter is below the edge of the navigator's table near the ash receiver on the front forward corner.

#### 7. RADIO COMPASS RECEIVER.

a. The radio compass receiver is above the navigator's table and may be remotely controlled either from the pilot's compartment ceiling or from the control unit on the navigator's table. Operation of the radio compass receiver is the same for the navigator as for the pilot. Refer to section II, paragraph 2.

b. The bearing indicator is mounted beneath the forward inboard corner of the navigator's table and its dial may be seen by lifting the cover on the table. The loop antenna is remotely controlled from the radio compass receiver.

#### 8. APERIODIC COMPASS.

The navigation compass is on the right side of the compartment, below the bomb-sight storage box.

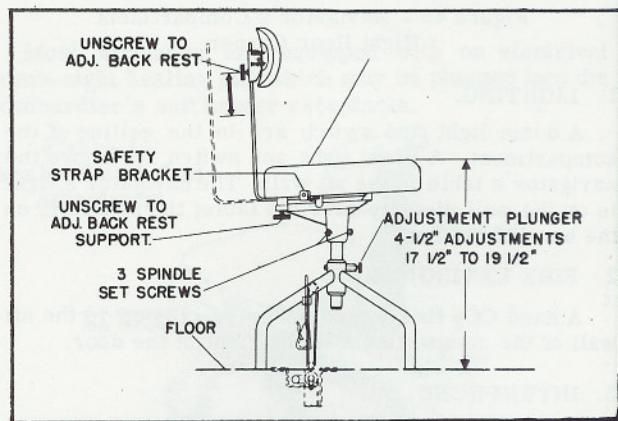
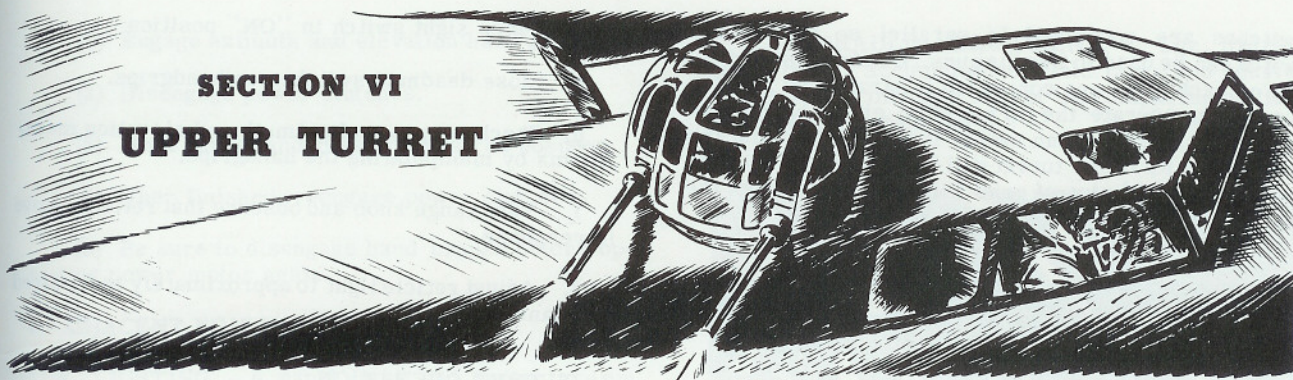


Figure 48 - Navigator's Seat Adjustment



## SECTION VI UPPER TURRET



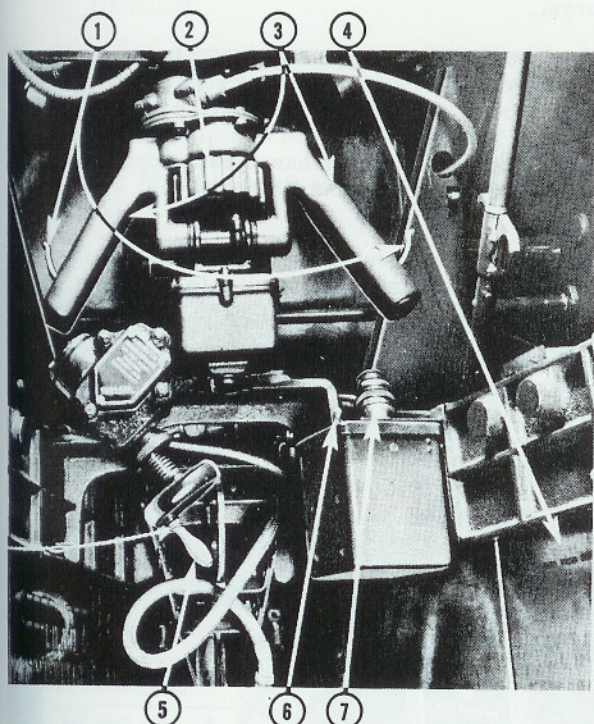
### 1. GENERAL.

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. Rotation of the turret is obtained by turning the handgrips about the vertical axis. The range knob is mounted between the grips, so that the gunner rests both thumbs on this knob while holding the grips in the palms of his hands. This knob sets the range in the computing sight.

c. The hydraulic power unit furnishes the mechanical power for rotating the turret and elevating the guns.

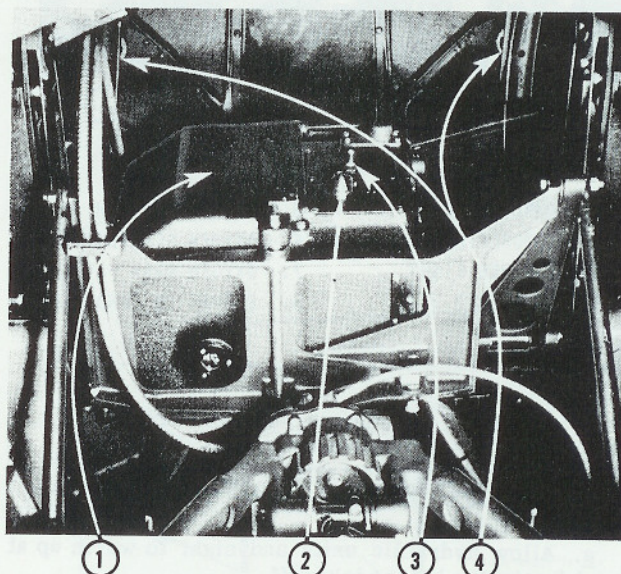
d. A gun firing switch is mounted to the rear and at the upper end of each handgrip. The two firing



KEY TO FIGURE 49

- |                   |                         |
|-------------------|-------------------------|
| 1. DEADMAN SWITCH | 5. AZIMUTH HANDCRANK    |
| 2. RANGE KNOB     | 6. TROUBLE LIGHT SWITCH |
| 3. HAND GRIP      | 7. TROUBLE LIGHT        |
| 4. AMMUNITION BOX |                         |

Figure 49 - Upper Turret Controls



KEY TO FIGURE 50

- |                                 |
|---------------------------------|
| 1. GUN SIGHT                    |
| 2. SIGHT LIGHT RHEOSTAT CONTROL |
| 3. SIGHT SWITCH                 |
| 4. GUN CHARGING HANDLES         |

Figure 50 - Inside Upper Turret