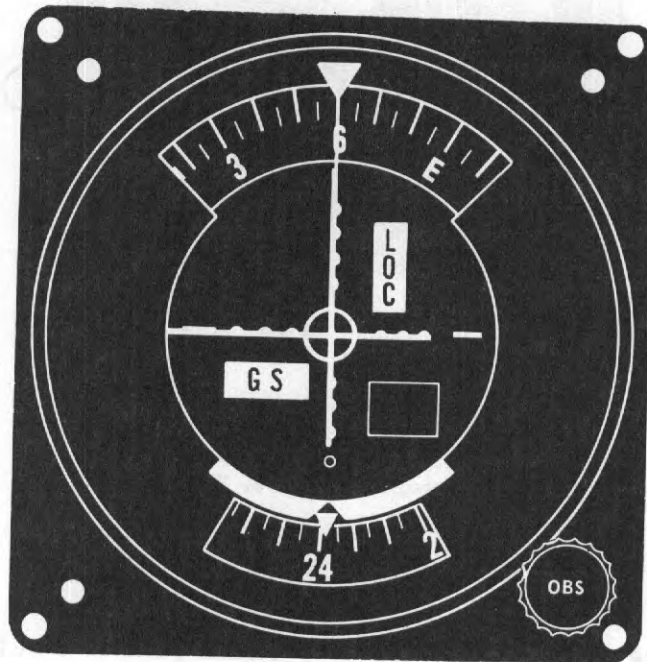


5-143. COURSE INDICATOR - ID-1347/ARN-82.

5-144. The course indicator (see figure 5-18) used with the AN/ARN-82 system is installed in the instrument panel. The purpose of the indicator is to present

a visual indication of deviation of the aircraft from a selected source. The data presented on the course indicator is from the ARN-82 or from the AN/ARC-54 FM Receiver when the mode selector switch is in the HOME position.



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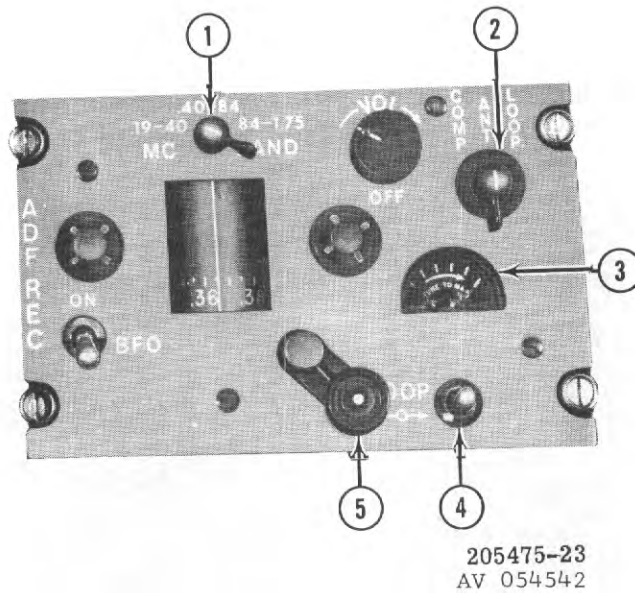
Figure 5-18. Course indicator ID-1347/ARN-82

5-145. DIRECTION FINDER CONTROL PANEL.

5-146. The direction finder control panel (see figure 5-19) is marked ADF REC. The control panel is lo-

cated in the pedestal and is used to control the AN/ARN-59 receiver. The controls and indicators located on the panel and their functions are as follows:

| CONTROL         | FUNCTION   |
|-----------------|--|
| MC BAND switch  | Selects the desired frequency band.  |
| VOL-OFF control | Turns direction finder set on or off and adjusts receiver audio volume.  |
| Function switch | COMP position - Receiver operates on combined loop and sense antennas as a radio compass.<br>ANT position - receiver operates with sense antenna. Loop position - receiver operates with loop antenna. |
| LOOP switch     | Positions the loop antenna when the function switch is in either COMP or LOOP position.  |
| Tuning crank    | Tunes the receiver to the frequency of the received signal.  |
| Tuning meter    | Facilitates accurate tuning of the receiver.   |
| BFO switch      | Turns BFO ON or OFF.   |



- 1. Band Switch
- 2. Function Switch
- 3. Tuning Meter
- 4. Loop Switch
- 5. Tuning Crank

Figure 5-19. ADF control panel

5-147. DIRECTION FINDER CONTROL PANEL - C-6899/ARN-83.

control panel is used to control the AN/ARN-83 receiver, and to select and control the loop antenna and sense antenna. The controls and indicators located on the panel and their functions are as follows:

5-148. The C-6899 control panel (see figure 5-20) is marked ADF, and is located in the pedestal. The

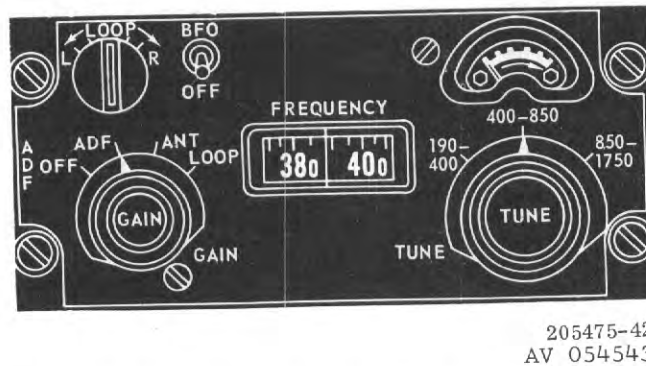


Figure 5-20. Direction finder control panel - C6899/ARN-83

CONTROL

FUNCTION

- Band selector switch
- TUNE control
- Tuning meter
- GAIN control

- Selects the desired frequency band.
- Selects the desired frequency.
- Facilitates accurate tuning of the receiver.
- Controls receiver audio volume.

CONTROL

FUNCTION

Mode selector switch

Turns set OFF and selects ADF, ANT and LOOP modes of operation.

LOOP L-R switch

Controls rotation of loop left or right.

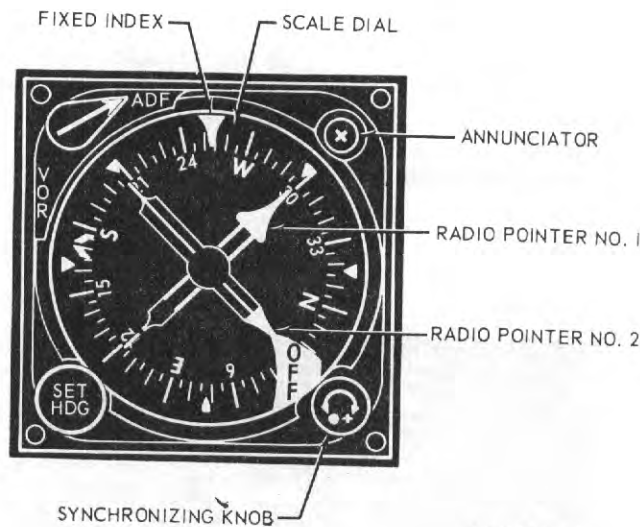
BFO switch

Turns BFO, on or off.

5-149. RADIO MAGNETIC INDICATOR (RMI).

5-150. The radio magnetic indicators are installed in the instrument panel (figure 5-21). The copilot's indicator (not shown) is a repeater type instrument similar to pilot's indicator except that it does not have a set heading knob, annunciator, VOR/ADF knob or a heading synchronization knob. The moving type

dials on both indicators display the gyro magnetic compass heading. The No. 1 (single bar) pointers display the radio magnetic bearing from the direction finder set. The No. 2 (double bar) pointers display the bearing of the station being received on the VHF navigation receiver. The controls located on the bearing-heading indicators and their functions are as follows:



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Figure 5-21. Radio magnetic indicator (RMI)

CONTROL

FUNCTION

Heading synchronization knob

Used to align the heading indicator with the J-2 compass system.

SET HDG Knob

This knob is marked SET HDG and is in the lower left corner of the indicator. Turning the knob drives a selector pointer around the heading dial as a heading reminder.

VOR-ADF knob

This switch is to be used when two VOR and one ADF units are installed. This installation has one VOR and one ADF unit and the VOR-ADF switch shall be set to ADF at all times. Setting switch to VOR will result in no display on pointer No. 1.

5-151. **MARKER BEACON CONTROLS.**

the instrument panel. The control and indicators and their functions are as follows:

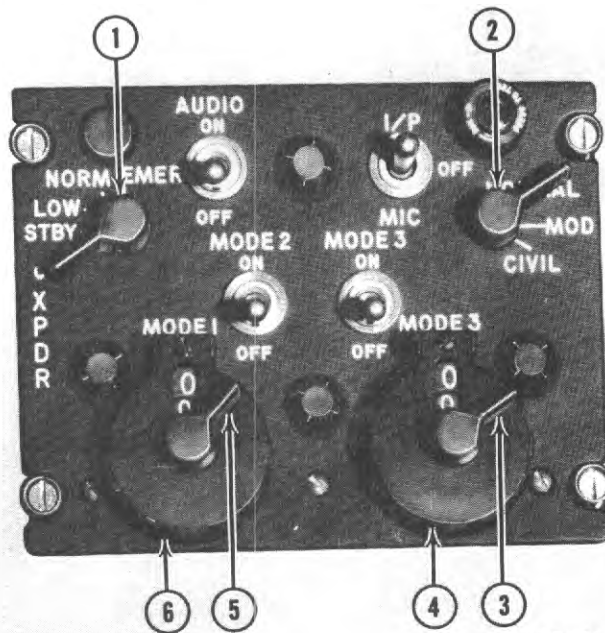
5-152. The marker beacon receiver controls (see figure 2-5) are located on the lower right section of

| CONTROL OR INDICATOR          | FUNCTION   |
|-------------------------------|--|
| VOLUME OFF-INCR control       | Turns set ON or OFF and adjusts volume.  |
| SENSING switch                | HIGH position - Increases sensitivity.   |
| Marker beacon indicator light | Flashes on and off when marker beacon receiver is operating and aircraft is passing over the ground transmitter. |

5-153. **TRANSPONDER CONTROL PANEL - AN/APX-44.**

of the AN/APX-44 transponder set. The controls and indicators on the panel and their functions are as follows:

5-154. The control panel (see figure 5-22) is installed on the pedestal and provides remote control



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1. Master Control
2. Function Control
3. Second Digit Selector
4. First Digit Selector
5. Second Digit Selector
6. First Digit Selector

Figure 5-22. Transponder control panel AN/APX-44

## CONTROL OR INDICATOR

## FUNCTION

|                     |  |
|---------------------|--|
| Master control      | <p>OFF position - Removes power from the equipment.</p> <p>STBY position - Places the set in standby or warmup condition.</p> <p>LOW position - Selects low receiver sensitivity.</p> <p>NORM position - Selects normal receiver sensitivity.</p> <p>EMER position - Places transmitter in condition for emergency automatic operation.</p>  |
| Function control    | <p>Selects operational mode as follows:</p> <p>NORMAL position - Permits transponder set to replay with normal pulse codes, representing modes 1, 2, and 3.</p> <p>MOD position - Permits transponder set to replay with SIF pulse codes, representing modes 1, 2, and 3.</p> <p>CIVIL position - Permits transponder set to reply with civil pulse codes, representing modes 1, 2, and 3.</p> |
| I/P switch          | <p>Enables I/P reply operation as follows:</p> <p>MIC position - Connects I/P energizing circuits to aircraft microphone key circuits and permits aural I/P for 30 seconds when speaking into the microphone.</p> <p>OFF position - Disconnects microphone keying and I/P initiating circuits. I/P position - when momentarily actuated initiates I/P operation for 30 seconds.</p>            |
| AUDIO switch        | <p>ON position - Permits monitoring transmitted reply pulses.</p>  |
| MODE 2 switch       | <p>Permits transponder set to provide mode 2 replies for mode 2 interrogations.</p>  |
| MODE 3 switch       | <p>Permits transponder set to provide mode 3 replies for mode 3 interrogations.</p>  |
| MODE 1 code control | <p>Selects and indicates the two-digit, mode 1 code number.</p> <p>First digit selector selects first digit of mode 1 code number.</p> <p>Second digit selector selects second digit of mode 1 code number.</p>  |
| MODE 3 code control | <p>Selects and indicates the two-digit, mode 3, code number.</p> <p>First digit selector selects the first digit of the mode 3 code number.</p> <p>Second digit selector selects second digit of mode 3 code number.</p>   |
| Emergency barrier   | <p>Prevents accidental placement of the master control to the EMER position.</p>   |

CONTROL OR INDICATOR

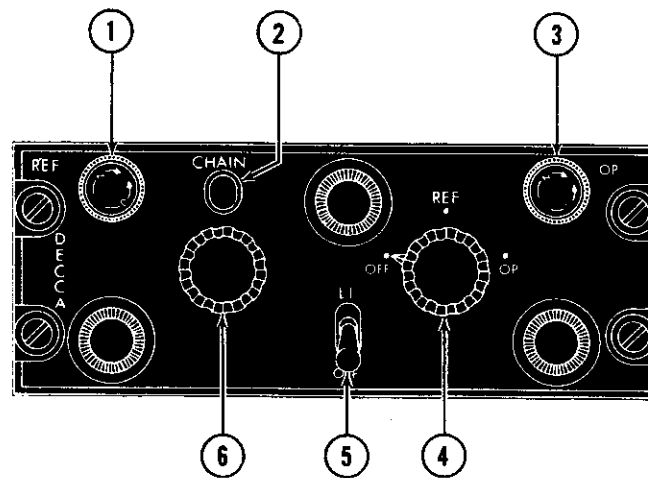
FUNCTION

|                   |  |
|-------------------|--|
| Pilot light       | Lights when power is applied to transponder.                             |
| Lens shutter      | Controls brilliance of pilot light.                                      |
| Test button       | Permits test of pilot light.   |
| Emergency barrier | Prevents accidental placement of master control switch to EMER position. |

5-155. RECEIVER CONTROL PANEL AN/ASN-72.

ASN-72 receiver. The controls and indicators on the panel and their functions are as follows:

5-156. The control panel (figure 5-23) is installed on the pedestal and provides remote control of the AN/



- 1. REF Lamp (Amber)
- 2. CHAIN Indicator
- 3. OP Lamp (Green)
- 4. OFF-REF-OP Switch
- 5. LI-OFF Switch
- 6. CHAIN Selector Switch

Figure 5-23. Receiver control panel AN/ASN-72

CONTROL OR INDICATOR

FUNCTION

|                       |   |
|-----------------------|---|
| Chain selector switch | Selects one of nine ground chain frequencies. The selected ground chain number is indicated in the small window above the switch knob.  |
| OFF-REF-OP switch     | Turns power on to receiver and selects two modes of operation.<br><br>OFF position - Turns receiver off.<br><br>REF position - Prepares receiver for reference checking.<br><br>OP position - Sets receiver to normal operating mode. |
| LI-OFF switch         | Applies power to lane identification indicator on each of the three decometers.   |

CONTROL OR INDICATOR

FUNCTION

LI position - Allows the lane identification indicator on the proper decimeter to light, during the lane identification periods.

OFF position - Removes power from the lane identification indicators on the decimeters.

REF lamp (amber)

Lights only when the OFF-REF-OP switch is set at REF position to indicate that receiver is in reference checking mode.

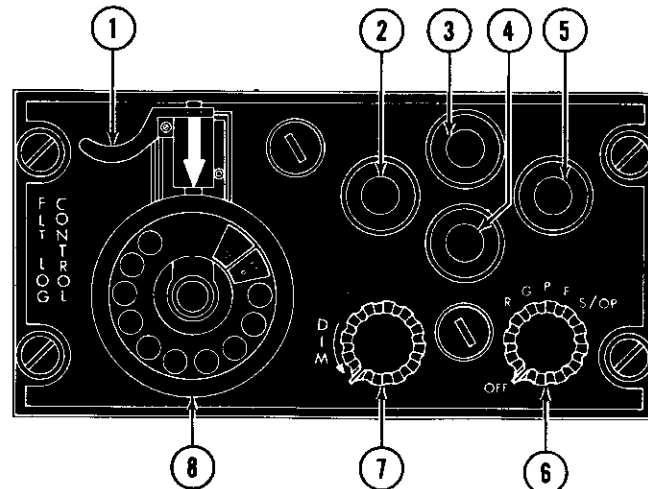
OP lamp (green)

Lights when the OFF-REF-OP switch is set at either REF or OP positions to indicate that receiver is turned on.

5-157. FLIGHT LOG CONTROL PANEL AN/ASN-72

AN/ASN-72 computer and flight log display. The controls and indicators on the panel and their functions are as follows:

5-158. The control panel (figure 5-24) is installed on the pedestal and provides remote control of the



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- 1. Turret Index Lever
- 2. W Push-Button Switch
- 3. N Push-Button Switch
- 4. S Push-Button Switch
- 5. E Push-Button Switch
- 6. Facility Switch
- 7. Dim Control
- 8. Turret Switch

Figure 5-24. Flight log control panel - AN/ASN-72

CONTROL OR INDICATOR

FUNCTION

Turret switch (with keys)

Programs the computer for proper display on the chart selected. Key faces appear as markings on the turret switch and depend on which keys are inserted in the turret. Each key is coded to a particular chart on the roll in use.

Turret switch lamp

Illuminates key markings on the turret switch. The lamp lights when the aircraft master switch applies power to the navigation set.

## CONTROL OR INDICATOR

## FUNCTION

Turret index lever

Locks turret switch in selected position. Lever must be depressed to rotate the switch. Arrow indicates the key selected.

DIM control

Turns on, and controls the intensity of the backlighting on the flight log display.

Facility switch

Turns power on to the computer and flight log display and prepares the two units for adjusting the chart on the flight log.

OFF position - Disconnects power from the computer and flight log display.

R position - Allows use of N and S pushbuttons to move flight log pen exactly one lane in the red pattern.

G position - Allows use of N and S pushbuttons to move flight log pen exactly one lane in the green pattern.

P position - Allows use of N and S pushbuttons to move flight log pen exactly one lane in the purple pattern.

**Note**

When the N and S pushbuttons are used to move the pen one lane, the pushbutton must be depressed until the pen has traversed more than half a lane. When the pushbutton is released, the pen will continue to move until it has taken up a position exactly one lane away from its original position. If the pushbutton is released before half a lane is traversed, the pen will move back to its original position.

F position - Allows use of the N and S pushbuttons to move the chart down and up, respectively, at a fast rate. The E and W pushbuttons will produce a slow movement of the pen to the right and left, respectively.

S/OP position - Allows normal operation of the computer and flight log. Pushbuttons remain operative for slow movement of chart and pen.

N, S, E, W pushbuttons

Control the movement of the chart and pen on the flight log as follows:

**Caution**

Do not depress the N and S pushbuttons at the same time.

N pushbutton - Produces a downward movement of the chart (corresponding to an upward or N movement of the pen). When the facility switch is set to its R, G, or P position, the N pushbutton will produce a pen movement of one lane in the selected color pattern, when the pushbutton is held, until more than one-half a lane is traversed and the pushbutton is released.



CONTROL OR INDICATOR

FUNCTION

S pushbutton - Produces an upward movement of the chart (corresponding to a downward or S movement of the pen). When the facility switch is set to its R, G, or P position, the S pushbutton will produce a pen movement of one lane in the selected color pattern, when the pushbutton is held, until more than one-half a lane is traversed and the pushbutton is released.

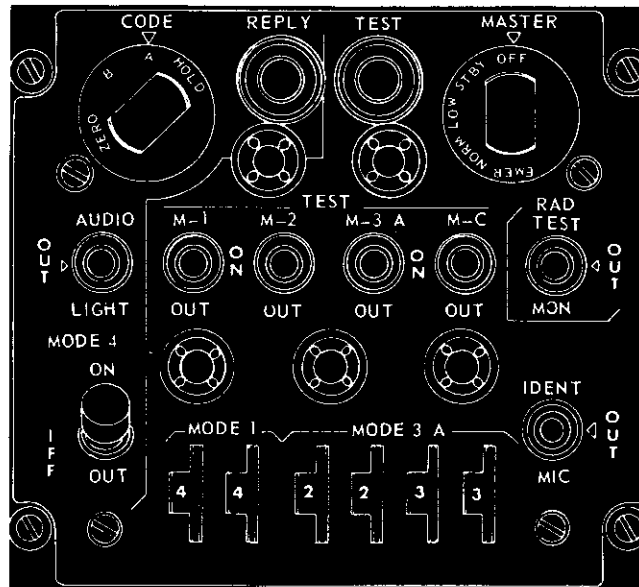
E pushbutton - Moves the flight log pen to the right.

W pushbutton - Moves the flight log pen to the left.

5-159. TRANSPONDER CONTROL PANEL.

Set (see figure 5-25). Mode 2 code select switch is on the front panel of the receiver-transmitter radio. The controls and indicators on the panel and their functions are as follows:

5-160. This control panel is located in the pedestal. It provides remote control of the APX-72 Transponder



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Figure 5-25. APX-72 transponder control panel

| CONTROL        | POSITION | FUNCTION   |
|----------------|----------|--|
| MASTER control | OFF      | Turns set off.   |
|                | STBD     | Places in warnup (standby) condition.  |
|                | LOW      | Applies power to operate set, but at reduced receiver sensitivity.   |
|                | NORM     | Applies power to operate set at normal receiver sensitivity.   |
|                | EMER     | Transmits emergency reply signals to mode 1, 2, or 3/A interrogations regardless of mode control settings. |

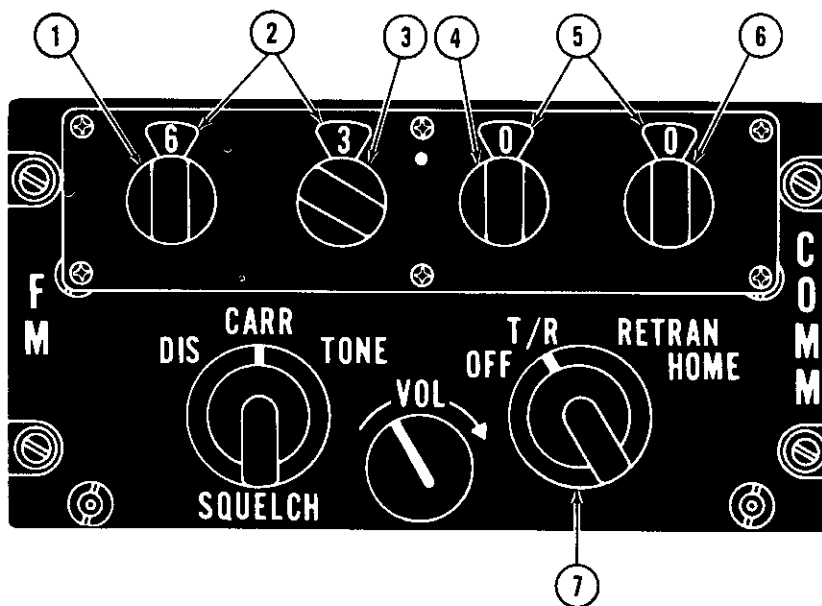
| CONTROL                       | POSITION | FUNCTION   |
|-------------------------------|----------|--|
| IDENT-MIC switch              | IDENT    | When momentarily actuated (switch has spring-loaded return) initiates identification of position reply for approximately 25 seconds. |
|                               | OUT      | Prevent triggering of identification of position reply.  |
|                               | MIC      | Not used.  |
| M-1 switch                    | ON       | Enables the set to reply to mode 1 interrogations.   |
|                               | OUT      | Disables the reply to mode 1 interrogations.   |
|                               | TEST     | Enables the TS-1843/APX to locally interrogate the set in mode 1.  |
| M-2 switch                    | ON       | Enables the set to reply to mode 2 interrogations.   |
|                               | OUT      | Disables the reply to mode 2 interrogations.   |
|                               | TEST     | Enables the TS-1843/APX to locally interrogate the set in mode 2.  |
| M-3/A switch                  | ON       | Enables the set to reply to mode 3/A interrogations.   |
|                               | OUT      | Disables the reply to mode 3/A interrogations.   |
|                               | TEST     | Enables the TS-1843/APX to locally interrogate the set in mode 3/A.  |
| MC switch                     | ON       | Non-functional   |
|                               | OUT      | Non-functional   |
|                               | TEST     | Non-functional   |
| MODE 1 code select switches   |          | Selects and indicates the mode 1 two-digit reply code number.  |
| MODE 3/A code select switches |          | Selects and indicates the mode 3/A four-digit reply code number.   |
| TEST indicator                |          | Lights when the set responds properly to a mode 1, 2, 3/A or C test, or when depressed.  |
| MODE 4 switch                 | ON       | Enables the set to reply to mode 4 interrogations.   |
|                               | OUT      | Disables the reply to mode 4 interrogations.   |
| CODE control                  |          | Functions of this switch are operationally classified.   |
| AUDIO-LIGHT switch            | AUDIO    | Enables aural and REPLY light monitoring of valid mode 4 interrogations and replies.   |
|                               | LIGHT    | Enables REPLY light only monitoring of valid mode 4 interrogations and replies.  |
|                               | OUT      | Disables aural and REPLY light monitoring of valid mode 4 interrogations and replies.  |
| REPLY indicator               |          | Lights when valid mode 4 replies are present, or when depressed.   |

| CONTROL             | POSITION | FUNCTION  |
|---------------------|----------|---|
| RAD TEST-MON switch | RAD TEST | Enables set to reply to TEST mode interrogations from an AN/APM-123A(V), or equivalent. Other functions of this switch position are classified. |
|                     | MON      | Enables the monitor circuits of the TS-1843/APX.  |
|                     | OUT      | Disables the RAD TEST and MON features of the control panel.  |

5-161. CONTROL PANEL C-7088/ARC-131.

in the pedestal. All electrical connections are made through a connector at the rear of the control panel. The controls located on the panel and their functions are as follows:

5-162. Control panel C-7088/ARC-131 (figure 5-26) is separately housed and contains all the controls for the radio set. The control panel is mounted



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1. Tens Megacycle Digit Frequency Selector</li> <li>2. Frequency Indicators</li> <li>3. Units Megacycle Digit Frequency Selector</li> </ul> | <ul style="list-style-type: none"> <li>4. Tenths Megacycle Digit Frequency Selector</li> <li>5. Frequency Indicators</li> <li>6. Hundredths Megacycle Digit Frequency Selector</li> <li>7. Mode Control Switch</li> </ul> |
|--|---|

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Figure 5-26. AN/ARC-131 radio set control panel

| CONTROL                                    | FUNCTION  |                 |                |     |                          |                        |
|--|---|-----------------|----------------|-----|--------------------------|------------------------|
| Mode control switch (four-position switch) | Applies power to the radio set and selects the mode of operation.   |                 |                |     |                          |                        |
|  | <table border="0"> <thead> <tr> <th>Switch position</th> <th>Operating mode</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>Turns off primary power.</td> </tr> <tr> <td>T/R (transmit/receive)</td> <td>Applies power. Radio set operates in normal communication mode (reception). (Aircraft transmit switch must be depressed to transmit.)</td> </tr> </tbody> </table> | Switch position | Operating mode | OFF | Turns off primary power. | T/R (transmit/receive) |
| Switch position                            | Operating mode  |                 |                |     |                          |                        |
| OFF  | Turns off primary power.  |                 |                |     |                          |                        |
| T/R (transmit/receive)                     | Applies power. Radio set operates in normal communication mode (reception). (Aircraft transmit switch must be depressed to transmit.)   |                 |                |     |                          |                        |

CONTROL

FUNCTION

**RETRAN**  
(retransmit) Applies power. Radio set operates as a two-way relay station. (Two radio sets are required.)

**HOME** Applies power. Radio set operates as a homing facility. (Requires a homing antenna and indicator.)

VOL control  
SQUELCH switch (three-position rotary switch)

Adjusts the audio output level of the radio set.

Selects the desired squelch mode as follows:

| Switch position | Operating mode   |
|-----------------|--|
| DIS (disable)   | Squelch circuits are disabled.   |
| CARR (carrier)  | Squelch circuits operate normally in presence of any carrier.  |
| TONE            | Squelch opens (unsquelches) only on selected signals (signals containing a 150-cps tone modulation). |

Tens megacycle frequency selector  
Units megacycle frequency selector

Selects the tens megacycle digit of the operating frequency.  
Selects the units megacycle digit of the operating frequency.

Tenths megacycle frequency selector

Selects the tenths megacycle digit of the operating frequency.

Hundredths megacycle frequency selector

Selects the hundredths megacycle digit of the operating frequency

Frequency indicator

Displays the operating frequency of the radio set.

**Section IV - Operating Procedures**

**5-163. AN/ARC-44 OPERATION.**

5-164. The ARC-44 may be operated in the following modes of operation: interphone system, FM liaison set, and FM homing. The different modes of operation and the starting and stopping procedures are presented in the following paragraphs.

**5-165. PRELIMINARY CHECK.**

5-166. Set the controls and switches on the SB/329-AR Signal Distribution Panel FM Control Panel and FM Switch Panel as follows:

- a. FM power switch - OFF.
- b. FM home switch - DOWN.
- c. TRANS selector switch - INT.
- d. REM-LOCAL switch - LOCAL.
- e. Frequency - Select.

**5-167. STARTING PROCEDURE.**

5-168. With controls set as outlined in the preliminary check, perform the starting procedure as follows:

- a. Battery switch - ON (OFF for APU).
- b. INT and FM circuit breakers - IN.
- c. ICS switch - UP (Allow three minute warm up).

**5-169. INTERPHONE OPERATION.**

- a. Microphone switch - PRESS.
- b. Speak into the microphone - Adjust interphone volume.

**5-170. FM RECEIVER-TRANSMITTER OPERATION.**

5-171. Refer to paragraph 5-167 for starting procedure and perform the following steps:

- a. RECEIVERS NO- 1 switch - UP.
- b. FM ON-OFF power switch - ON.

**Note**

Cycling may take place in the receiver-transmitter. This will be indicated by a 400-cycle-per-second signal heard in the headset.

- c. FM VOL control - As desired.
- d. TRANS selector switch - NO. 1 POSITION
- e. Microphone switch - Press.

**5-172. FM HOMING OPERATION.**

5-173. To operate the AN/ARC-44 for FM homing perform the following step:

FM HOME switch - UP.

**5-174. SHUT-DOWN PROCEDURE.**

5-175. To turn off the AN/ARC-44 equipment proceed as follows:

- a. FM HOME switch - DOWN.
- b. FM POWER switch - OFF.
- c. ICS switch - DOWN.

**Note**

The operation of the electronic equipment in this helicopter is dependent on the operation of the interphone system. Do not turn the interphone system off until the end of the flight day.

**5-176. C-1611A/AIC OPERATION.**

5-177. The procedure for operating the C-1611A/AIC Signal Distribution Panel is presented in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. INT circuit breakers - IN.
- c. Transmit-interphone selector switch - As desired.
- d. Receiver switches - As desired.
- e. Microphone switches - As desired.
- f. VOL control - As desired.

**5-178. AN/ARC-54 OPERATION.**

5-179. The operating procedures for voice transmission and reception, the homing operation and stopping procedure for the AN/ARC-54 FM Liaison Set are presented in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. FM and INT circuit breakers - IN.
- c. FM Mode selector switch - PTT (Allow three minute warm up).
- d. Frequency - Select.

**Note**

A channel changing tone should be heard in the headset while radio set is tuning. When the tone stops, the radio set is tuned.

- e. FM VOL control - Adjust
- f. FM SQUELCH control - CARR (or as desired).
- g. Receiver switch No. 1 - UP.
- h. TRANS selector switch - No. 1.
- i. Microphone switch - Press.

**5-180. HOMING OPERATION.**

5-181. The procedure for operating the AN/ARC-54 Radio Set in the homing mode is presented as follows:

FM mode selector switch - HOME.

**Note**

Voice reception is possible in HOME position.

**5-182. STOPPING PROCEDURE - AN/ARC-54.**

FM mode selector switch - OFF.

**5-183. AN/ARC-55B OPERATION.**

5-184. The operating procedure for operation of the ARC-55B UHF Command Set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. UHF circuit breaker - IN.
- c. UHF function selector switch - T/R G REC AS REQUIRED. Allow five minute warmup.

- d. Frequency - Select.
- e. Receiver switch No. 2 - UP.
- f. UHF VOL-SENS controls - Adjust.
- g. Transmit-Interphone selector switch - No. 2 position.
- h. Microphone switch - Press.

## 5-185. OPERATION ON GUARD FREQUENCY.

- a. UHF function selector switch - T/R G REC.
- b. Guard frequency - Select.
- c. Microphone switch - Press.

## 5-186. STOPPING PROCEDURE - AN/ARC-55B.

UHF function selector switch - OFF.

## 5-187. AN/ARC-51X OPERATION.

5-188. The operating procedure for the ARC-51X UHF Command Set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. UHF and INT circuit breakers - IN.
- c. UHF function selector switch - T/R (T/R+G as desired). Allow five minute warmup.
- d. Frequency - Select.
- e. Receiver switch No. 2 - UP.
- f. SENS and VOL controls - Adjust.
- g. Transmit-interphone selector switch - No. 2 position.
- h. Microphone switch - Press.

## 5-189. AN/ARC-51X FREQUENCY OPERATION.

5-190. The operation of the ARC-51X on the guard frequency is the same as the procedure outlined in paragraph 5-187, except, the function select switch must be in the T/R + G position, and the megacycle controls must be tuned to the assigned guard frequency.

## 5-191. STOPPING PROCEDURE.

UHF function selector switch - OFF.

## 5-192. AN/ARC-51BX OPERATION.

5-193. The operating procedure for the ARC-51BX UHF command set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. UHF and INT circuit breakers - IN.
- c. UHF function select switch - T/R (T/R G as desired).
- d. UHF mode selector switch - PRESET CHAN. Allow five minute warmup.
- e. RECEIVERS switch No. 2 - ON.
- f. Channel - Select.

**Note**

An 800-cps audio tone should be heard during channel changing cycle.

- g. SQ DISABLE switch - ON.
- h. Volume - Adjust.
- i. Transmit-interphone selector switch - No. 2 position.
- j. Microphone switch - Press.

## 5-194. AN/ARC-51BX GUARD FREQUENCY OPERATION.

5-195. Operation of the ARC-51BX guard frequency may be accomplished by any of the following methods:

- a. Preset Guard.
  - (1) UHF function select switch - T/R G.
  - (2) UHF mode selector - DF XMIT.
  - (3) Microphone switch - Press.
- b. Preset.
  - (1) UHF mode selector - Preset.
  - (2) UHF function select switch. T/R (T/R G).
  - (3) Guard channel - Select.
  - (4) Microphone switch - Press.
- c. Manual.
  - (1) UHF mode selector - Manual.
  - (2) UHF function select switch - T/R (T/R G).
  - (3) Guard frequency - Select.
  - (4) Microphone switch - Press.

## 5-196. STOPPING PROCEDURE.

UHF function select switch - OFF.

## 5-197. AN/ARC-73 OPERATION.

5-198. The operating procedure for the VHF command set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. VHF (ARC-73) and INT circuit breakers - IN.
- c. VHF POWER switch - ON.
- d. Frequency - Select.
- e. RECEIVERS switch No. 3 - UP.
- f. VHF SQ and VOL controls - Adjust.
- g. Transmit-interphone selector switch - No. 3 position.
- h. Microphone switch - Press.

## 5-199. AN/ARC-73 GUARD FREQUENCY OPERATION.

Emergency frequency - Select.

## 5-200. AN/ARC-73 STOPPING PROCEDURE.

VHF POWER switch - OFF.

## 5-201. AN/ARC-134 OPERATION.

5-202. The operating procedure for the ARC-134 VHF Command Set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. VHF and INT circuit breakers - IN.
- c. OFF/PWR switch - PWR. Allow set to warm up.
- d. Frequency - Select.
- e. RECEIVERS switch No. 3 - UP.
- f. Volume - Adjust. If signal is not audible with VOL control fully clockwise, press COMM TEST switch to unsquelch circuits.
- g. Transmit-interphone selector switch - No. 3 position.
- h. Microphone switch - Press.

## 5-203. AN/ARC-134 GUARD FREQUENCY OPERATION.

Emergency frequency - Select.

## 5-204. AN/ARC-134 STOPPING PROCEDURE.

OFF/PWR switch - OFF.

## 5-205. EMERGENCY TRANSMITTER OPERATION.

5-206. The operating procedure for the T366/ARC Emergency Transmitter is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. VHF XMTR T-366 circuit breaker - IN.
- c. Transmit-interphone selector switch - No. 3 position.
- d. Toggle switch(s) (pilot and copilot) on EMER COMM switch panel - STBY VHF.
- e. Emergency VHF power switch - ON.
- f. Frequency - Select.
- g. Microphone switch - Press.

## 5-207. STOPPING PROCEDURE.

Power switch - OFF.

## 5-208. HF RADIO SET OPERATION.

5-209. The operating procedure for the AN/ARC-102 HF Radio Set is presented in the following steps:

**Warning**

When ground testing ARC-102 equipment, be sure that personnel are clear of antenna. Serious burns can result if body contact is made with the antenna during ground testing.

- a. Check that master helicopter power is on.
- b. Check that ARC-102 circuit breakers are in.
- c. Position the function selector switch to the desired mode of operation.
- d. Rotate the frequency control knobs to select the desired frequency.

**Note**

If the function selector is moved from the OFF position to an operating mode and the desired operating frequency is already set up on the control panel, rotate the 10-kilo-hertz knob one digit off frequency and then back to the operating frequency. This will allow the system to return to the frequency.

e. To monitor the HF receiver position RECEIVERS switch marked HF to up position.

f. Adjust RF SENS control and volume controls on HF control panel and signal distribution panel to a comfortable level.

g. To transmit set the transmit-interphone selector switch on signal distribution panel to HF position (refer to transmitter selector decal).

h. Depress foot switch or cyclic stick trigger switch and speak into the microphone.

i. To turn the HF radio set off rotate the function selector switch to OFF position.

**5-210. HF RADIO EMERGENCY PROCEDURES.**

5-211. The HF radio has two built in protective devices that could cause the set to stop operating. The condition and corrective steps are as follows:

a. A protective circuit is designed to turn the receiver-transmitter off, when a short exists in the output circuit. To restore the receiver-transmitter to operation, move the function selector to OFF position and then back to the desired operating mode.

b. When the associated antenna coupler is required to complete several consecutive tuning cycles it may become overheated. In this event a thermal relay in the coupler unit is designed to turn off the receiver-transmitter. If the receiver-transmitter stops operating after a series of tuning cycles, position the function selector switch to OFF position, allow the thermal relay to cool for two minutes, and return the function selector to the desired operating mode.

c. If the above procedures does not return the HF radio set to normal operation, place the function selector in the OFF position and report the failure to the maintenance personnel.

**5-212. VHF NAVIGATION RECEIVER OPERATION.**

5-213. The different modes of operation for the AN/ARN-30E VHF navigation receiver are presented in the following paragraphs.

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**5-214. VISUAL OMNI RANGE INSTRUCTIONS.**

5-215. To operate the VHF receiver as a Visual Omni Range (VOR) receiver perform the following steps:

a. Rotate VOL-OFF control clockwise until a click is heard, indicating that the set is energized. Allow five minutes for set to warm up.

b. Rotate SQUELCH control knob full counter-clockwise.

c. Turn selector knob to select the desired frequency on the MC dials.

d. Ensure that the warning flag for the vertical pointer is out of sight.

**Warning**

The warning flag for the vertical pointer is an indication of signal strength and reliability. Under no circumstances should navigation be attempted if the flag is visible or if the TO-FROM indicator remains blank.

e. Check to see that the TO-FROM indicator is operating properly.

f. Adjust SQUELCH control knob as desired.

**5-216. NAVIGATION RECEIVER - AN/ARN-82 - OPERATION.**

5-217. The different modes of operation for the AN/ARN-82 Receiver are outlined in the following paragraphs.

**5-218. VOR INSTRUCTION - ARN-82.**

5-219. To operate the ARN-82 Receiver as a Visual omni Range (VOR) receiver perform the following steps:

a. Battery switch - ON (OFF for APU).

b. ARN-82 and INT circuit breakers - IN.

c. Power switch - PWR.

d. Frequency - Select.

e. NAV switch on C-1611/AIC panel - UP.

f. Volume - Adjust.

**5-220. AN/ARN-82 STOPPING PROCEDURE.**

Power switch - OFF.



**5-221. DIRECTION FINDER SET OPERATION.**

5-222. The operating procedure for the AN/ARN-59 Direction Finder Set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. ADF and INT circuit breakers - IN.
- c. ADF VOL control - ON.
- d. Receiver switch (NAV) - ON.
- e. Function switch - ANT.
- f. Frequency - Select.
- g. Function switch - COMP.

**5-223. MANUAL OPERATION OF DIRECTION FINDER SET, AN/ARN-59.**

5-224. To operate the direction finder set manually, perform the following steps:

- a. Function switch - LOOP.
- b. BFO switch - ON.
- c. LOOP switch - Press right or left and rotate loop for null.

**5-225. STOPPING PROCEDURE AN/ARN-59.**

Vol control - OFF.

**5-226. DIRECTION FINDER SET OPERATION - AN/ARN-83.**

5-227. The operating procedure for the AN/ARN-83 Direction Finder Set is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. ADF and INT circuit breakers - IN.
- c. Receiver switch (NAV) - ON.
- d. Mode selector switch - ANT.
- e. Frequency - Select.
- f. Volume - Adjust.
- g. Mode selector switch - ADF.

**5-228. MANUAL OPERATION OF DIRECTION FINDER SET - AN/ARN-83.**

5-229. To operate the direction finder set manually, perform the following steps:

- a. Mode selector switch - LOOP.
- b. BFO switch - ON.
- c. LOOP L/R switch - Press right or left and rotate loop for null.

**5-230. STOPPING PROCEDURE - AN/ARN-83.**

Mode selector switch - OFF.

**5-231. MARKER BEACON RECEIVER OPERATION.**

5-232. The marker beacon on-off volume control switch and high-low sensing switch are located on the lower right corner of the instrument panel. The operating procedure is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. MARKER BEACON and INT circuit breakers - IN.
- c. VOLUME ON/OFF control - ON.
- d. Receiver switch (NAV) (MB switch if SB/329AR panel is used) - ON.
- e. Volume - Adjust.
- f. HIGH/LOW SENSING switch - As desired.

**5-233. STOPPING PROCEDURE.**

VOLUME ON/OFF control - OFF.

**5-234. TRANSPONDER SET OPERATION.**

5-235. The preliminary starting procedure and different modes of operation for the AN/APX-44 Transponder Set are given in the following paragraphs:

a. Preliminary Starting Procedure. Set the controls on the control panel as follows:

- (1) Master control - OFF.
- (2) AUDIO switch - OFF.
- (3) I/P switch - OFF.
- (4) MODE 2 switch - OFF.
- (5) MODE 3 switch - OFF.
- (6) MODE 1 control - To read 00.
- (7) MODE 3 control - To read 00.
- (8) Function control - NORMAL.

a. Starting Procedure.

- (1) Battery switch - ON (OFF for APU).
- (2) IFF circuit breaker - IN.
- (3) Master control - STDBY. The pilot light should light. Allow three to five minutes for warmup.

**Note**

If the pilot light does not light, press the test button. If the light does not light when the test button is pressed, either the light is burned out or operating power is not reaching the transponder set.

- (4) Pilot light - Adjust brilliance.

## 5-236. NORMAL OPERATION.

5-237. The normal operating procedure is outlined in the following steps:

a. For Mode 1 operation set the controls as follows:

- (1) Function control - NORMAL.
- (2) Master control - LOW or NORM as required.
- (3) MODE 2 switch - OFF.
- (4) MODE 3 switch - OFF.
- (5) I/P switch - Refer to paragraph 5-242.
- (6) AUDIO switch - Refer to paragraph 5-244.

b. Combined modes 1 and 2. Set the controls as follows:

- (1) Function control - NORMAL.
- (2) Master control - LOW or NORM as required.
- (3) MODE 2 switch - ON.
- (4) MODE 3 switch - OFF.
- (5) I/P switch - Refer to paragraph 5-242.
- (6) AUDIO switch - Refer to paragraph 5-244.

c. Combined modes 1 and 3. Set the controls as follows:

- (1) Function control - NORMAL.
- (2) Master control - LOW or NORM as required.
- (3) MODE 3 switch - ON.
- (4) MODE 2 switch - OFF.
- (5) I/P switch - Refer to paragraph 5-242.
- (6) AUDIO switch - Refer to paragraph 5-244.

d. Combined modes 1, 2 and 3. Set the controls as follows:

- (1) Function control - NORMAL.
- (2) MODE 2 switch - ON.
- (3) MODE 3 switch - ON.
- (4) Master control - LOW or NORM as required.
- (5) I/P switch - Refer to paragraph 5-242.
- (6) AUDIO switch - Refer to paragraph 5-244.

## 5-238. MODIFIED OPERATION.

5-239. The procedure for operating with the function selector at MOD position is outlined in the following steps:

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a. Mode 1. Set the controls as follows:

- (1) Function control - MOD.
- (2) MODE 1 code control - Assigned two digit code number.
- (3) Master control - LOW or NORM as required.
- (4) MODE 2 switch - OFF.
- (5) MODE 3 switch - OFF.
- (6) I/P switch - Refer to paragraph 5-242.
- (7) AUDIO switch - Refer to paragraph 5-244.

b. Combines Modes 1 and 2. Set the controls as follows:

- (1) Function control - MOD.
- (2) MODE 1 code control - Assigned two digit code number.
- (3) MODE 2 switch - ON.
- (4) Master control - LOW or NORM as required.
- (5) MODE 3 switch - OFF.
- (6) I/P switch - Refer to paragraph 5-242.
- (7) AUDIO switch - Refer to paragraph 5-244.

c. Combined Modes 1 and 3. Set the controls as follows:

- (1) Function control - MOD.
- (2) MODE 2 switch - OFF.
- (3) MODE 3 switch - ON.
- (4) MODE 1 code control - Assigned two digit code number.
- (5) MODE 3 code control - Assigned two digit code number.
- (6) Master control - LOW or NORM as required.
- (7) I/P switch - Refer to paragraph 5-242.
- (8) AUDIO switch - Refer to paragraph 5-244.

d. Combined modes 1, 2 and 3. Set the controls as follows:

- (1) Function control - MOD.
- (2) MODE 1 code control - Assigned two digit code number.
- (3) MODE 2 switch - ON.
- (4) MODE 3 switch - ON.
- (5) MODE 3 code control - Assigned two digit code number.
- (6) Master control - LOW or NORM as required.
- (7) I/P switch - Refer to paragraph 5-242.
- (8) AUDIO switch - Refer to paragraph 5-244.

## 5-240. CIVIL OPERATION.

5-241. The procedure for operating with the function selector at civil position is outlined in the following steps:

a. Combined Civil and Military Mode 1. Set the controls as follows:

- (1) Function control - CIVIL.
- (2) MODE 3 code control - Assigned two digit code number.
- (3) MODE 3 switch - ON.
- (4) MODE 2 switch - OFF.
- (5) MODE 1 code control - Assigned two digit code number.
- (6) Master control - LOW or NORM as required.
- (7) I/P switch - Refer to paragraph 5-242.
- (8) AUDIO switch - Refer to paragraph 5-244.

b. Combined Civil and Military Mode 1 and 2. Set the controls as follows:

- (1) Function control - CIVIL.
- (2) MODE 3 code control - Assigned two digit code number.
- (3) MODE 3 switch - ON.
- (4) MODE 2 switch - ON.
- (5) MODE 1 code control - Assigned two digit number.
- (6) Master control - LOW or NORM as required.
- (7) I/P switch - Refer to paragraph 5-242.
- (8) AUDIO switch - Refer to paragraph 5-244.

#### 5-242. I/P (POSITION IDENTIFICATION) OPERATION.

5-243. The pilot may identify the position of his helicopter without being interrogated by a ground based IFF system. This type of operation is initiated by the pilot upon receipt of request via communications set, or upon arrival at pre-established check points. The transponder set will transmit position identifying signals when either of the following procedures are used:

a. Procedure No. 1. Perform the following steps:

- (1) To transmit position-identifying signals, momentarily hold the I/P switch in the I/P position.

- (2) On completion, release the I/P switch.

b. Procedure No. 2. Perform the following steps:

- (1) Place the I/P switch in MIC position.

- (2) Press the switch on the microphone; the transponder set is now transmitting position identifying signals.

- (3) On completion of identification of position, release the microphone switch button.

- (4) Place the I/P switch in the OFF position.

#### Note

The I/P switch may remain in the MIC position for the duration of a flight. This

permits position-identifying signals to be transmitted each time the radio-telephone equipment is operated.

#### 5-244. MONITORING.

5-245. Monitor the reply pulses transmitted by the transponder set as follows:

- a. Place the AUDIO switch in the ON position. Transmitted reply pulses, following interrogation, will be audible in the pilot's headset.

- b. Immediately following completion of the monitoring procedure, place the AUDIO switch in the OFF position.

#### 5-246. EMERGENCY OPERATION.

5-247. In the event of an emergency or distress condition, the transponder set may be used to transmit specially coded emergency signals. These emergency signals are automatically set up and will be transmitted as long as the master control of the transponder set remains in the EMER position. Even after the transponder set is interrogated by a ground-based IFF system, these signals will continue to be transmitted automatically, regardless of any mode and function combination previously set up, and will provide indications to the ground-based IFF system that the helicopter is in an emergency or distress condition. For emergency operation, set the controls as follows:

- a. Depress and hold in the emergency barrier button.

- b. Turn the master control to the EMER position.

- c. Release the barrier button.

- d. Permit the master control to remain in the EMER position for the duration of the emergency.

- e. When the emergency is over, return the master control to the NORM or LOW position.

#### 5-248. STOPPING PROCEDURE.

5-249. To turn off the transponder set, set the controls on the control panel as follows:

- a. Master control - OFF.

- b. AUDIO switch - OFF.

- c. I/P switch - OFF, then release the microphone switch button.

- d. MODE 2 switch - OFF.

- e. MODE 3 switch - OFF.
- f. MODE 1 code control - To read 00.
- g. MODE 3 code control - To read 00.
- h. Function control - NORMAL.

#### 5-250. GYRO MAGNETIC COMPASS OPERATION.

5-251. The gyro magnetic compass may be operated in the slaved or free mode of operation, depending upon the reliability of the earth's magnetic reference.

#### 5-252. SLAVED GYRO MODE OF OPERATION.

5-253. The procedure for the slaved gyro mode of operation is presented in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. Inverter switch - MAIN or SPARE.
- c. Compass slaving switch - IN.
- d. Compass AC and DC circuit breakers - IN.  
Allow three minute warmup.

#### 5-254. FREE GYRO MODE OF OPERATION.

5-255. The procedure for the free mode of operation is presented in the following steps:

- a. Compass slaving switch - OUT.
- b. When the compass system is initially placed in operation in the free mode, there will be no magnetic sensing, no slaving of the compass system, and consequently no reference for obtaining directional indications. In this mode of operation, the compass system is used chiefly as a turn indicator.

c. During flight from an area where magnetic sensing is reliable into or through an area where magnetic sensing is unreliable, the compass system may be used in the free mode to determine heading information. The slaving cut-out switch must be operated from the IN position (Slaved Mode) to the OUT position (Free Mode) before flying into the unreliable area. The compass system does not automatically compensate for gyro drift in the free mode, nor can manual corrections be made. Periodic correction based on the gyro drift rate and the latitude of operation must be calculated algebraically and added to the indicated heading. Heading information determined in this manner should also be checked against two known references.

d. If the aircraft lands in an area where magnetic sensing is unreliable, and the compass system is kept operating in the free mode until take off, the

compass system may still be used as a turn indicator and also to supply directional information. If, however, the compass system is turned off after landing, it should be used in the free mode and only as a turn indicator on subsequent flights within the area where magnetic sensing is unreliable.

#### 5-256. STOPPING PROCEDURE:

5-257. The compass system stops operating when the helicopter's electrical power supply is turned off.

#### 5-258. AN/ASN-43 GYRO MAGNETIC COMPASS OPERATION.

5-259. This compass may be operated magnetically slaved (compass slaving in) or free gyro (compass slaving out).

#### 5-260. SLAVED GYRO MODE OF OPERATION.

5-261. To operate the equipment in the slaved mode, perform the following steps:

- a. Battery switch - ON (OFF for APU).
- b. Inverter switch - MAIN or SPARE.
- c. Compass slaving switch - MAG HDG.
- d. GYRO CMPS and COURSE IND circuit breakers - IN.

#### Note

If a misalignment (non-synchronization) of the AN/ASN-43 Compass is indicated by the annunciator on the Pilot's Radio Magnetic Indicator (shows DOT or CROSS, the synchronizing knob on the indicator must be manually rotated to null the annunciator (neither the DOT nor CROSS is showing) prior to takeoff.

#### 5-262. FREE GYRO MODE OF OPERATION.

- a. COMPASS SLAVING switch - GYRO HDG.
- b. LATITUDE knob (located on the gyro base in the aft radio compartment) - set to local latitude.
- c. LATITUDE switch (beside latitude knob) - N (for northern hemisphere operation) or S (for southern hemisphere operation).
- d. RMI synchronizing knob - set known heading.

#### Note

RMI annunciator is de-energized in the free gyro mode.

## 5-263. STOPPING PROCEDURE.

5-264. The compass system is turned off when helicopter electrical power is turned off.

## 5-265. AN/ASN-72 NAVIGATION SET OPERATION.

5-266. The operating procedure for the Navigation Set AN/ASN-72 is outlined in the following steps:

- a. Battery switch - ON (OFF for APU).
- b. DECCA circuit breaker - IN.
- c. OFF-REF-OP switch on the receiver control panel - OP.
- d. Facility switch on the flight log control panel - F.
- e. Install a chart roll with a chart of the area into the flight log display. Insert the corresponding key of the chart into the turret switch of the flight log control. Set the turret switch to this key.
- f. Set the CHAIN selector switch on the receiver control panel to the chain covering the area and set the LI-OFF switch to the LI position. Consult the chart and set the zone and estimated lanes on the appropriate decometers.
- g. After the receiver has been on for 5 to 10 minutes, set the OFF-REF-OP switch on the receiver control panel to REF position. The amber REF lamp will light.
- h. Perform receiver referencing.
- i. After helicopter takeoff, set the OFF-REF-OP on the receiver control panel to OP position and check the decometers for torque.
- j. Check to see that the lane identification lamps on the decometers light in the correct red-green-purple sequence.
- k. Perform the LI check.
- l. Use the appropriate pushbuttons on the flight log control and position the flight log display pen to agree approximately with the decometer readings.
- m. Set the facility switch on the flight log control panel to S/OP position. Use the appropriate pushbuttons and accurately position the pen to agree with the decometer readings.
- n. Fly the helicopter over a selected fix point, such as cross roads, bridge, tower or building and perform receiver referencing and the LI check for correct lane setting.

## Note

Erratic decometer indications and intermittent disagreement between the decometers and the lane identification meter may occur, especially at distances greater than 150 miles from the master station, because of interference or atmospheric conditions. Do not reset decometers unless a discrepancy greater than half a lane is consistent for three consecutive LI check readings.

o. Reset the OFF-REF-OP switch on the receiver control panel to OP position, and accurately set the flight log display pen to the fix point. Record the decometer readings of the fix point and note the exact pen position.

p. Set the LI-OFF switch on the receiver control panel to OFF position.

q. Remaining within the confines of the area shown on the chart, fly the helicopter along a triangular flight path, each leg of which is approximately 5 to 10 miles long, and then return to the fix point. Record the decometer readings and note the pen position.

r. The decometer readings recorded (o and q) above) should not differ by more than one-tenth of a lane. The pen positions noted in the same steps should not differ more than 1/16 of an inch.

s. To turn the navigation set off, set the OFF-REF-OP switch on the receiver control panel to OFF position and set the facility switch on the flight log control panel to OFF position.

## 5-267. TRANSPONDER SET OPERATION - APX-72.

## 5-268. TYPES OF OPERATION.

5-269. The APX-72 receiver-transmitter operates as an active receiver-transmitter unit which will respond only to an interrogating signal from the external source corresponding panel and the APX-72.

a. The APX-72 is capable of responding in nine codes modes of operation to six coded modes of interrogation. The coded interrogation inputs are classified as modes 1, 2, 3/A, C, 4 and test. The normal coded output responses are classified as modes 1, 2, 3/A, C and 4. Modes 1, 2, 3/A, C and 4. Modes 1, 2, 3/A can be modified for special responses, designated identification of position, emergency and X pulse. Mode C can be modified for special pulse indications.

**Note**

On helicopters 68-15214 and subsequent an IFF MODE 4 indicator light and CODE HOLD switch is installed on the center area of the instrument panel. The switch when in the ON position, allows the IFF MODE 4 preset code to be retained. The indicator light serves as a reminder of the switches position.

b. To operate the APX-72 in any of the modes described above, perform the following procedures:

- (1) Starting Procedures.
- (2) Normal Operation.
- (3) Identification of Position (I/P) Operation.
- (4) Emergency Operation.
- (5) Monitoring Operation.

## 5-270. STARTING PROCEDURE.

a. Preliminary.

- (1) MASTER control - OFF.
- (2) IDENT-MIC switch - OUT.
- (3) M-1, M-2, M-3/A, M-C and MODE 4 switches - OUT.
- (4) AUDIO-LIGHT switch - OUT.
- (5) RAD TEST-MON switch - OUT.
- (6) MODE 1, 3/A and 4 code select switches - Set to operational code required.
- (7) MODE 2 code select switch - Set to operational code required.

b. Starting.

- (1) MASTER control.

STBY - one minute for standard temperature conditions and two minutes under extreme ranges of operating temperature.

LOW - low receiver sensitivity for receiving high energy signals.

NORM - normal receiver sensitivity.

EMER - refer to paragraph 5-274.

- (2) M-1, M-2, M-3/A, M-C and MODE 4 switches - ON as required.
- (3) AUDIO-LIGHT switch - LIGHT.
- (4) IDENT-MIC switch - OUT.
- (5) RAD TEST-MON switch - MON.

## 5-271. NORMAL OPERATION.

a. MASTER control - LOW or NORM as required.

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b. M-1, M-2, M-3/A, M-C and MODE 4 switches ON - unless operational requirements indicate that only specific modes are to be used, then all other mode switches will be OUT.

- c. AUDIO-LIGHT switch - LIGHT.
- d. IDENT-MIC switch - OUT.
- e. RAD TEST-MON switch - OUT.

## 5-272. IDENTIFICATION OF POSITION (I/P) OPERATION.

5-273. The APX-72 will transmit position identifying signals to all interrogating stations on modes 1, 2, and 3/A when the IDENT-MIC switch on the control panel is set to IDENT. Transmission of the I/P signal will occur in these modes even if the mode enable switches are in the OUT position. The I/P operation is as follows: Momentarily hold the IDENT-MIC switch in the IDENT position (spring-loaded return) and then release it. This action will cause the APX-72 to transmit the I/P signal for a period of approximately 30 seconds to all interrogating stations on modes 1, 2 and 3/A. Repeat as required.

## 5-274. EMERGENCY OPERATION.

5-275. During an aircraft emergency or distress condition, the APX-72 may be used to transmit specially coded emergency signals on modes 1, 2, and 3/A to all interrogating stations. These emergency signals will be transmitted as long as the MASTER control on the control panel remains in the EMER position. For emergency operation, set the controls as follows:

a. MASTER control - EMER - leave in that position for the duration of the emergency.

b. MASTER control - NORM or LOW after emergency is over.

## 5-276. MONITORING OPERATION.

5-277. Valid mode 4 interrogations and replies can be monitored either aurally and visually or visually by placement of the AUDIO LIGHT switch on the control panel as follows:

a. AUDIO-LIGHT switch - AUDIO - Mode 4 interrogating and reply pulses will be audible in the pilot's headset and visible on the RELAY light.

b. AUDIO-LIGHT switch - LIGHT - Indication of mode 4 interrogating and reply pulses will be visible on the REPLY light.

## 5-278. STOPPING PROCEDURE.

- a. MASTER control - OFF.

- b. IDENT-MIC switch - OUT.
- c. M-1, M-2, M-3/A, M-C and MODE 4 switches OUT.
- d. AUDIO-LIGHT switch - OUT.

#### 5-279. AN/ARC-131 RADIO SET OPERATION.

5-280. The operating procedure and different modes of operation for the AN/ARC-131 radio set are given in the following paragraphs:

#### 5-281. MODES OF OPERATION.

5-282. Depending on the settings of the control panel controls (figure 5-26), the radio set can be used for the following types of operation: Two-way voice communication and homing.

#### 5-283. TWO-WAY VOICE COMMUNICATION.

- a. Battery switch - ON (OFF for APU).
- b. INT and FM circuit breakers - IN.
- c. Mode control switch - T/R (allow two minute warm up).
- d. Frequency - Select.
- e. Receivers No. 1 switch - Up position.

#### Note

A channel-changing tone should be heard in the headset while radio set is tuning. When the tone stops, the radio set is tuned.

- f. VOL control - Adjust for comfortable volume.
- g. SQUELCH control - Set for desired squelch mode.

- h. TRANS selector switch - No. 1.
- i. Microphone switch - Press.

#### 5-284. HOMING OPERATION.

- a. Mode control switch - HOME.
- b. FM HOME switch - UP.
- c. Frequency - Adjust to frequency of selected homing station.
- d. SQUELCH control may be set to CARR or TONE however, the carrier squelch is automatically selected by an internal contact arrangement on HOME position.

#### Note

Operation in DIS position is possible; however, flags on course indicator will be inoperative.

e. Fly aircraft toward the homing station by heading in direction that causes homing indicator right-left vertical pointer to position itself in the center of indicator scale. To insure that aircraft is not heading away from homing station, change the heading slightly and note that the homing indicator vertical pointer reflects in direction opposite that of the turn.

#### 5-285. STOPPING PROCEDURE - AN/ARC-131.

- a. FM HOME switch - DOWN.
- b. Mode control switch - OFF.

#### Note

The operation of the electronic equipment in this helicopter is dependent on the operation of the interphone system. Do not turn interphone system off until the end of flight day.

**CHAPTER 6**  
**AUXILIARY EQUIPMENT**  
**SECTION I SCOPE**

**6-1. SCOPE OF AUXILIARY EQUIPMENT INSTRUCTIONS.**

6-2. This chapter includes the description, normal operation, and emergency operation of all equipment not directly contributing to flight, but which enables the helicopter to perform certain specialized functions.

6-3. Much of the equipment discussed in this chapter is highly specialized or interchangeable for use in other aircraft. Coverage for specialized or interchangeable equipment of this type will be brief, since complete coverage is appropriately available in publications devoted entirely to that equipment.

**SECTION II HEATING AND VENTILATION**

**6-4. VENTILATING SYSTEM.**

6-5. The ventilating system consists of four independently controlled scoop type ventilators. (9 and 28, figure 2-1) located as follows: two single orifice scoops on the top side of the cockpit section and two double orifice scoops on the top side of the cargo-passenger section of the cabin. The amount of outside air entering the cabin through the ventilators is regulated by knurled rings located on the ventilators above the pilot's, copilot's and passenger's stations.

**6-6. OPERATION.**

6-7. Rotate knurled control ring to desired position to provide outside air for flight.

**6-8. BLEED AIR HEATING AND DEFROSTING SYSTEM.**

6-9. The heating and defrosting system (see figure 6-1) consists of tube assemblies, selector valve, noise suppressors, ducts, outlets control panel, and attaching hardware. Heat is supplied from the engine compressor bleed air system (figure 6-1). Electric power for heating and defrosting system operation is supplied by the 28-volt DC electrical system. Circuit protection is provided by CABIN HEATER PWR and CONT circuit breakers. (Figure 2-11.)

**6-10. BLEED AIR HEATING AND DEFROSTING SYSTEM (SERIAL NUMBERS 65-9565 THROUGH 66-16860).**

6-11. This system differs from system installed on helicopters prior to serial number 65-9565 (figures 6-1 and 6-2) as follows: Bleed air ducts under seat outlets, one noise suppressor, two valve assemblies and one thermostat have been deleted. The

bleed air mixing valve and one noise suppressor are relocated to the heater compartment for easy removal when winterization kit is installed.

**6-12. HEATING AND DEFROSTING CONTROLS.**

6-13. The heating and defrosting controls consist of the cabin heater panel and the pedestal-mounted heater control levers (figure 6-1). A dual purpose CABIN HEATING panel is located on the overhead console (figure 6-1). The aft portion of this panel, marked HEATER, is inactive unless the winterization combustion heater equipment is installed. The forward section of the panel, marked BLEED AIR is active for use of the bleed air for heating and defrosting. Electric power to the panel is supplied by the 28-volt DC electrical system.

6-14. PEDESTAL-MOUNTED HEATER CONTROL. Manual controls are secured to the forward outer edges of the pedestal installation (10, 11 and 12, figure 6-1). The outboard levers are installed as part of the winterization equipment and are used in conjunction with the combustion heater. The inner right-hand lever is used to actuate the bleed air circuit.

6-15. CABIN HEATER CONTROLS (SERIAL NUMBERS 65-9565 THROUGH 66-16860). The overhead console contains a panel labeled "CABIN HEATING" (figure 6-2). This panel contains two rotating switches, one labeled BLEED AIR and the other labeled AFT OUTLET. Rotating the BLEED AIR switch clockwise increases the amount of heated air. Rotating the switch labeled AFT OUTLET, clockwise distributes an increasing amount of heated air to the aft cabin through the door post outlets, while decreasing the amount of air to cockpit through the center pedestal outlets. In the OFF position of this switch the door post outlets are closed and all of the air is directed to the center



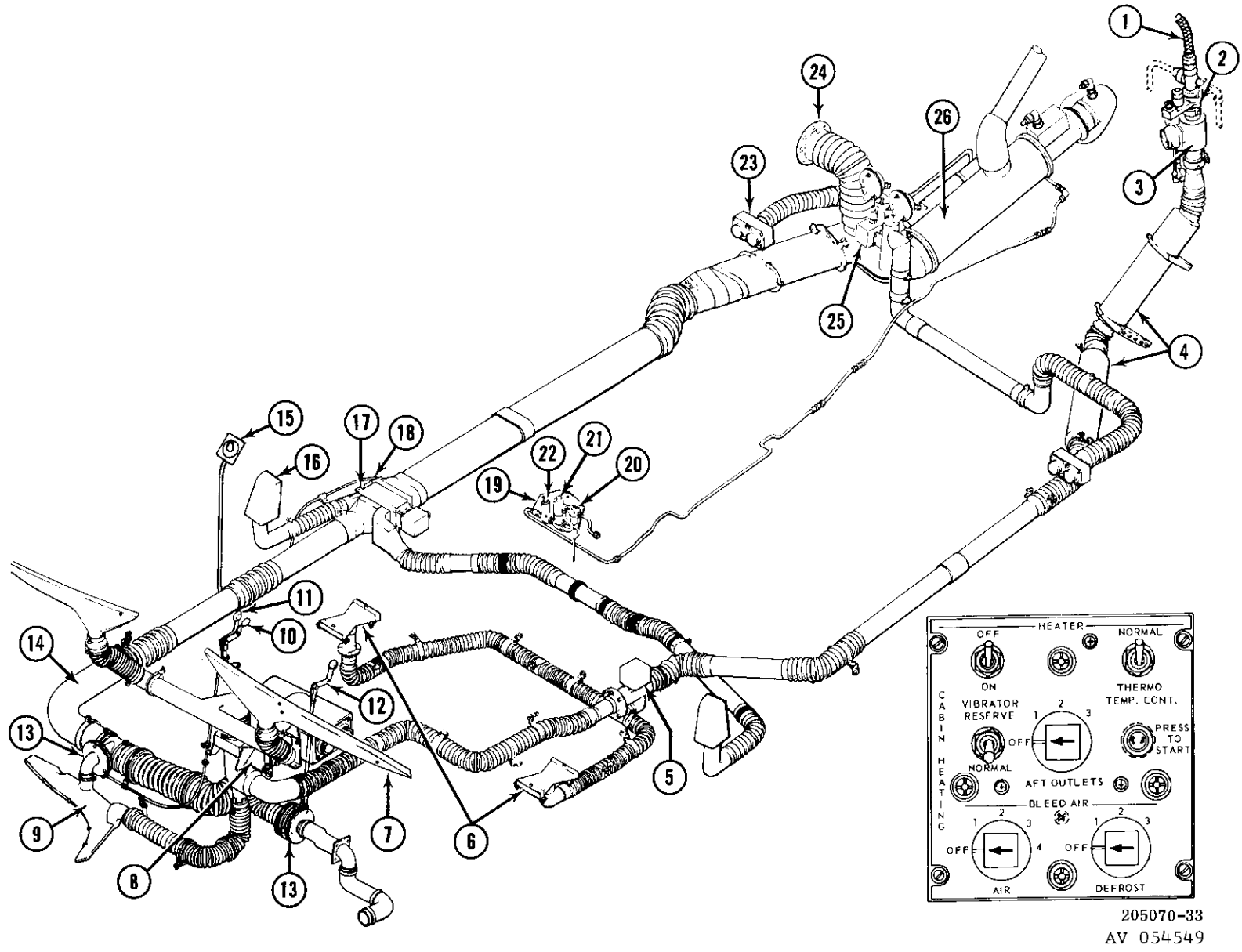


Figure 6-1. Heating and defrosting system (Sheet 1 of 2)

## BLEED AIR HEAT SYSTEM:

1. Engine Bleed Air Hose
2. Bleed Air Control Valve
3. Air Mixing Valve
4. Noise Suppressors
5. Bleed Air Heat Distribution Valve
6. Under-Seat Registers
7. Windshield Nozzles
8. Heat Selector Valve
9. Lower Window Nozzle
10. Heat Selector Control

## AUXILIARY HEATING SYSTEM:

- |                                |                                 |
|--------------------------------|---------------------------------|
| 11. Lower Right Outlet Control | 19. Heater Fuel Train Assembly  |
| 12. Lower Left Outlet Control  | 20. Fuel Filter                 |
| 13. Iris Valves                | 21. Fuel Pump                   |
| 14. Auxiliary Heat Duct        | 22. Fuel Solenoid Valve         |
| 15. Thermostat Dial            | 23. Aft Heat Outlets            |
| 16. Door Post Outlets          | 24. Spot Heating Connection     |
| 17. Distribution Valve         | 25. Aft Outlets Valve           |
| 18. Thermostat                 | 26. Auxiliary Combustion Heater |

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Figure 6-1. Heating and defrosting system (Sheet 2 of 2)

pedestal outlet. Positions 1, 2, and 3 open the door post outlets an increasing amount so that less air is distributed through the center pedestal outlet. In No. 3 position air is still supplied through the center pedestal outlets, unless the flapper is closed in the ball outlet.

6-16. A lever on the forward right-hand edge of the center pedestal is used for directing air to the defrost nozzles on the cockpit and cabin outlets (figure 6-2). In the full forward position all of the air is directed to the defrost nozzles. Intermediate positions may be selected for partial defrost and partial cockpit and cabin heat. The full aft position permits no air flow to the defrost nozzles, and directs all heat to the cockpit and cabin area.

## 6-17. HEATING AND DEFROSTING SYSTEM OPERATION.

6-18. The operating procedure for the bleed air heating and defrosting system is presented in the following paragraphs.

6-19. PRECAUTIONS TO BE OBSERVED. The pilot shall comply with cautionary steps listed below. Failure to comply may cause engine compressor stall resulting in possible severe damage to engine, transmission, main rotor, or tail rotor.

## a. T53-L-9 engine:

(1) Do not use bleed air heater on takeoff or during Engine Restart During Flight. (Refer to Chapter 4.)

(2) Do not use bleed air heater with AIR selector switch in position 3 or 4 when above 85 percent NI speed.

## b. T53-L-9A, -11 and -13 engines:

## Caution

The bleed air heater should be in the OFF position during take-off and landing and other flight conditions requiring maximum engine power available.

(1) Do not use bleed air during Engine Restart During Flight.

## 6-20. NORMAL OPERATION.

a. Position the inner right-hand lever on forward edge of pedestal aft to CLOSED DEFROST to actuate the system.

b. Rotate AIR switch on overhead console CABIN HEATING control panel clockwise to increase defrost air to under-seat outlet and defrost outlet.

c. Rotate DEFROST switch on control panel clockwise to:

(1) DEFROST OFF position - 100 percent to under-seat registers.

(2) No. 1 position - 33 percent to defrost nozzles and 67 percent to under-seat registers.

(3) No. 2 position - 67 percent to defrost nozzles and 33 percent to under-seat registers.

(4) No. 3 position - 100 percent to defrost nozzles.

d. To turn off the system, rotate AIR switch to OFF and position inner right-hand lever adjacent to pedestal fully forward.

6-21. NORMAL OPERATION - CABIN HEATER AND DEFROSTING SYSTEM NUMBERS (65-9565 THROUGH 66-16860.) See cabin heater controls, figure 6-2.

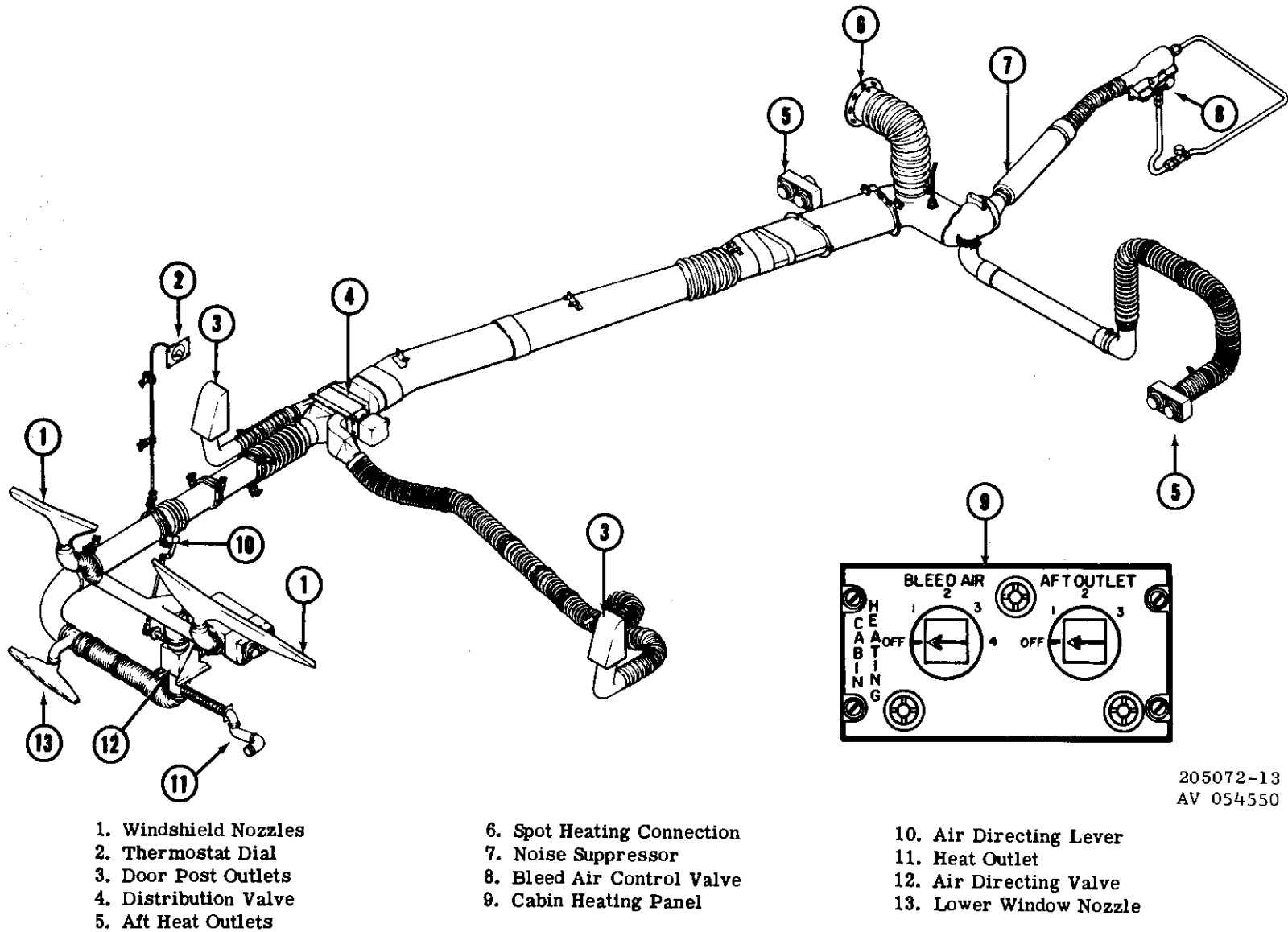


Figure 6-2. Heating and defrosting system serial numbers 65-9565 through 66-16860

a. BLEED AIR rotating switch - Rotate clockwise from OFF position to actuate the system. Set to 1, 2, 3, or 4 position as required for amount of heat desired.

b. AFT OUTLET rotating switch - position to distribute the desired amount of heated air to aft cabin through door post outlets.

#### Note

When the AFT OUTLET switch is in the OFF position the door post outlets are closed and all of the air is directed to the center pedestal outlet.

c. Lever on pedestal - Position as required.

(1) Full forward position - all heated air is directed to the defrost nozzles.

(2) Full aft position - all heated air is directed to the cockpit and cabin area.

(3) Intermediate positions - may be selected for partial defrost and partial cockpit and cabin heat.

d. To turn off the system - Rotate BLEED AIR switch counterclockwise to OFF position.

6-22. EMERGENCY OPERATION. There is no emergency operation of the bleed air heating and defrosting system. If engine temperature surge occurs during flight, the bleed air system shall be turned off.

#### 6-23. COMBUSTION HEATING AND DEFROSTING SYSTEM.

6-24. The 100,000 BTU combustion type heating and defrosting system (figure 6-1) equips the helicopter with a sufficient heat supply to maintain a plus 40 degrees Fahrenheit cabin temperature with an outside temperature to minus 60 degree Fahrenheit. With the combustion heater installed, a combination of bleed air heat and combustion heat is available for heating, or bleed air for defrosting and combustion heat for heating, or combustion heat for defrosting only. Bleed air is OFF for the last condition. The combustion heater consists of a fuel system, cycling switch, temperature control, and distribution system. The heater fuel system consists of a fuel pressure regulator, fuel filter, fuel pump, and a fuel shutoff valve.

#### Note

The main fuel switch must be ON, activating the right boost pump, before fuel is available for heater combustion.

6-25. The safety devices are: purge switch, overheat switch, and air pressure switch. The purge switch keeps the blowers operating after shutdown to prevent overheating of the system due to residual heat. The overheat switch automatically turns the heater off if a malfunction occurs, and the starting cycle has to be repeated to start the heater. In the event air blower pressure drops off the air pressure switch will trip a relay turning combustion heater off.

#### 6-26. COMBUSTION CABIN HEATER CONTROLS.

6-27. The aft section of the dual purpose cabin heating panel (figure 6-1) located on the overhead console, controls the combustion heater when installed. Electric power to the panel is supplied by the 28-volt DC essential bus of the electrical system.

#### Caution

To prevent fire hazard to the helicopter due to possibility of cabin heater exhaust blast causing fire on landing surfaces, move the cabin heater switch to the OFF position at least one minute prior to landing on clean surface and at least two minutes prior to landing on surface with combustible materials present.

#### 6-28. PEDESTAL MOUNTED HEATER CONTROLS COMBUSTION.

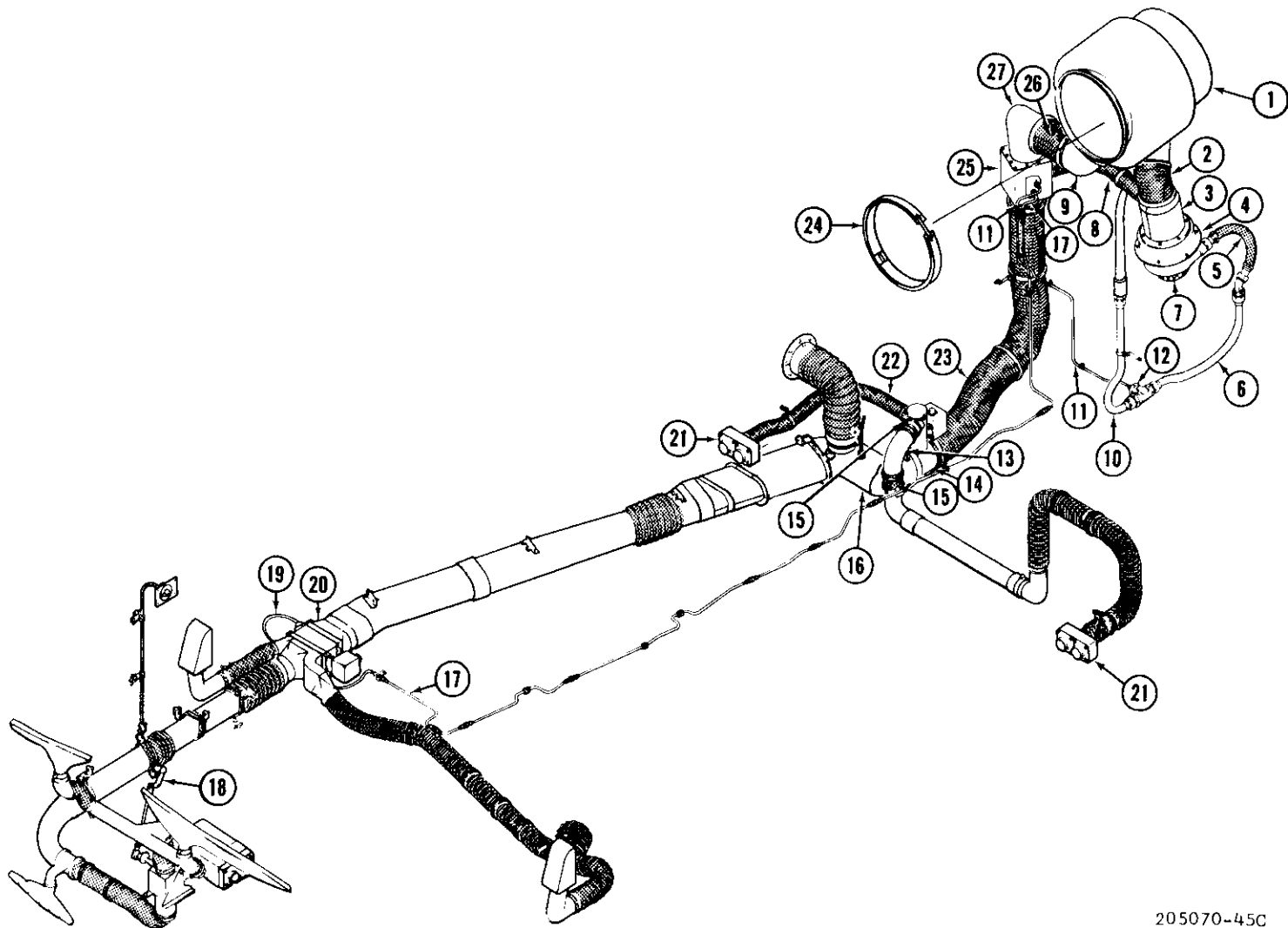
6-29. Manual controls are secured to the forward outer edges of the pedestal installation (figure 2-3 and 6-1). The outboard levers control valves to admit hot air to the pilot's and copilot's foot area ducts. The inner right-hand lever is used to control the bleed air combustion air separator valve.

#### 6-30. NORMAL OPERATION - COMBUSTION.

6-31. The combustion air blower and the ventilation blower are the axivane type, operated by 28-volt DC. Both of these blowers operate when the heater switch is ON and continue operation until the switch is OFF. The cycling switch, located on the heater plenum, operates in conjunction with the temperature control system and is set at 25 degrees Fahrenheit. It turns the fuel on and off, cycling the heater at approximately this temperature. The temperature control systems are the automatic or the duct sensing control. The automatic system is a three-temperature pickup system; outside temperature, cabin temperature, and duct temperature controlled from the overhead console. The duct sensing control system controls only the duct temperature from a control located on the right-hand door post.

a. External power - Connected or battery switch to BAT-ON.

b. Fuel MAIN switch - ON.



- 1. Heater Exchange
- 2. Duct
- 3. Tee
- 4. Fan
- 5. Hot Air Bleed Line
- 6. Tube
- 7. Blower

- 8. Duct
- 9. Elbow
- 10. Drain Line
- 11. Tubing
- 12. Reducer
- 13. Elbow
- 14. Hot Air Mixing Valve

- 15. Flexible Coupling
- 16. Plenum
- 17. Tube
- 18. Air Directing Lever
- 19. Tube
- 20. Distribution Valve
- 21. Capped Air Outlets

- 22. Duct
- 23. Duct
- 24. "V" Clamp
- 25. Temperature Control Valve
- 26. Duct
- 27. Elbow

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Figure 6-3. Auxiliary exhaust heater system

- c. HEATER ON/OFF switch - ON.
- d. VIBRATOR switch - NORMAL.
- e. PRESS TO START switch - DEPRESS and hold in for three to four seconds, then release.
- f. Heater air control knobs - Regulate as desired.
- g. HEATER ON/OFF switch - OFF to stop heater operation.

#### 6-32. EMERGENCY OPERATION - COMBUSTION.

6-33. There is no emergency operation of the combustion heating and defrosting system.

#### 6-34. AUXILIARY EXHAUST HEATER SYSTEM.

6-35. The auxiliary exhaust heater system (figure 6-3) consists of a heat exchanger, a blower for circulating air through heat exchanger, a mixing valve to control the air to maintain desired temperature, a temperature control valve assembly which controls aft cabin outlet duct and connecting ducts. The blower is bleed air driven with bleed air from the engine compressor bleed air system. The heat exchanger is

heat air which in turn is distributed through the heat-defrost system by the blower fan.

#### 6-36. EXHAUST HEATER SYSTEM CONTROLS.

6-37. The exhaust heater system controls consist of the cabin heating panel (figure 2-10) on the overhead console; duct sensing switch on right-hand door post; and the air directing lever on the pedestal (figure 6-3).

#### 6-38. EXHAUST HEATER SYSTEM OPERATION.

##### Caution

The exhaust heater system should be in OFF position during take-off and landing and other flight conditions requiring maximum engine power available.

- a. BLEED AIR rotating switch (on overhead console) - Rotate clockwise to ON position.
- b. Duct sensing switch (on right-hand door post) - Adjust as desired. The larger the number the higher the temperature.
- c. Air directing lever (on pedestal) - Position forward for defrost or full aft for cabin heat.

### SECTION III ANTI-ICING, DE-ICING AND DEFROSTER SYSTEM

#### 6-39. ENGINE ANTI-ICING SYSTEM.

6-40. The engine anti-icing system prevents icing of the air inlet areas when the engine is operating at low ambient temperatures. Hot air under pressure, from the annular manifold within the air diffuser housing, flows forward through the airflow shutoff anti-icing valve into the hollow annulus on top of the air inlet housing. This hot air is then directed through five of the six hollow inlet housing support struts to de-ice the air inlet area. Hot scavenge oil, draining through the lower strut into the accessory drive gearbox, de-ices the bottom of the air inlet area. Hot air also flows into the inlet guide vane area and is directed through an annulus around the region of the temperature sensing element of the main fuel control to prevent ice formation in the area of the ambient temperature sensing bulb. Small openings in the bottom of the inlet guide vanes allow hot air to bleed back into the compressor area. The shutoff anti-icing valve is spring-loaded in the open or ON position. The pilot can close the valve by positioning DE-ICE switch on ENGINE panel to OFF (figure 2-3). This energizes a solenoid, causing the valve to shift to the closed or OFF position. If an electrical power failure occurs, the solenoid is de-energized, allowing

the spring-loaded valve to open and anti-icing becomes continuous. With anti-icing ON, full power will be limited due to increased exhaust gas temperature (egt). Pilot shall closely monitor egt when anti-icing is ON.

##### Note

Engine anti-icing system is inoperative on helicopters with sand and dust separator system installed. (Refer to Chapter 2.)

#### 6-41. INDICATOR LIGHTS - ENGINE ANTI-ICING SYSTEM.

6-42. Two indicator lights are located on the pedestal-mounted CAUTION panel (figure 2-14). These lights provide visual information as to the system status. The ENGINE ICING indicator light illuminates to denote engine icing conditions and the operation of the detector proportional to the engine ice accumulation. The ENGINE ICE DET disarmed light will be illuminated when the circuit breaker is out (de-actuated), or the probe is clogged, or when there is an electrical malfunction in the system.

**6-43. PITOT HEATER.**

6-44. The pitot heater is installed in the pitot head and functions to prevent ice forming in the pitot tube. Electric power for pitot heater operation is supplied by the 28-volt DC electrical system. Circuit protection is provided by PITOT TUBE HTR circuit breaker on the DC circuit breaker panel (figure 2-11).

**6-45. PITOT HEATER SWITCH.**

6-46. The PITOT HTR switch is on the DOME LT panel on the overhead console (figure 2-10). This is

a two-position switch marked OFF in aft position and ON in the forward position.

**6-47. OPERATION.**

6-48. PITOT HTR switch - Fwd to ON to prevent ice forming in pitot tube. To shut pitot heater off, position PITOT HTR switch aft to OFF.

**6-49. DEFROSTING SYSTEM.**

6-50. The defrosting system is a part of the heating and de-frosting system. Refer to paragraphs 6-8 through 6-38.

**SECTION IV LIGHTING EQUIPMENT****6-51. NAVIGATION LIGHTS.**

6-52. The navigation lights consist of eight lights (figure 6-4). Two green lights on the right side of the fuselage are mounted, one above and one below the cabin door. Two red lights on the left side of the fuselage are mounted, one above and one below the cabin door. Two white lights are mounted on the top of the fuselage, just inboard of the red and green lights, and one white light is mounted on the bottom of the fuselage. One yellow light is mounted on the tail boom fin. Electric power to operate the lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by NAV LIGHTS circuit breaker on the DC circuit breaker panel (see figure 2-11).

6-53. The navigation lights are controlled from a panel on the overhead console marked EXT LTS (figure 2-10). A three-position switch permits selection of STEADY, OFF, or FLASH. The other, a two-position switch, controls brilliance and is marked DIM and BRIGHT. When the three-position switch is in STEADY position, all eight navigation lights are illuminated. In FLASH position, the colored lights illuminate alternately with the white lights.

**6-54. ANTI-COLLISION LIGHT.**

6-55. One anti-collision light is mounted on top of the fuselage, aft of the cabin area (see figure 6-4). Rotation of the light creates a flashing beam of light that is visible for a considerable distance. Electric power to operate the light is supplied by the 28-volt DC electrical system. Circuit protection is provided by ANTI-COLL LIGHT circuit breaker on the DC circuit breaker panel (see figure 2-11). The light is controlled from the EXT LTS panel on the overhead console (see figure 2-10) by the ANTI-COLLISION switch marked ON and OFF.

**Note**

Under instrument conditions, particularly at night during conditions of extremely low visibility, unnecessary operation of the anti-collision light should be avoided. Reflections on the helicopter's windows, caused by the rotating light beams being reflected back from the clouds and through the whirling blades, may cause vertigo.

**6-56. LANDING LIGHT.**

6-57. The extend-retract landing light is flush-mounted to the underside of the fuselage (figure 6-4). This light may be extended or retracted, as desired, to improve forward illumination. Electric power to operate the light is supplied by the 28-volt DC electrical system. Circuit protection is provided by LDG LIGHT PWR and LDG & SEARCHLIGHT CONT circuit breakers on the DC circuit breaker panel (figure 2-11). The light is controlled by two three-position switches on the light switch box assembly on the pilot's collective stick and marked LDG LT ON/OFF and LDG LT EXT/OFF/RETR (see figure 2-4).

**6-58. OPERATION.**

- a. Upper LDG LT switch - Position to ON.
- b. Lower LDG LT switch - POSITION to EXT until desired extend position is obtained, then return to OFF.
- c. To retract - Position lower LDG LT switch to RETR, then return to OFF.

**Caution**

Upon landing turn landing light OFF to prevent fire hazard.

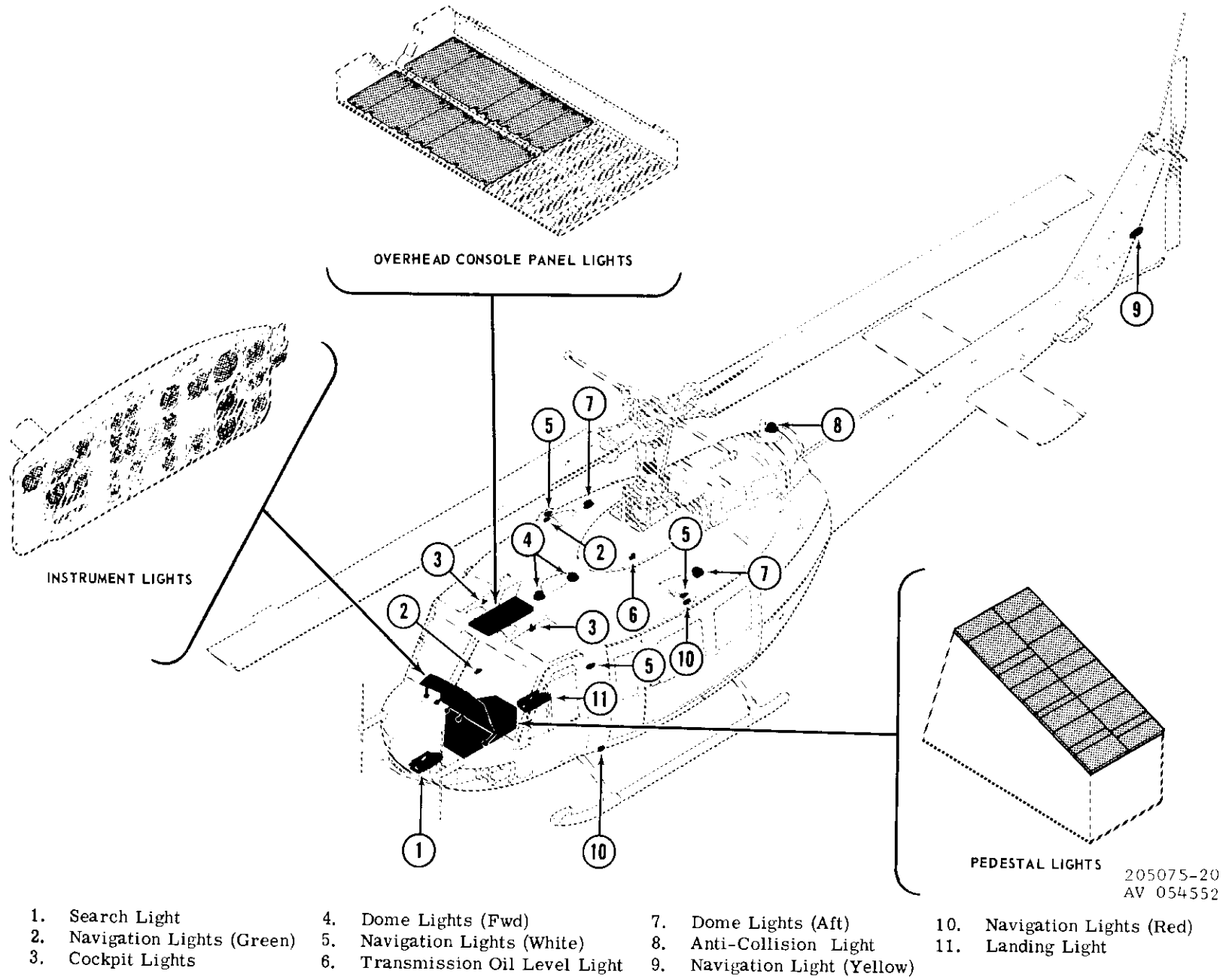


Figure 6-4. Lighting equipment diagram



d. To shut off landing light - Position upper LDG LT switch to OFF.

#### 6-59. SEARCHLIGHT.

6-60. The remote-controlled searchlight is flush-mounted to the underside of the fuselage (figure 6-4). The light can be extended or retracted for search illumination. At any desired position in the light's extend or retract arc, it may be stopped and moved in a horizontal plane to the left or right. Electric power to operate the light is supplied by the 28-volt DC electrical system. Circuit protection is provided by SEARCHLIGHT PWR and LDG & SEARCHLIGHT CONT circuit breakers on the DC circuit breaker panel (figure 2-11). The light is controlled by two switches on the light switch box assembly on the pilot's collective stick (see figure 2-4). The upper switch is marked SL ON/OFF/STOW. The lower switch is a four position switch marked SEARCH CONT EXT/RETR/L/R, and is used to control searchlight movement.

#### 6-61. OPERATION.

- a. SL switch - position to ON.
- b. SEARCH CONT switch - Operate to obtain desired searchlight position.
- c. To stow searchlight - Position SL switch to STOW.

#### Caution

Upon landing turn searchlight OFF to prevent fire hazard.

- d. To shut off light - Position SL switch to OFF.

#### 6-62. DOME LIGHTS.

6-63. The dome lights provide overhead lighting for the cabin area. The forward lights are controlled by the pilot with FWD switch on the DOME LT panel on the overhead console. The aft dome lights are controlled by the medical attendant with a switch on the AFT DOME LTS panel on the roof within easy reach of the medical attendant's station. Electric power to operate the dome lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by DOME LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-64. FWD DOME LIGHTS CONTROL PANEL - PILOT.

6-65. The DOME LT control panel, provided for pilot's control of the forward dome lights, contains a three-position switch marked FWD WHITE/OFF/RED, thus permitting a choice of red or white illumination or lights off.

6-10

#### 6-66. AFT DOME LIGHTS CONTROL PANEL - MEDICAL ATTENDANT.

6-67. The aft dome lights control panel is conveniently located on the roof panel to provide the medical attendant control of the aft dome lights when required. The panel contains one three-position switch and a switch-type rheostat. The three-position switch is marked WHITE/OFF/RED, thus permitting a choice of red or white illumination or lights off. The rheostat marked OFF/MED/BRT functions to increase or decrease the brightness of the aft dome lights as desired.

#### 6-68. COCKPIT LIGHTS.

6-69. Cockpit lights are provided at two locations. One is located at the right of the overhead console within easy reach of the pilot; and the other at the left of the overhead console within easy reach of the copilot or crew member. Rheostat switches for each light are part of the light assembly body. Brightness is increased by turning rheostat clockwise or dimmed by turning counterclockwise. Clockwise rotation of the lens provides white lighting. Counterclockwise rotation of the lens provides red lighting.

#### 6-70. TRANSMISSION OIL LEVEL LIGHT.

6-71. A transmission oil level light has been installed and positioned to provide the necessary illumination to visually check the transmission oil sight gage. The circuit is actuated by a button-type switch marked XMSN OIL LEVEL LT SWITCH and is located on the right side of the transmission bulkhead, forward of the aft bulkhead. Electric power for the transmission oil level light circuit is supplied by the 28-volt DC battery circuit. Circuit protection is provided by the battery voltmeter circuit breaker

#### 6-72. INSTRUMENT LIGHTS.

6-73. The instrument lights control panel is located on the right section of the overhead console (figure 2-10). This panel contains six switch-type rheostats for actuating and dimming the various instrument lights. The switch-type rheostats are marked CONSOLE, PED, SEC, ENGINE, COPILOT, and PILOT. Electric power to the instrument lights control panel is supplied by the 28-volt DC electrical system. Circuit protection is provided by CONSOLE PED LIGHTS INST PANEL LIGHTS, and INST SEC LIGHTS circuit breakers located on the DC circuit breaker panel.

#### 6-74. PILOT'S INSTRUMENT LIGHTS.

6-75. The pilot's instrument lights furnish illumination for the following instruments: gas producer tachometer, torquemeter, exhaust temperature indicator, dual tachometer, airspeed indicator, clock, vertical velocity indicator, turn and slip indicator,

altimeter, attitude indicator, radio magnetic indicator, OMNI indicator, and standby compass. These lights are all on one circuit and are controlled by the switch-type rheostat marked PILOT on the INST LTG control panel (figure 2-10). Clockwise rotation of the rheostat knob turns lights on and increases brilliance. Counterclockwise rotation of the rheostat knob dims lights, and the final movement (OFF position) breaks the circuit to the pilot's instrument lights. Electric power to operate the lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by INST PANEL LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-76. COPILOT'S INSTRUMENT LIGHTS.

6-77. The copilot's instrument lights furnish illumination for the instruments on the copilot's section of the instrument panel. These instruments consist of an airspeed indicator, attitude indicator, altimeter, vertical velocity indicator and radio magnetic indicator. The copilot's instrument lights are all on one circuit, and control is accomplished by the switch-type rheostat marked COPILOT on the INST LTG control panel (figure 2-10). Clockwise rotation of the rheostat knob turns lights on and increases brilliance. Counterclockwise rotation of the knob dims lights, and the final (OFF position) movement breaks the circuit to the copilot's instrument lights. Electric power to operate lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by INST PANEL LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-78. ENGINE INSTRUMENT LIGHTS.

6-79. The engine instrument lights furnish illumination for the following instruments: transmission oil temperature, fuel quantity, transmission oil pressure, engine oil pressure, loadmeter, AC voltmeter, fuel pressure indicator and DC voltmeter. Each instrument is individually illuminated and control is accomplished by the switch-type rheostat marked ENGINE on the INST LTG control panel (figure 2-10). Clockwise rotation of the rheostat knob turns engine instrument lights on and increases brilliance. Counterclockwise rotation of the knob dims lights, and the final movement (OFF position) breaks the circuit to the engine instrument lights. Electric power to operate the lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by INST PANEL LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-80. SECONDARY LIGHTS - INSTRUMENT PANEL.

6-81. The four secondary instrument lights are spaced across the top of the instrument panel shield (see figure 2-5). These lights furnish secondary illumination for the instrument panel face. The lights are actuated and controlled by the switch-type rheostat marked SEC on the INST LTG control panel (figure 2-10). Clockwise rotation of the rheostat knob turns the four secondary lights on and increases brilliance. Counterclockwise rotation of the knob dims lights, and the final movement (OFF position) breaks the circuit to the secondary lights. Electric power to operate the lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by INST SEC LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-82. OVERHEAD CONSOLE PANEL LIGHTS.

6-83. The overhead console panel lights furnish illumination for the DC POWER panel, AC POWER panel, INST LTG panel, DOME LT panel, EXT LTS panel, MISC panel, and CABIN HEATING panel. Each panel is individually illuminated and control is accomplished by the switch-type rheostat, marked CONSOLE on the INST LTG control panel (figure 2-10). Clockwise rotation of the rheostat knob turns overhead console panel lights on and increases brilliance. Counterclockwise rotation of the rheostat knob dims lights, and the final movement (OFF position) breaks the electrical circuit to the overhead console panel lights. Electric power to operate the overhead console panel lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by CONSOLE PED LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

#### 6-84. PEDESTAL LIGHTS.

6-85. The pedestal lights furnish illumination for the control panels on the pedestal. Each panel is individually illuminated and control is accomplished by the switch-type rheostat marked PED on the INST LTG control panel (see figure 2-10). Clockwise rotation of the rheostat knob turns the pedestal lights on and increases brilliance. Counterclockwise rotation of the knob dims lights, and the final movement (OFF position) breaks the circuit to the pedestal lights. Electric power to operate the pedestal lights is supplied by the 28-volt DC electrical system. Circuit protection is provided by CONSOLE PED LIGHTS circuit breaker on the DC circuit breaker panel (figure 2-11).

### SECTION V OXYGEN SYSTEM

(Not Applicable)

SECTION VI AUXILIARY POWER UNIT

(Not Applicable)

SECTION VII ARMAMENT SYSTEM

6-86. ARMAMENT SUBSYSTEM PROVISIONS.

6-87. Attaching points for the armament subsystem are provided on each side of the helicopter at approximate fuselage stations 61 and 84, 129 and 155 by means of adapter assemblies (figure 2-15).

6-88. ARMAMENT SUBSYSTEM M23.

6-89. The armament subsystem M23 is attached to external stores hard point fittings on both sides of the helicopter (figure 6-5). The two flexible 7.62 millimeter machine guns M60D (figure 6-6) are free pointing but limited in traverse, elevation, and depression by cam surfaces and stops on pintles and pintle post assemblies of the two mount assemblies (figure 6-7) on which the M60D machine guns are mounted. An ejection control bag (figure 6-8) is latched to the right side of each M60D machine gun to hold the spent cartridges and links. Cartridges travel from ammunition box and cover assemblies (figure 6-7) to M60D machine gun through flexible chute and brace assemblies (figure 6-7).

6-90. COMPONENTS OF SUBSYSTEM M23.

a. 7.62 Millimeter Machine Gun M60D. Machine gun M60D is a link-belt fed, gas operated, air cooled, automatic weapon (figure 6-6).

b. Armament Subsystem M23 Mount Assembly. The mount assembly (figure 6-9) is installed on the aft external stores hard points on both sides of the helicopter.

6-91. TABULATED DATA - ARMAMENT SUBSYSTEM M23.

|  |            |
|--|------------|
| Weight (W/O ammunition)                        | 66.0 lbs   |
| Weight (W/ammunition-600 rounds)               | 104.4 lbs  |
| Flexible chutes - links per chute              | 42         |
| Rate of fire-rounds-per-minute (Approximately) | 550        |
| Ammunition - All types                         | 7.62 mm    |
| Overall length of machine gun M60D             | 44 7/8 in. |

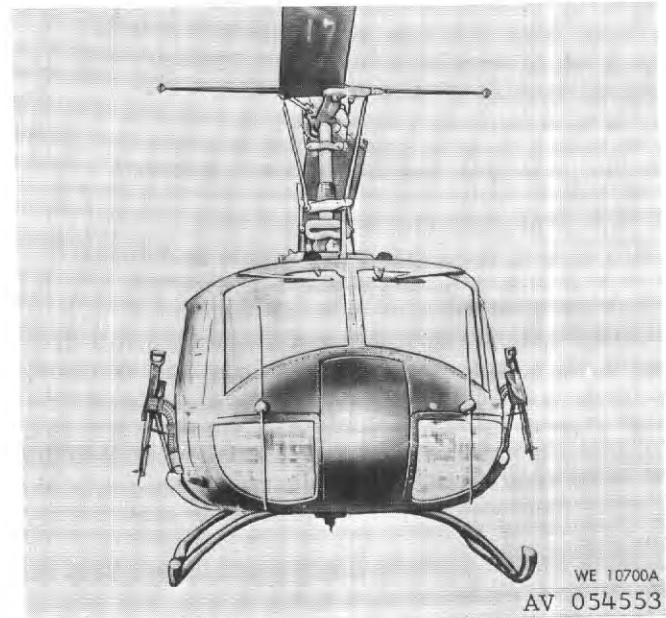


Figure 6-5. Armament subsystem M23 installed on helicopter

6-92. TRAVERSE, DEPRESSION, AND ELEVATION LIMITS.

|                          |            |
|--------------------------|------------|
| Forward traversing limit | 1546 mils. |
| Aft traversing limit     | 1546 mils. |

Depression and elevation limits:

| Gun Direction   | Left and Right Side | Left and Right Side |
|-----------------|---------------------|---------------------|
|                 | Depression          | Elevation           |
| Maximum forward | 1457 Mils           | 61 mils             |
| Center          | 1457 mils           | 89 mils             |
| Maximum aft     | 1386 mils           | 115 mils            |

6-93. CONTROLS - ARMAMENT SUBSYSTEM.

6-94. The following paragraphs locates, describes and illustrates the controls provided for operating machine gun M60D and armament subsystem M23

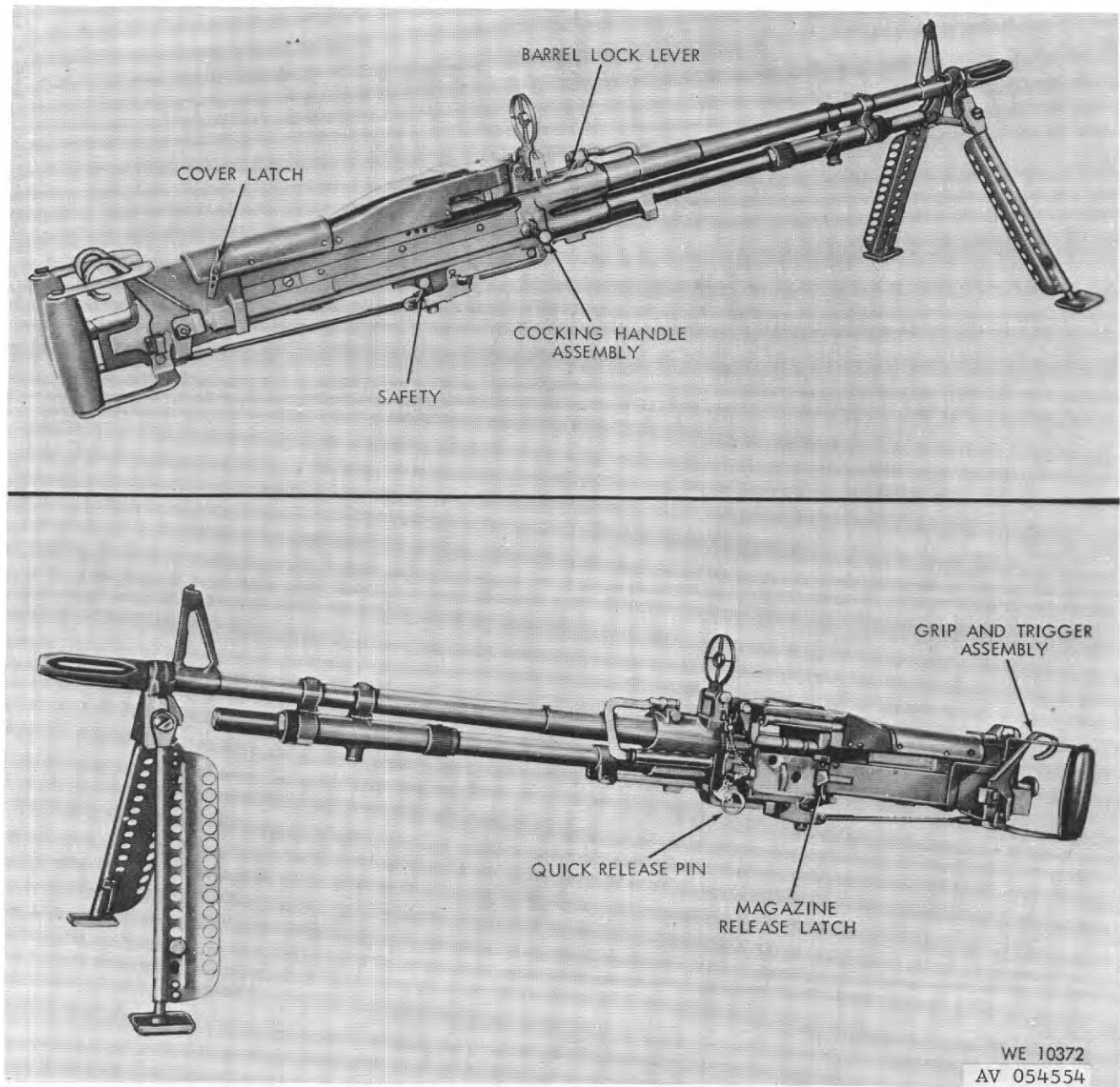


Figure 6-6. 7.62 millimeter machine gun M60D - right rear and left front views

mount assembly. For information on basic weapon 7.62 millimeter machine gun M60, refer to TM 9-1005-224-12.

6-95. MACHINE GUN M60D CONTROLS.

a. Cover latch (figure 6-6). The cover latch is located at the right rear of the cover assembly. In a vertical position it secures cover assembly in closed position, turning to horizontal position unlocks cover assembly.

b. Barrel Lock Lever (figure 6-6). The barrel lock lever, located at right front of receiver, is se-

cured to barrel locking shaft and rotates shaft to lock or unlock barrel assembly.

c. Cocking Handle Assembly (figure 6-6). The cocking handle assembly, at right front of receiver, is used for manually charging the weapon.

**Warning**

Cocking handle assembly must be returned to the forward or locked position before firing to prevent injury to personnel.

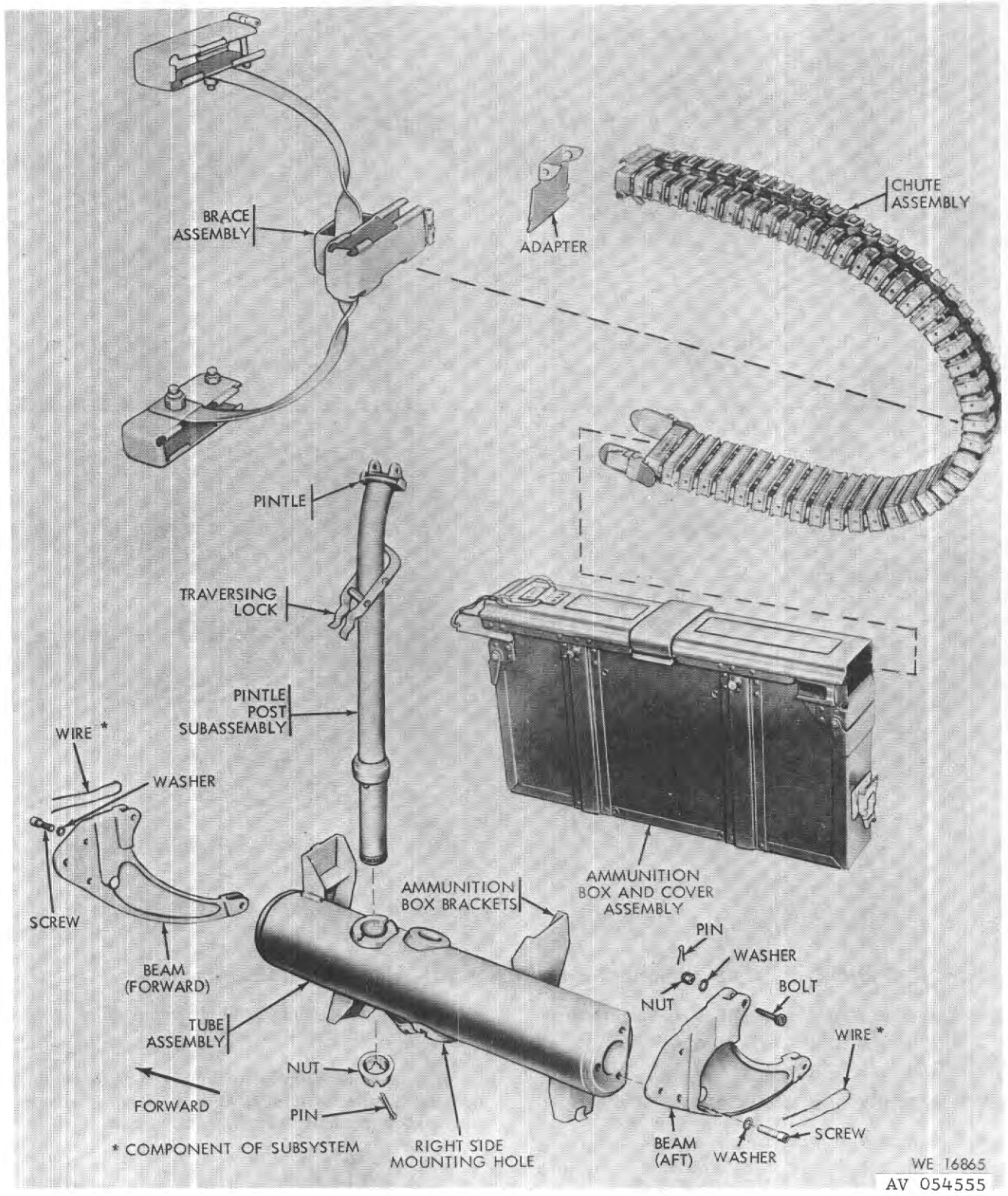


Figure 6-7. Armament subsystem M23 mount assembly - exploded view

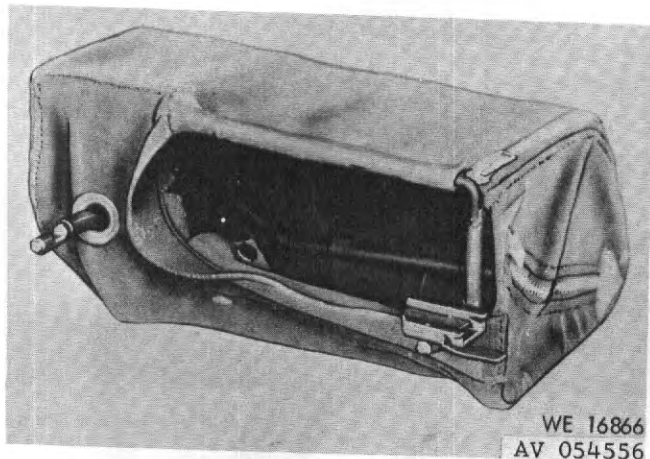


Figure 6-8. Ejection control bag

d. Safety (figure 6-6). The safety, located at lower front of receiver, consists of a cylindrical pin with a sear clearance cut which slides across receiver to block the sear and prevent accidental firing. Ends of pin are marked for pushing to "S" safe and "F" firing positions.

e. Grip and Trigger Assembly (figure 6-6). The grip and trigger assembly includes the spade grips and is located at rear of receiver. The U-shaped design permits firing of weapon by thumb pressure from either hand.

#### Warning

Pressing the trigger to release the bolt assembly also accomplishes feeding and releases the firing mechanism. Make certain the weapon is cleared of cartridges before pressing trigger assembly, unless firing is intended.

#### Caution

When ammunition is not present in machine gun M60D, retard forward force of released bolt assembly by manually restraining forward movement of cocking handle assembly to prevent damage to cartridge tray.

f. Magazine Release Latch (figure 6-6). The magazine release latch, located on left side of receiver, locks adapter of the ammunition chute when it is seated in magazine bracket.

#### 6-96. ARMAMENT SUBSYSTEM M23 MOUNT ASSEMBLY CONTROL.

a. Maximum traverse movements of the machine gun M60D are controlled by stops on both sides of cam surface on pintle post assembly. Maximum

elevation and depression are controlled by cam surfaces on pintle.

b. A spring-type traversing lock mounted on the pintle post assembly, is used to stow machine gun M60D in muzzle-down position (figure 6-10).

#### 6-97. OPERATION - ARMAMENT SUBSYSTEM.

##### 6-98. PRE-FLIGHT CHECKS.

6-99. The pre-flight check will consist of a check of the following:

a. Machine Gun M60D - Properly mounted and secured in stowed position.

b. Barrel - Dry and free of obstruction.

c. Gas Cylinder - Plug is tight in cylinder.

d. Cover Assembly - Check for freedom of movement and secureness of latch.

e. Ejection Control Bag - Properly latched (figure 6-11).

f. Ammunition Box and Cover Assembly. Secured to ammunition box brackets on tube assembly (figure 6-12).

g. Chute and Brace Assemblies - Properly fasten brace assembly to chute assembly, and chute assembly to machine gun M60D and ammunition box and cover assembly (figures 6-13 and 6-14).

h. Safety - Push safety button to safe position. Attempt to fire unloaded machine gun M60D (figure 6-6).

i. Mount Assembly - Secured, check for free pintle movement (figure 6-9).

j. Ammunition Boxes - Properly stowed.

#### 6-100. INFLIGHT OPERATION.

##### a. Preparation for Firing.

(1) Check machine gun M60D to see that it has been thoroughly cleaned and lubricated, in working order, and secured on pintle with quick release pin (figure 6-15).

(2) Check machine gun M60D for freedom of movement in elevation, depression, and traverse.

(3) Load linked cartridges into machine gun M60D (figure 6-16).

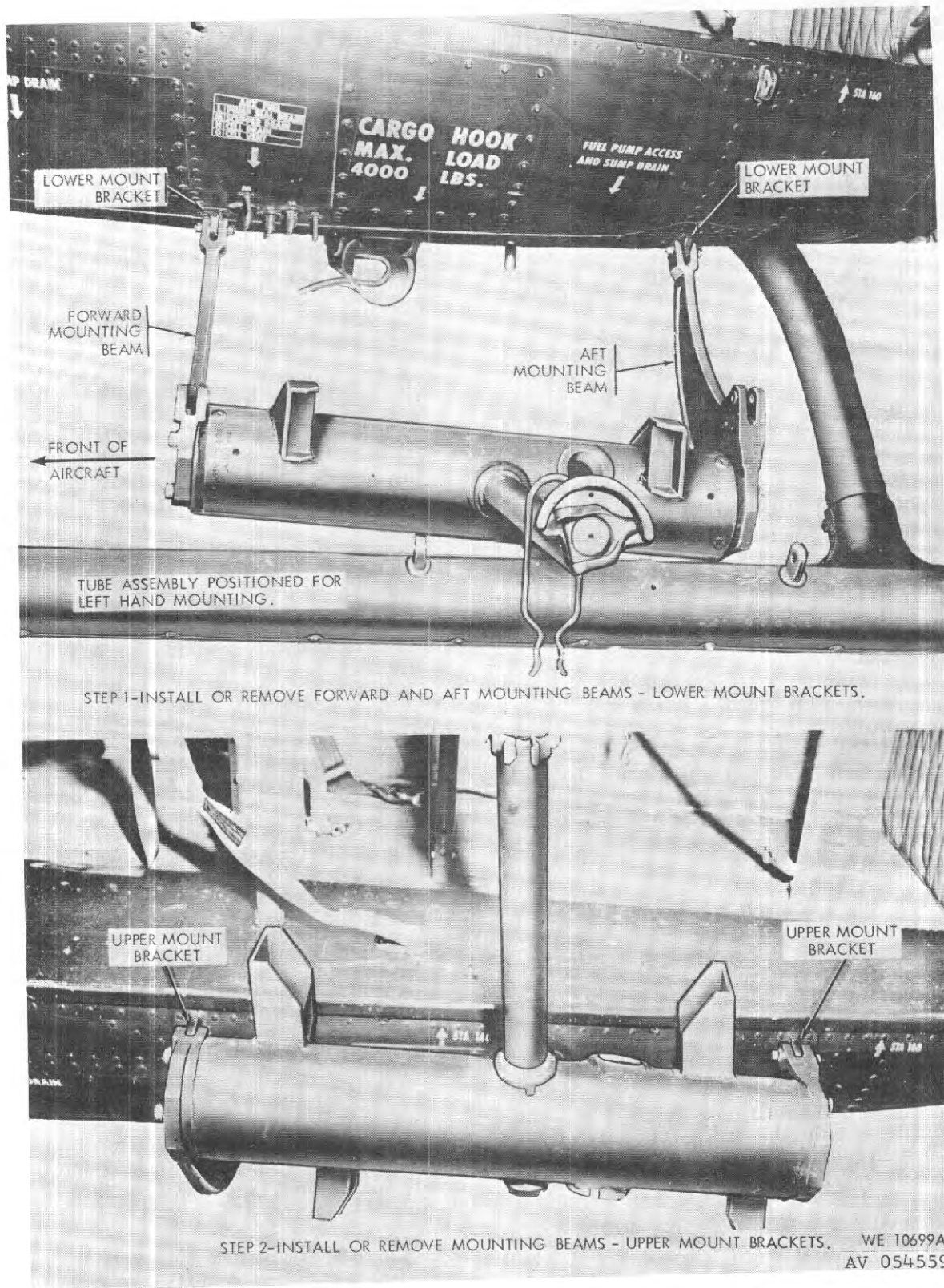


Figure 6-9. Armament subsystem M23 mount assembly - installed on helicopter - left side shown

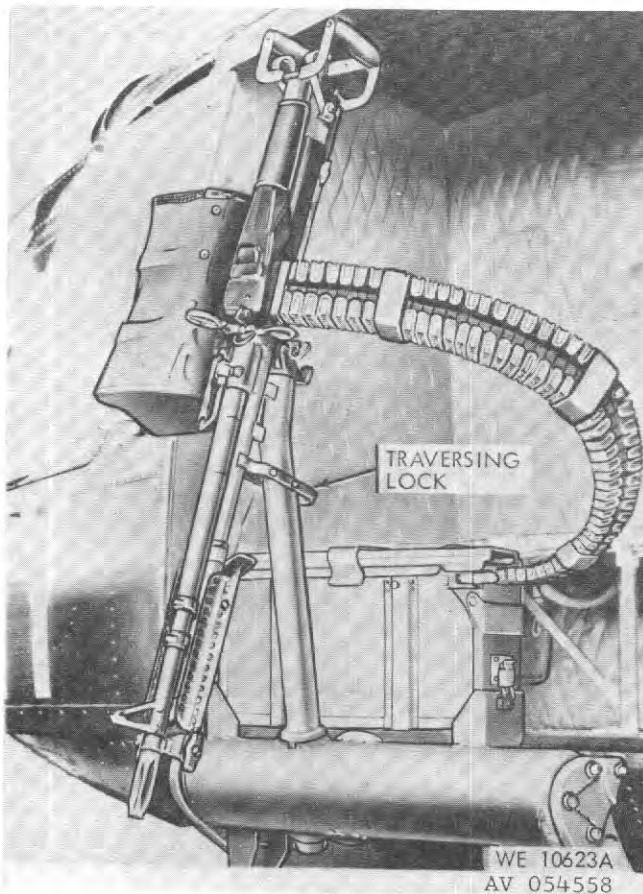


Figure 6-10. Armament subsystem M23 installed - machine gun M60D in stowed position - right side shown

**Note**

Inspect linked cartridges to see that cartridges are properly positioned in links.

(a) Retract bolt assembly by pulling handle assembly fully rearward until sear engages and push handle assembly to forward position. Push safety button to safe "S" position. Turn cover latch rearward to horizontal position and raise cover assembly.

(b) Place linked cartridges, with open sides of links down, on cartridge tray assembly (figure 6-16) making certain that first cartridge to be fired is in cartridge tray groove. The pawl in cartridge tray assembly will then engage the second cartridge. Cartridges must be positioned with open side of links down to permit stripping of cartridge from the link. Close and latch cover assembly.

b. Firing. With the machine gun M60D positioned, loaded, and aimed, push safety button to fire "F" position. Due to low cyclic rate of fire of machine gun, single cartridges or short bursts can be easily fired. Trigger must be completely released for each shot to fire single cartridges or to interrupt firing.

When ammunition is exhausted, the last link will remain in cartridge tray assembly. Remove link and end plug by hand after cover assembly is opened for loading.

c. After Firing Operation.

(1) Push safety button to safe "S" position and attempt to fire machine gun.

(2) Retract bolt assembly by pulling handle assembly fully rearward until sear engages and push handle to the forward position. Move cover latch rearward to horizontal position and raise cover assembly. Remove linked cartridges.

(3) Inspect chamber to be sure it is clear.

(4) Close cover assembly and secure machine gun in stowed position.

6-101. EMERGENCY PROCEDURE.

a. Failure to Fire.

(1) Misfire. A misfire is a complete failure to fire. A misfire in itself is not dangerous but since it cannot be immediately distinguished from a delay in functioning of the firing mechanism or from a hangfire (see paragraph (2) below), it should be considered as a possible hangfire until such possibility has been eliminated. Such delay in functioning of the firing mechanism, for example, could result from the presence of foreign matter, such as grit, sand, frost, ice, or improper or excessive oil or grease which might create, initially, a partial mechanical restraint but which, after some interminate delay, is overcome as a result of the continued force applied by the spring, and the firing pin then driven into the primer in normal manner. As a safety measure, no cartridges should be left in a hot machine gun any longer than the circumstances require, because of a possibility of a cock-off (see paragraph (3) below).

(2) Hangfire. A hangfire is a delay in the functioning of a propelling charge at the time of firing. The amount of delay is unpredictable but, in most cases, will fall within the range of a split second to several seconds. A hangfire cannot be distinguished immediately from a misfire and therein lies its principal danger. What might initially be assumed to be a failure to fire, or misfire, might prove to be a hangfire.

**Warning**

During the prescribed time intervals, the machine gun M60D will be kept trained on target. All personnel will stand clear of muzzle.



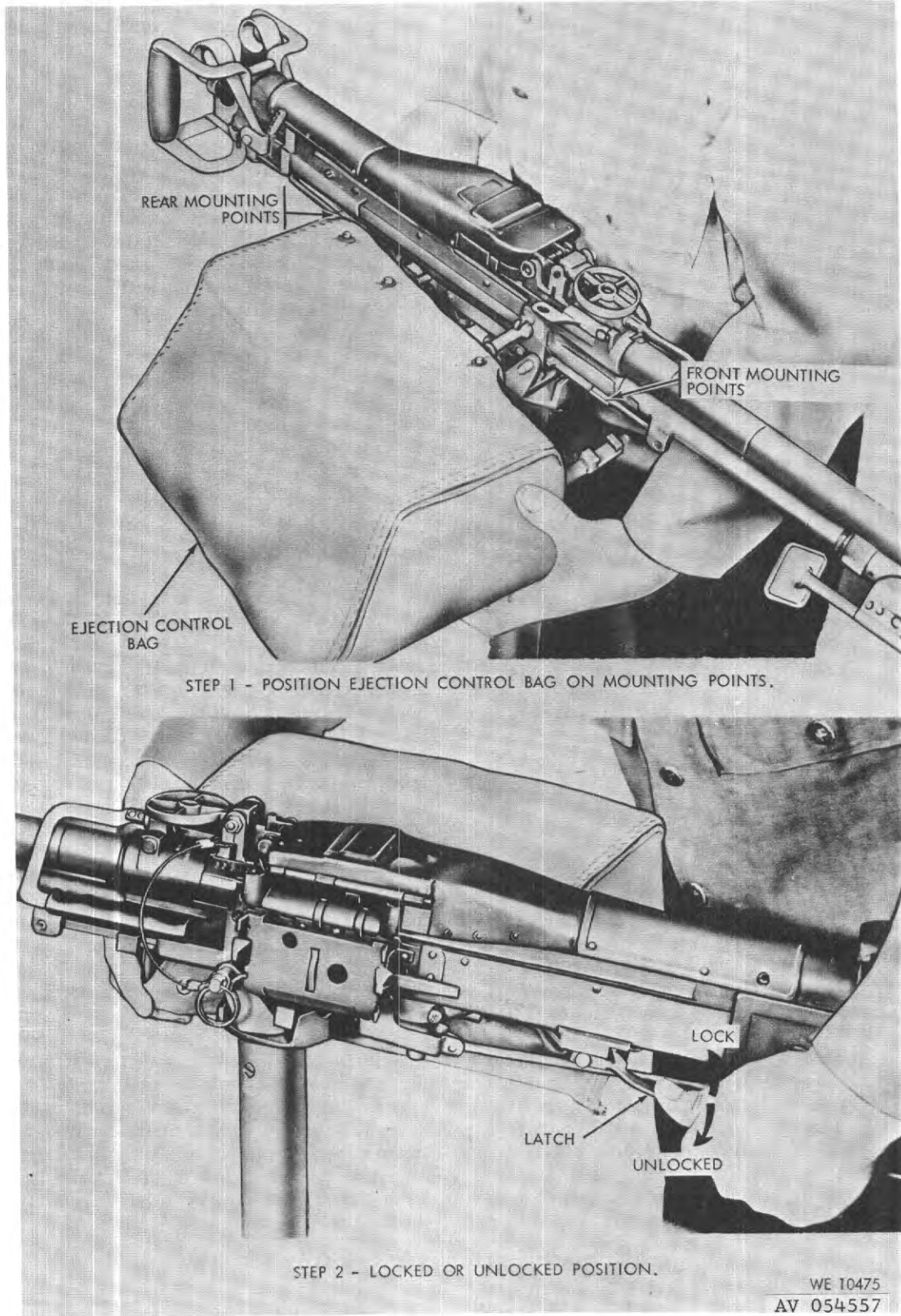


Figure 6-11. Installation or removal of ejection control bag

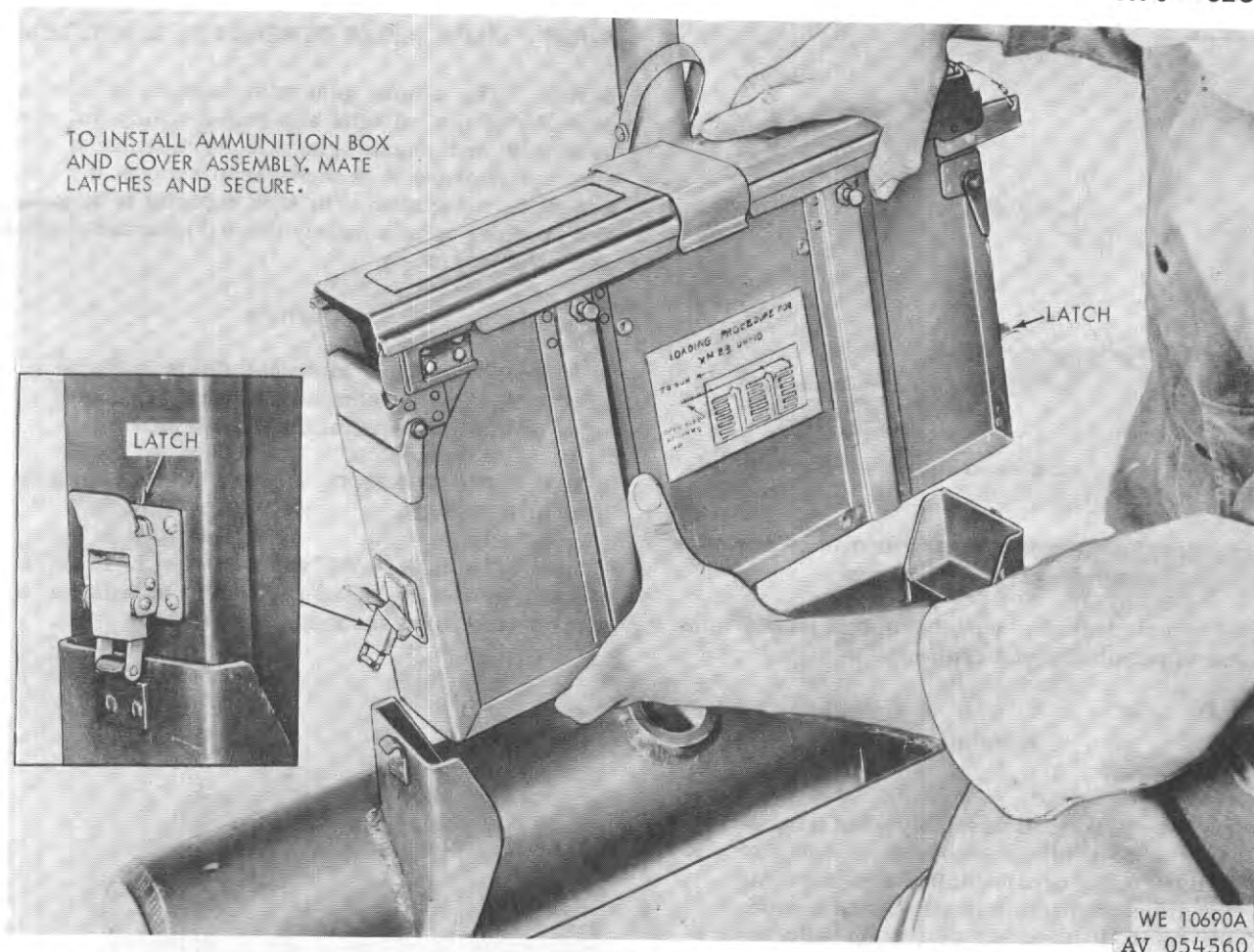


Figure 6-12. Installation or removal of ammunition box and cover assembly on tube assembly

(3) **Cook-off.** A cook-off is a functioning of any or all of the explosive components of a cartridge chambered in a very hot machine gun. If the primer or propelling charge should cook-off, the projectile may be propelled from the machine gun with normal velocity even through no attempt was made to fire the primer by actuating firing mechanism. In such a case, although there may be uncertainty as to whether or when cartridge will fire, the precautions to be observed are the same as those prescribed for a hangfire (see paragraph (2) above). To prevent a cook-off, a cartridge which has been loaded into a very hot machine gun should be fired immediately or removed after 5 seconds and within 10 seconds.

(4) **Unloading an unfired cartridge.** After a failure to fire, due to the possibility of a hangfire or a cook-off, the following general precautions, as applicable, will be observed until cartridge has been removed from the machine gun and cause of failure determined.

(a) Keep machine gun trained on target. All personnel will stand clear of muzzle.

(b) Before retracting bolt assembly either to remove cartridge or to recock as the case may be, personnel not required for operation will be cleared from the vicinity.

(c) The cartridge, after removal from the machine gun, will be kept separate from other cartridges until it has been determined whether the cartridge or the firing mechanism was at fault. If it is determined that the cartridge is at fault, it will be retained separate from other cartridges until disposed. On the other hand, if examination reveals that the firing mechanism was at fault, the cartridge may be reloaded and fired after correction of the cause for failure to fire.

(5) **Time Interval.** Always keep cartridge locked in chamber for 5 seconds from time a misfire occurs to insure against an explosion outside of machine gun in the event a hangfire develops. If the barrel is hot and a misfire stops automatic operation of machine gun, wait 5 seconds with cartridge locked in chamber to insure against hangfire dangers, then extract cartridge immediately to prevent a cook-off. If the cartridge cannot be extracted within 10 seconds,

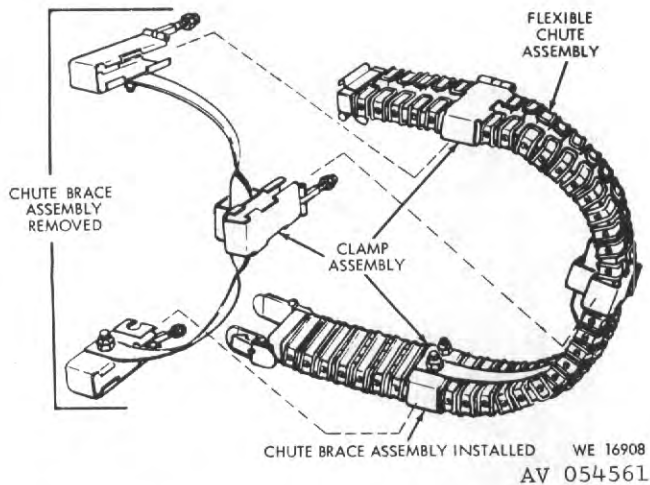


Figure 6-13. Installation or removal of brace assembly on chute assembly

it must remain locked in chamber for at least 5 minutes due to possibility of a cook-off.

**Warning**

Do not retract bolt assembly when a hangfire or cook-off is suspected. A hangfire will normally occur within 5 seconds from the time the primer is struck and a cook-off after 10 seconds of contact with the chamber in a hot barrel. One hundred fifty cartridges fired in a 2 minute period will make a barrel hot enough to produce a cook-off.

b. Runway Gun. If machine gun M60D continues to fire after trigger has been released, immediately open cover assembly permitting the bolt assembly to go underneath cartridge and stop in the forward position.

6-102. AMMUNITION.

a. General. The ammunition for the 7.62 millimeter machine gun M60D is classified as small arms ammunition and is issued in the form of a complete round in linked belts. Issue is in proportion by types to meet tactical requirements.

b. Authorized 7.62 Millimeter Cartridges.

- Cartridge, 7.62 millimeter: AP, NATO, M61.
- Cartridge, 7.62 millimeter: Ball, NATO, M59.
- Cartridge, 7.62 millimeter: Ball, NATO, M80.
- Cartridge, 7.62 millimeter: Tracer, NATO, M62.
- Cartridge, 7.62 millimeter: Dummy, NATO, M63.

6-103. XM52 SMOKE GENERATOR SUBSYSTEM,

6-104. The smoke generator subsystem basically consists of the oil tank and hoses, pump and motor assembly and nozzle ring. A new designed bench seat and door panel is necessary to accept the smoke generator subsystem. The tank capacity is 50 gallons and provides approximately three (3) minutes of smoke generator operation.

**Warning**

Do not use any alternate fluids in the oil tank. The prescribed fog oil is type SGF2 (Military Specification MIL-F-12070.)

6-105. COMPONENTS - XM52 SMOKE GENERATOR SUBSYSTEM.

a. The tank level fog oil circuit breaker is located in the overhead panel. The circuit breaker protects the pump and motor assembly.

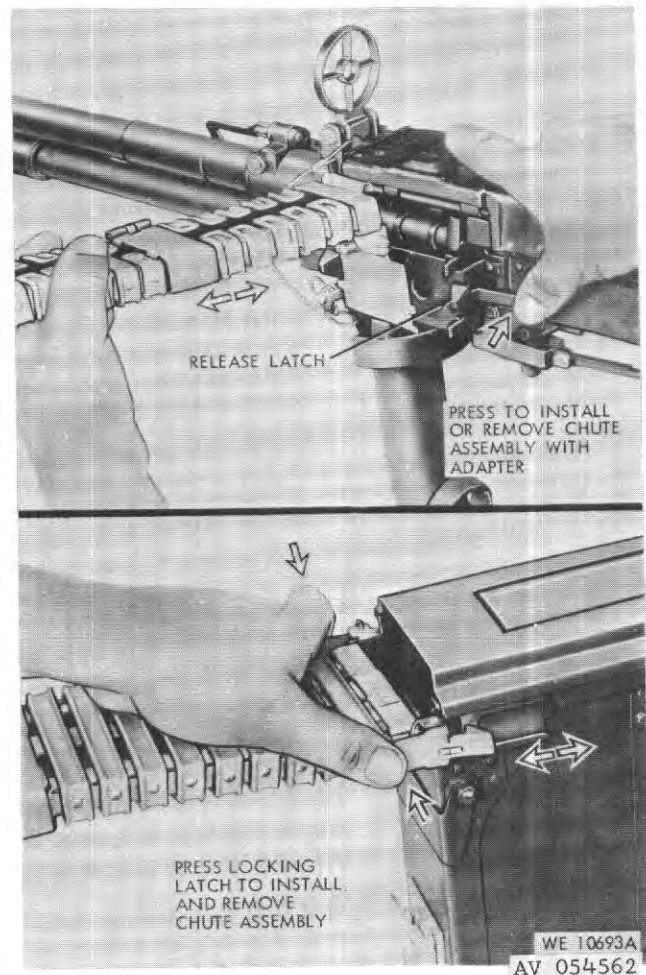


Figure 6-14. Installation or removal of chute assembly on machine gun M60D and ammunition box and cover assembly

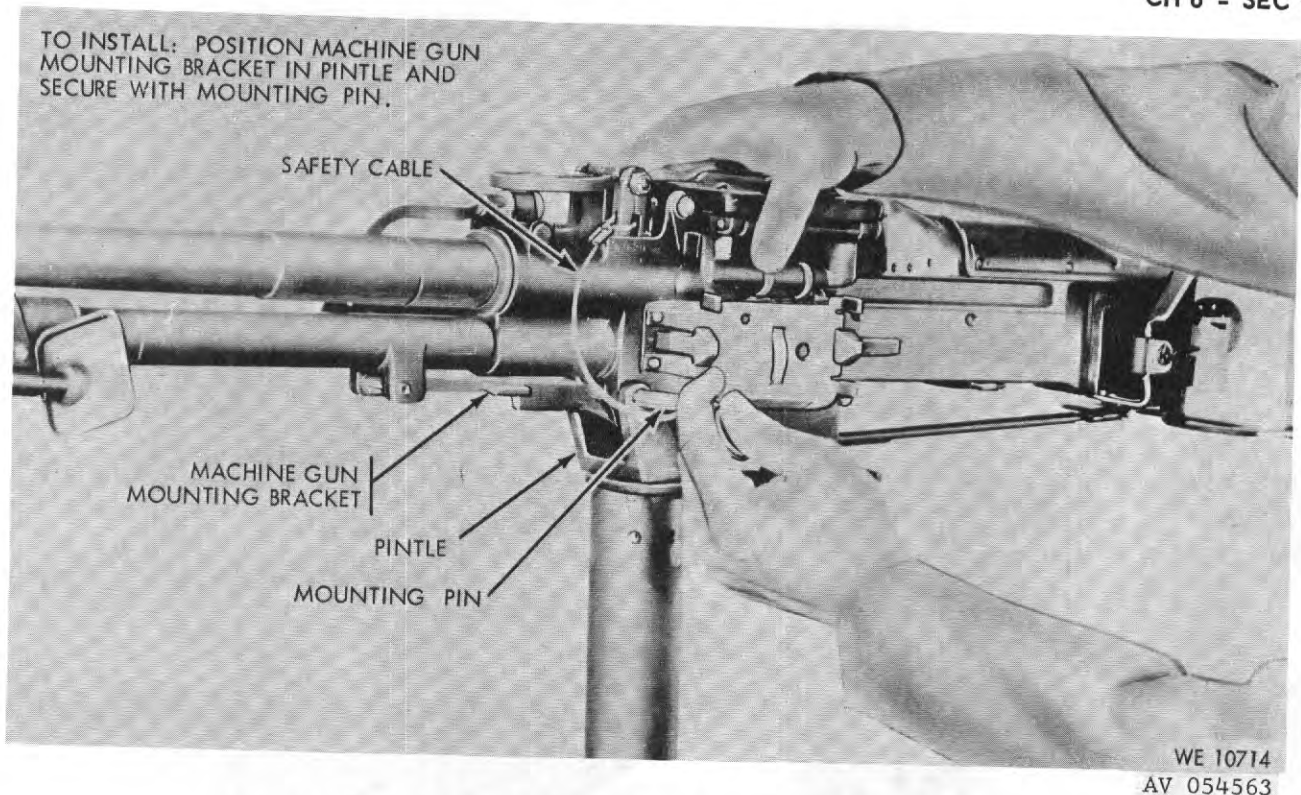


Figure 6-15. Machine gun M60D position on pintle - left side shown

b. The operating switch is a hand held push button switch that is attached to the end of a six foot length of coiled cable suspended from the cabin roof and held by a clip secured near the center line of the roof structure. Its location is accessible to the pilot, copilot, and crew members.

c. An oil level gage is mounted on the center post in the cockpit. The gage is marked from E (empty) to F (full) in 1/4 tank increments, to indicate the quantity of oil remaining in the oil tank.

#### 6-106. OPERATION - XM52 SMOKE GENERATOR SUBSYSTEM.

a. Press tank level fog oil and smoke generator pump control circuit breakers (on overhead panel) to IN position.

b. To generate smoke, press and hold operating switch push button for as long as smoke generation is desired. The oil level gage will indicate the amount of fog oil remaining in the oil tank at all times. The total continuous operating time (starting with a full oil tank) is approximately three (3) minutes.

#### Note

Smoke can be generated either continuously or in short bursts. Smoke generation will stop when the operating switch push button is released.

#### 6-107. DESTRUCTION OF MATERIAL.

#### 6-108. GENERAL.

#### Note

The information contained in the following paragraphs is in accordance with demolition information contained in International Standardization Agreement-STANAG 2113.

a. It is essential to destroy to the maximum degree possible military technical equipment, abandoned in wartime operations, to prevent its eventual repair and use by the enemy.

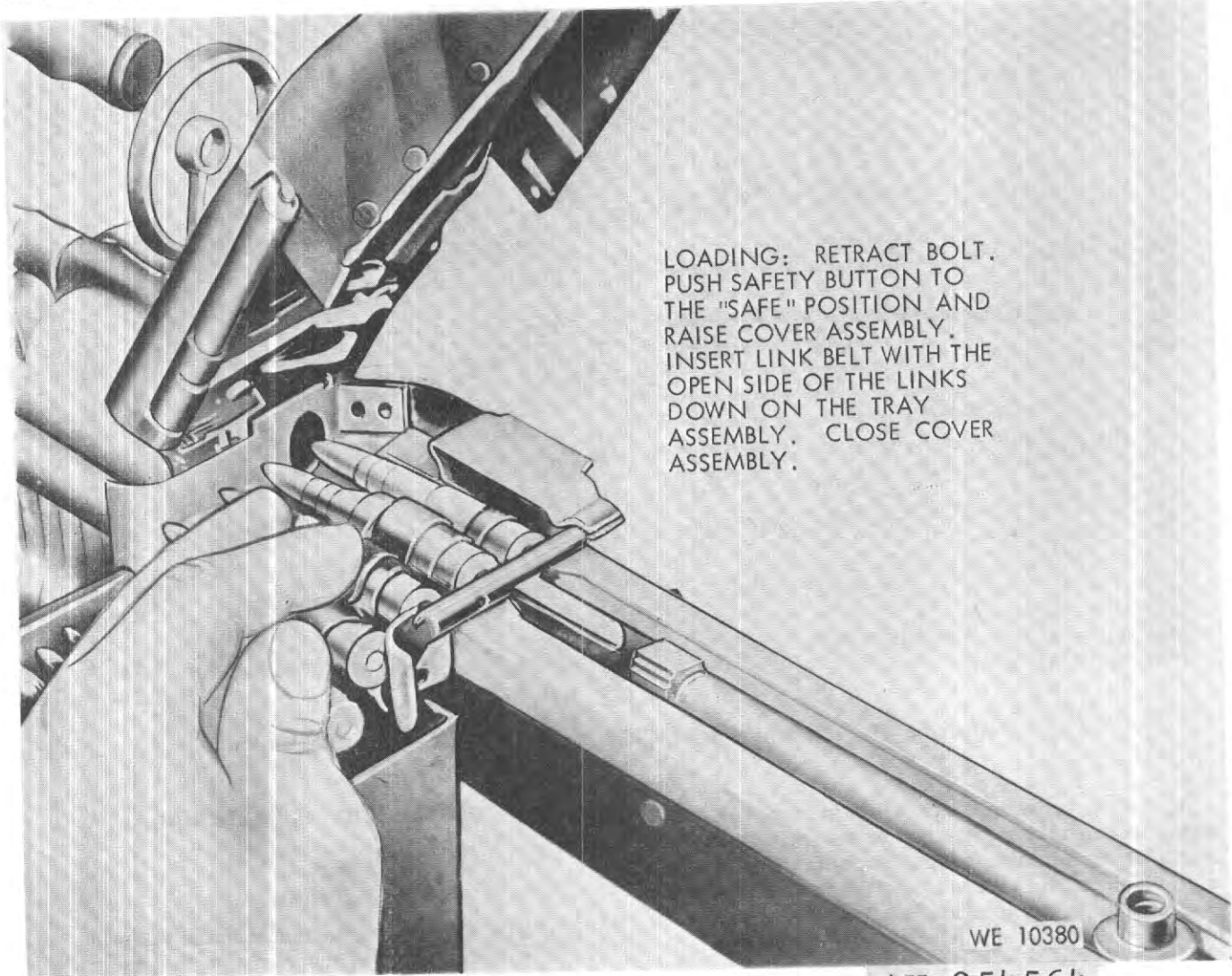
b. Methods of destruction should achieve such damage to equipment and essential spare parts that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or cannibalization.

#### 6-109. PRIORITIES.

a. When lack of time and/or stores prevents complete destruction of equipment priority is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment.

b. The priority for destruction of equipment components shall be as follows:

- (1) Receiver and breech mechanism.
- (2) Gun barrels.



LOADING: RETRACT BOLT.  
PUSH SAFETY BUTTON TO  
THE "SAFE" POSITION AND  
RAISE COVER ASSEMBLY.  
INSERT LINK BELT WITH THE  
OPEN SIDE OF THE LINKS  
DOWN ON THE TRAY  
ASSEMBLY. CLOSE COVER  
ASSEMBLY.

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Figure 6-16. Positioning linked cartridges on cartridge tray assembly

(3) Front and rear sights.

(4) Armament subsystem M23 Mount Assemblies.

c. Equipment installed on aircraft shall be destroyed in accordance with the priorities for the equipment itself. The same priority, for destruction of component parts of armament subsystems, must be given to the destruction of similar components in spare parts storage areas, if they cannot be evacuated.

#### 6-110. METHODS.

a. Ordinarily the armament should be destroyed in conjunction with the destruction of the helicopter.

b. If the material is off the helicopter, the armament can be destroyed by using one of the following methods:

(1) Mechanical. Requires axe, pick, sledge, crowbar, or similar implement.

(2) Burning. Requires gasoline, oil, incendiary grenades, or other flammables, or welding or cutting torch.

(3) Demolition. Requires suitable explosives or ammunition.

#### 6-111. AUTHORIZATION AND REPORTING.

a. The authority for ordering the destruction of equipment is vested in the divisional and higher commanders, who may delegate authority to subordinate commanders when the situation requires.

b. The reporting of the destruction of equipment is done through command channels.

## SECTION VIII PHOTOGRAPHIC EQUIPMENT

(Not Applicable)

## SECTION IX AUTOMATIC STABILIZATION EQUIPMENT

(Not Applicable)

## SECTION X MISCELLANEOUS EQUIPMENT

## 6-112. WINDSHIELD WIPER.

6-113. Two windshield wipers are provided, one for the pilot on the right-hand section of the windshield and one for the copilot on the left-hand section of the windshield. The wipers are driven by electric motors with electric power supplied by the 28-volt DC electrical system. Circuit protection is provided by WINDSHIELD WIPER PILOT and WINDSHIELD WIPER COPILOT circuit breakers on the DC circuit breaker panel. (See figure 2-11.) The windshield wiper switches on the overhead console mounted MISC panel (see figure 2-10), have five positions: HIGH, MED, LOW, OFF and PARK. The panel also has a selector which permits the operation of windshield wiper for pilot, copilot or both as desired.

**Caution**

Do not operate the wiper on a dry windshield.

## 6-114. CASUALTY CARRYING EQUIPMENT.

6-115. See figure 6-17 for a typical litter installation.

## 6-116. LITTER PROVISION.

6-117. Provisions for the installation of folding litter racks adapt the helicopter to carry six litter patients. Three standard army medical service litters are located on each side of the transmission support structure and are attached to the transmission support structure and stanchions. Alternate litter loading is to position three litters laterally. Litter patients are loaded through the cargo doors. Passenger safety belts are used to secure litter patients to the litters. The litters are designed to be quickly installed, folded for internal storage, or removed when their use is not anticipated.

## 6-118. MEDICAL ATTENDANT'S SEAT.

6-119. When six litters are installed, the center forward-facing troop seat (attached to transmission support structure) is used for the medical attendant. The seat may be folded and stowed or removed, as required, for accomplishment of various missions. The seat is attached to the floor and the transmission support structure and is equipped with a detachable safety belt. When lateral litter loading is used, a single seat attached to the floor behind the pilot and copilot and facing aft, is used for the medical attendant. This seat is equipped with a safety belt.

**Note**

The medical attendant's seat is not installed on helicopter serial number 65-9605 and subsequent helicopters.

## 6-120. CARGO LOADING EQUIPMENT.

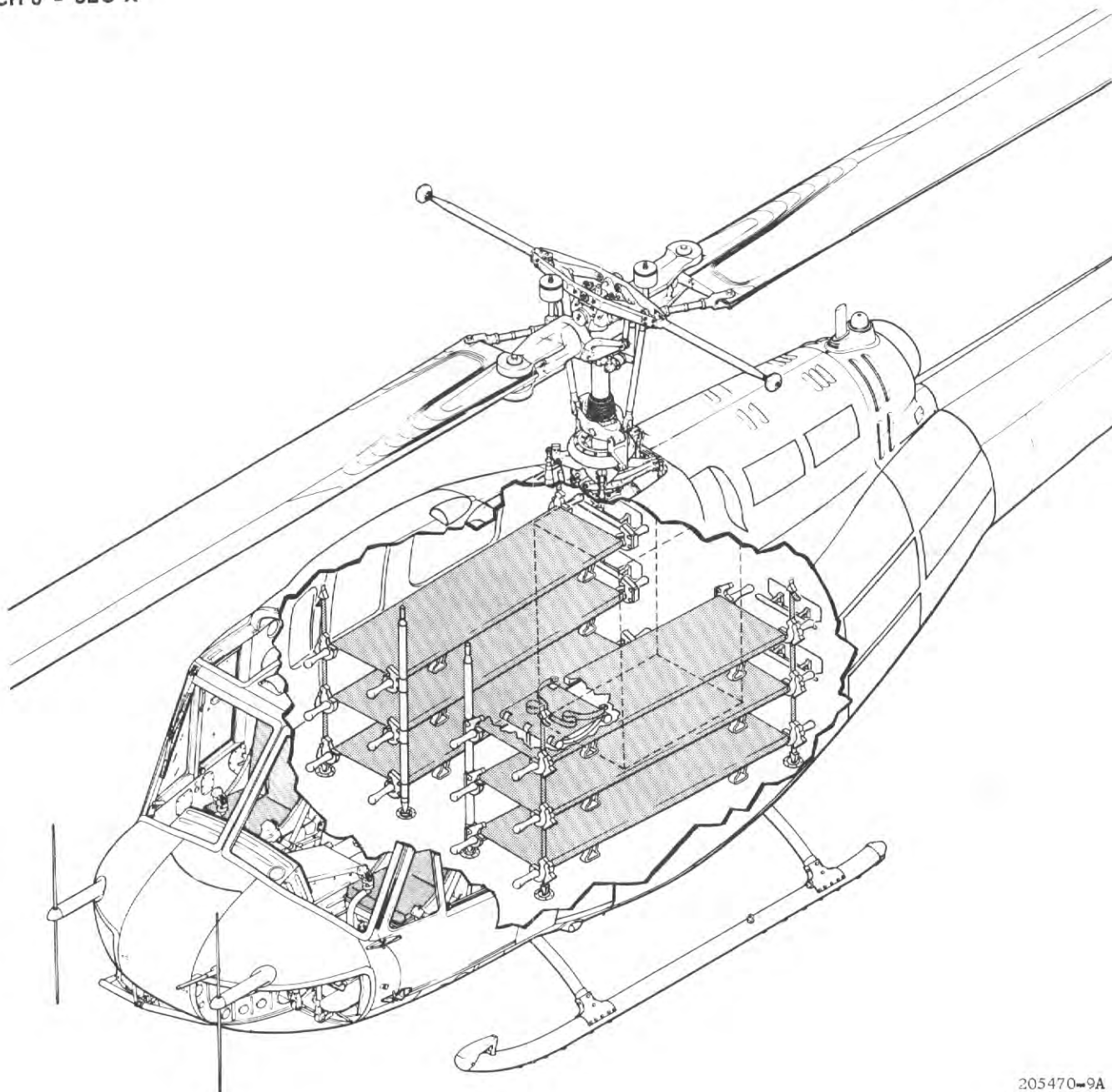
6-121. The helicopter cargo areas do not require any special loading aids or equipment to accomplish loading or unloading.

## 6-122. EXTERNAL CARGO SUSPENSION UNIT.

6-123. See figure 6-18, External Cargo Suspension System.

**Caution**

Helicopters equipped with a non-rotating cargo suspension unit, which maintains the hook in a fixed position, (facing forward) should be used only with a cargo sling having a swivel attachment ring. A device which may be used for this application is: Sling, Endless, Nylon Webbing, Type I, 10 inch, Part No. PD 101-10.

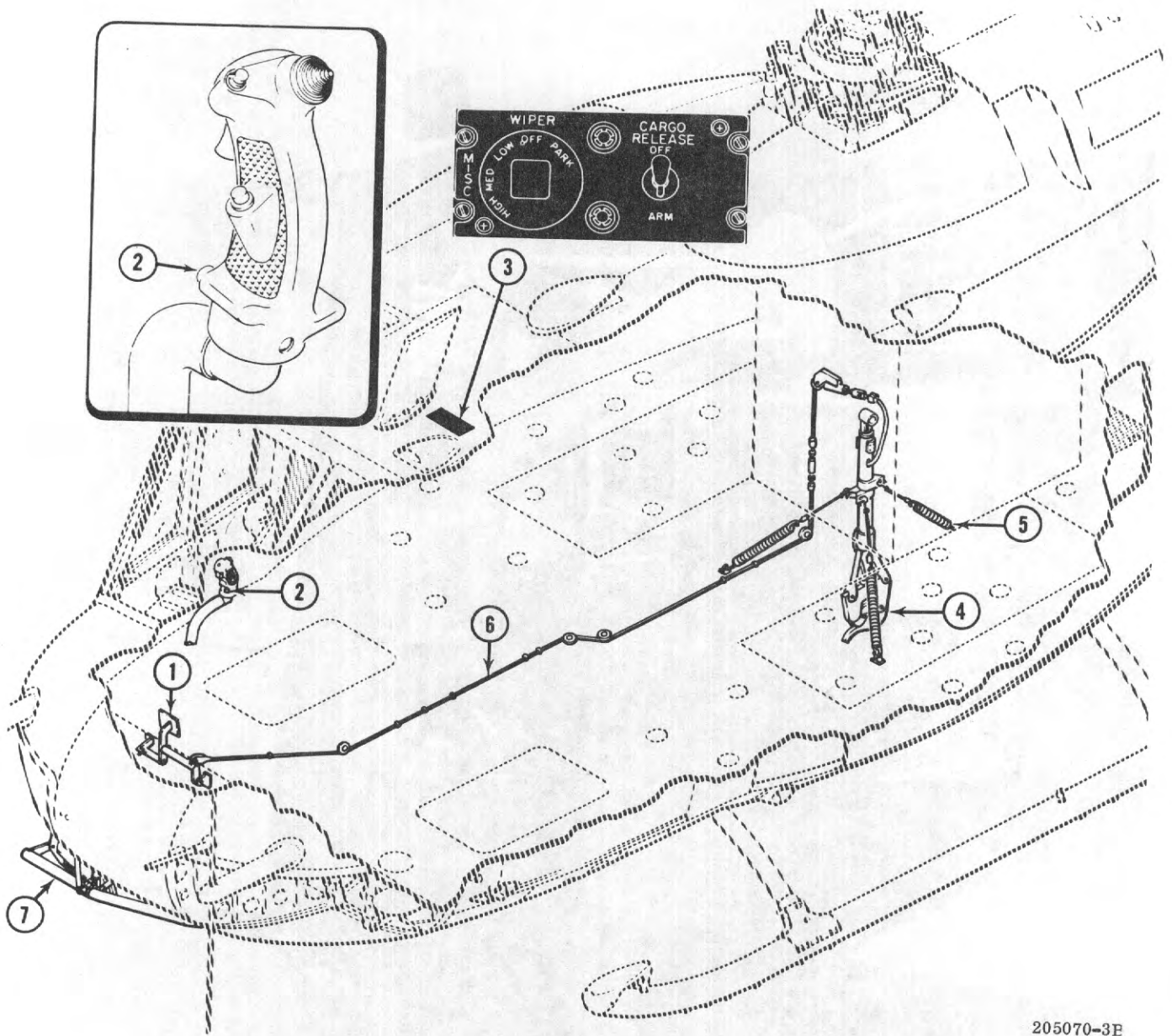


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Figure 6-17. Litter installation - typical

6-124. External cargo can be carried by means of a short single-cable suspension unit (figure 6-18), secured to the primary structure and located at the approximate center of gravity. This method of attachment and location has proved to be the most satisfactory for carrying external cargo. Pitching and rolling due to cargo swinging is minimized, and good stability and control characteristics are maintained under load. A MANUAL CARGO RELEASE PUSH pedal is located between the pilot's tail rotor control pedals, and an electrical release pushbutton

switch is on the cyclic control stick. Before the electrical release switch on the cyclic control stick can be actuated, the CARGO RELEASE switch on the overhead panel must be positioned to ARM. When not in use, the cargo suspension unit need not be removed, nor does it require stowing. Three cable and spring attachments keep the unit centralized, and the hook protrudes only slightly below the lower surface of the helicopter. A rear view mirror enables the pilot to visually check operation of the external cargo suspension hook.



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- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. External Cargo Mechanical Release</li> <li>2. External Cargo Electrical Release Switch</li> <li>3. Cargo Release Off/Arm Switch - Miscellaneous Panel</li> <li>4. External Cargo Suspension Assembly</li> </ol> | <ol style="list-style-type: none"> <li>5. Suspension Unit Centering Assembly Springs (3)</li> <li>6. Mechanical Release Cable Assembly</li> <li>7. Cargo Rear View Mirror</li> </ol> |
|---|--|

Figure 6-18. External cargo suspension system





Figure 6-19. Holst installation (Sheet 1 of 2)