

applies 28 volts dc to the switches and relays necessary to establish the flare ejection program. The flare ejection program is initiated by depressing the RELEASE switch on the control panel or on any one of the remote firing locations, which applies power to a holding circuit of the safety relay. The safety relay applies power to the cam-controlled contacts of the program pulse generator. Depressing the RELEASE switch also energizes a release relay, which applies power to the burst-selector circuits. The burst-selector circuits determine the number of bursts (1 to 29) to be used during a flare release program. Power is provided to the burst interval timer through contacts on the burst selector relay. The burst interval timer circuits determine the interval between bursts (selected timed intervals of 2 to 20 seconds in 1-second increments). Depressing the RELEASE switch at any of the remote firing locations energizes the release relay through the AUTO/OFF switch on the control panel. The FAST TRAIN switch on the control panel provides a means to salvo, in sequence, all flares installed on the helicopter. Depressing the FAST TRAIN switch energizes the fast train relay, which removes the 28 volts dc from all other circuits in the control panel and applies power to the fast train pulse generator through the reset switch and fast train safety relay in the junction box (figure 6-9). Depressing the RESET switch on the junction box also energizes the fast train pulse generator and returns both stepping switches to the No. 1 position, if the STEPPER RESET is turned on. When all stepping switches have been reset, the two reset indicator lights on the junction box will light. Placing the TRANSFER switch on the control panel to TRANSFER position energizes the transfer relay in the junction box. When energized, the transfer relay applies motor and firing pulses to the right-hand stepping switch only. Motor pulses developed by the pulse relay in the junction box are applied to the stepping motor through the transfer-reset relay in the stepping switch. The stepping motor advances the stepping switch on contact for each motor pulse received. Firing pulses also developed by the pulse relay are sent through a 7.5-ohm current-limiting resistor in the junction box to the stepping switch. The stepping switch applies the firing pulse to the flare battery to ignite and release the flares. After all the flares have been fired from one flare battery, the next pulse is sent through the flare battery selector switch and energizes the release solenoid of the transfer-reset relay. All succeeding firing and motor pulses are sent through the transfer-reset relay to the next stepping switch. After the last flare from the right-hand flare battery has been fired, a pulse is sent back to the control panel energizing the RH empty relay causing the RH EMPTY light to come on.

6-27. Control Panel. The control panel located on the right side of the cargo compartment at station 262 provides controls for setting and initiating flare release programs.

6-28. Junction Box. The junction box for the flare ejector set is located on the right side of the cargo compartment at station 262 and provides for the junction of all cables from the control panel to the stepping switches. A RESET pushbutton switch on the junction box provides a means of resetting all stepping switches to the No. 1 position. Two indicator lights indicate when all stepping switches have been reset.

6-29. Stepping Switch. Two identical stepping switches, one mounted on each flare case are located aft of the pods. Each stepping switch contains a motor-driven stepping type switch, which advances one contact each time a pulse is received from the junction box.

6-30. Flare Case. One flare case is used with each stepping switch. The flare case has no operating parts, but provides a case to hold the flare set and the stepping switch electrical connector, which conducts the firing pulse to each flare.

6-31. Remote Firing Locations. Five remote firing locations are at various positions throughout the helicopter. Each location provides a release switch for initiating flare release programs.

6-32. Emergency Control Panel. The emergency control panel is located in the center cockpit console and allows the pilot to control application of power to the flare ejector set. The WEAPONS ARMED switch is located on the panel.

### 6-33. AN/ALE-20(V) FLARE EJECTOR SET FUNCTIONAL TEST.

#### Tools and Test Equipment Required

<u>T-No.</u>	<u>Nomenclature</u>	<u>Use and Application</u>
T-189	Multimeter	Explosive bolt circuit test
T-283	Stop watch	To check time of flare program
T-284	Portable Circuit Continuity and Sequence Test Set T1022	To check out and troubleshoot the flare ejector set

#### NOTE

Six test cables and instruction book are furnished with the T1022 test set.

6-34. A functional test of the flare ejector set is required prior to loading of flares to verify that the equipment is working properly and to detect improper operation as a preventive maintenance technique. The functional test approximates the testing and adjustment procedures required when the equipment was originally installed on

## Key to figure 6-6

1 Rate control box	13 Strap assembly	25 Strap assembly
2 Ammunition container	14 Quick release pin	26 Bolt, washer
3 Ammo tie-down assembly	15 Hook	27 Angle
4 Screw	16 Bolt, washer	28 Panel
5 Battery (power pack)	17 Cable	29 Angle
6 Shelf assembly	18 Clip	30 Bolt, washer
7 Strap assembly	19 Pin, washer, cotter pin	31 Tube
8 Eyebolt, washer, nut	20 Tee	32 Tube
9 Tube	21 Bolt, washer	33 Checknut
10 Pin, washer, cotter pin	22 Bolt, washer	34 Rod end
11 Rod end	23 Angle	35 Pin, washer, cotter pin
12 Checknut	24 Bolt, washer, nut	

the helicopter and should be used when a thorough check of the system is required or as an aid in troubleshooting the system.

**6-35. HELICOPTER PREPARATION FOR FUNCTIONAL TEST.** Preparation of the helicopter for the functional check shall be accomplished as follows:

1. Position helicopter with wheels chocked and gear lockpins installed; helicopter electrically grounded.
2. Check Form 781 to ensure helicopter is ready for functional check.
3. Position firefighting equipment and inspect for serviceability.
4. Flare case ground safety pins installed.

**6-36. FUNCTIONAL TEST.**

WARNING

If a malfunction occurs during the functional check, disconnect the cannon plugs for the ejector bolts prior to performing any maintenance on the system.

1. The functional test requires the following AGE equipment; T1022 Test Set, stopwatch, and PSM-6 Multimeter.
2. Check that all units are securely mounted, all connecting cables are connected, lock rings are tight, and all knobs and switches are operable. Make sure that case assembly manual jettison pins are properly installed and that safety pins are in place.
3. Make sure that the CASE JETTISON switches on the flight engineer's panel are OFF.
4. Set the FLARES PER BURST switch on the back of the control panel to 2.

WARNING

Do not apply power or perform any maintenance on the AN/ALE-20(V) flare ejector system if flares are loaded.

5. Apply power to the helicopter.
6. Close the three ALE-20 circuit breakers.
7. Set the pilot's AN/ALE-20 WEAPONS ARMED switch to ON.
8. On the control panel, set the POWER/OFF switch to POWER, and the AUTO/OFF switch to AUTO.
9. Set the GRD MAINT switch located above the junction box to ON.
10. Set the STEPPER MTR RESET switch located above the junction box to ON. Press the PRESS TO RESET switch on the junction box and hold the switch down until the LH and RH RESET indicator lamps blink rapidly.
11. Release the PRESS TO RESET switch.
12. Connect the T1022 Test Set to each flare ejector case assembly in accordance with instructions furnished with the test set, except that only two (LH1 and RH1) of the six available probe assemblies are to be used. Set all test set counters to 0000.
13. Press the control panel FAST TRAIN switch and start the stopwatch simultaneously. Stop the watch when the RH EMPTY lamp lights. Elapsed time should be  $6 \pm 2$  seconds and test set counters should indicate 0051. The transfer pulse may cause an additional count.
14. Set the control panel POWER/OFF switch to OFF. Set it back to POWER. Test set counters should not move.
15. Reset all test set counters to 0000.

16. Press the PRESS TO RESET switch on the junction box and hold the switch down until the LH and RH RESET indicator lamps blink rapidly. Release the PRESS TO RESET switch.

17. Set the control panel switches as follows:

BURST SELECTOR to 5

INTERVAL SELECTOR to 2

FLARES PER BURST to 2

TRANSFER/OFF to OFF

18. Press the control panel RELEASE switch and start the stopwatch simultaneously. Stop the watch when the PROGRAM IN PROGRESS lamp goes out. Elapsed time should be  $8 \pm 0.4$  seconds and LH1 on the test set should indicate 0010.

19. Set the TRANSFER/OFF switch to TRANSFER.

20. Repeat step 18. Elapsed time should be  $8 \pm 0.4$  seconds and counter RH1 on the test set should indicate 0010.

21. Set the TRANSFER/OFF switch to OFF.

22. Press the PRESS TO RESET switch on the junction box and hold the switch down until the LH and RH RESET indicator lamps blink rapidly. Release the PRESS TO RESET switch.

23. Set the control panel switches as follows:

BURST SELECTOR to 1

INTERVAL SELECTOR to 2

FLARES PER BURST to 2

Ensure TRANSFER/OFF is OFF

24. Reset all test set counters to 0000.

25. Press the pilot's cyclic stick FLARE release switch. Test set counter LH1 should indicate 0002.

26. Press the copilot's cyclic stick FLARE release switch. Test set counter LH1 should indicate 0004.

27. Press the left gun FLARE release switch. Test set counter LH1 should indicate 0006.

28. Press the flight mechanic's panel FLARE release switch. Test set counter LH1 should read 0008.

29. Press the ramp gun FLARE release switch. Test set counter LH1 should read 0010.

30. Set the GRD MAINT switch located above the junction box to OFF.

31. Press and hold the PRESS TO RESET switch on the junction box. The case assembly stepper should not step and the LH and RH RESET lamps should not light. Release the PRESS TO RESET switch.

32. Set the GRD MAINT switch located above the junction box to ON.

33. Press the PRESS TO RESET switch on the junction box and hold the switch down until the LH and RH RESET indicator lamps blink rapidly. Release the PRESS TO RESET switch. Set the STEPPER MTR RESET switch to OFF.

34. On the control panel, set the POWER/OFF switch to OFF, and the AUTO/OFF switch to OFF.

35. Set the emergency control panel WEAPONS ARMED switch to OFF.

36. Disconnect both explosive bolt cables from the helicopter fuselage.

37. Set the PSM-6 multimeter FUNCTION switch to DC V 20K $\Omega$ /V and RANGE switch to  $\Omega$  X100 50.

38. Connect the multimeter between pin A (-) and B (+) on the right-hand explosive bolt fuselage jack.

39. Set the RH CASE JETTISON switch on the flight engineer's panel to ON. The multimeter should indicate  $+28 \pm 2$ . Set the RH CASE JETTISON switch to OFF. The multimeter should return to 0 volt.

40. Set the multimeter FUNCTION switch to AC V 1K $\Omega$ /V and RANGE switch to 0.5. The multimeter should read 0 volts. Disconnect multimeter.

41. Set the multimeter FUNCTION switch to DC V 20K $\Omega$ /V and RANGE switch to  $\Omega$  X100 50.

42. Connect the multimeter to pin A (-) and pin B (+) of the left-hand explosive bolt fuselage jack.

43. Set the LH CASE JETTISON switch on the flight engineer's panel to ON. The multimeter should indicate  $+28 \pm 2$ . Set the LH CASE JETTISON switch to OFF. The multimeter should return to 0 volt.

44. Set the multimeter FUNCTION switch to AC V 1K $\Omega$ /V and RANGE switch to 0.5. The multimeter should read 0 volts.

45. Disconnect the multimeter.

46. Reconnect the explosive bolt cables.

47. Set the GRD MAINT switch located above the junction box to OFF.

- 48. Open the three ALE-20 circuit breakers.
- 49. Disconnect the T1022 test set from the flare case assemblies.
- 50. Safety-wire flight mechanic's panel CASE JETTISON switches to OFF.
- 51. Make AFTO Form 781 entry.

**6-37. Mechanical Jettison Handle Check.** The following procedure should be followed to check operation of the mechanical jettison handle.

- 1. Turn off all power to the helicopter.
- 2. Make sure the safety pins are installed on the flare case assemblies.
- 3. Pull the flare case manual jettison handle.
- 4. Verify that both pins have been pulled from the flare case mount.
- 5. Return the manual jettison handle to the normal position and insert both pins into the flare case mount.

**6-38. PROGRAMMING INSTRUCTIONS.**

**6-39. Flare per Burst Adjustment.** The FLARES PER BURST switch is located on the back of the control panel (figure 6-8). The flares may be programmed to fire in bursts of one, two, or three flares.

No programming controls may be adjusted during the execution of the flare program.

**6-43. OPERATING PROCEDURES.**

**6-44. Preliminary Procedures.**

- | STEP   | RESULT |
|--|--------|
| 1. Turn STEPPER MTR RESET switch to ON position.   |        |
| 2. Turn WEAPONS ARMED switch to ON position.   |        |
| 3. Ensure TRANSFER/OFF switch on control panel is in OFF position.   |        |
| 4. Ensure BURST SELECTOR and INTERVAL SELECTOR are at proper settings for desired program. Reset if necessary. |        |
| 5. Turn POWER/OFF switch to ON position.   |        |
| 6. Turn AUTO/OFF switch to AUTO position.  |        |

**NOTE**

PROGRAM IN PROGRESS and RH EMPTY indicator lights remain OFF.

**NOTE**

The AUTO/OFF switch must be in the AUTO position to enable the remote flare release locations to initiate a flare program.

**6-40. Bursts Remaining Indicator Adjustment.** The BURSTS REMAINING indicator on the control panel is set by turning the knurled bursts-remaining manual-reset control. The BURSTS REMAINING indicator is set to the number of bursts installed on the helicopter. The number of bursts installed is determined by the number of flare sets installed and the position of the FLARES PER BURST switch located on the back of the control panel. For example, if two flare sets containing 16 flares each (32 flares total) are installed and the FLARES PER BURST switch is placed in the 2 position, the bursts-remaining indicator should be set to indicate 16 bursts.

**6-41. Burst Selector Adjustment.** The burst counter is set by turning the knurled BURST SELECTOR thumbwheel located on the right side of the control panel. The BURST SELECTOR determines the number of bursts (1 to 29) to be released during a flare program. The BURST SELECTOR may be reset by the operator during flight if required.

**6-42. Burst Interval Selector Adjustment.** The burst interval indicator is set by turning the knurled burst interval selector thumbwheel located on the left side of the control panel. For programs using more than one burst, the burst interval selector determines the interval between bursts (selected time intervals of 2 to 20 seconds in 1-second increments). The burst interval selector may be reset by the operator during flight, if required.

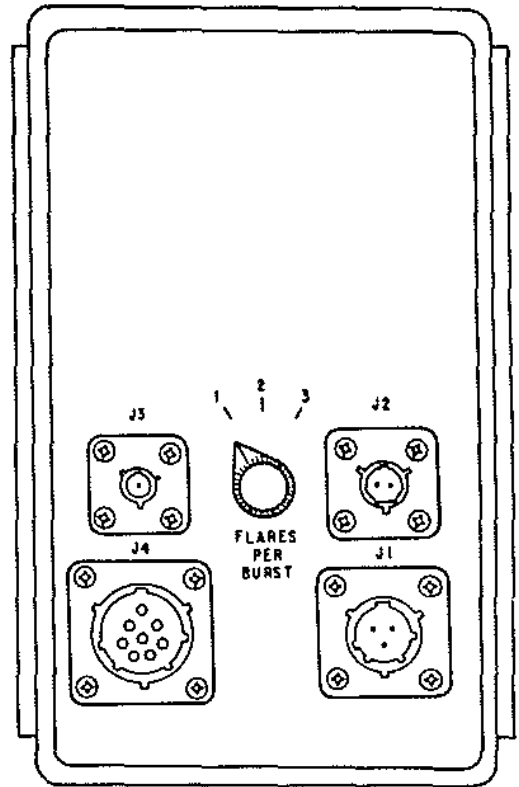
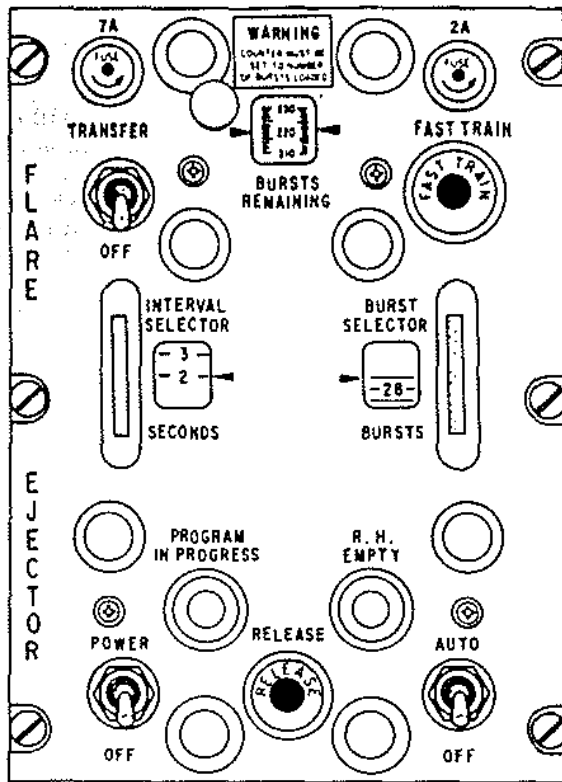


Figure 6-8. Flare Ejector Set, AN/ALE-20(V) Control Panel

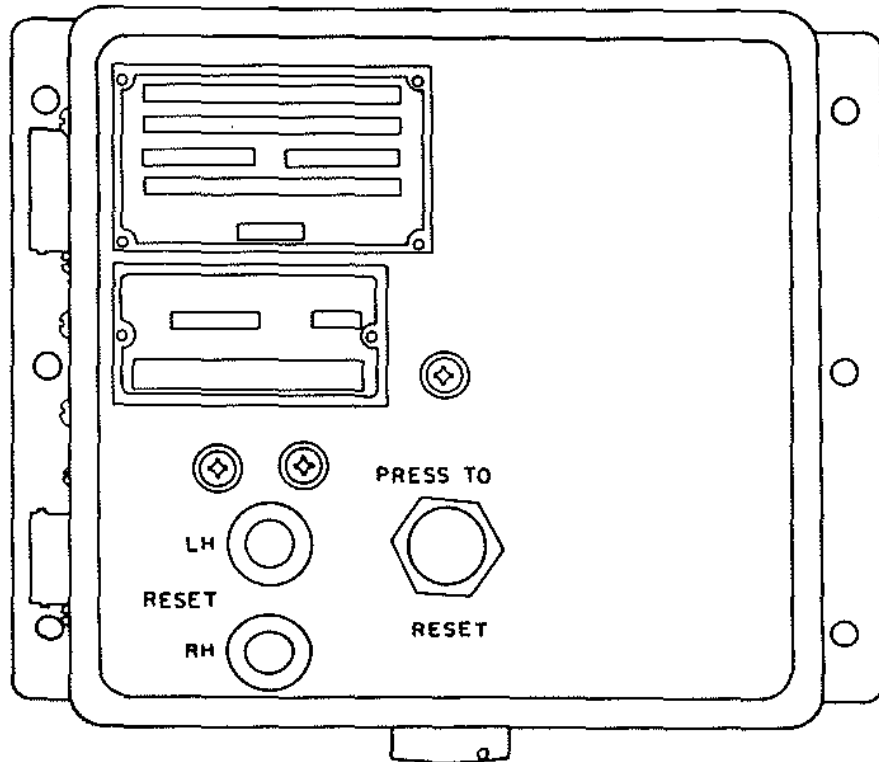


Figure 6-9. Flare Ejector Set, AN/ALE-20(V) Junction Box

**6-45. Flare Ejection Procedure.**

**STEP**

1. Momentarily press the RELEASE switch on the control panel or on any of the remote flare release locations.

**RESULT**

First flare burst will be immediately released.

PROGRAM IN PROGRESS indicator light will immediately come on and remain on until program is complete. BURST SELECTOR counter and BURSTS REMAINING counters will count down with each burst released.

**NOTE**

RH EMPTY indicator light will come on when all flares have been expended from the right-hand flare ejector case.

**6-46. Emergency Alternative Flare Ejection Procedure.** If flares fail to release when a RELEASE switch is pressed, and the RH EMPTY indicator light is not on, place the TRANSFER/OFF switch to the TRANSFER position and momentarily press the RELEASE switch.

**NOTE**

If the TRANSFER switch is used as outlined above, any flares remaining in the left-hand case will be bypassed. These flares cannot be released unless the TRANSFER/OFF switch is returned to the OFF position.

**6-47. Emergency Fire Procedure.** In case of fire in the vicinity of either flare case, momentarily press the FAST TRAIN switch.

**NOTE**

Fast train operation, once initiated, cannot be stopped unless the POWER/OFF switch is recycled. Fast train operation causes all remaining flares to be rapidly ejected.

**6-48. REMOVAL/INSTALLATION.** Flare ejector set units removed from the helicopter for servicing are the flare case assemblies, the control panel, the junction box, gun grip flare release switch, and the cyclic grip FLARE button guard.

**6-49. Case Assembly Removal.** The flare case assemblies are located outside the helicopter aft of the left and right side sponsons. The case assemblies are held in place by two pins on the flare case mounting or, while on the ground, by safety pins. To remove the case assembly from the helicopter, refer to figure 6-10 and proceed as follows:

1. Turn off electrical power.

**WARNING**

Before case assembly removal, be sure that the flare cartridge is removed from the flare case.

2. Disconnect the two case assembly cables from the helicopter.

3. Connect a temporary shorting wire between pins A and B of the explosive bolt connector and the adapter assembly near the explosive bolt.

4. Pull the two safety pins (13 and 14, figure 6-10) holding the case assembly to the mounting bracket.

5. Support the flare case and pull the two manual jettison pins (15, figure 6-10) holding the flare case on the mount.

6. Remove the flare case from the helicopter.

**6-50. Case Assembly Installation.**

1. Hold the case assembly in place on the tee bracket and insert the manual jettison pins (15, figure 6-10).

**WARNING**

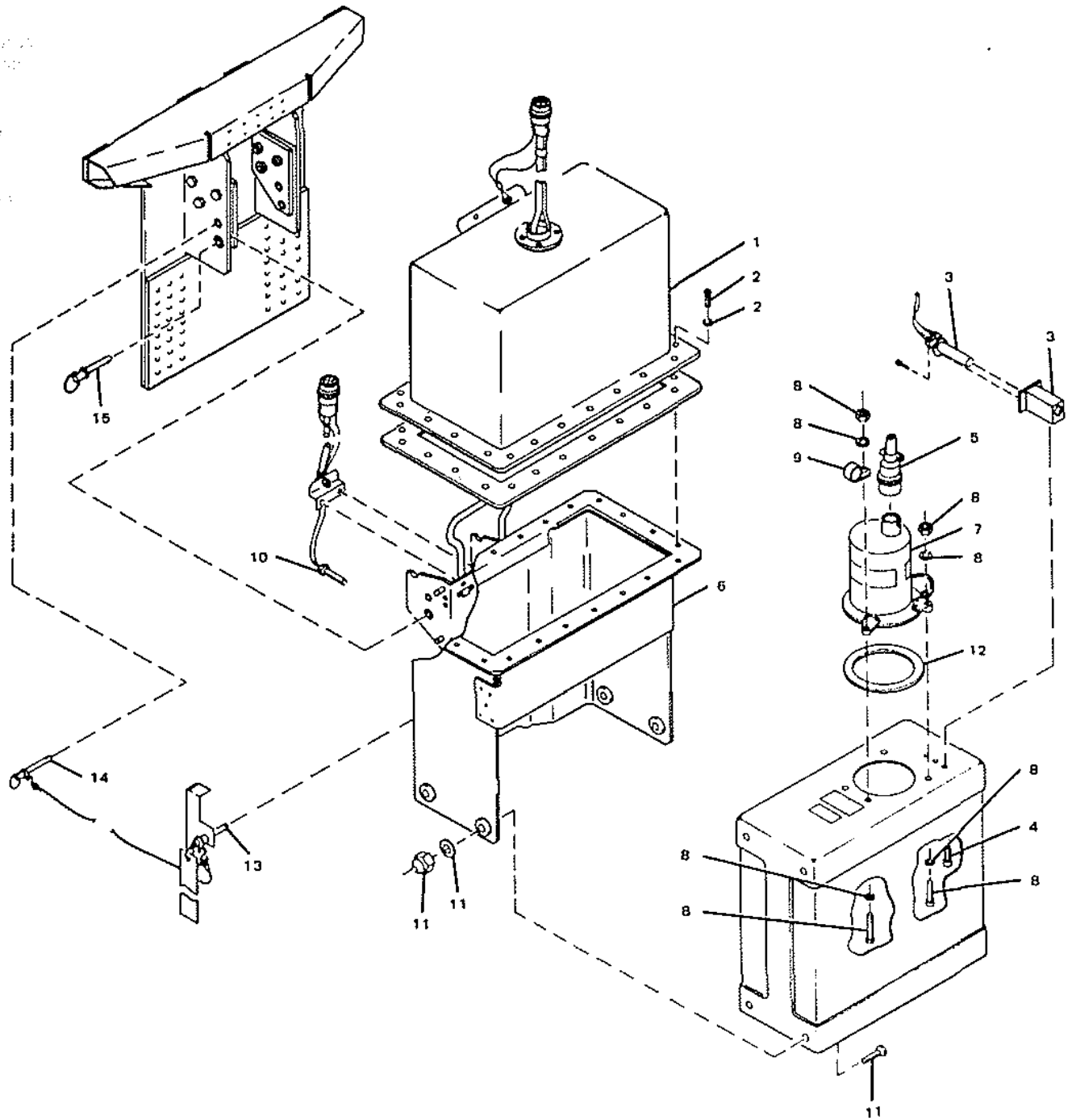
Before case assembly installation, be sure that the flare cartridge is removed from the case assembly.

2. Install the two safety pins (13 and 14, figure 6-10).

**WARNING**

Stray voltage checks will be performed on the aircraft fuselage jack prior to connecting the explosives bolt cable connector.

3. Disconnect both explosive bolt cables from the helicopter fuselage. Temporarily install shorting wire between pins A and B on both explosive connectors (P15 and P16).



- 1 Fiberglass cover
- 2 Screws, lockwashers
- 3 Thermal switch and bracket
- 4 Screw
- 5 Connector
- 6 Wraparound adapter
- 7 Stepping switch
- 8 Screws, washers, nuts

- 9 Cable clamp
- 10 Explosive bolt
- 11 Screws, washers, nuts
- 12 Gasket
- 13 Safety pin
- 14 Safety pin
- 15 Manual jettison pin

Figure 6-10. Flare Case Assembly, Exploded View

4. Close the three ALE-20 circuit breakers.
5. On the control panel, set the POWER/OFF switch to OFF, and the AUTO/OFF switch to OFF.
6. Set the emergency control panel WEAPONS ARMED switch to OFF.
7. Apply power to helicopter.
8. Set the GRD MAINT switch located above the junction box to ON.
9. Set the PSM-6 multimeter FUNCTION switch to DC V 20K OHM/V and RANGE switch to OHM X 100 50.
10. Connect the multimeter between pin A(-) and B(+) on the righthand explosive bolt fuselage jack.
11. Set the RH CASE JETTISON switch on the flight engineer's panel to ON. The multimeter should indicate +28±2. Set the RH CASE JETTISON switch to OFF. The multimeter should return to "0" volts.
12. Set the multimeter FUNCTION switch to AC V 1K OHM/V and RANGE switch to 0.5. The multimeter should read "0" volts. Disconnect multimeter.
13. Set the multimeter FUNCTION switch to DC V 20K OHM/V and RANGE switch to OHM X 100 50.
14. Connect the multimeter to pin A(-) and pin B(+) of the lefthand explosive bolt fuselage jack.
15. Set the LH CASE JETTISON switch on the flight engineer's panel to ON. The multimeter should indicate +28±2. Set the LH CASE JETTISON switch to OFF. The multimeter should return to "0" volts.
16. Set the multimeter FUNCTION switch to AC V 1K OHM/V and RANGE switch to 0.5. The multimeter should read "0" volts. Disconnect the multimeter.
17. Remove temporary shorting wire and connect the explosive bolt cables to the helicopter connectors.
18. Connect the stepping quick-disconnect cables to the helicopter connectors.

**6-51. Case Assembly Disassembly.** Disassembly of the case assembly consists of removing the flare case and stepping switch from the assembly wrap-around. The flare case heat sensor is also removed as necessary for replacement. See figure 6-10.

1. With case assembly removed from the helicopter, remove screws and washers (2, figure 6-10).

2. Lift fiberglass cover (1) and disconnect stepping switch connector (5) and remove wires from the thermal switch (3).
3. Remove thermal switch (3) and three screws (4).
4. Remove the case and stepping switch assembly from wraparound adapter (6) by removing screws, washers, and nuts (11).
5. Remove stepping switch (7) from case by removing screws, washers, and nuts (8) and cable clamp (9). For more details refer to T.O. 12P3-2ALE20-2.
6. To remove explosive bolt (10) from wrap-around adapter (6), use a torque wrench to unscrew explosive bolt from the wraparound adapter. Slide wraparound adapter mount from shoulder bolts.

WARNING

Just as soon as the explosive bolt is removed from the wraparound adapter, cut the explosive bolt wires from the cable and short the explosive bolt wires together and ground the wires to the bolt. Do not exceed 8 pound-feet of torque when removing the explosive bolt.

**6-52. Case Assembly Reassembly.** A new flare case when received will not have mounting holes drilled for the thermal switch (3, figure 6-10). Drill mounting holes per detail A, figure 6-11. Assemble the flare case as follows:

1. Attach wraparound adapter mount on the shoulder bolts and insert a new explosive bolt into the wraparound adapter and mount.
2. Torque the explosive bolt to 6(+0, -1) pound-feet.

WARNING

Sealant, MIL-S-8784, is toxic to skin, eyes and respiratory tract. Skin and eye protection required. Avoid repeated or prolonged contact. Good general ventilation is normally adequate.

3. Apply sealing compound (C-73). Class B between flare case and wrap/around adapter (6).
4. Install thermal switch (3) with screws (4). Apply sealing/potting compound, MIL-S-8516 or equivalent to the thermal switch electrical connections, following the procedures and observing the precautions contained in T.O. 1-1A-14.
5. Install stepping switch (7) on flare case with gasket (12) between flare case and stepping switch.
6. Fasten stepping switch (7) in place using screws, nuts, washers (8) and cable clamp (9). Cable should be routed as shown in detail B, figure 6-11.

**CAUTION**

Screws (8) must be inserted through the flare case into the stepping switch as shown on figure 6-10 or the flare cartridge will stick in the flare case. Screw heads must be inside the flare case.

7. Connect cable connector to stepping switch and connect remaining wires to thermal switch.
8. Place fiberglass cover (1) and gasket (12) on wraparound adapter (8) and fasten in place using screws and lockwashers (2).
9. Check seal around fiberglass cable entry and, if damaged, repair using sealing compound (C-73), Class B.

**6-53. Control Panel Removal/Installation.** The control panel is located on the right side of the helicopter at station 262. The control panel is removed by unfastening the quick-release fasteners located on each side of the control panel and by removing the connectors attached to the rear of the panel. Install the control panel by fastening the connectors to the rear of the panel, installing the panel in the bracket, and fastening the quick-release fasteners.

**6-54. Junction Box Removal/Installation.** The junction box is located on the right side of the helicopter at station 262. Remove the junction box by first removing the three cable connectors from the box and by releasing the quick-release fasteners. Install the junction box by fastening the quick-release fasteners and by connecting the three cable connectors.

**6-55. Gun Grip Flare Release Switch Removal/Installation.** A flare release switch is located on the left and ramp gun mounts on the left gun grip. The switch is fastened to the grip with the two screws located on top of the grip. To remove the flare release switch and bracket, remove the two screws, remove the top of the grip and the flare release switch. Replace the flare release switch and bracket by placing the bracket on the left gun grip, replacing the top of the grip and fastening with the existing two screws.

**6-56. Cyclic Stick Flare Release Switch Guard Removal.** The cyclic stick FLARE release switch guard is located on the left of the pilot's and co-pilot's cyclic stick. The switch guard is removed by filing or carefully grinding the guard from the grip after first removing the switch from the grip.

**6-57. Cyclic Stick Flare Release Switch Guard Replacement.** Replace the cyclic stick FLARE release switch guard as follows:

1. Remove the existing switch guard as stated in paragraph 6-56.

2. Mix Eccobond 45 (C-84) with catalyst 15 as stated on the Eccobond container.
3. Place a small amount of the Eccobond on the switch guard and place the guard on the cyclic grip.
4. Allow the bonding agent to cure as directed.
5. Replace the switch into the cyclic grip as directed in T.O. 1H-53(H)B-2-4.

**6-58. EXPLOSIVE BOLT MAINTENANCE.** To ensure proper emergency flare case jettison, replace the explosive bolt every 6 months.

**6-59. COUNTERMEASURE DISPENSING SYSTEM AN/ALE-40(V).**

6-60. The countermeasure dispensing system is a family of dispensing sets using a number of common and unique units in varying quantities. The system consists of programmers, sequencer switches, EMI filters, dispenser assemblies, and control panels. (See figure 6-12 for component location and figure 6-13 for system block diagram.) The system has one circuit breaker labeled ALE-40 located on the co-pilot's No. 1 Primary D.C. bus.

**6-61. LIST OF COMPONENTS.**

UNIT	NO. USED	REFERENCE DESIGNATOR
PROGRAMMER	2	C-10286/ALE-40(V)
SEQUENCER SWITCH	4	SA-2150/ALE-40(V)
REMOTE DISPENSER SWITCH	1	BAC-S30V-4
DISPENSER ASSEMBLY	8	D-39/ALE-40(V)
DISPENSER SW., GUNNERS	2	4-79521
EMI FILTER	4	F-1444/ALE-40(V)
CB PANEL	1	4079519-1
CONTROL PANEL ASSEMBLY	1	4079516-9

**6-62. PROGRAMMER C-10286/ALE-40(V).** (See figure 6-12.) The programmer generates appropriate output chaff and/or flare dispense signals in response to received input signals manually initiated by an aircraft crew member. The number of dispense signals and the relative time interval between dispense signals are determined by the programmer front panel switch settings. The programmer generated dispense signals are routed from the programmer through interconnecting wiring to the dispensers to dispense applicable chaff/flare components. (See figure 6-13 for block diagram.) Two programmers are installed in the cargo compartment aft of forward door, above the hydraulic trough.

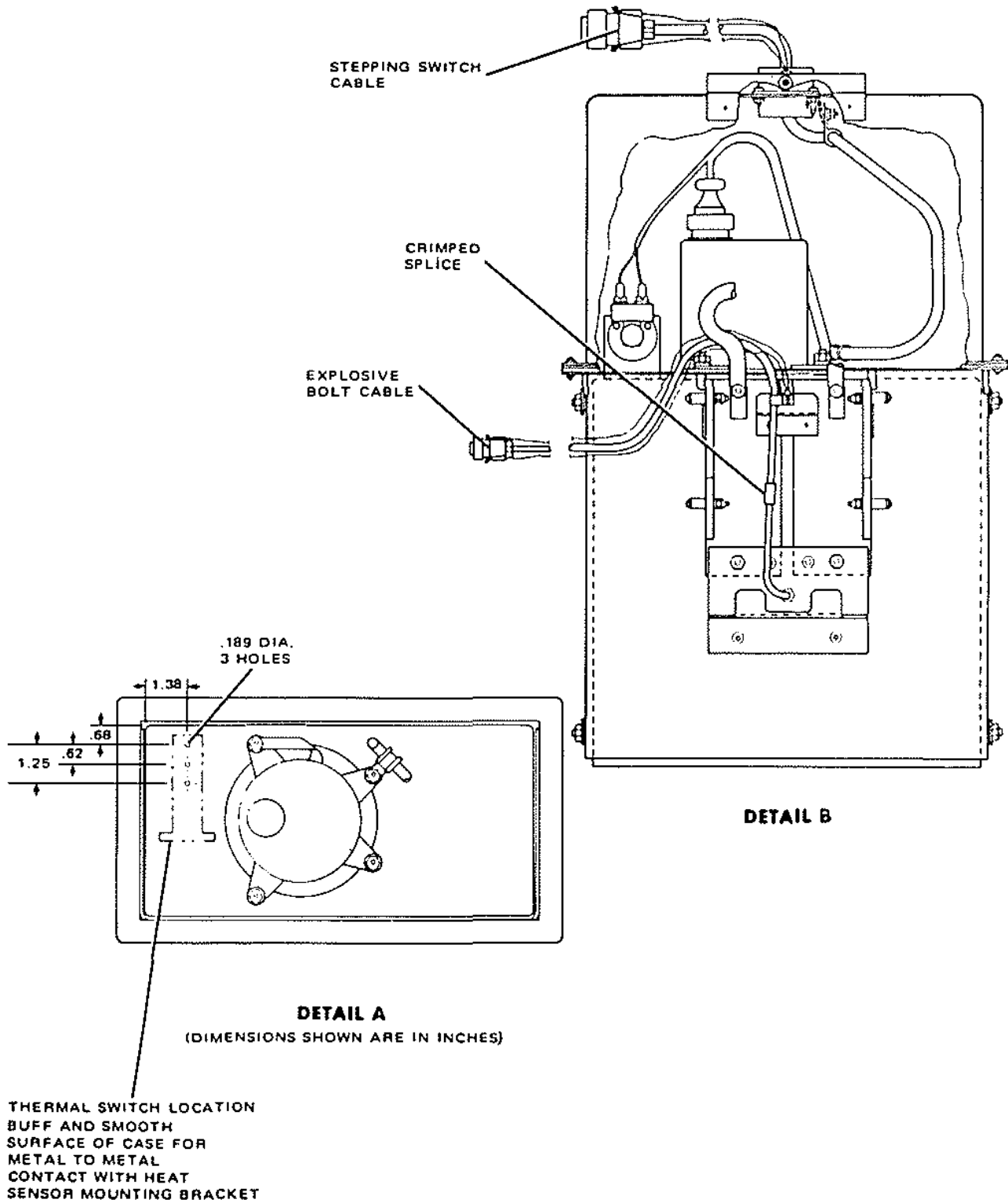


Figure 6-11. Flare Case Assembly Thermal Switch and Cable Locations

The left programmer controls the chaff dispenser and the flare dispenser on the left side of fuselage. The right programmer controls the flare and chaff dispensers on the right side of fuselage. The programmer circuit breakers (7 amp) are located on the ALE-40 circuit breaker panel in the cargo compartment, aft of forward door, above the hydraulic trough.

#### 6-63. SEQUENCER SWITCH SA-2150/ALE-40(V).

The sequencer switch assembly is one of the self-contained units that make up the countermeasure dispensing system. The sequencer switch routes dispense signals to the breech plate contact pins of the dispenser assembly. (See figure 6-12.) Four sequencer switches are installed in the aircraft. One sequencer switch is located near each pair of the dispenser assemblies. The sequencer switch assembly also has a rotary switch which has to be set to correspond with the type cartridge installed in the magazine. The switch is identified as S3 and selects the size of cartridge being used.

**6-64. DISPENSER ASSEMBLY D-39/ALE-40(V).** The dispenser is comprised of a breech plate, a wiring harness, a housing assembly, and a connector. The breech plate mates with a chaff/flare preload magazine which is inserted into the housing assembly. The breech plate electrically interfaces the countermeasure cartridges and their electrically initiated squibs through electrical spring-loaded contacts and grounding spring. Contacts are hardwired from the rear of the breech plate and are electrically connected to the associated sequencer switch by a cable assembly and the 55 pin dispenser connector. Four dispense sets/pairs are located on the aircraft; two sets for each side of the aft fuselage.

**6-65. ELECTROMAGNETIC INTERFERENCE FILTER (EMI) 135878-0001.** The EMI filter assembly is comprised of a housing which contains seven EMI filters, a safety switch, a reset switch, a transient suppressor for the power line, and a current limiting resistor. The housing has three mounting feet, an input and output connector, and an entry point for the safety pin. The EMI filter eliminates EMI transients from the chaff/flare dispense signals and the +28V power coming from the programmer to the dispenser and/or the sequencer switch. The reset circuit breaker is used to reset the rotary stepping switches and the relay in the sequencer switch assembly. A switch removes +28V power from the dispensing unit when the safety pin is installed in the EMI filter. (See figure 6-12.) Four electromagnetic interference filters are installed on the aircraft. Two of the filters are located on the right side of the rear cargo compartment at F.S. 542 and 462. Two filters are located on the left side of the rear cargo compartment at F.S. 542 and 462.

**6-66. CONTROL PANEL ASSEMBLY 7323-40040-1.** (See figure 6-12.) The control panel is located in the overhead flight deck. The control panel has four functions: flare jettison, chaff dispense, and right and left flare dispense. The flare jettison switch has a guard to guard against activating the switch in error. In addition, flare dispenser

switches are located at the forward LH and RH gunner's positions (see figure 6-12) and a remote pistol grip switch is located near the ramp gunner's position. (See figure 6-12.)

#### 6-67. AN/ALE-40 FUNCTIONAL CHECK.

##### 6-68. Flare Test.

1. Insure ALE-40 MASTER circuit breaker (copilot CB panel) is pulled (Power off).
2. Insure safety pins are installed in each of the four EMI filters. (Cargo compartment left and right sides)
3. Connect the AN/ALM-177 test set to both aft pairs of dispensers. (See figure 6-14.)
4. Set counters on both test sets to "00".
5. Set controls on both programmers (cargo compartment overhead) as follows:
  - a. Flare burst count: 8
  - b. Flare burst interval: 3
6. Push ALE-40 MASTER circuit breaker in. (Power on)
7. Place both aft reset/operate switches to the Reset position.
8. Remove safety pins from the two aft EMI filters. Observe that both aft sequencer switches reset and that both aft reset/operate switches return to the Operate position.
9. Press and hold for approximately one second cockpit right flare dispense switch. (Cockpit overhead). Observe the following:
  - a. Right test set Disp A, odd, 1-10 lamp will illuminate and counter will increment.
  - b. Left test set Disp A, odd, 1-10 lamp will illuminate and counter will increment, .2 to .8 second later.
  - c. In 3 second intervals the Disp A, 1-10, odd, and Disp A, 1-10 even lamps will illuminate alternately with the left test set lamps following the right test set lamps by .2 to .8 second. The counters will increment with each illumination.
  - d. At the end of this sequence both counters will indicate 8.

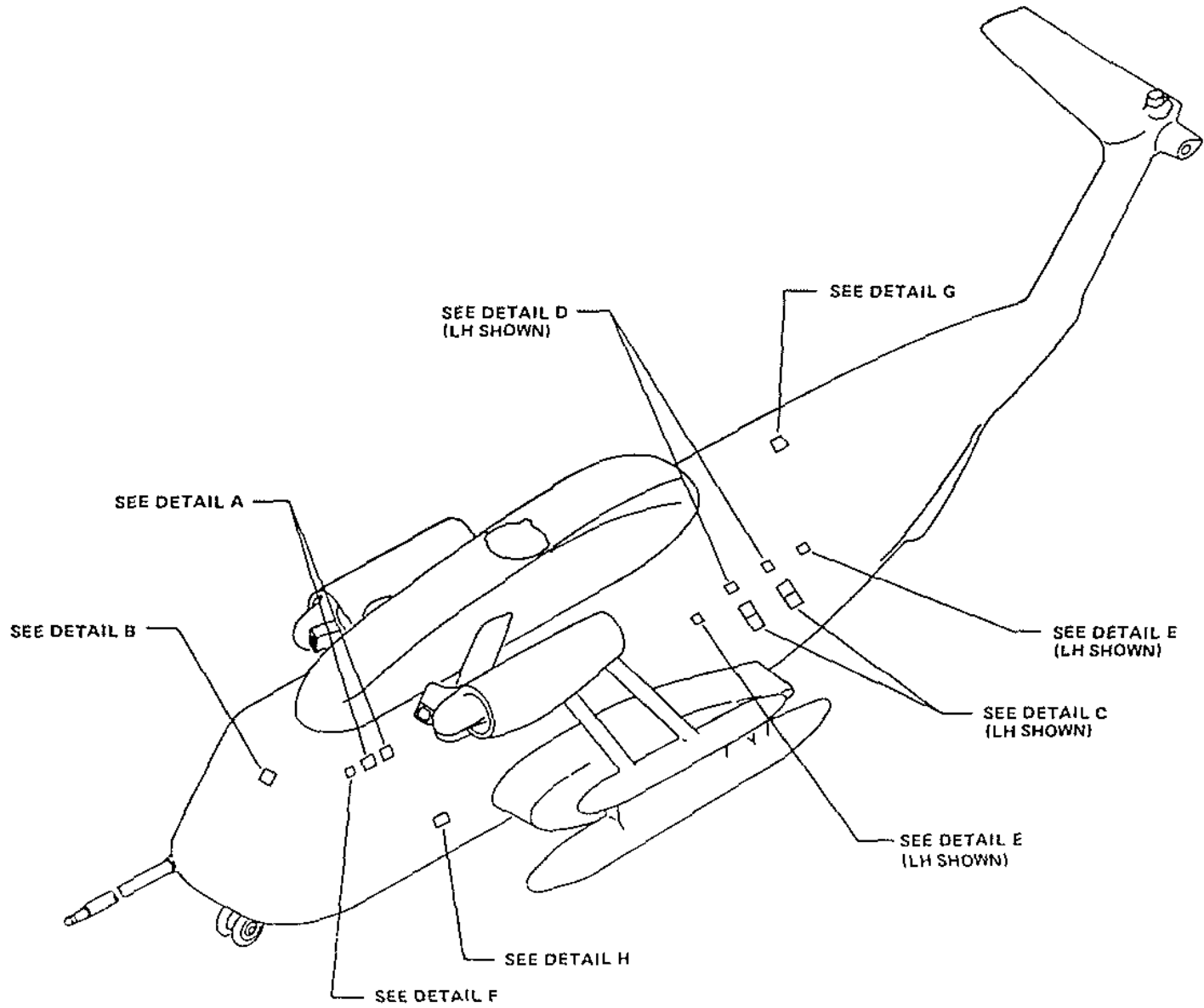
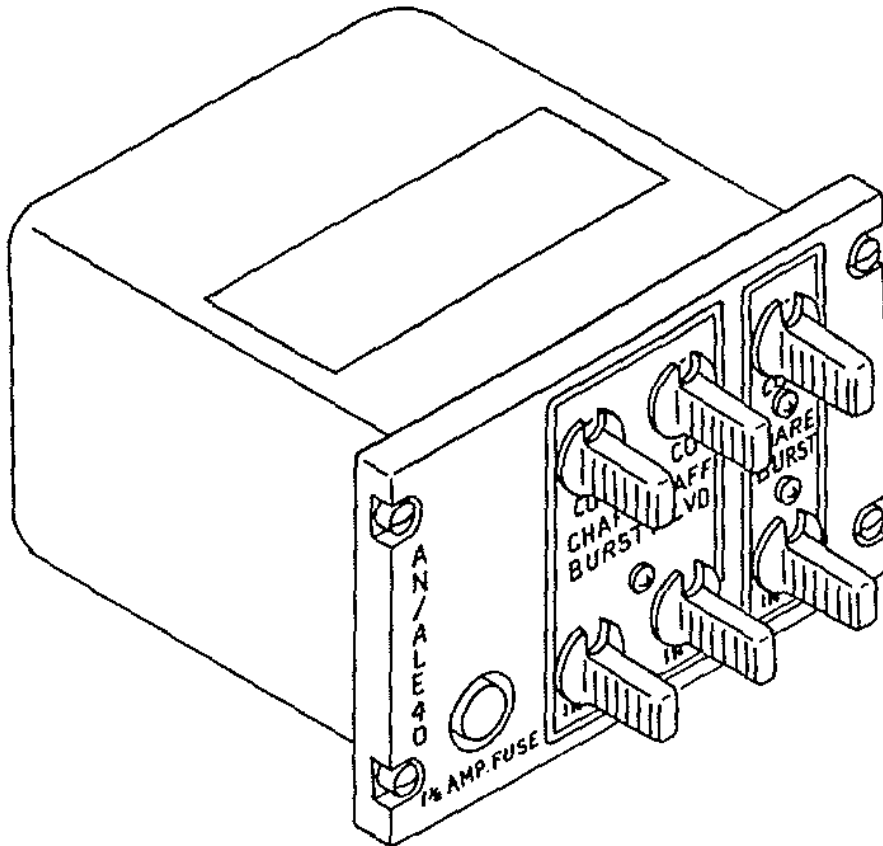
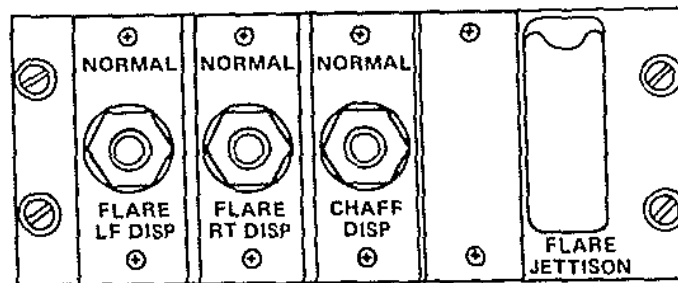


Figure 6-12. Component Location ALE/40 (Sheet 1 of 4)

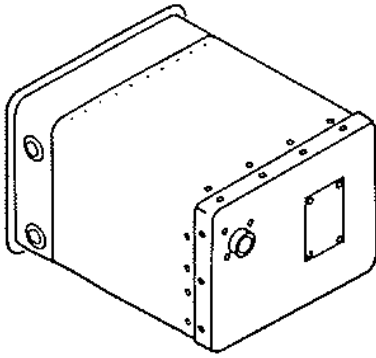


C-10286/ALE-40(V)  
PROGRAMMER  
DETAIL A

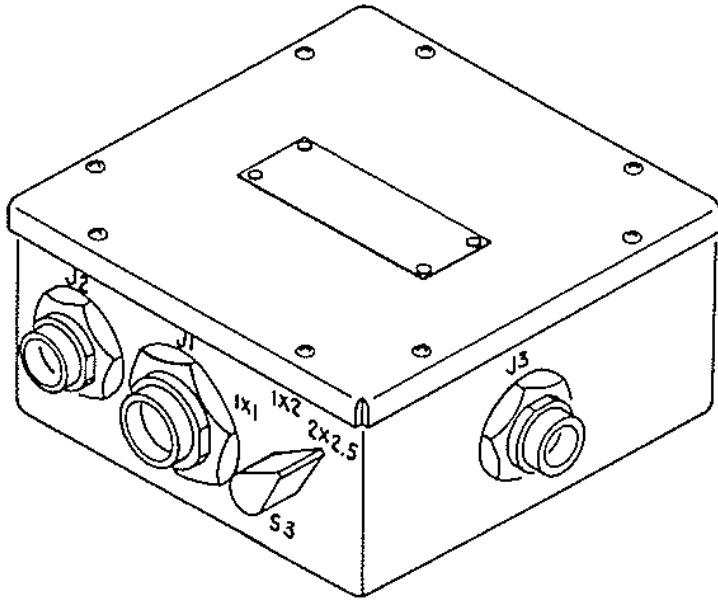


4079516-9  
CONTROL PANEL  
DETAIL B

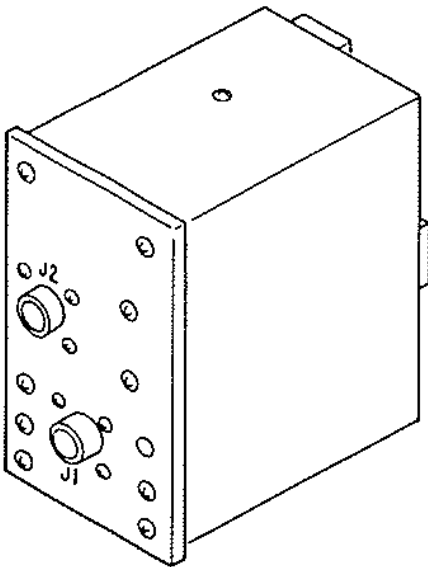
Figure 6-12. Component Location ALE/40 (Sheet 2 of 4)



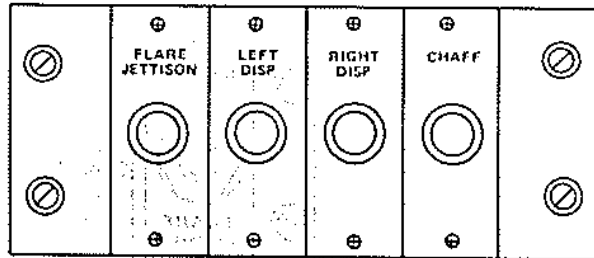
D-39/ALE-40(V)  
DISPENSER  
DETAIL C



SA-2150/ALE-40(V)  
SEQUENCER SWITCH  
DETAIL D

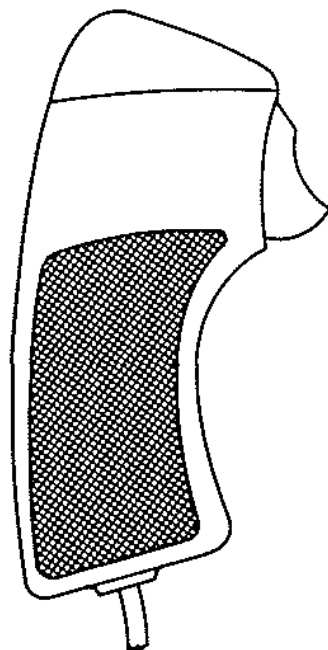


F-144/ALE-40(V)  
EMI FILTER  
DETAIL E

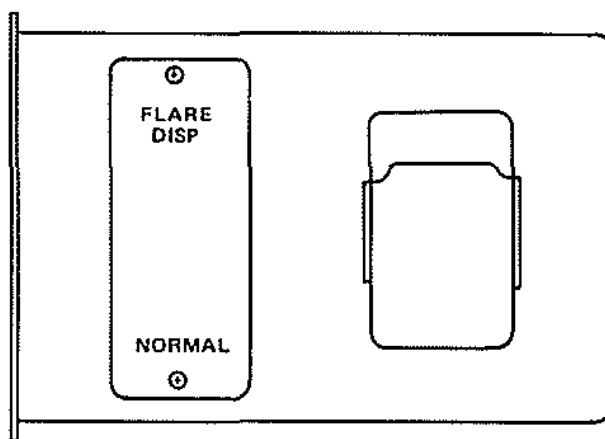


4079591-1  
CB PANEL  
DETAIL F

Figure 6-12. Component Location ALE/40 (Sheet 3 of 4)



BAC-S30V-4  
RAMP GUN REMOTE DISPENSER SWITCH  
DETAIL G



4-78521  
GUN STATION DISPENSER SWITCH  
DETAIL H

Figure 6-12. Component Location ALE/40 (Sheet 4 of 4)