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JOHN F. KENNEDY
SPACE CENTER

ELECTRICAL REFERENCE HANDBOOK
LAUNCH EQUIPMENT BRANCH
ELECTRICAL SUPPORT EQUIPMENT
LC - 39

VOLUME I of II

Launch Equipment Branch

Launch Support Equipment Engineering Division

SP-166-D

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APPROVAL

ELECTRICAL REFERENCE HANDBOOK

FOR

LAUNCH EQUIPMENT BRANCH

ELECTRICAL SUPPORT EQUIPMENT

LC-39

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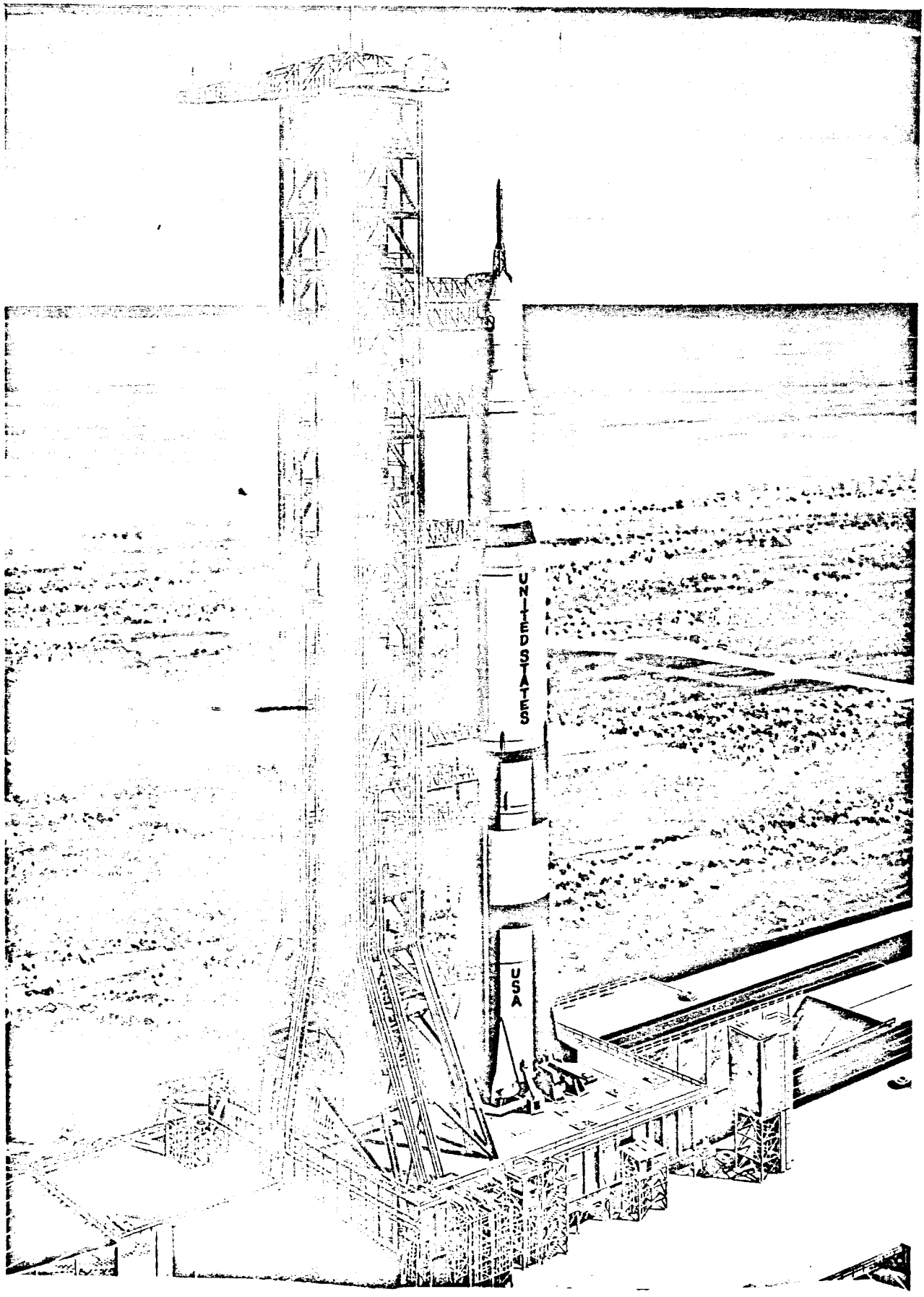
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SECTION I

INTRODUCTION

1-1. SCOPE AND PURPOSE

This handbook describes that Electrical Support Equipment Equipment (ESE) which is the responsibility of the Launch Equipment Branch. The Launch Equipment Branch ESE comprises electrical subsystems which provide control, test, and monitoring of the service arms, command module access arm, tail service masts, pneumatic distribution panels, hydraulic charging and supply units, engine servicing platforms, Q-ball cover removal mechanism, and oxygen conditioning system. As the design of these systems is further refined, or as new systems are added to Launch Equipment Branch responsibility, this document will be revised and re-issued.

It should be noted that equipment also known as ESE is used in propellant loading, in certain vehicle-oriented systems on the Mobile Launcher, and in the integrated electrical networks for LC-39; no ESE except that named above is within the scope of this handbook.

In this document the ESE is described as an overall integrated system (section III), and again as individual panels and cabinets (section IV). It is also possible to determine the physical location of a particular item of Electrical Support Equipment installed in the Mobile Launcher or Launch Control Center. Detailed information about the equipments for which the ESE provides monitor and control, such as the tail service masts, may be obtained by reference to the document list, paragraph 1-2.

Section IV describes standard equipment such as panels, distributors, racks, test sets, and component modules employed throughout the ESE. These standard assemblies are the building blocks of present electrical ground networks and they should aid in the design of new systems.

Section V provides physical descriptions of the four ESE system test units. Their face panels and test functions are also given in section III in conjunction with the systems to be tested.

Reference material which applies to the entire ESE, such as the Mobile Launcher isometric drawing, the family tree of drawings, etc. is contained in section VI.

1-2. RELATED DOCUMENTS.

The following documents offer detailed information on systems controlled and monitored by the ESE:

a. Apollo Systems Description, Volume III
NASA TM X-882

b. Tail Service Mast Design Report
TM-23-0-D
Launch Equipment Branch
Launch Support Equipment Engineering Division

c. Saturn V Service Arms Preliminary Engineering Report
TR-4-4-2-D
Launch Equipment Branch
Launch Support Equipment Engineering Division

d. LC-39 L/UT GSE Installation
SP-95-D
Launch Equipment Branch
Launch Support Equipment Engineering Division

e. Saturn V Service Arms Functional Description
Launch Equipment Branch
Launch Support Equipment Engineering Division

f. Standard Cables, Saturn I
LTM-4-4

g. Standard Electrical Components, GSE Saturn Vehicles
LTM-4-11

h. Data Booklet, Saturn V Service Arms and Related Equipment, Complex 39
KSC SP-4-50-D
Launch Equipment Branch
Launch Support Equipment Engineering Division

i. Information Handbook, Saturn V Vehicle Service Arms and Access Arm, Launch Complex 39
SP-87-D
Launch Equipment Branch
Launch Support Equipment Engineering Division

SECTION II

LAUNCH COMPLEX 39

2-1. GENERAL DESCRIPTION.

The Saturn/Apollo space vehicle (Saturn V) will be launched from NASA's Launch Complex 39. Owing to the complexity and size of the space vehicle and to the need for maximum reliability in the Apollo program, the launch procedure for LC-39 departs from previous ones as follows:

a. Assembly and checkout of the space vehicle on its launcher, in the Vehicle Assembly Building (VAB) as shown in figure 2-1.

b. Transfer of the assembled and checked space vehicle on its launcher to the launch pad, figures 2-2 and 2-3.

c. Automatic checkout.

d. Remote control of actual launch operations from a distant Launch Control Center (LCC).

As the Saturn V is assembled on its launcher in the VAB, all vehicle and launch support systems are remotely exercised and checked out from consoles in the Launch Control Center, which adjoins the VAB. After transfer to a launch pad the Mobile Launcher and Saturn V are again checked out from these consoles. Finally, all events at launch are sequenced by computers in the LCC and Mobile Launcher and are monitored from the LCC consoles.

One group of equipment thus controlled from the LCC is the Launch Equipment (see figure 3-6), which is utilized to mate the vehicle to the Mobile Launcher during installation, checkout, and launch operations. Among the Launch Equipment are the service arms, tail service masts, and their associated hydraulic, pneumatic, and electrical units. These systems are located aboard various levels of the Mobile Launcher tower and base.

Electrical control for them is provided by the Electrical Support Equipment (ESE), figures 2-4 and 2-5, which is the central topic of this handbook.

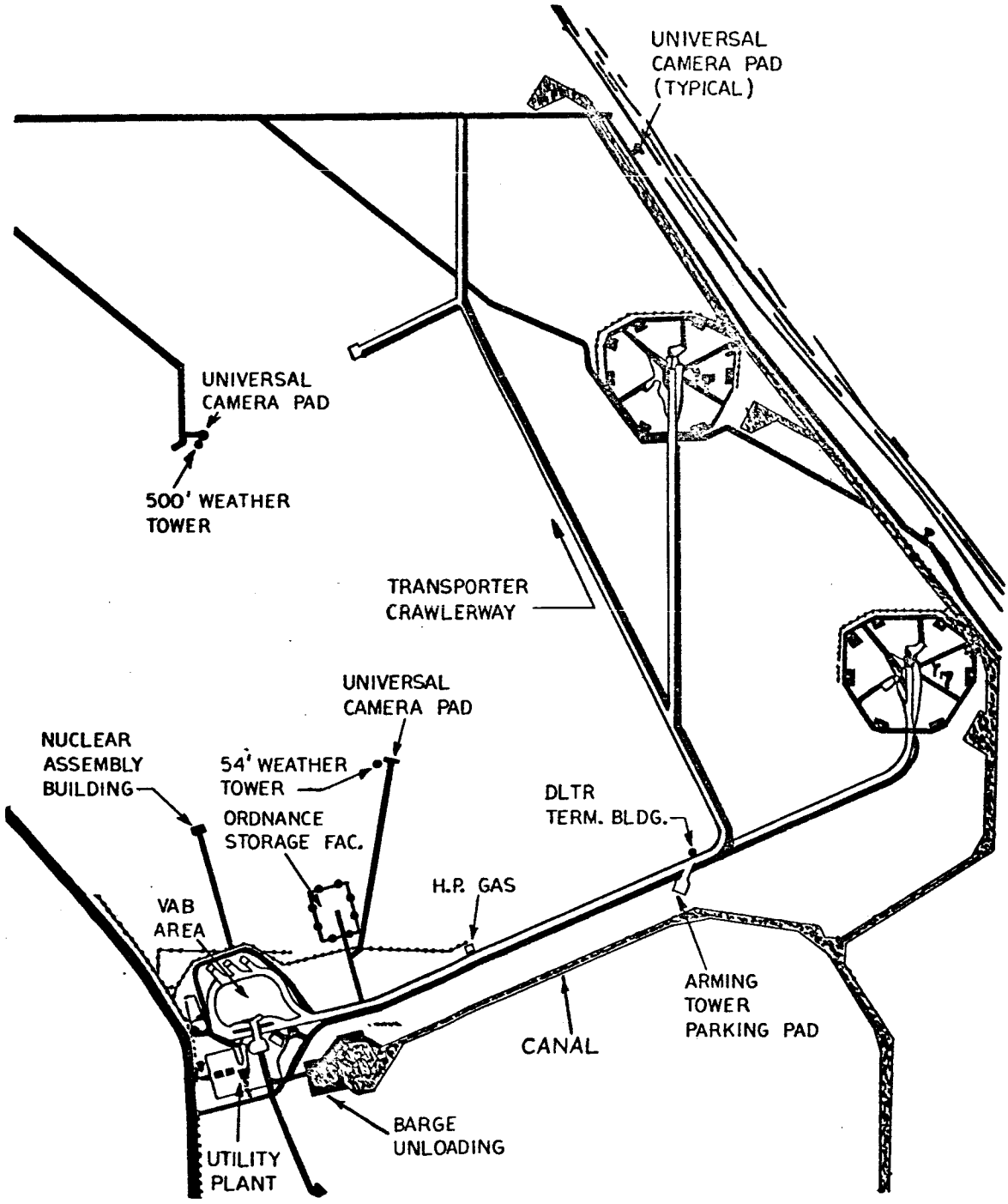
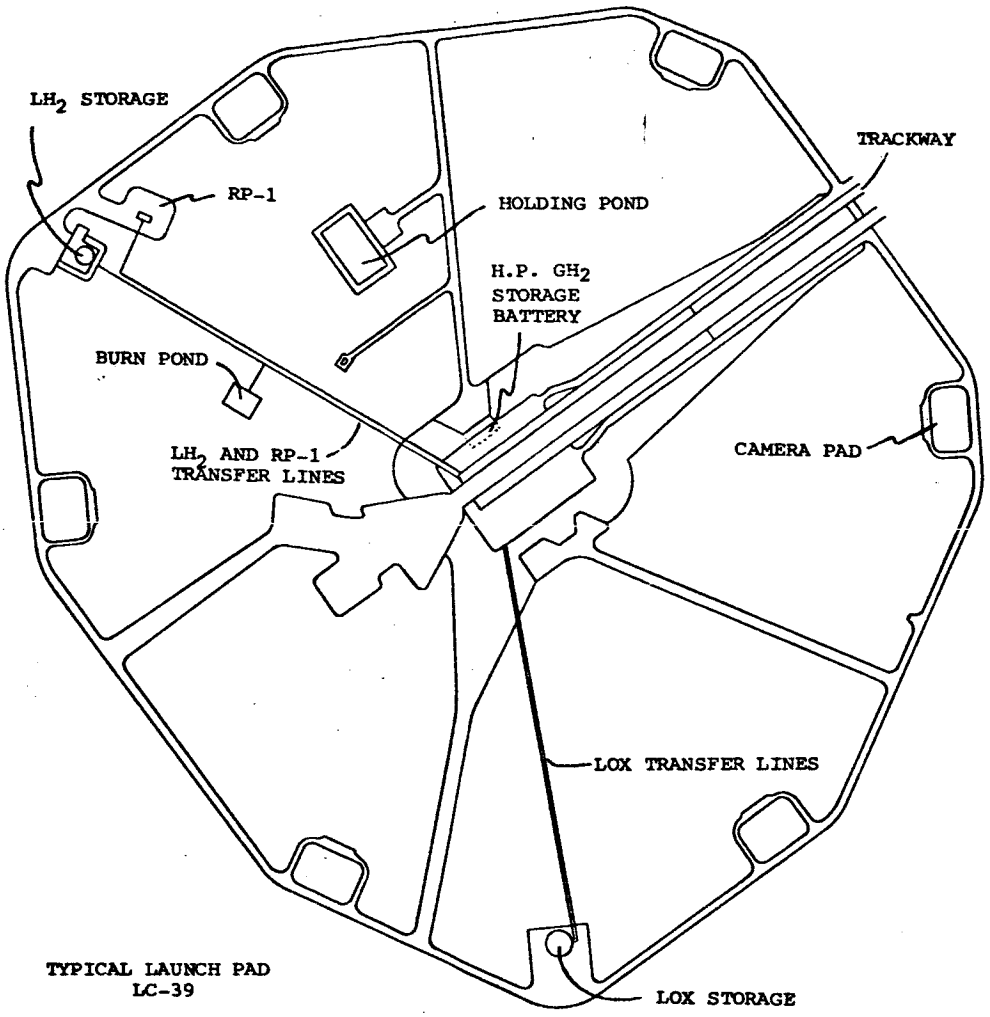


Figure 2-1 Launch Complex 39



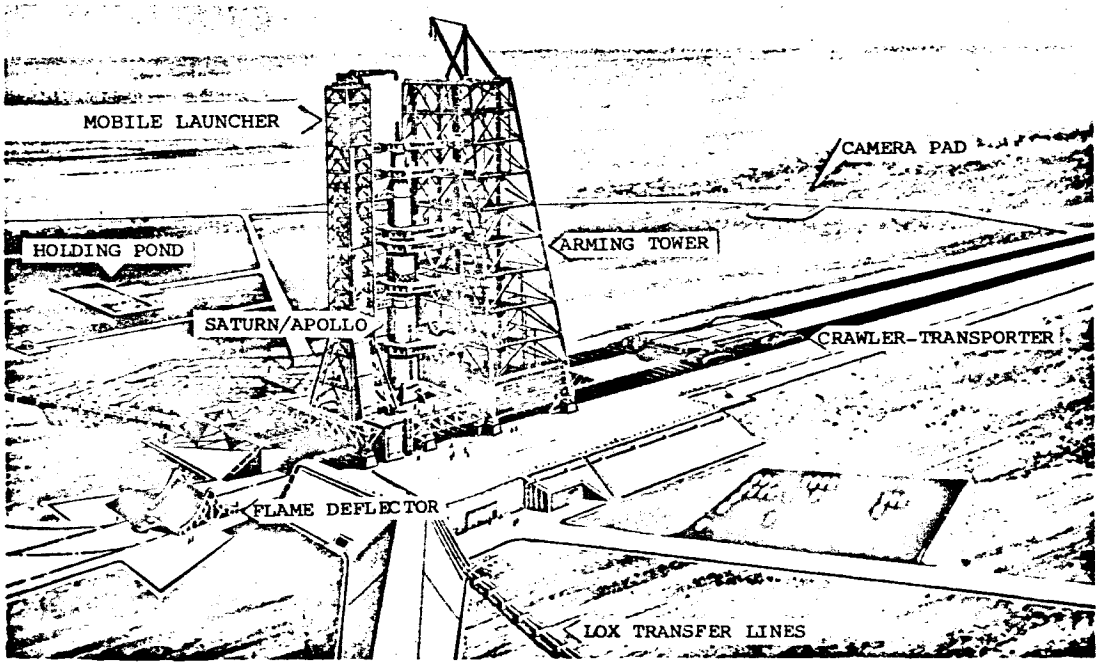


Figure 2-2 Typical Launch Pad, LC-39

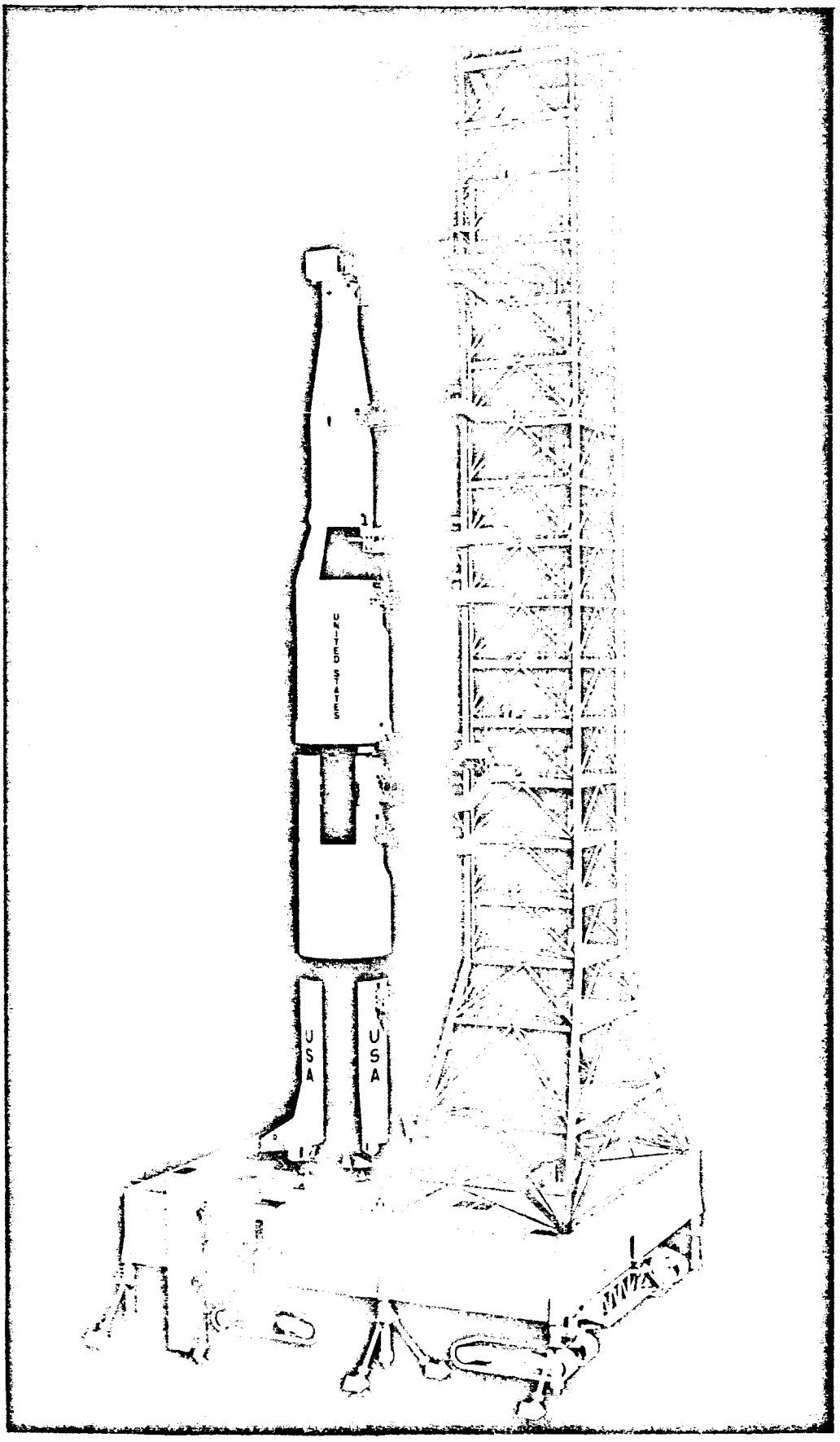


Figure 2-3 Mobile Launcher

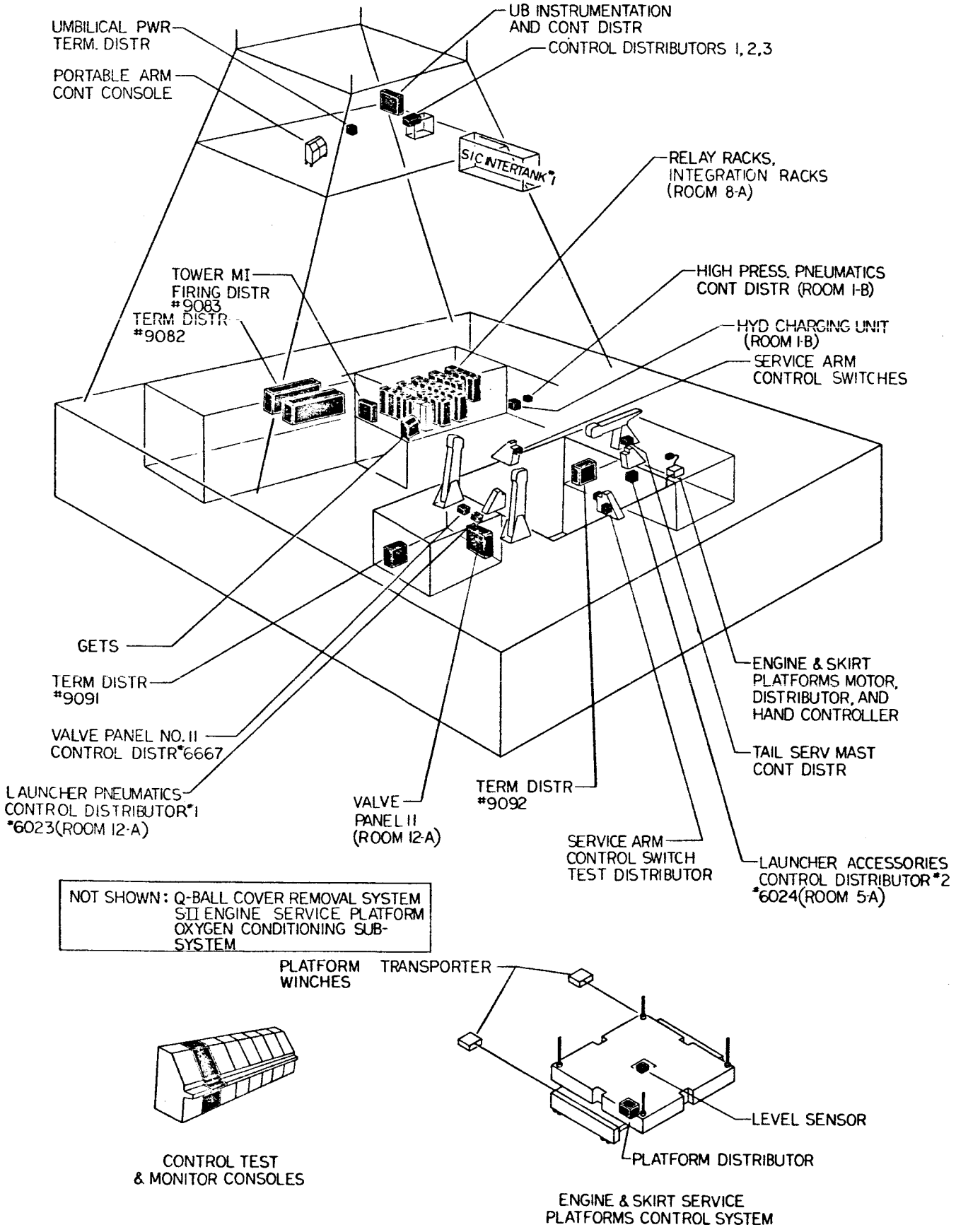


Figure 2-4 Electrical Support Equipment

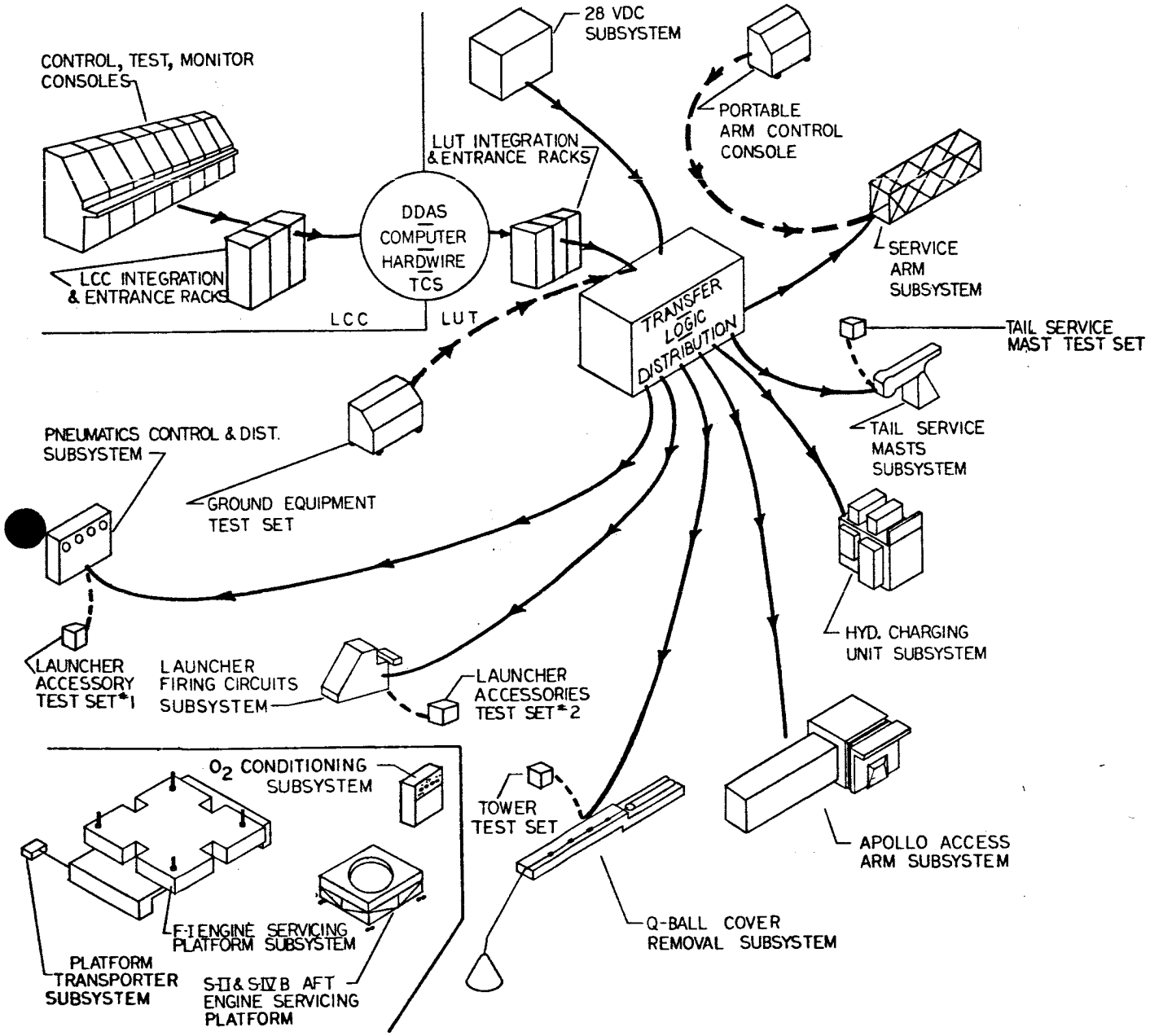


Figure 2-5 ESE Subsystems

SECTION III

ELECTRICAL SUPPORT EQUIPMENT (ESE)

3-1. INTRODUCTION.

The tail service masts and tower service arms are moved by pneumatic and hydraulic actuators. Local hydraulic and pneumatic accumulators and lines for these actuators are charged for check-out operations in the VAB, and are normally reduced to standby pressure only during Mobile Launcher transit to the pad.

For prelaunch operations these actuators and their electrical controls are remotely checked, operated and monitored from ESE consoles in the Launch Control Center, using 28 volts dc primary power. During countdown and launch the service arms, the tail service masts, and their hydraulic/pneumatic actuators are controlled by the ESE consoles in the LCC, by the Mobile Launcher and LCC computer complex, and partly by ESE sequencing circuits in the Mobile Launcher.

The twelve subsystems comprising the Mobile Launcher ESE are shown in figure 2-5 and are individually delineated in paragraphs 3-2 through 3-58. Among these, only four subsystems are independent of the LCC. They are the S-IC Engine Servicing Platform, the Platform Transporter, the S-II/S-IVB Engine Servicing Platform, and the Oxygen Conditioning System.

The remaining nine electrical subsystems are primarily controlled from the Launch Control Center via the DDAS-Computer-Hardwire-Terminal Countdown Sequencer (TCS) complex and the Transfer-Logic-Distribution Complex as in figure 2-5. The latter complex is comprised of relay racks which provide both interface separation and logic, and of distributors which provide a means for power and signal distribution.

The relay-rack portion of the Transfer-Logic-Distribution Complex also provides a central location for connecting the Launcher Ground Equipment Test

Sets (Launcher (GETS), which simulate either the LCC or any subsystem interfacing with the relay racks. The GETS (paragraph 5-2) can also test the relay racks themselves.

Another test unit shown in figure 2-5 is the Portable Arm Control Console. This unit allows an operator to check out or operate any service arm at the service arm level. See paragraph 5-12. In addition, test sets are provided to locally test launcher accessories and tail service masts.

In the following table some of the major LC-39 launch activities and events are given in chronological order. Those which make direct use of the Electrical Support Equipment are marked by an asterisk (*).

	VEHICLE ASSEMBLY BUILDING
L-58 to L-55 days	Offload S-IC and erect on mobile launcher.
L-55 to L-49 days	* Install S-IC engine servicing platform; connect ESE to LCC via data link.
L-53 to L-49 days	* Install S-II, S-IVB, and IU; make umbilical connections.
L-48 to L-29 days	Check telemetry, navigation, power transfer, launch vehicle systems, etc.
L-28 to L-17 days	Install spacecraft and test spacecraft systems; install light ordnance items.
L-16 to L-15 days	* Perform interface and compatibility tests, including vehicle-ESE; perform simulated flight test, check LCC-pad data link with simulators.
	LAUNCH PAD
L-12 to L-10 days	* Crawler transports vehicle and mobile launcher to pad; mate launcher to ground connections; power on (all systems "quick look" to the LCC); position engine servicing platform.

L-10 to L-4 days	* Position arming tower; perform RF tests, propellant loading tests, and limited electrical subsystem verification tests from LCC.
L-3 days	Perform simulated flight test.
L-2 to L-1 days	* Remove work platforms, test equipment, and arming tower; retract Q-ball cover.
L-0	Terminal countdown.
T-7 hours	Begin LOX and LH_2 loading.
T-4 hours	Astronauts ingress via Mobile Launcher.
T-105 min.	Conduct final systems tests.
T-187 sec	* Launch support equipment preparation complete and terminal countdown sequencer start.
T-60 sec	* Unlock & retract Apollo access arm.
T-30 sec	* Apollo access arm retracted and latched; unlock preflight service arms.
T-22 sec	* Retract S-IC intertank reconnect mechanism.
T-17 sec	* Retract S-IC Intertank & S-IC Forward service arms; unlock inflight service arms.
T-10 sec	* Pad water system on; tail service mast purge on
T-9 sec	* Launch support equipment ready for ignition
T-7 sec	* Ignition command
T-0 sec	* Launch commit - arm the lift off switches, release holddown arms.
T+0 sec	* Lift off, retract inflight service arms and tail service masts

3-2. SERVICE ARMS SUBSYSTEM.

3-3. Purpose of the Service Arms Subsystem. The Service Arms Subsystem provides system control, test, and monitoring for service arm operation.

3-4. Equipment for the Service Arms Subsystem. The Service Arms Subsystem employs the following equipment:

a. Service Arms Nos. 1 through 8, figure 3-1

b. Service Arm Control Distributors (Control Console No. 1)

#6062, #6064, Level 60
#6122, #6124, Level 120
#6142, #6144, Level 140
#6162, #6163, #6164, Level 160
#6202, #6203, #6204, Level 200
#6222, #6223, #6224, Level 220
#6262, #6263, #6264, #6265, Level 260
#6302, #6303, #6304, Level 300

c. "J" Boxes (Control Console No. 2)

#6146, Level 140
#6206, Level 200
#6226, Level 220
#6266, Level 260
#6306, Level 300

d. Service Arm Racks, room 8-A. See Racks 9, 10, 11, 12, 13, 14, 15, 16, 17, figure 6-2.

e. Portable Arm Control Console.

f. Control, Test, and Monitor Console, LCC.

g. Integration Racks and Entrance Rack, room 8-A. See Racks 20, 21, and 22, figure 6-2.

h. Terminal Distributor #9082, room 7-A.

i. Power Racks, room 8-A. See Racks 5, 6, 7, 8, figure 6-2.

j. UB Instrumentation & Control Distributors #9006, #9010, #9014, #9016, #9020, #9022, #9025, #9026, #9028 and #9030, figure 3-1.

k. UB Power Distributors #9017, #9023, #9027, #9029, #9031, #9043, #9044, #9045, #9046. For locations see figure 3-44.

l. Local Control Units #6067, #6127, #6147, #6170, #6207, #6227, #6267, #6307

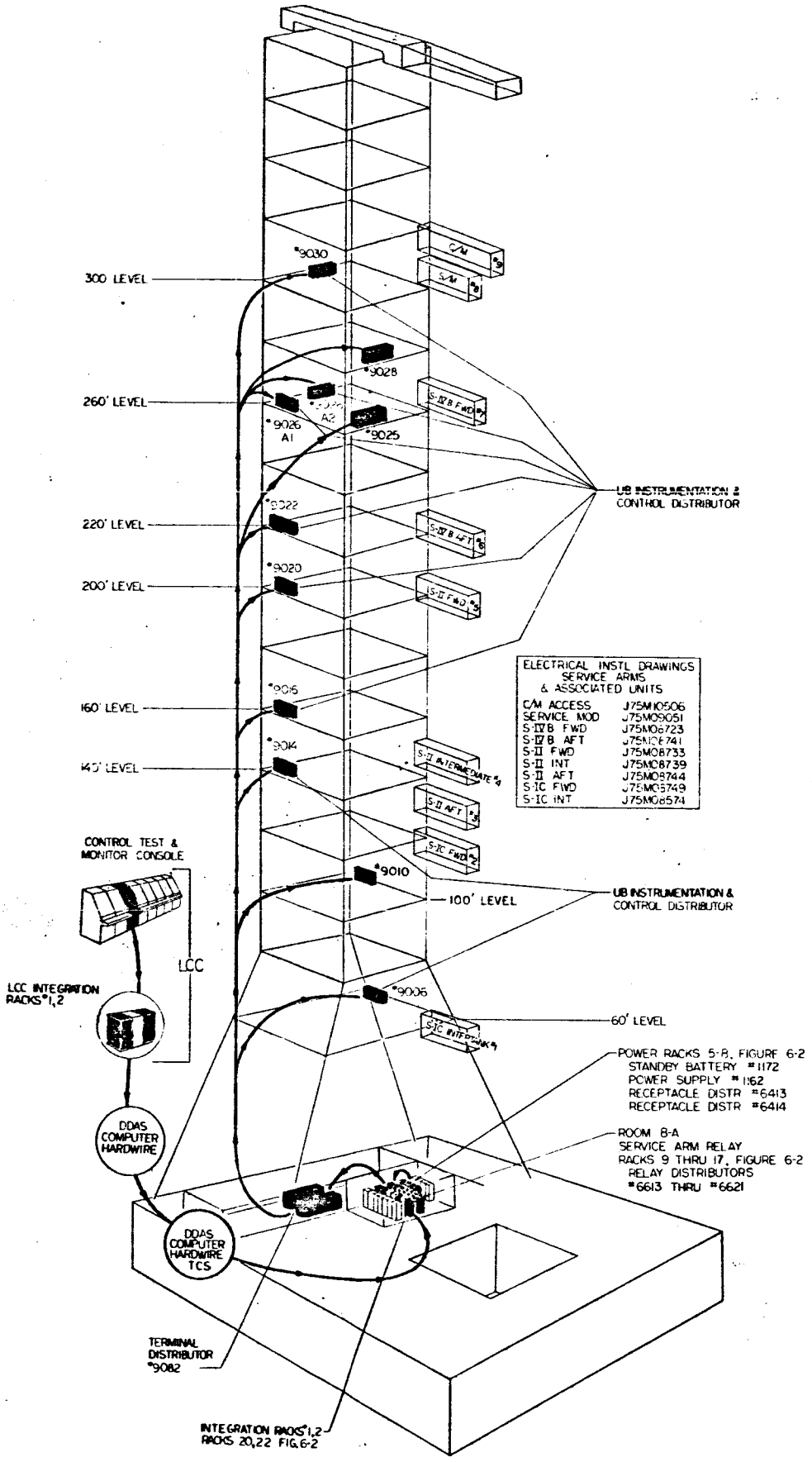


Figure 3-1 Service Arms Subsystem

3-5. Description of the Service Arms Subsystem. Control and display functions for each of the eight service arms are provided by the eight LCC Control, Test, and Monitor consoles (figures 3-4, typical) and the LCC Status Panel (figure 3-5). All ESE consoles are shown in figure 3-67. These consoles provide visual display for critical system parameters and electrical control of solenoid-operated valves and pressure switches associated with the service arms. The LCC consoles interface with the seven Relay Distributors (#6613 through #6618 and #6621) via the DDAS-Computer-Hardwire complex, as in figure 3-1. These relay racks provide control logic and act as transfer units for the Service Arm Subsystem as follows.

Manual Operation of switches on the LCC Console provides command signals which cause relays in the relay racks to be actuated. Relay operation in turn provides 28 volts dc via the terminal and control distributors, figure 3-2, to solenoid-operated valves, limit and pressure switches, and analog transducers associated with each tower level. These components are shown for a typical preflight arm in figure 3-3 and a typical inflight arm in figure 3-2. Resulting mechanical movements of the arm and its control mechanisms are monitored by switches and transducers which return feedback signals to the relay racks along a path parallel to the command signal. In the relay racks these feedback signals actuate additional relays which provide visual display at the LCC Control, Test, and Monitor Console. At the same time, some of these feedback signals provide a stimulus for automatic sequenced operation of the service arm.

NOTE

During launch conditions five of the eight service arms are retracted at vehicle liftoff. Initiating commands for retracting these five arms are provided by the Launch Equipment Firing Circuits Subsystem, paragraph 3-20.

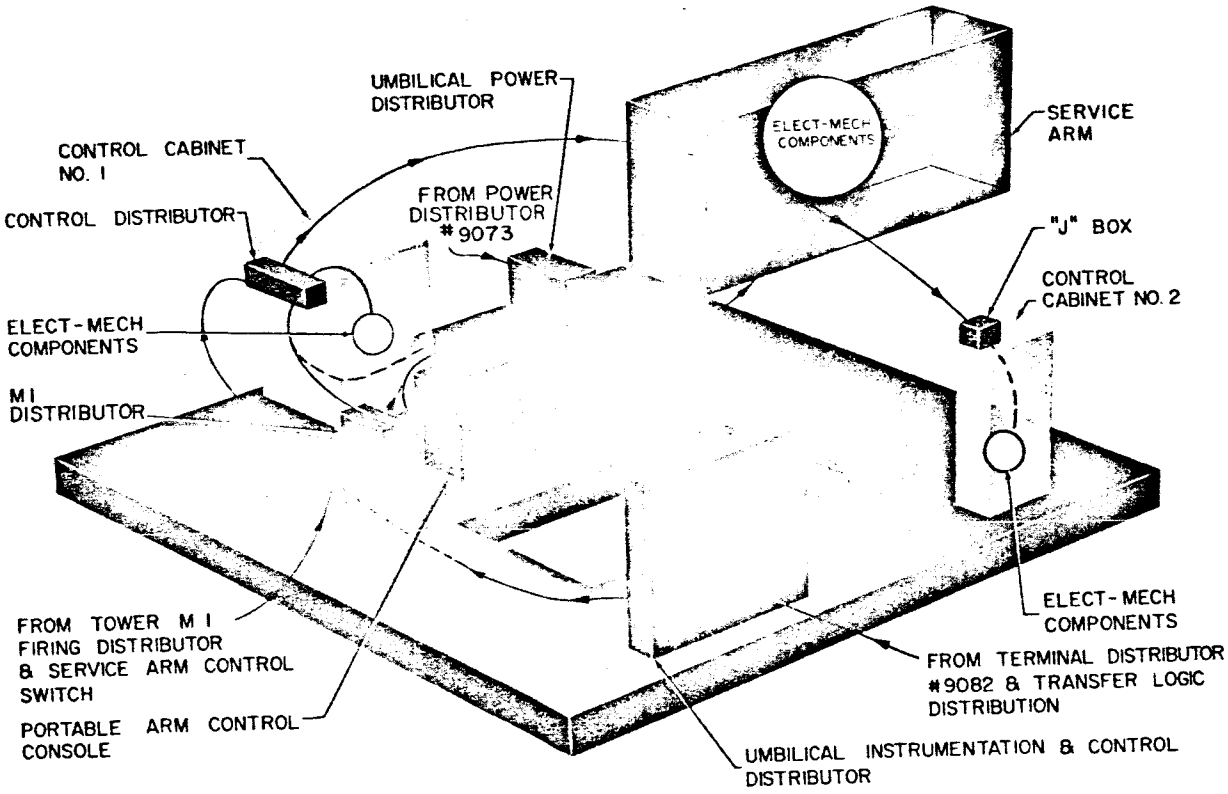


Figure 3-2 Typical Inflight Service Arm and Test Installation

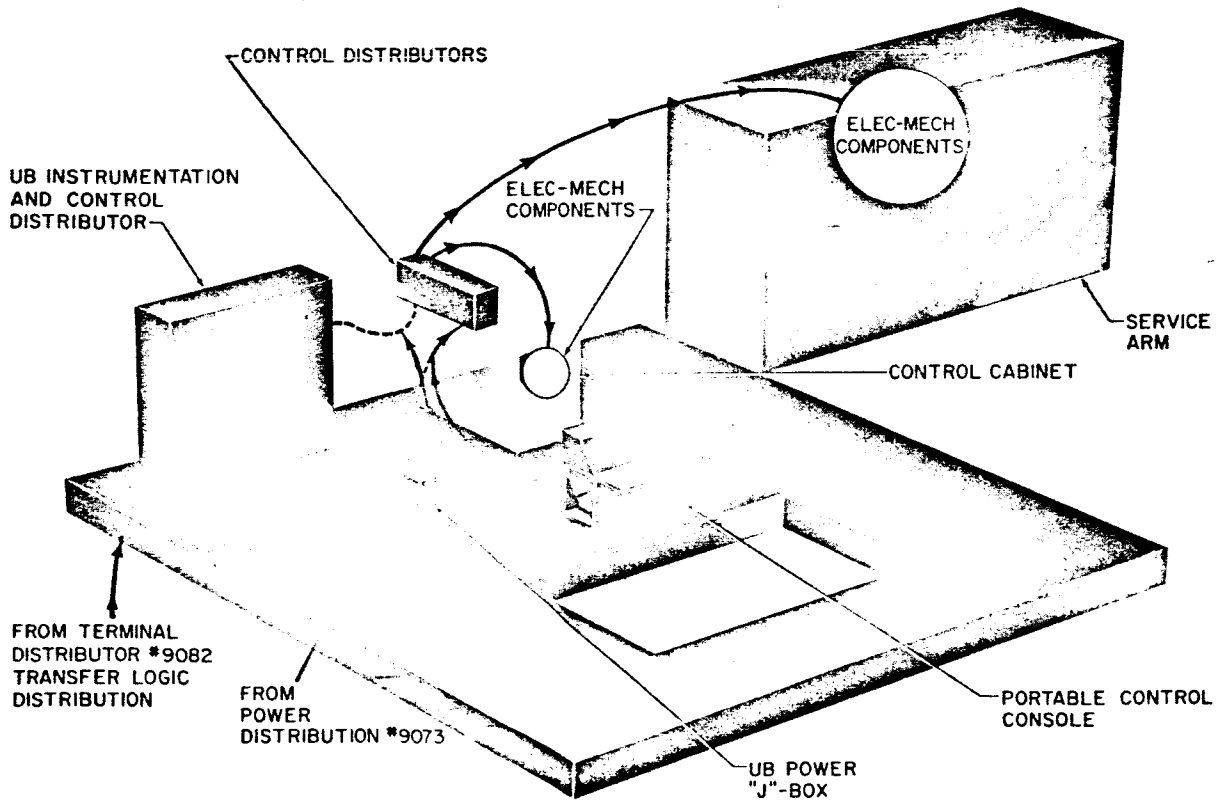


Figure 3-3 Typical Preflight Service Arm and Test Installation

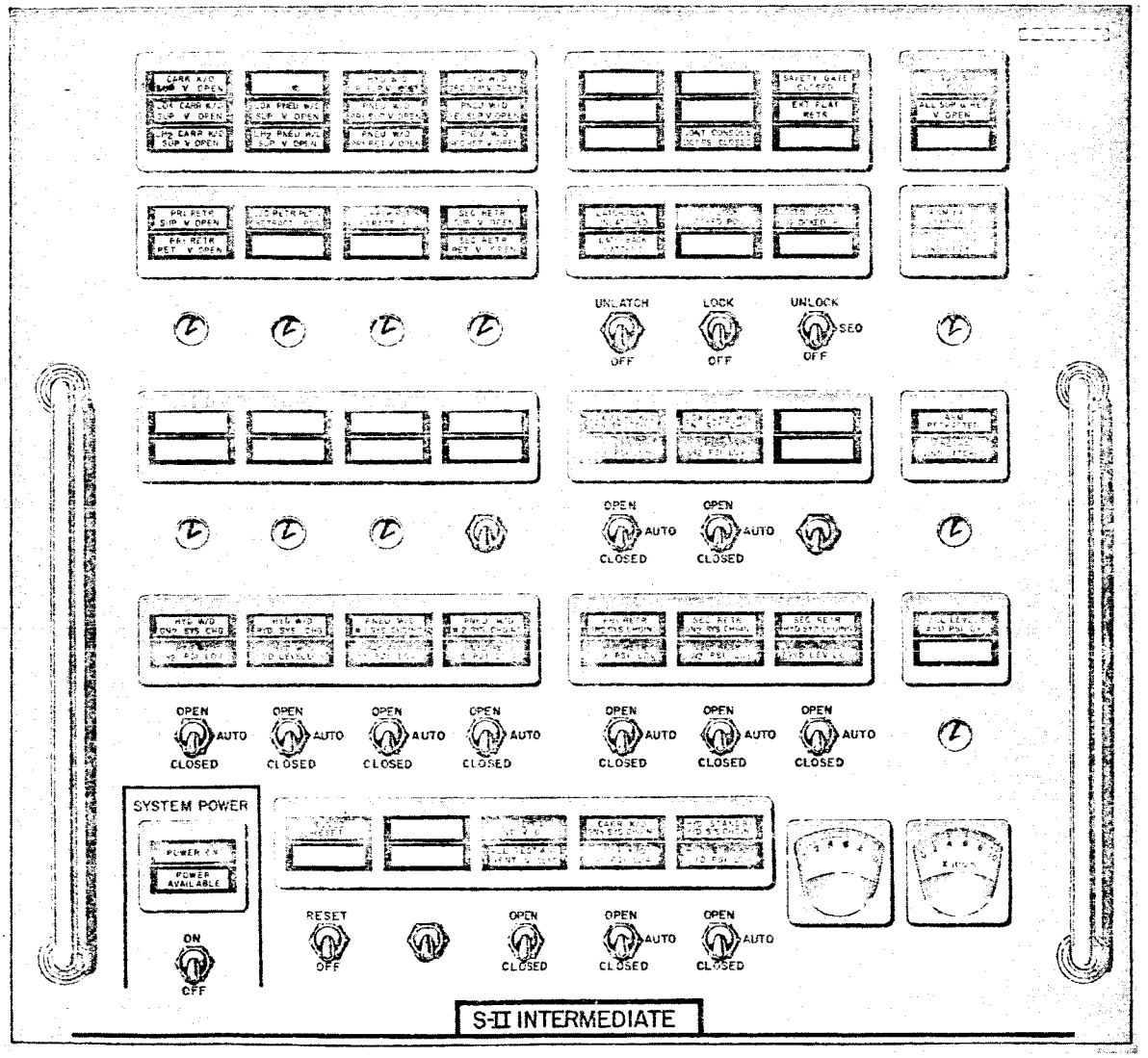


Figure 3-4 LCC Control Panel, S-II Intermediate

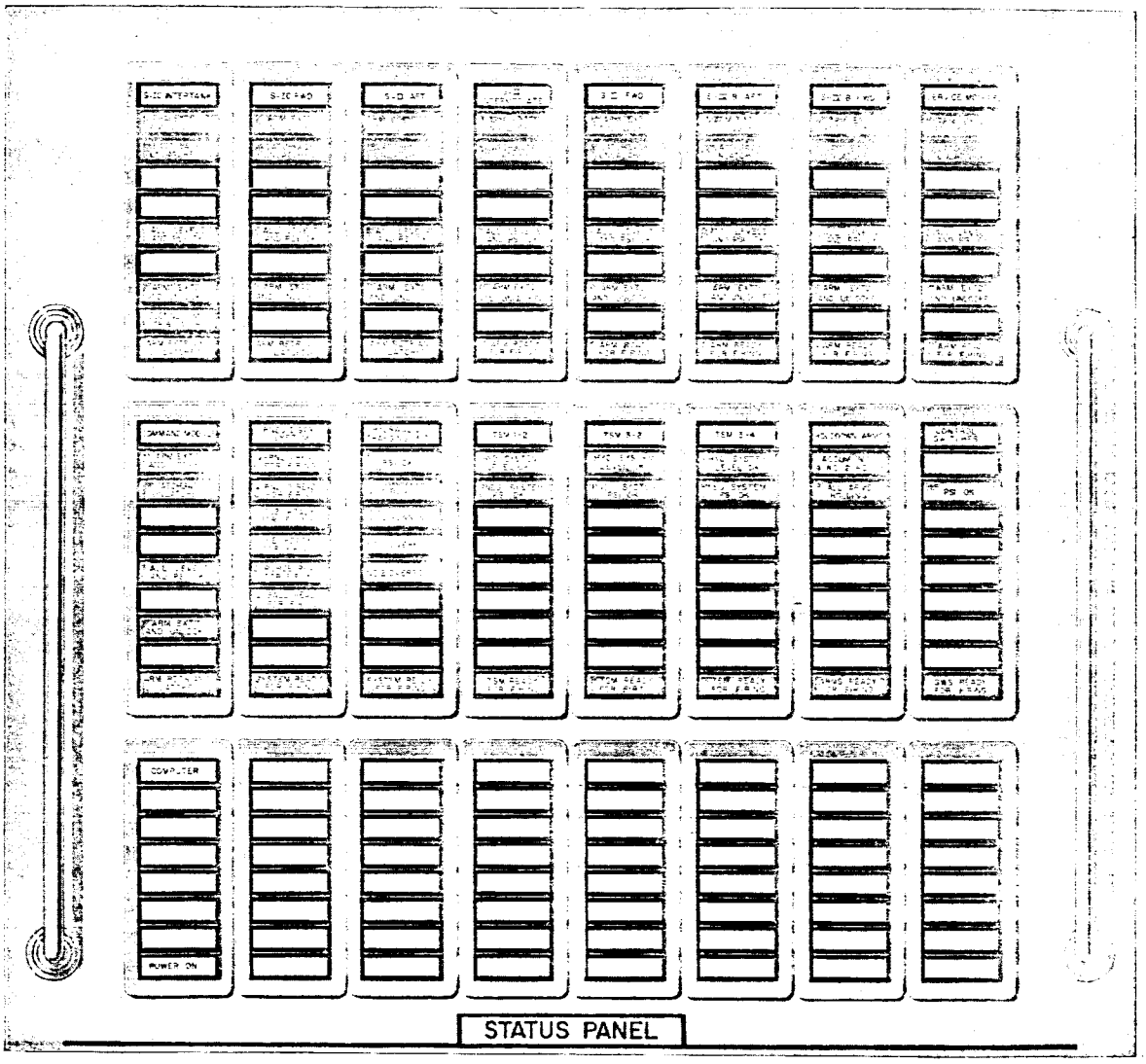


Figure 3-5 LCC Summation Panel D75M14440

3-6. Local Tests for the Service Arms Subsystem. In order to test and operate a service arm from the tower level with which it is associated the Portable Arm Control Console (figures 3-2 and 3-3) is employed. After this console is positioned on the tower level, special test cables are connected to appropriate distributors and electrical-mechanical components, in place of the system cables.

Once the Portable Arm Control Console is connected, the electrically controlled hydraulic and pneumatic systems can be charged and the condition of all pressure systems monitored. Upon completion of the charging sequence, the service arm can be operated as a complete system, or any of its three major sequential functions can be exercised individually. Provisions are made in the Portable Arm Control Console to allow the operation of each critical component to be monitored. See figures 3-7, 3-8 and 5-7.

The service and access arms can also be extended or retracted by use of the local control unit shown in figure 3-6. One such unit is stored in each Control Cabinet No. 1.

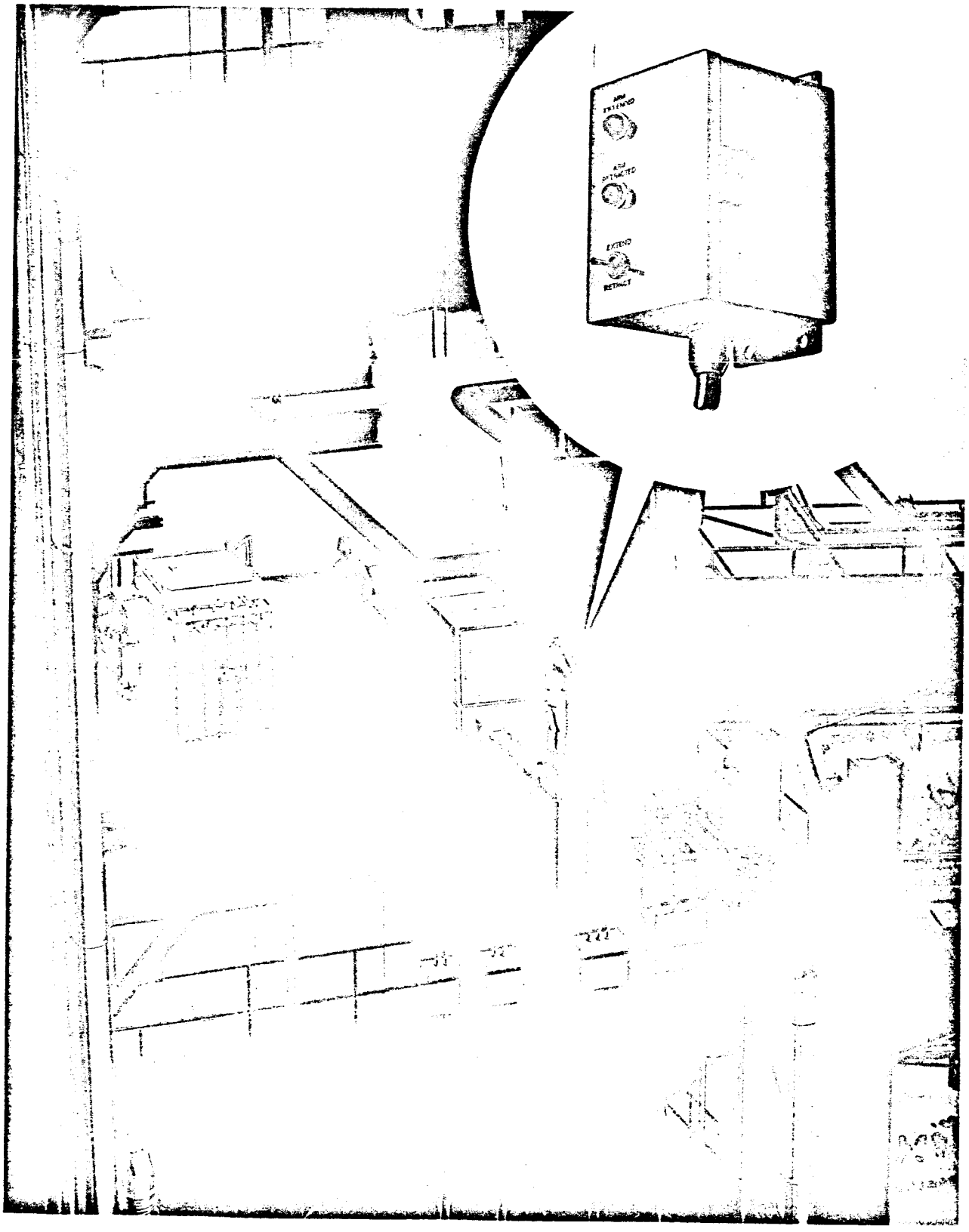


Figure 3-6 Local Control Unit - Service Arms

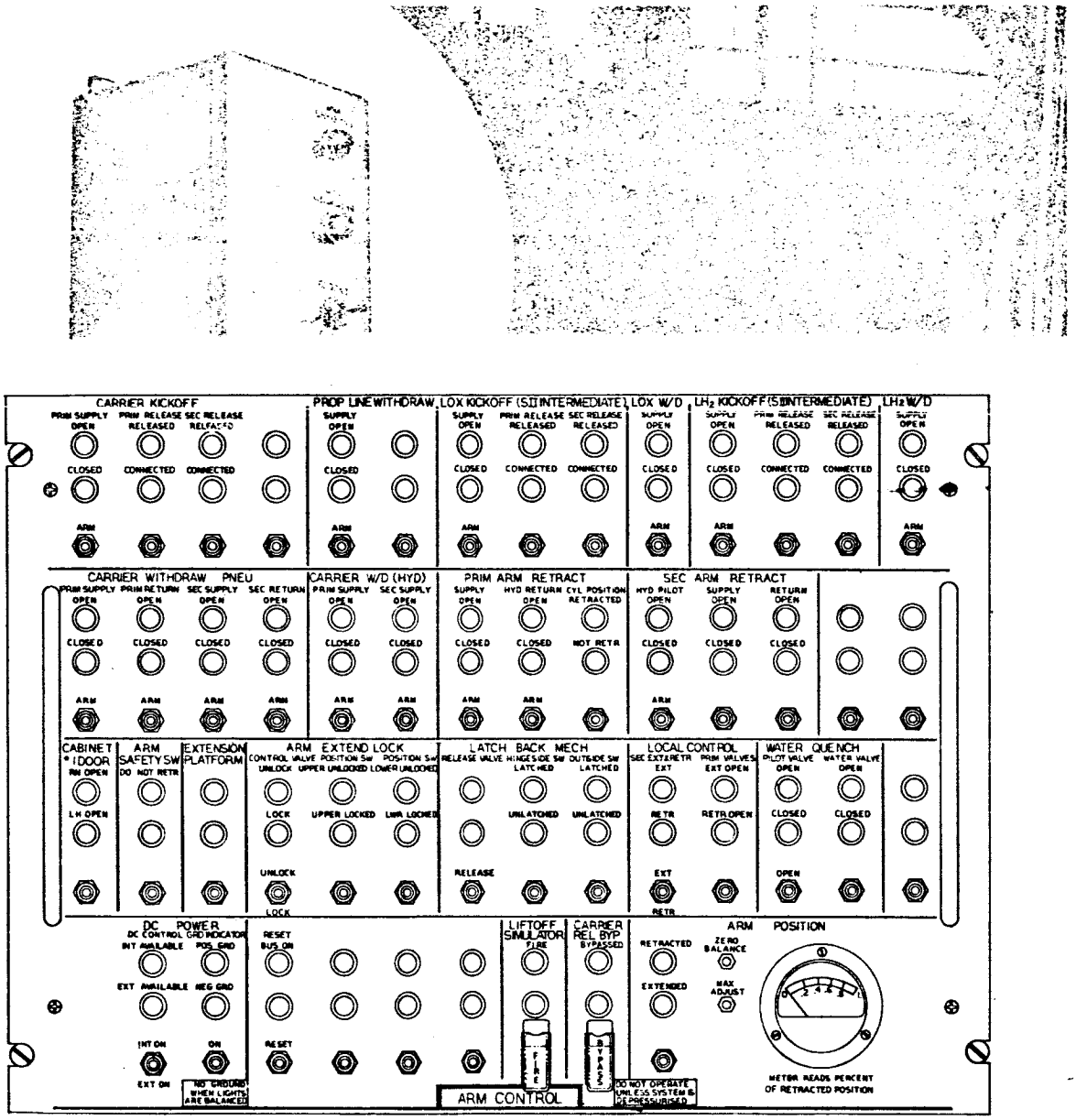


Figure 3-7 Arm Control Panel J75M07546-3, Portable Arm Console

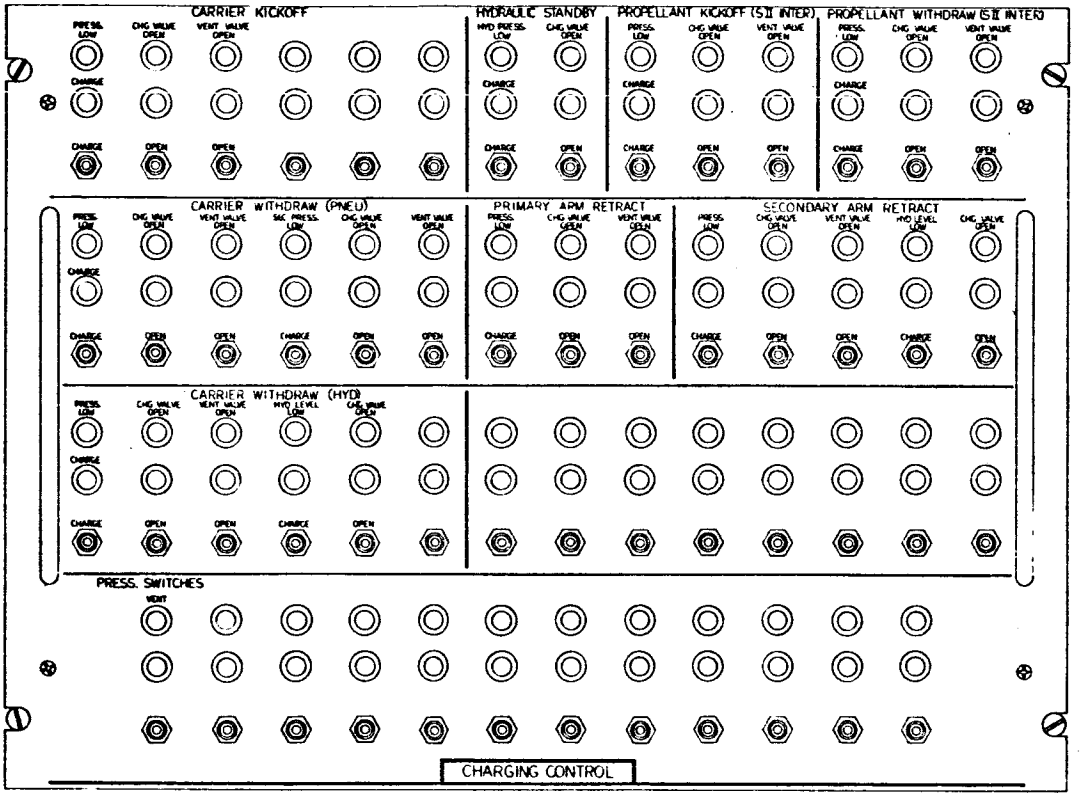


Figure 3-8 **Charging Control Panel J75M07546-1, Portable Arm Console**

3-7. APOLLO ACCESS ARM SUBSYSTEM.

3-8. Purpose of the Subsystem. The Apollo Access Arm Subsystem provides electrical control, test, and monitoring of the access arm and the hood positioning mechanism.

3-9. Equipment for the Subsystem. The Apollo Access Arm Subsystem employs the following equipment:

a. Access Arm and associated electrical-mechanical components

b. Hood positioning mechanism and associated electrical-mechanical components

c. Apollo Access Arm Control Panel, LCC

d. Relay Distributor #6619, Mobile Launcher room 8-A

e. Power Rack, Mobile Launcher room 8-A

f. Terminal Distributor #9082

g. UB Instrumentation and Control Distributor #9032

h. UB Power "J" Box #9047

i. Control Cabinet No. 1 #6328

j. Control Distributors #6322 and #6324

k. Control Distributor #6357A55A2

l. Portable Arm Control Console

m. Local Control Unit #6339

3-10. Description of the Subsystem. The Apollo access arm provides personnel access, environmental controls, and checkout service outlets for the Apollo Command Module. During launch conditions the arm is controlled from the Apollo Access Arm Control panel in the LCC, figure 3-12. When the arm control system is manually given READY TO FIRE status from the panel, the access arm disconnects itself from the vehicle and retracts approximately one minute before lift off, upon command from the Terminal Countdown Sequencer.

The command signals flow through the DDAS-Computer-Hardwire-TCS complex (figure 3-9) to Relay Distributor #6619 in the Mobile Launcher room 8-A. Relay closure provides 28 volt signals through Terminal Distributor #9082 to UB Instrumentation and Control Distributor #9032, at Mobile Launcher Level 320. The

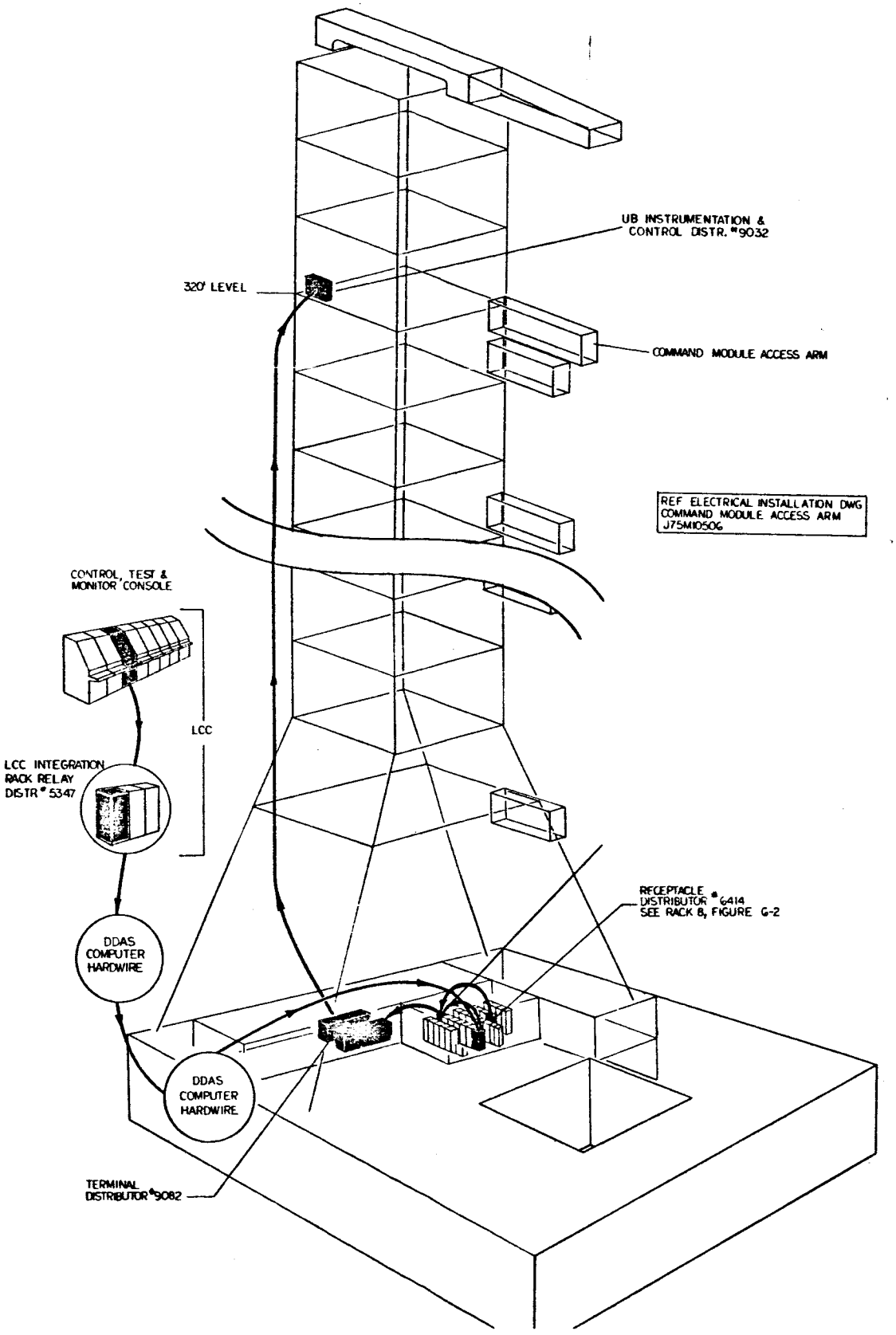


Figure 3-9 Apollo Access Arm Subsystem

control system then branches off into two operations, which are treated separately here.

The first operation, access hood positioning control, is illustrated in figure 3-10. At launch, command signals flow from the UB Instrumentation and Control Distributor #9032, through Control Distributor #6357A55A2, to various electrical-mechanical components in the vicinity of the access hood. These components control a pneumatic system which releases latching hooks, raises the hood, and retracts it several inches away from the Command Module.

The second operation, access arm control, is thereby automatically initiated. Signal flow as shown in figure 3-11 actuates electrical-mechanical components in the arm and in Control Cabinet No. 1. These components control the pneumatic and hydaulic system which swings the arm back and latches it to the tower.

During launch conditions or prelaunch testing, various specific mechanical movements of the access arm and hood positioning mechanism can be controlled and monitored from the LCC.

Thus at any time the arm can be extended and the access hood repositioned and latched to the space vehicle. See these functions in figure 3-12.

All major movements of the arm and its control elements are monitored by limit switches and analog transducers. Feedback signals from some of these components provide continuity for automatic operation. Others transmit monitor signals back to the LCC control panel.

3-11. Local Testing of the Access Arm. By use of the Portable Arm Control Console, the Apollo access arm can be locally tested and exercised. For this purpose the control console is outfitted with special overlay panels (figures 3-13 and 3-14) and is internally patchboard-programmed. It is then positioned on tower level 320 and connected to appropriate distributors and electrical-mechanical components, replacing system cables.

Thus the Portable Arm Control Console can charge all necessary

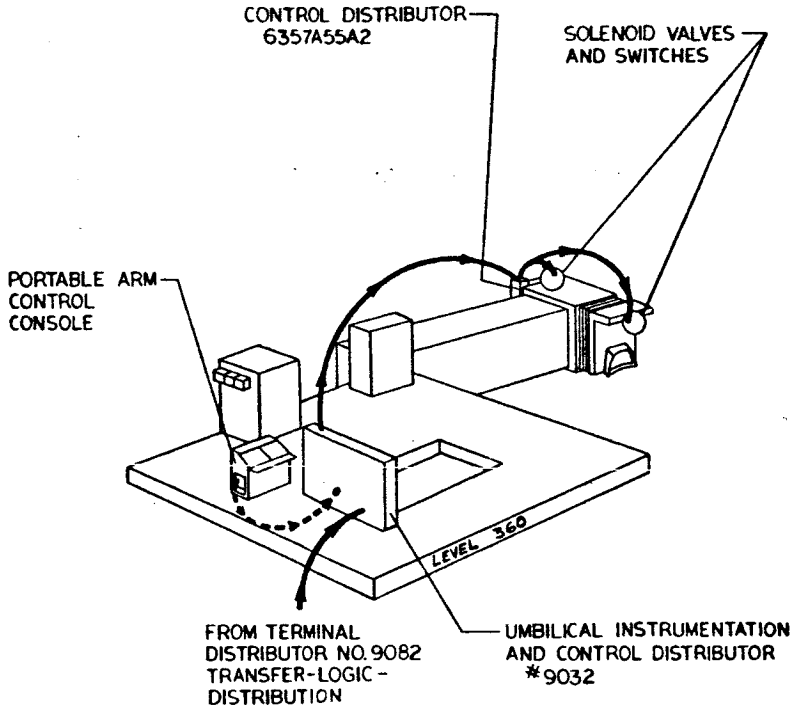


Figure 3-10 Apollo Access Arm Level (Access Hood Control)

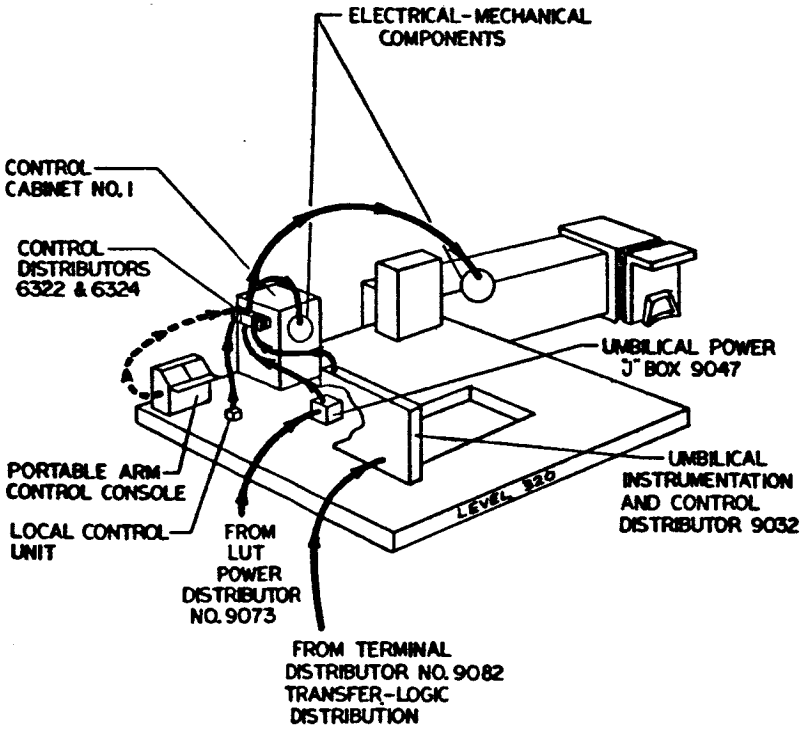


Figure 3-11 Apollo Access Arm Level (Arm Control)

hydraulic and pneumatic accumulators, and can fully exercise the access arm and hood positioning mechanism.

The arm itself can also be extended or retracted by Local Control Unit #6339, which is stored in Control Cabinet No. 1. A typical Local Control Unit is shown in figure 3-6.

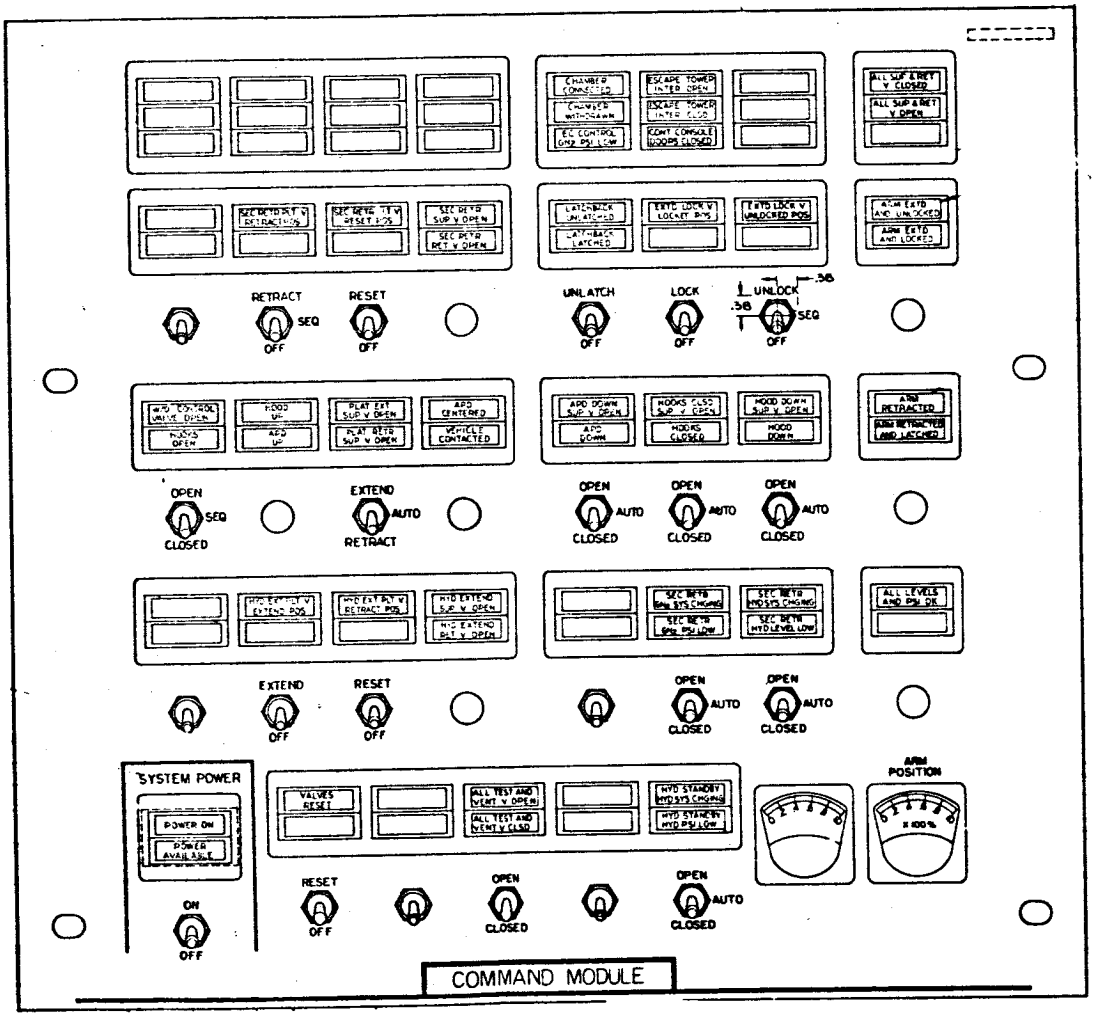


Figure 3-12 LCC Control Panel, Apollo Access Arm

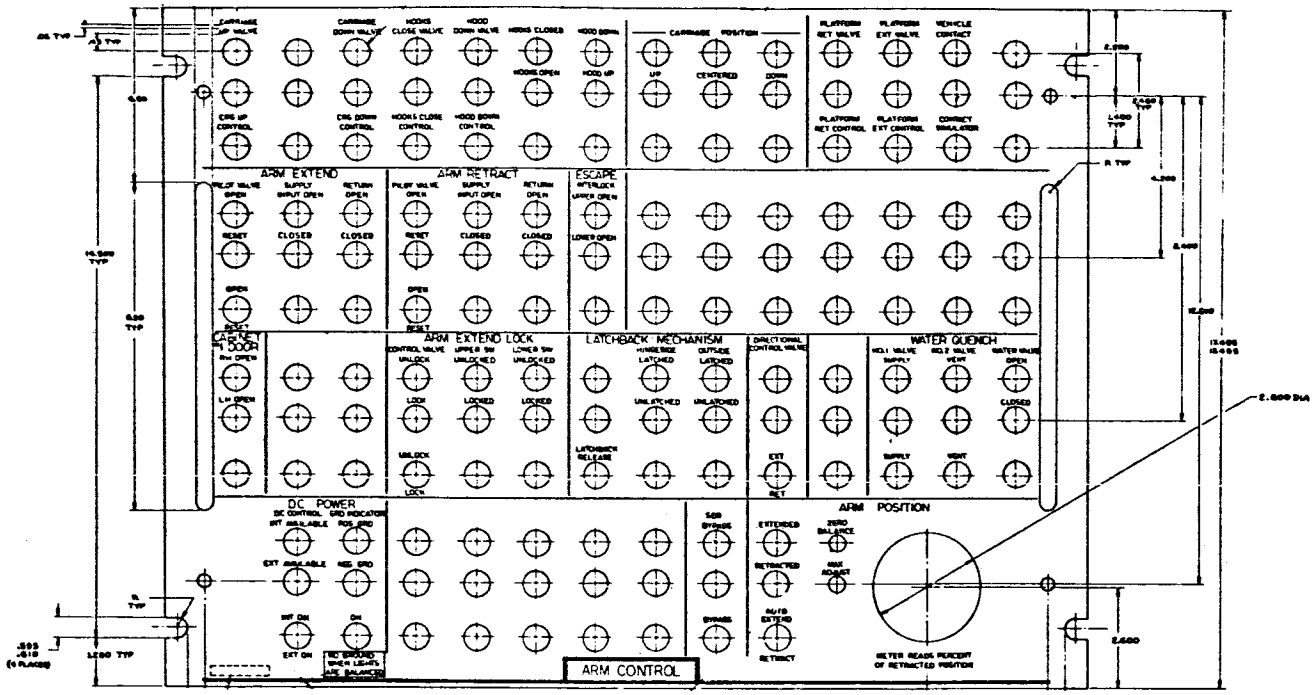


Figure 3-13 C/M Access Arm Overlay for Arm Control Panel, Portable Arm Control Console

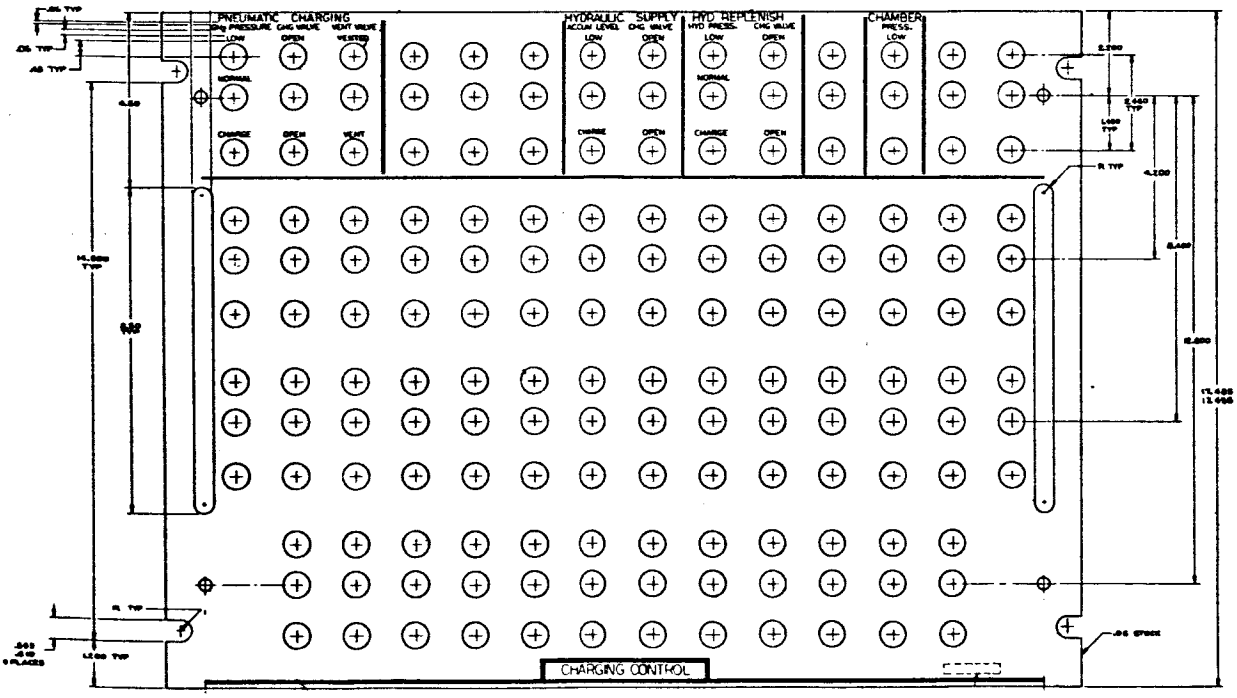


Figure 3-14 C/M Access Arm Overlay for Charging Control Panel, Portable Arm Control Console

3-12. OXYGEN CONDITIONING SUBSYSTEM.

3-13. Purpose of the Subsystem. The Oxygen Conditioning Subsystem provides pressurized gases to the GOX Module, figure 3-15, as follows:

a. Gaseous Oxygen (GOX) is supplied at 125 psi and 45° F, and is tapped for leak-testing the astronauts' suits, for cooling the interior of the Command Module, and for human consumption during pre-launch operations.

b. Gaseous helium and gaseous nitrogen are supplied at 125 psi for leak-testing the Command Module.

These pneumatic services are required only during testing and pre-launch checkout, and the Oxygen Conditioning Subsystem is shut down by tower technicians prior to launch.

3-14. Equipment for the Subsystem. The Oxygen Conditioning Subsystem employs the following equipment:

a. Oxygen Conditioning Console #6326

b. GOX Module #57A55A11

c. Pneumatic lines and electrical cabling between these two assemblies.

3-15. Description of the Subsystem. The Oxygen Conditioning Subsystem is a locally controlled electrical-pneumatic system. It prepares oxygen at the Oxygen Conditioning Console #6326 (figure 3-16) and delivers it under controlled pressure and temperature to the GOX Module (figure 3-17).

The Oxygen Conditioning Console #6326 receives gaseous oxygen from storage bottles on level 300. It heats or cools the GOX as required (see controls, figure 3-16), and delivers it through a water-glycol jacketed line to the GOX Module. Electrical-mechanical components required to condition the oxygen include switches, solenoid valves, pressure switches, a pump, a cooler, and a heater. Switching and logic are provided by a relay distributor on the console. The Oxygen Conditioning Console has two separate banks of GOX controls, either of which can automatically switch to the other in case of malfunction.

Pneumatic valves and gauges are also provided on the console for supplying gaseous nitrogen and helium to the GOX Module.

The GOX Module contains manual valves, pressure gages, and indicating lamps as shown in figure 3-17. The entire Oxygen Conditioning Subsystem can be turned on from this Module.

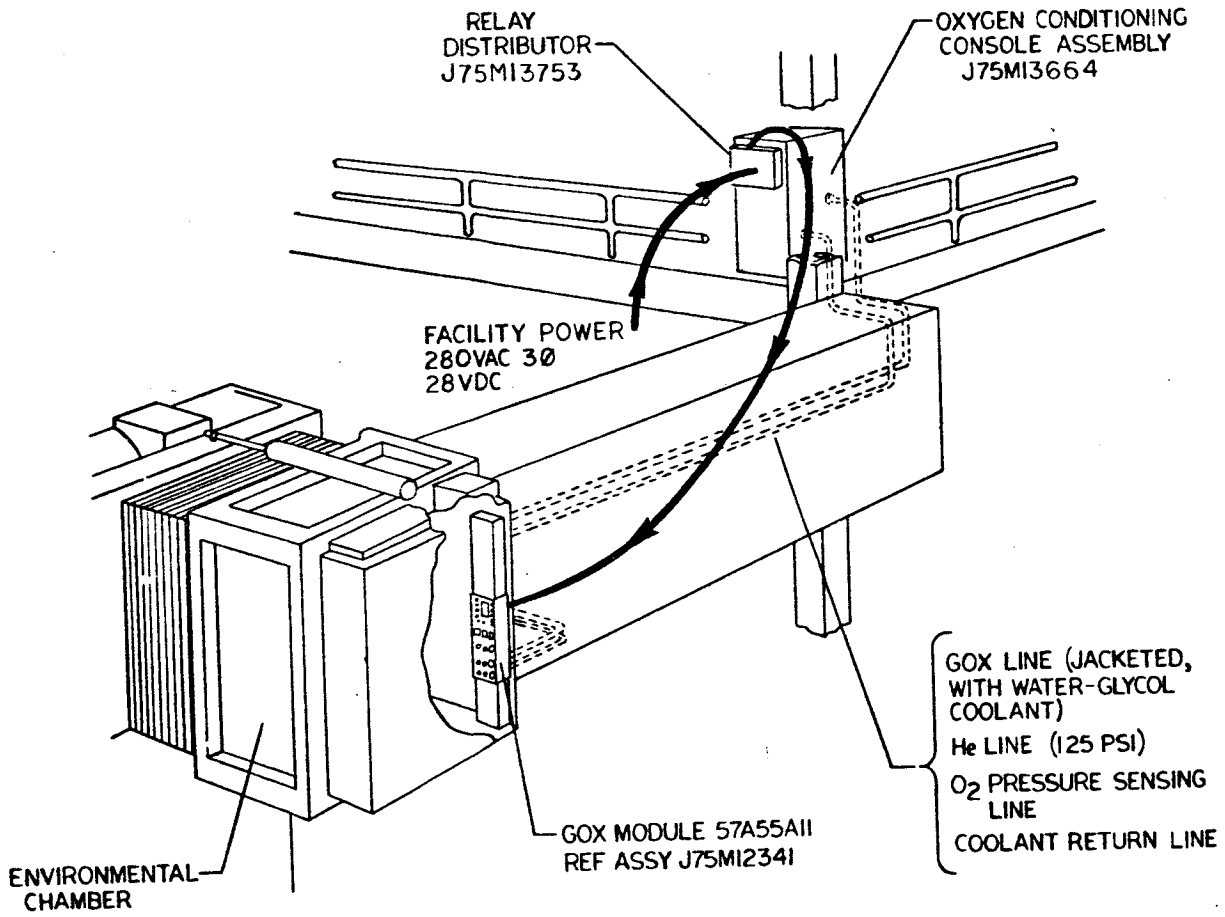


Figure 3-15 Oxygen Conditioning Subsystem

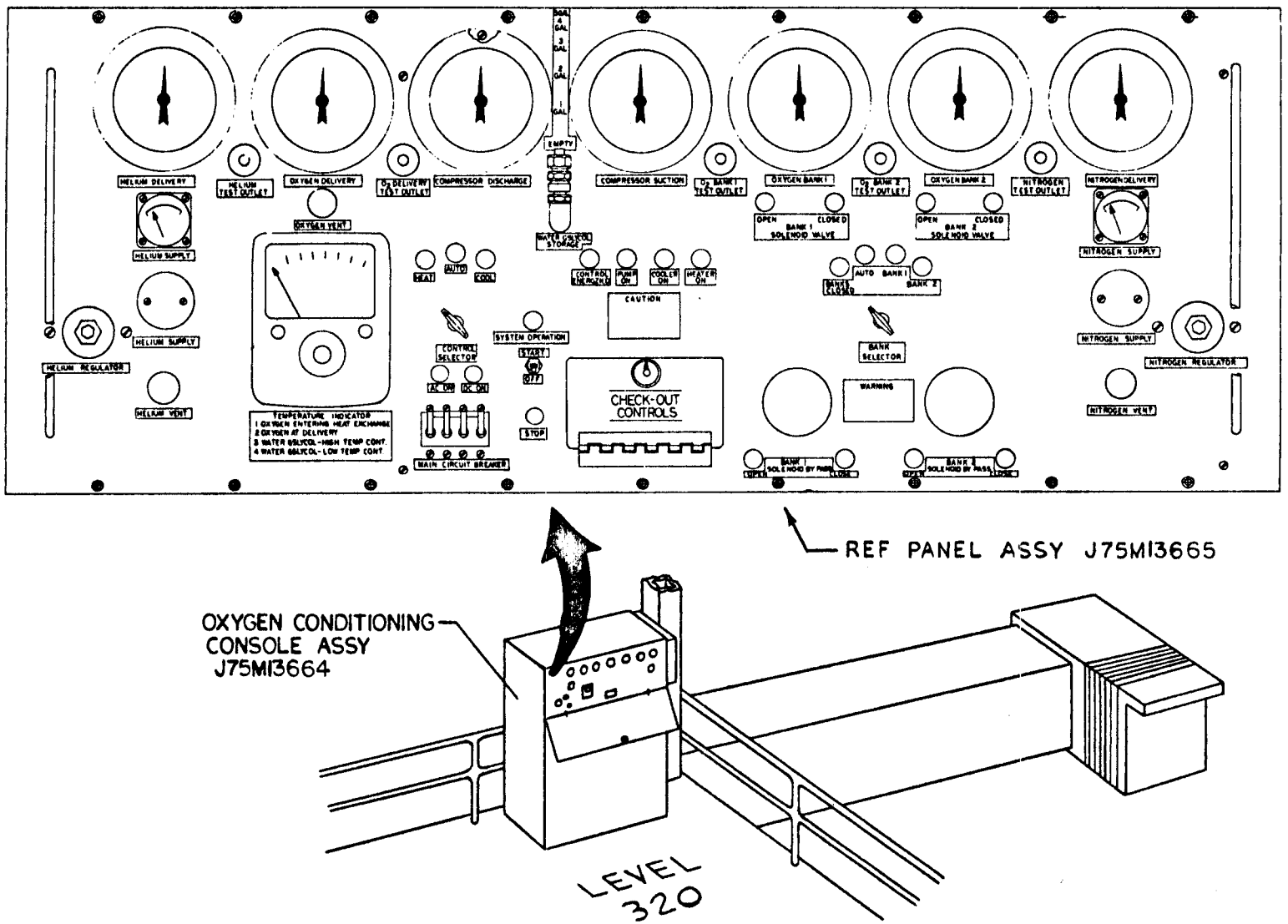


Figure 3-16 Oxygen Conditioning Console J75M13664

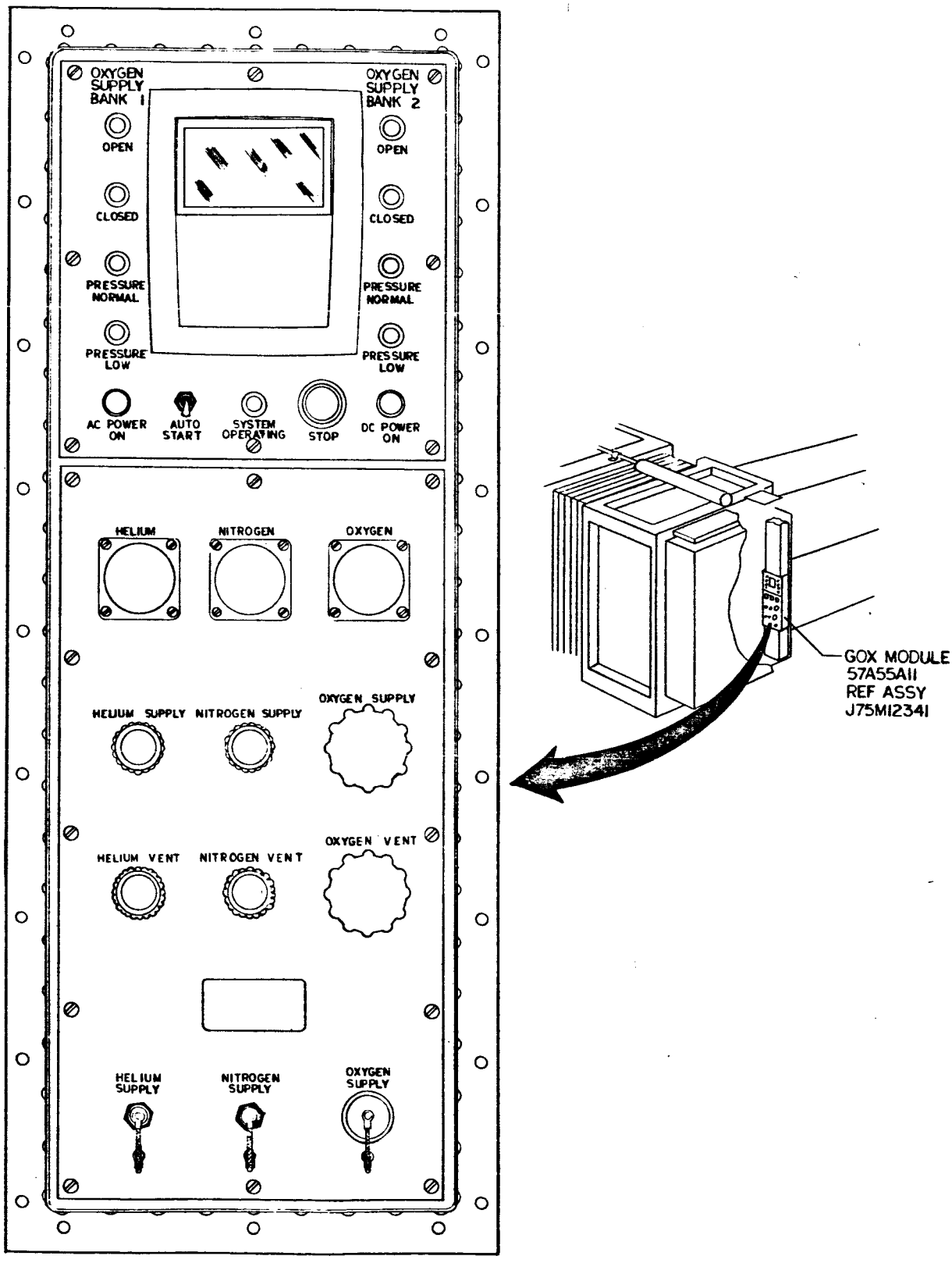


Figure 3-17 GOX Module J75M12341

3-16. HYDRAULIC CHARGING UNIT SUBSYSTEM.

3-17. Purpose of the Hydraulic Charging Unit Subsystem. The hydraulic charging unit furnishes high pressure hydraulic fluid to initially charge and periodically replenish the service and access arm control system hydraulic accumulators. The control system hydraulic accumulators supply the high pressure hydraulic fluid to the service and access arm hydraulic cylinders to allow umbilical carrier withdrawal or extension, and service/access arm retraction or extension. Periodic replenishment of the hydraulic accumulators occurs during in-transit and pre-launch operations to offset hydraulic fluid demands of the hydraulic mechanisms in tracking vehicle motion caused by wind loading, fuel operations, thermal bending or operation of the mobile launcher enroute from the VAB to the launch site.

3-18. Equipment for the Subsystem. The hydraulic charging unit subsystem is composed of the following equipment:

a. Motor - Pump Units, #6426 and #6419.
See figure 3-20.

b. Motor Starter Units, #6424 and #6417.
See figure 3-20.

c. Control Distributors, #6423 and #6416.
See figure 3-20.

d. Local Control Panels, #6425 and #6418.
See figure 3-20.

e. Main Power Switches, #6415 and #6420.
See figure 3-20.

f. Pressure Transducers, #6423A2 and #6416A2.

g. Pressure Switches, #6423A1 and #6416A1.

h. Relay Rack, Room 8A, Mobile Launcher.
See Rack 14, figure 6-2.

i. LCC Control and Monitor Panel, #5419.
See figure 3-19.

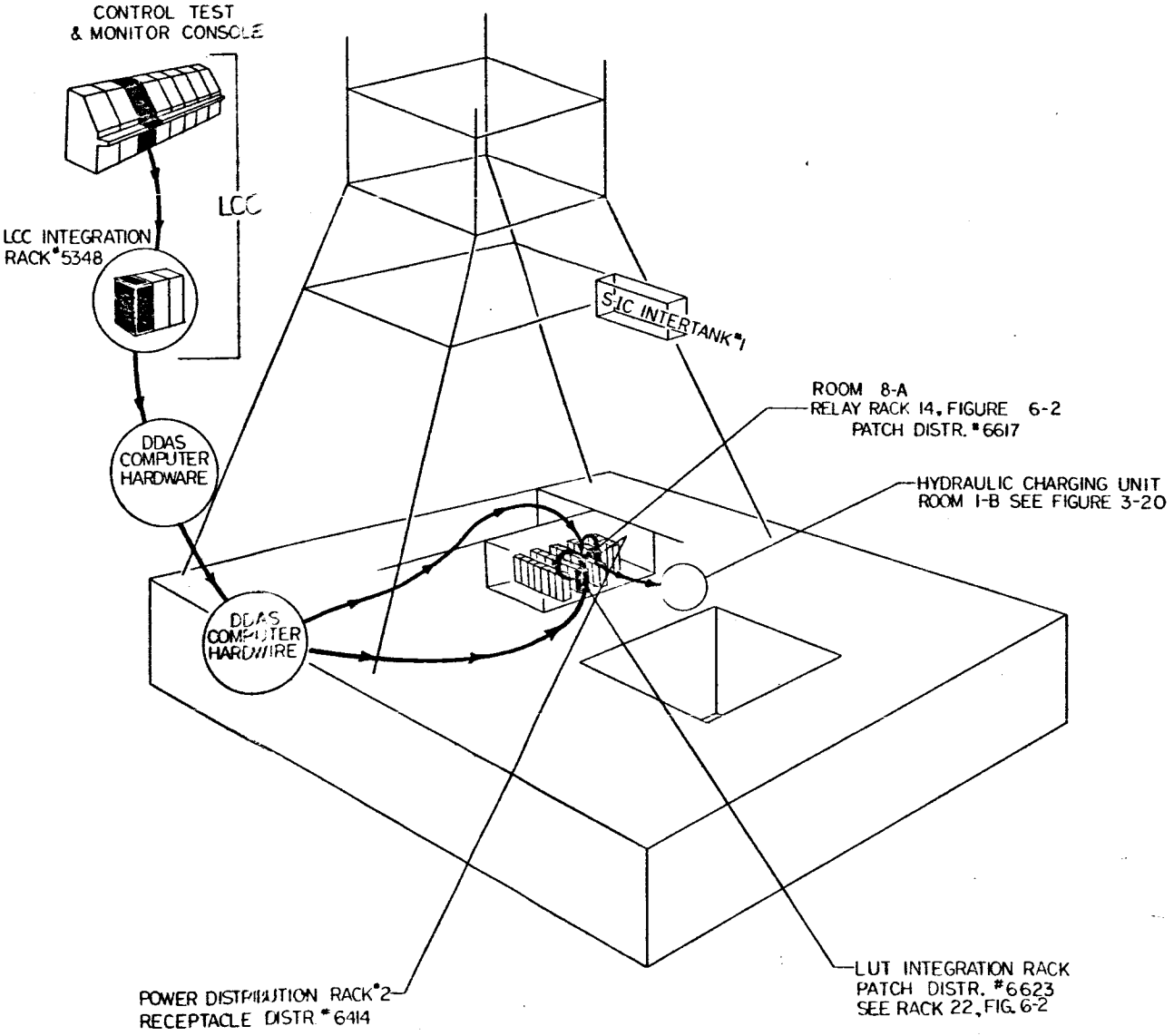


Figure 3-18 Hydraulic Charging Unit Subsystem

3-19. Description of the Subsystem. The hydraulic charging unit consists of a 500-gallon hydraulic fluid reservoir; two identical high pressure, low volume, parallel operated hydraulic pumping units; and separate, identical, electrical control systems.

The control systems for both motor-pump units employ separate motor starters and control distributors which may be controlled locally by two independent control panels (#6425 and #6418) or at the launch site by the LCC control panel (#5419). Both motor-pump units serve the same hydraulic reservoir.

During transit of the Mobile Launcher from the Vehicle Assembly Building (VAB) to the launch site, local control panels are utilized to control motor-pump operation. In order to reduce transients in the Crawler-Transporter power generator, internal circuitry prohibits simultaneous operation of both pumping units during in-transit operations of the Mobile Launcher.

Operation of the hydraulic charging unit at the launch site may be either through the use of the local control panels previously described or through use of the LCC control panel. Normal operation at the launch site employs the LCC panel.

The Control, Test, and Monitor Console housing the LCC control panel is electrically connected to the hydraulic charging unit control distributors by the Computer-Hardwire complex and Relay Distributor #6617. Command functions are electrically connected by both hardwire and the computer; discrete monitor functions are electrically connected only through the computer. See figures 3-18 and 3-20.

The electrical control system of the hydraulic charging unit is designed to sense a loss of electrical power to the motor-pump due to internal or external causes, or a loss of hydraulic fluid pressure to the service/access arm hydraulic accumulators. Either occurrence will automatically place the alternate motor-pump on the line without manual supervision.

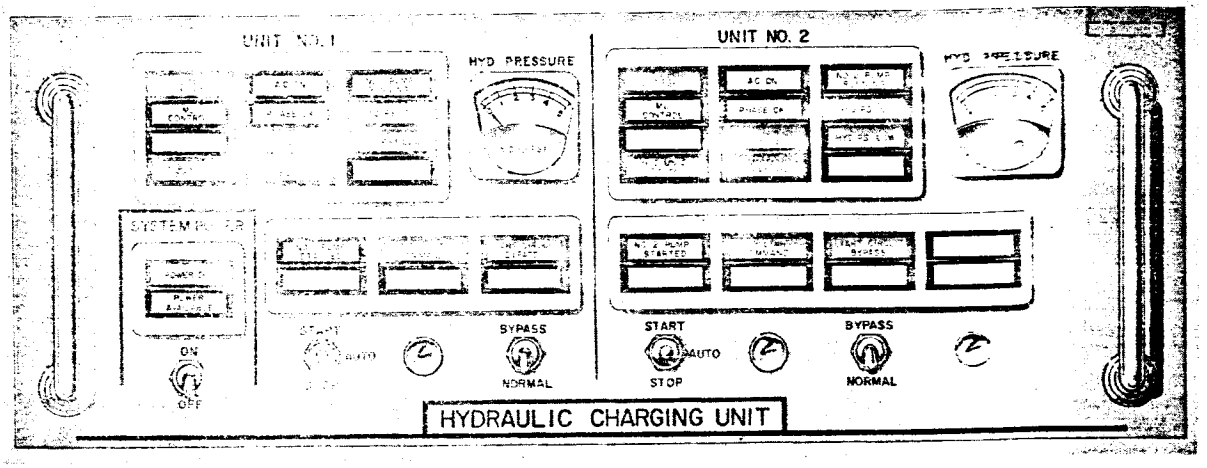


Figure 3-19 LCC Panel, Hydraulic Charging Unit

Hydraulic fluid pressure is indicated on the local and on the LCC control panels. Each panel contains electrical indicator lamps and meter circuits connected to the hydraulic supply line at the output of the main hydraulic pumps. Pressure transducers provide dynamic main-pump output pressures from 0 to 3000 psi, and fixed pressure switches provide discrete pressure indications (normal or abnormal pressure) at time of closure (2750 psi).

Should a hydraulic or electrical malfunction (with the exception of ac power loss) occur during critical launch countdown or mission abort, override capability of the start/control circuitry from the LCC control panel is provided. Use of the override capability will automatically cause a full-voltage start of the affected motor-pump, or, should the motor-pump be in a pump-running condition, continue operation of the affected pump until the override circuit is returned to the "normal" operating state.

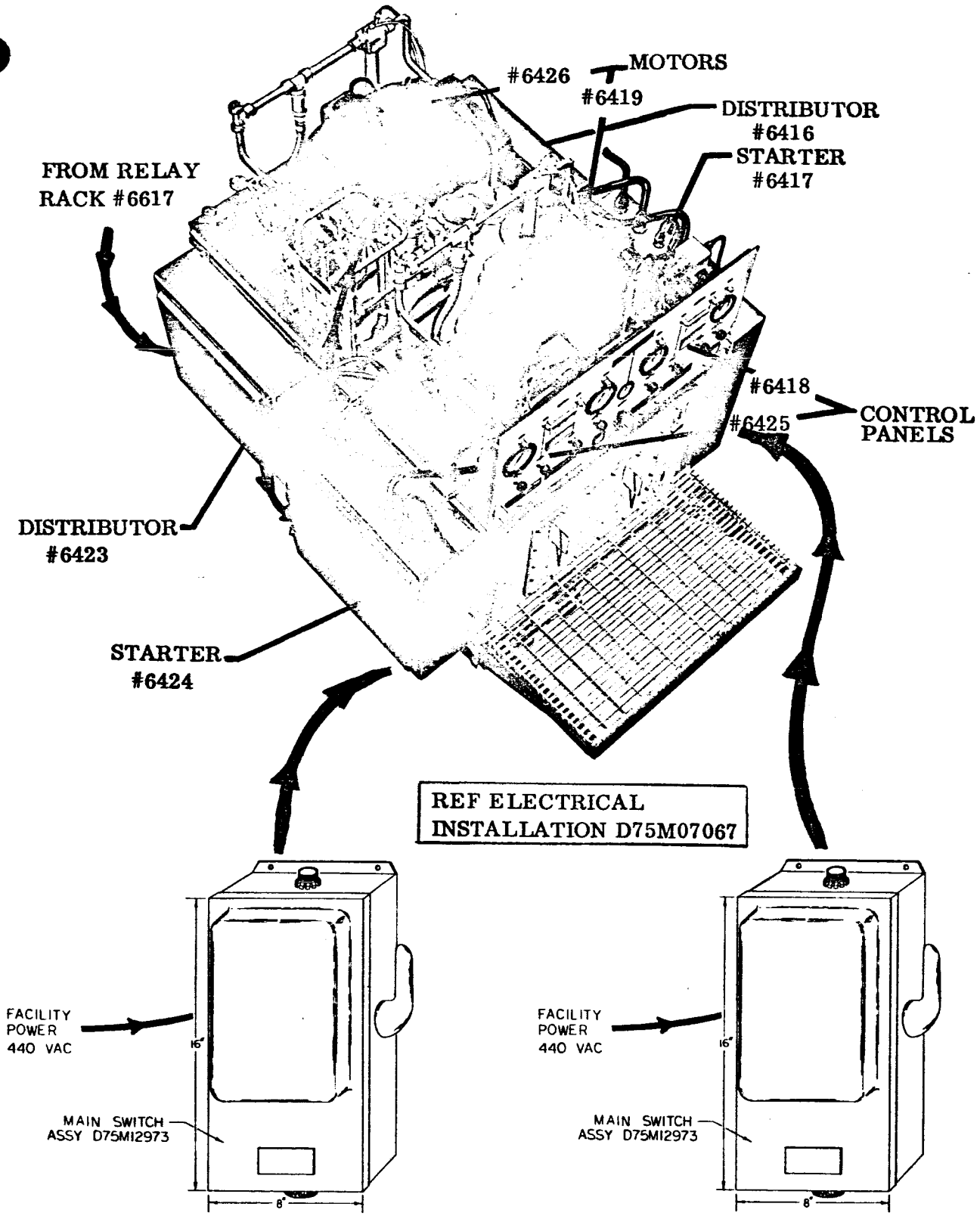


Figure 3-20 Hydraulic Charging Unit and Main Switches

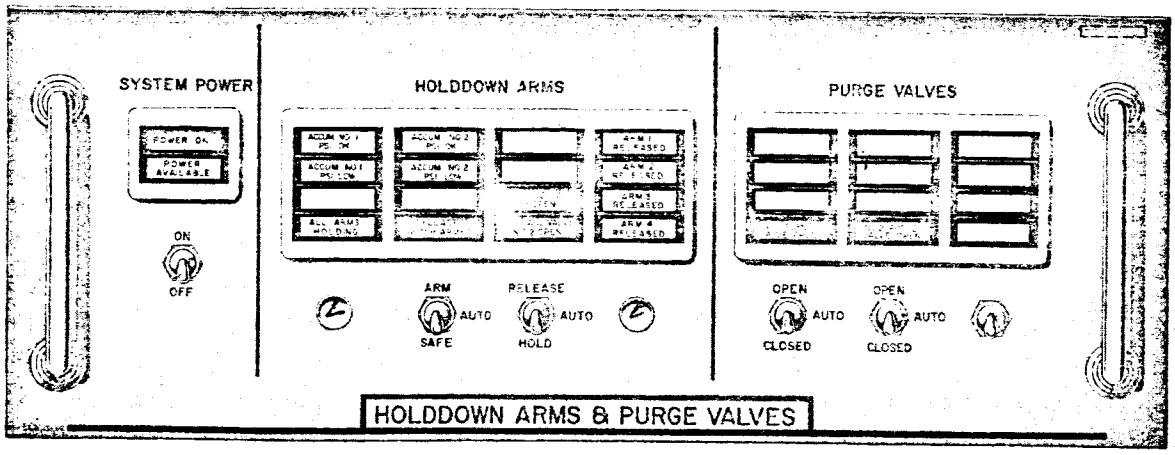
3-20. LAUNCH EQUIPMENT FIRING CIRCUITS SUBSYSTEM.

3-21. Purpose of the Subsystem. The Launch Equipment Firing Circuits Subsystem initiates holddown arm release and inflight service arm retraction.

3-22. Equipment for the Subsystem. The Launch Equipment Firing Circuits Subsystem employs the following equipment:

a. Holddown Arms and Purge Valves - LCC Panel #5424
b. Relay Distributor #6651 (Rack 19, figure 6-2)
c. Terminal Distributor #9082
d. Terminal Distributor #9091
e. Terminal Distributor #9092
f. Control Distributor #6023
g. Control Distributor #6024
h. Holddown arms 1, 2, 3 and 4
i. Relay Distributor #6615 (Rack 12, figure 6-2)
j. Firing Battery #6631
k. Firing Battery #6632
l. Arming Panel #6661 (Rack 24, Figure 6-2)
m. Arming Panel #6662 (Rack 24, figure 6-2)
n. Liftoff switches (Holddown arms 2 & 4)
o. Tower MI Firing Distributor #9083
p. Service Arm Firing Distributors #9054, #9055, #9056, #9057, #9059

3-23. Description of the Holddown Arms Firing Circuit. The holddown arms firing circuit provides control, testing, and monitoring of the vehicle holddown arms. These functions are controlled from the LCC Firing Accessories Monitor and Test Panel, figure 3-21, or from the terminal countdown sequencer, and at launch, a signal is routed from the terminal countdown sequencer through relay distributor #6651 and then through electrical control distributor #6023 to two parallel solenoid-operated pneumatic valves. The operation of either of these valves allows high pressure GN_2 to release the holddown arms.



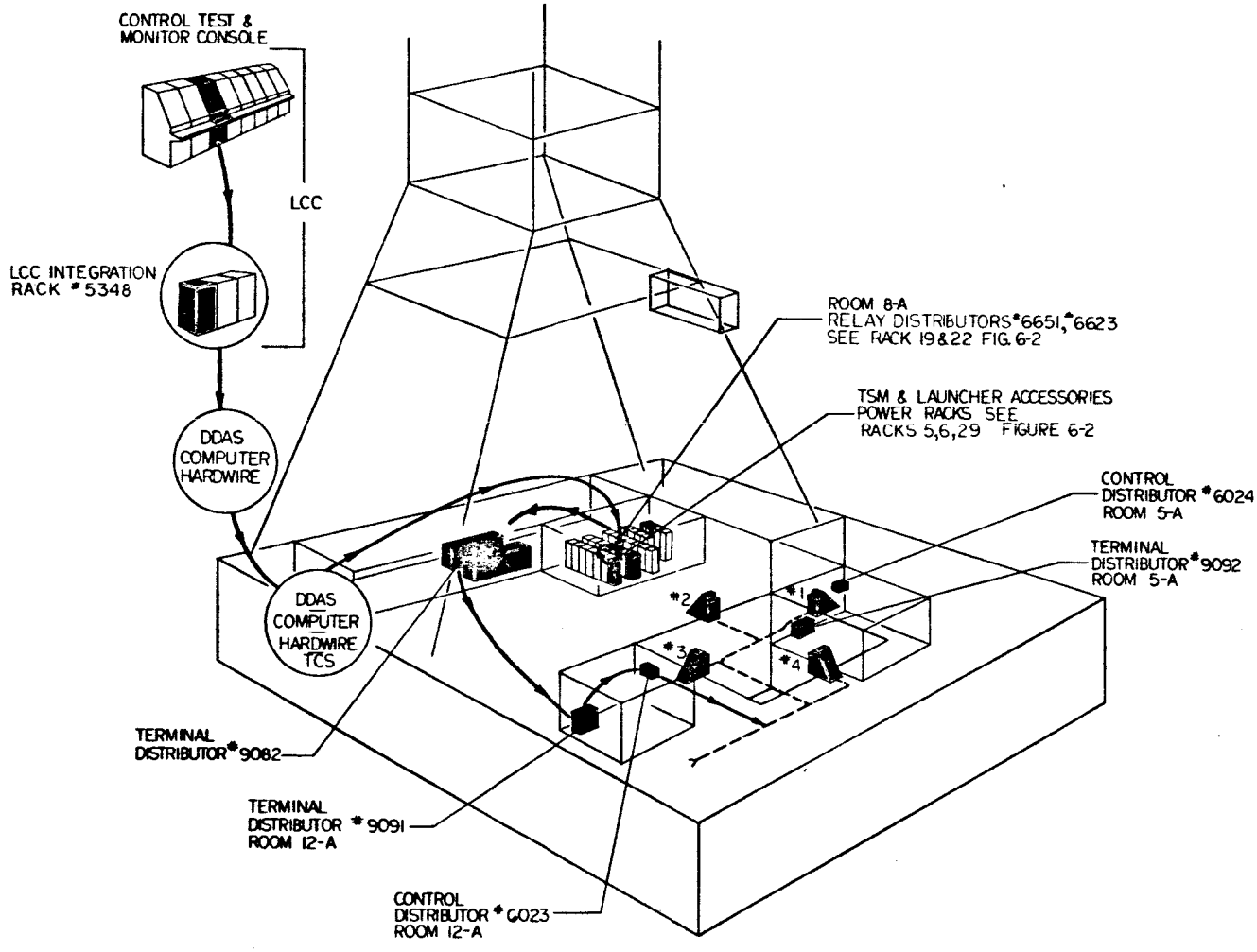


Figure 3-21 Holddown Arms Firing and Monitoring Circuits

When the holddown arms are fully retracted, limit switches return monitor signals to the LCC panel. The limit switches for holddown arms 1 and 4 are connected through distributors #6024 and #9092, and those for arms 2 and 3 are connected to distributors #6023 and #9091. The monitor signals flow back to the LCC through the DDAS-Computer-Hardwire Complex.

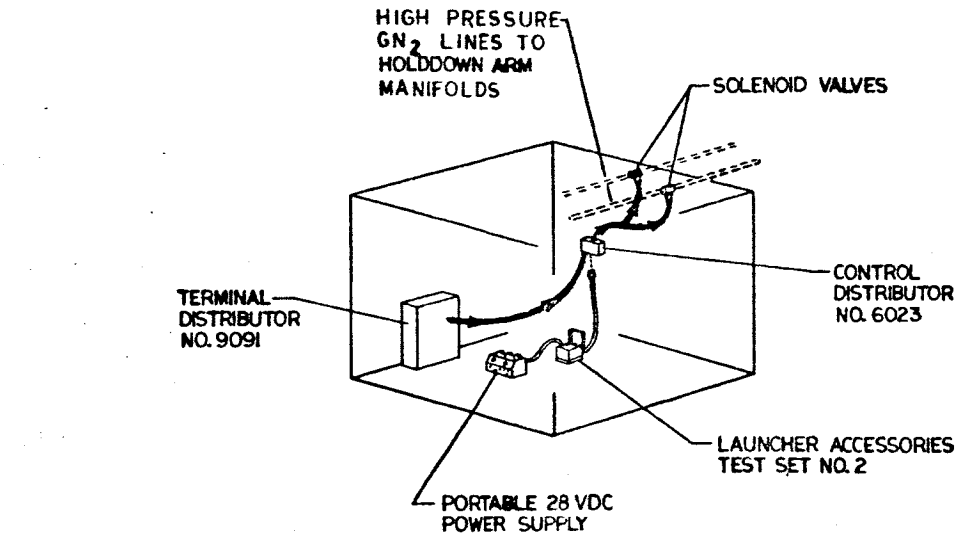
While in the manual mode, the LCC can also provide various test commands as shown in figure 3-21.

3-24. Local Test, Holddown Arms Firing Circuit. The holddown arms can be exercised by use of Launcher Accessories Test Set No. 2, figure 3-22. It is connected to Control Distributor #6023 in place of the power and system cables.

3-25. Description of the Service Arms Firing Circuit. The Service Arms Firing Circuit provides 28 volts dc and automatic sequencing for initiation of umbilical carrier kickoff, umbilical carrier withdrawal, and service arm retraction for the five inflight service arms. The circuit is illustrated in figures 3-23 and 3-24, and is described in the following paragraphs.

The Service Arm Firing Circuit is first armed by the terminal countdown sequencer, which sends a command to relays in Relay Distributor #6615. These relays arm the firing circuit by closing contactors in Arming Panels #6661 and #6662, figure 3-54. Contactor closure applies 28 volts dc from firing batteries #6631 and #6632 to the service arm control switches located in Holddown Arms 2 and 4, figure 3-24. This action provides 28 volts dc to two identical and redundant service arm control switch circuits.

When the vehicle begins rising, the holddown arm Primary Service Arm Control Switch closes, allowing 28 volts dc from the battery supply to be applied through the service arm control switches to the primary buses in the MI Firing Distributor #9083. Energizing these buses applies power to the primary buses in each of the five Service Arm MI Firing Distributors (paragraph 3-27) on the tower. Protected latching relays are also energized through the service arm control switches, allowing a parallel path around the switches to insure a maintained circuit during peak heat and vibration conditions.



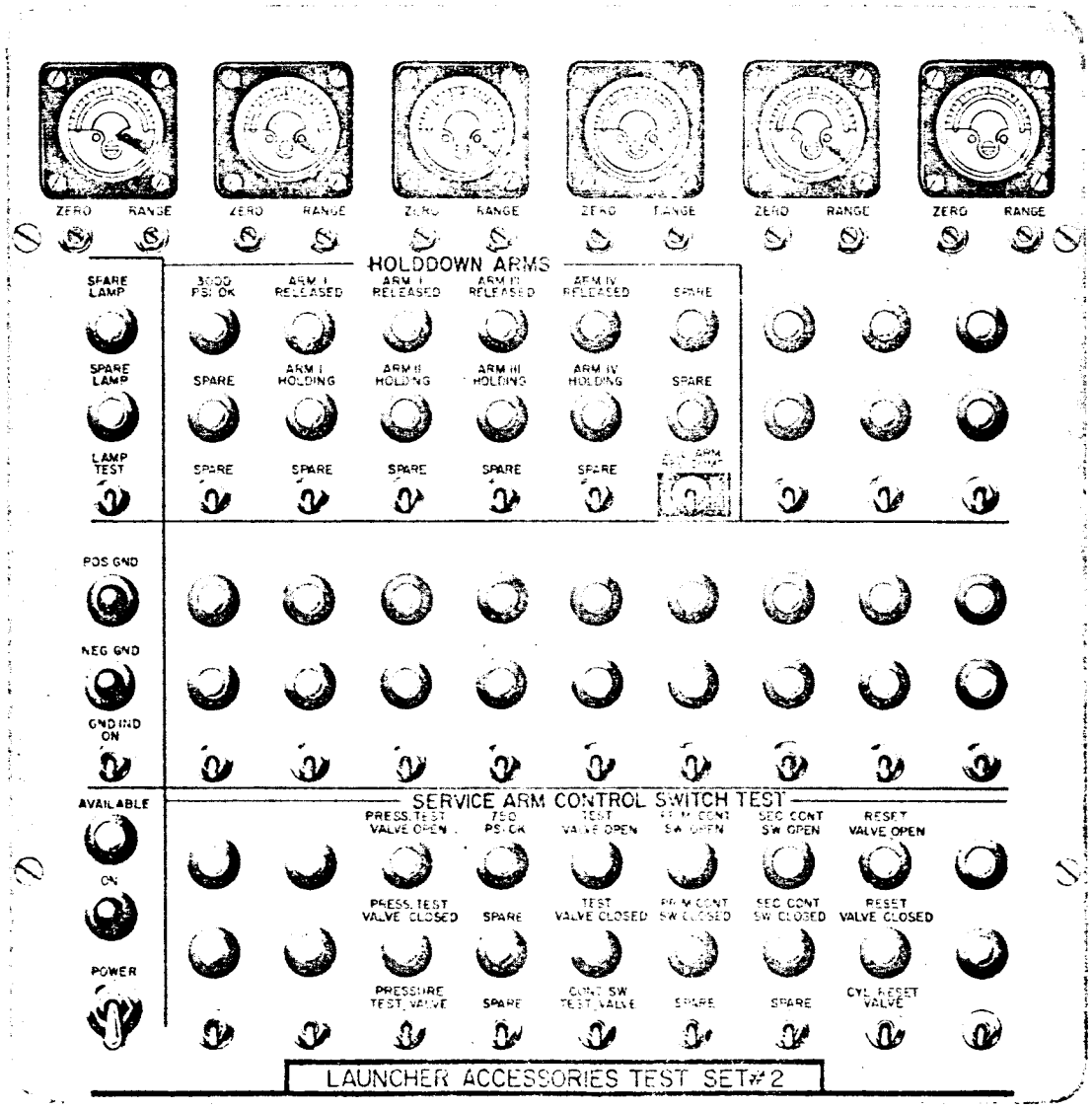


Figure 3-22 Launcher Accessories Test Set No. 2

Each MI Firing Distributor Bus supplies a signal which initiates umbilical carrier kickoff for the inflight arms. As the umbilical carrier separates, a release switch simultaneously initiates carrier withdrawal and arm retraction. Voltage for this last function is also supplied through the Service Arm MI Firing Distributor.

If the entire primary firing circuit functions properly, then carrier kickoff, carrier withdrawal, and arm retractions all occur before the secondary firing circuit is closed. Note, however, that the secondary firing circuit will be activated even if it is not needed.

The Secondary Service Arm Control Switch closes when the vehicle rises to 18 inches, providing excitation of a secondary firing circuit. This secondary circuit initiates carrier withdrawal and arm retraction directly, since carrier kickoff has already been effected mechanically. In all, two primary and two secondary circuits provide four possible actuations of the umbilical carrier and service arm at launch.

Functions relating to the five inflight arms not discussed here are functions of the Service Arm Subsystem, paragraph 3-2.

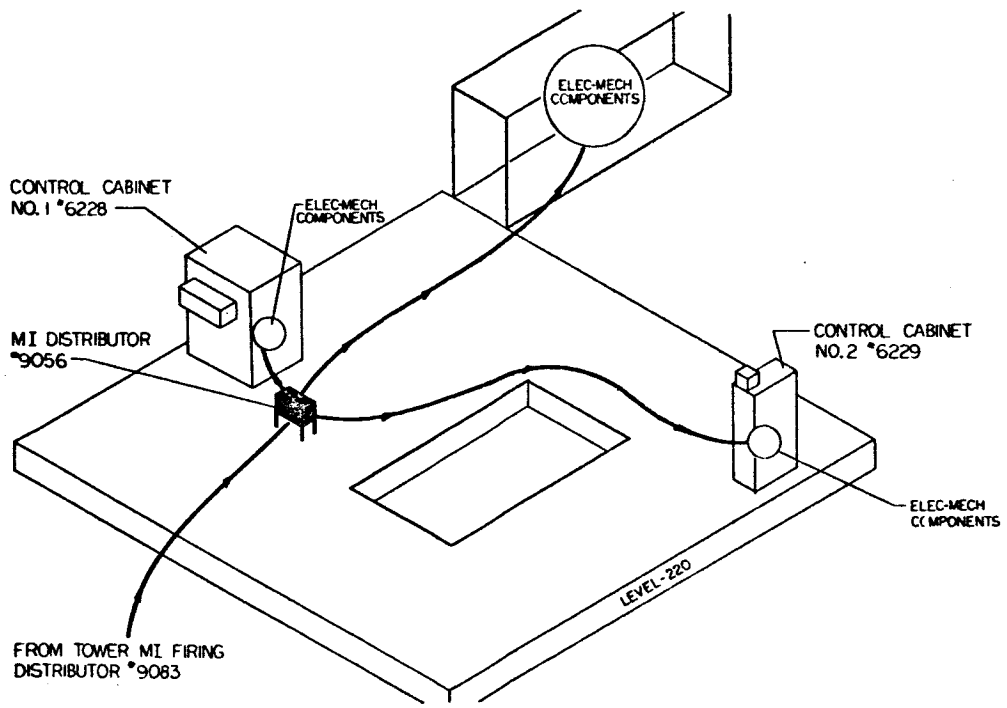


Figure 3-23 Typical Level, Service Arms Firing Circuit

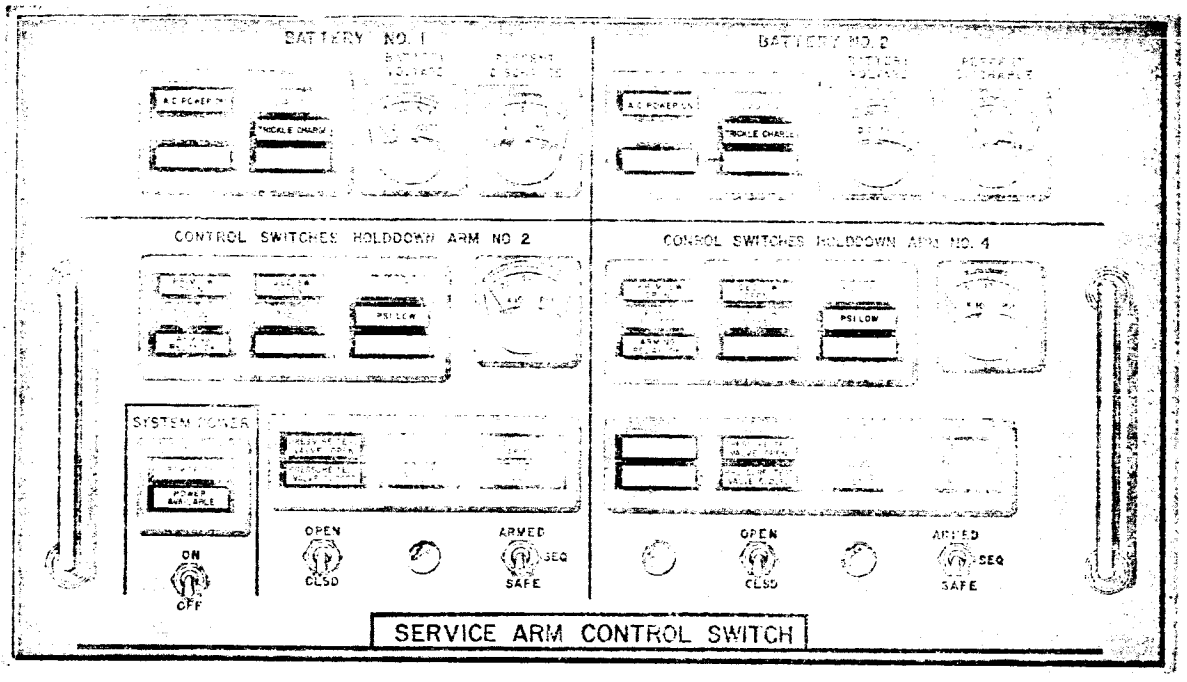


Figure 3-24A LCC Panel, Service Arms Firing Circuit

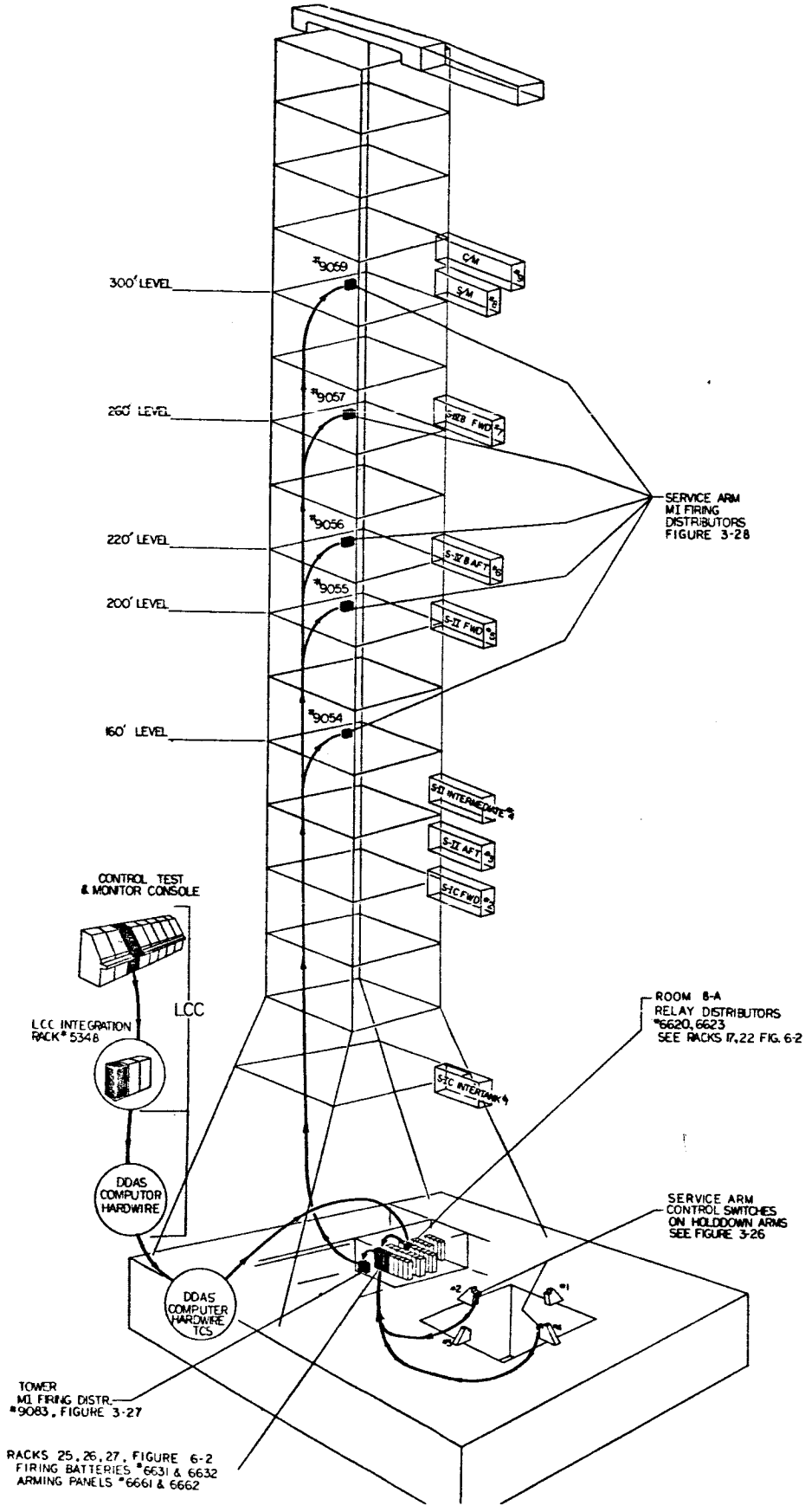


Figure 3-24B Service Arms Firing Circuit

3-26. Local Test of the Service Arm Firing Circuit. Within the service arm firing circuit, the only local test is that of the service arm control switches, figure 3-25. A pneumatic test mechanism is provided in the service arm control switch assembly which physically closes the switch for test. Pressure for the mechanism is supplied through a Pneumatic Box Assembly (figure 3-26), which is controlled through a standard eighteen-connector electrical distributor.

Test functions are applied to this distributor by the Launcher Pneumatics Test Set No. 2, a programming of the Universal Patchboard Test Set. This test set actuates the liftoff switch test mechanism and monitors pneumatic pressures and switch positions. Its test functions are outlined in figure 3-22.

3-27. MI Distributors and Cabling. The service arms firing circuit carries the umbilical release command through Tower MI Firing Distributor #9083 to the five service arm MI Firing Distributors. These are facility enclosures with distribution modules provided by the Launch Equipment Branch. The modules are shown in figures 3-27 and 3-28.

Owing to the critical nature of the service arm firing circuit, the firing distributors are interconnected by Mineral Insulated (MI) Cable. This is a copper-encased cable carrying one to seven conductors within compacted magnesium oxide insulation. It is highly resistant to heat, mechanical disturbances and RF radiation. Special bulkhead fittings are available for sealing its conductors against moisture and atmosphere.

Figure 3-29 shows a typical MI cable installation for the service arm firing circuit. MI cable also carries power to certain lighting J boxes and emergency J boxes aboard the service arms.

A typical termination of MI cable is shown in figure 3-30 and is described fully in procedure drawing A75M07450.

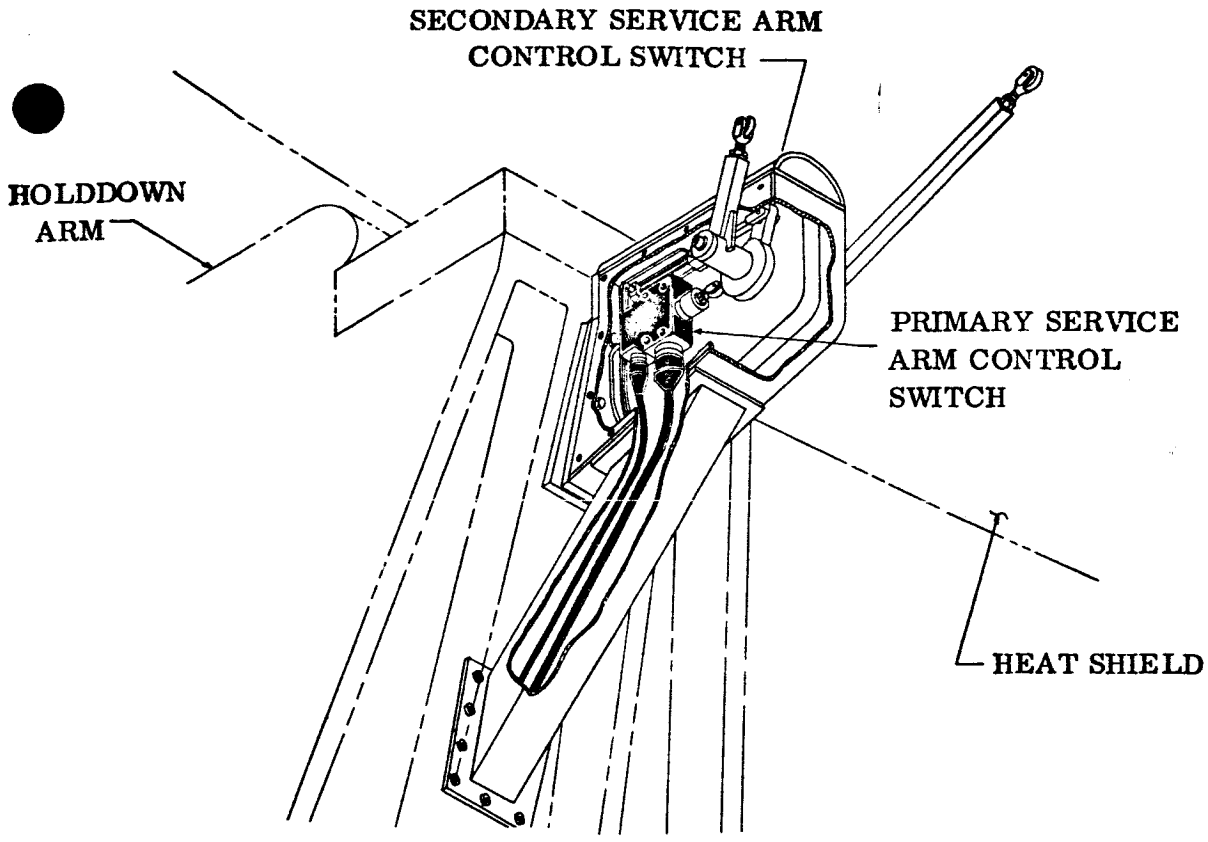


Figure 3-25 Typical Service Arm Control Switches

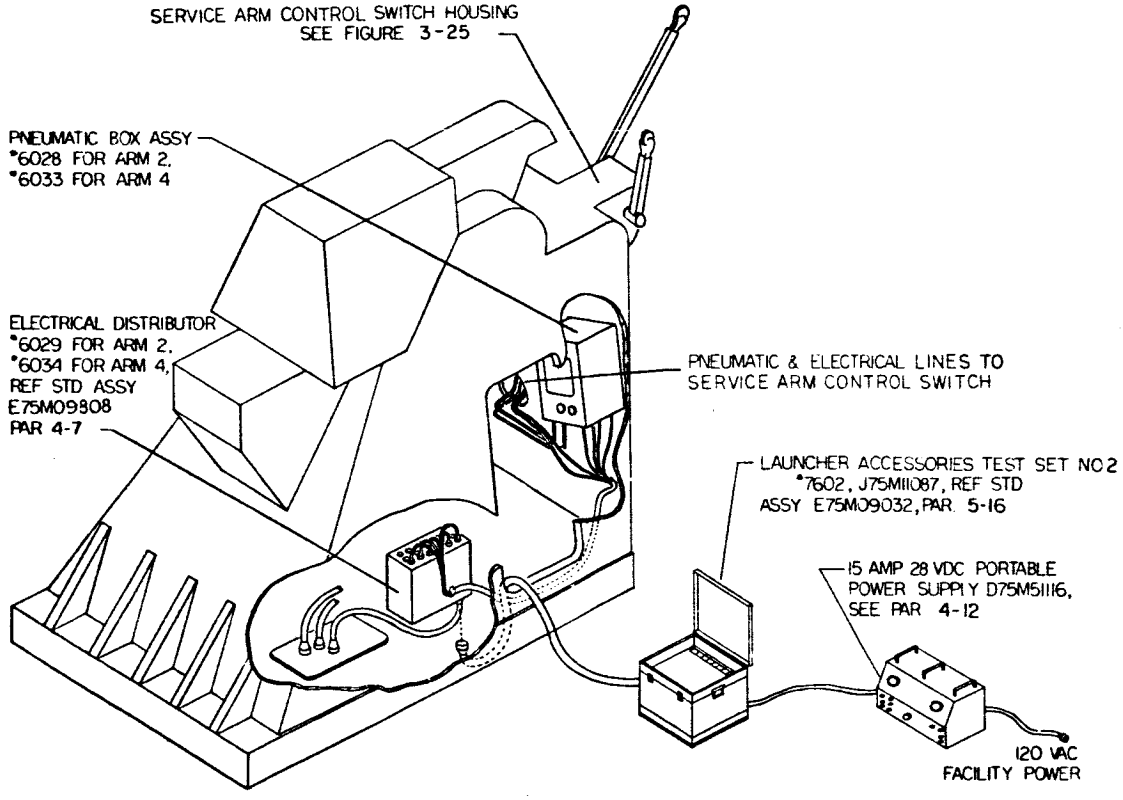


Figure 3-26 Typical Holddown Arm and Test Installation

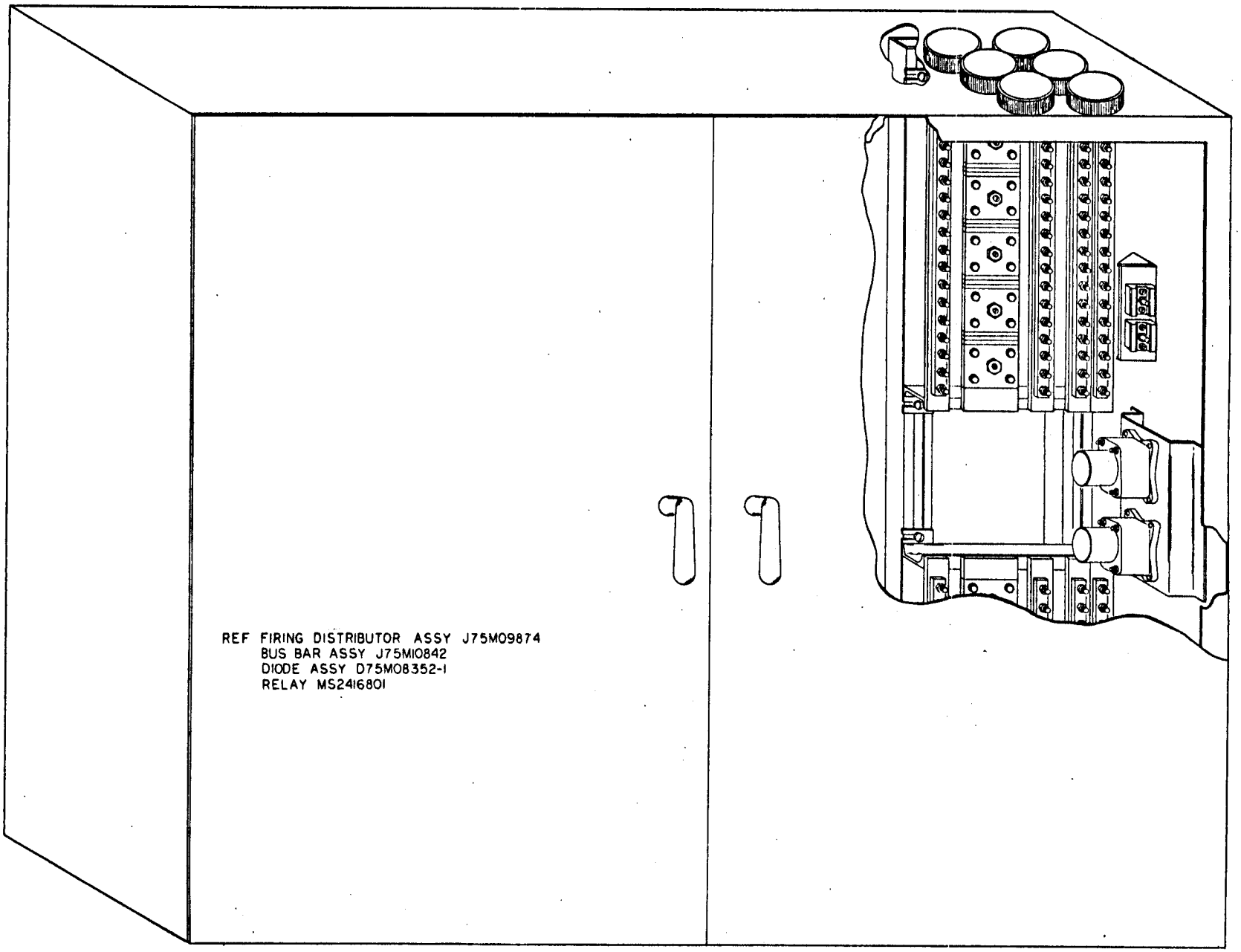


Figure 3-27 Tower MI Firing Distributor #9083

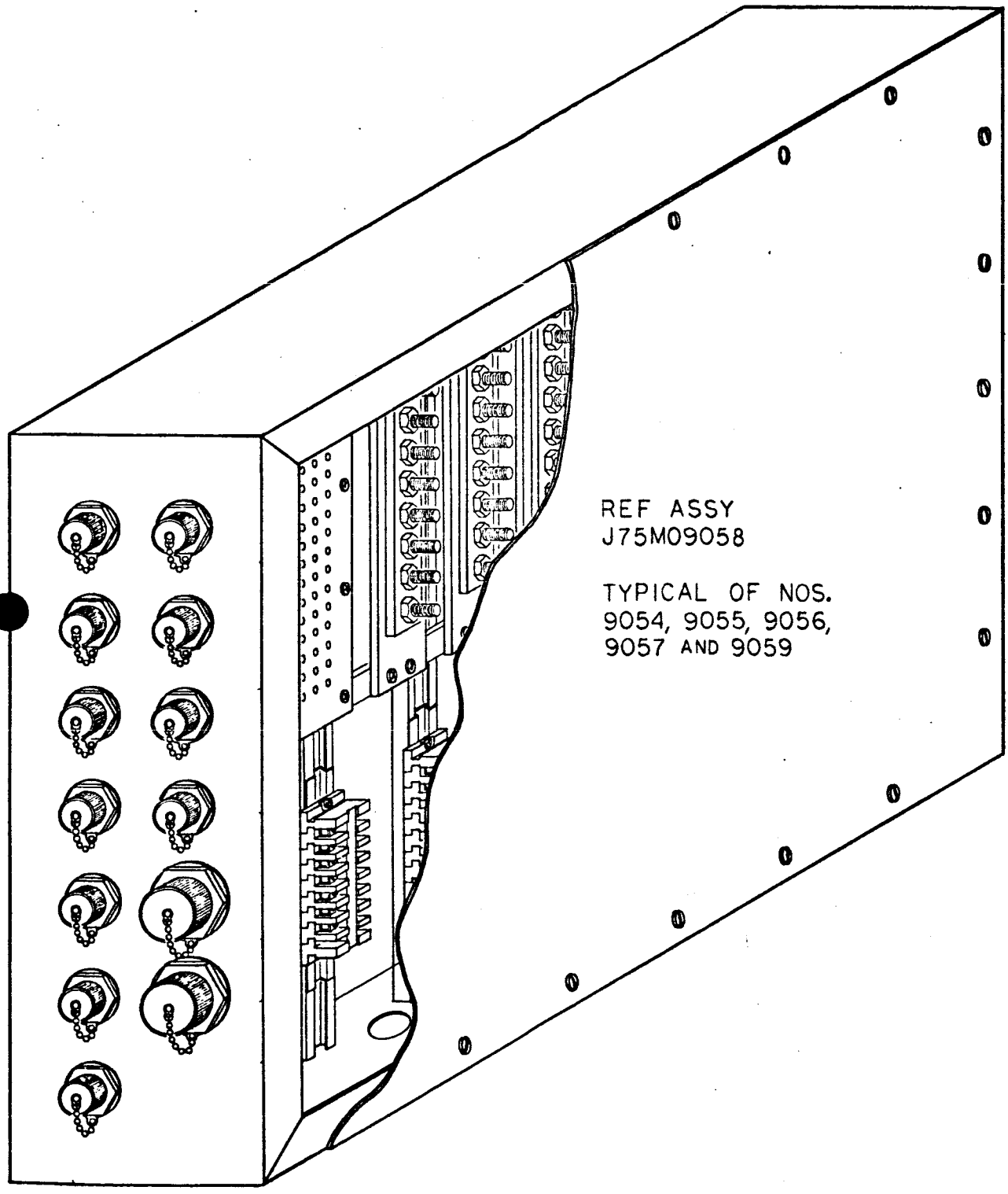


Figure 3-28 **Service Arm MI Firing Distributor (Typical)**

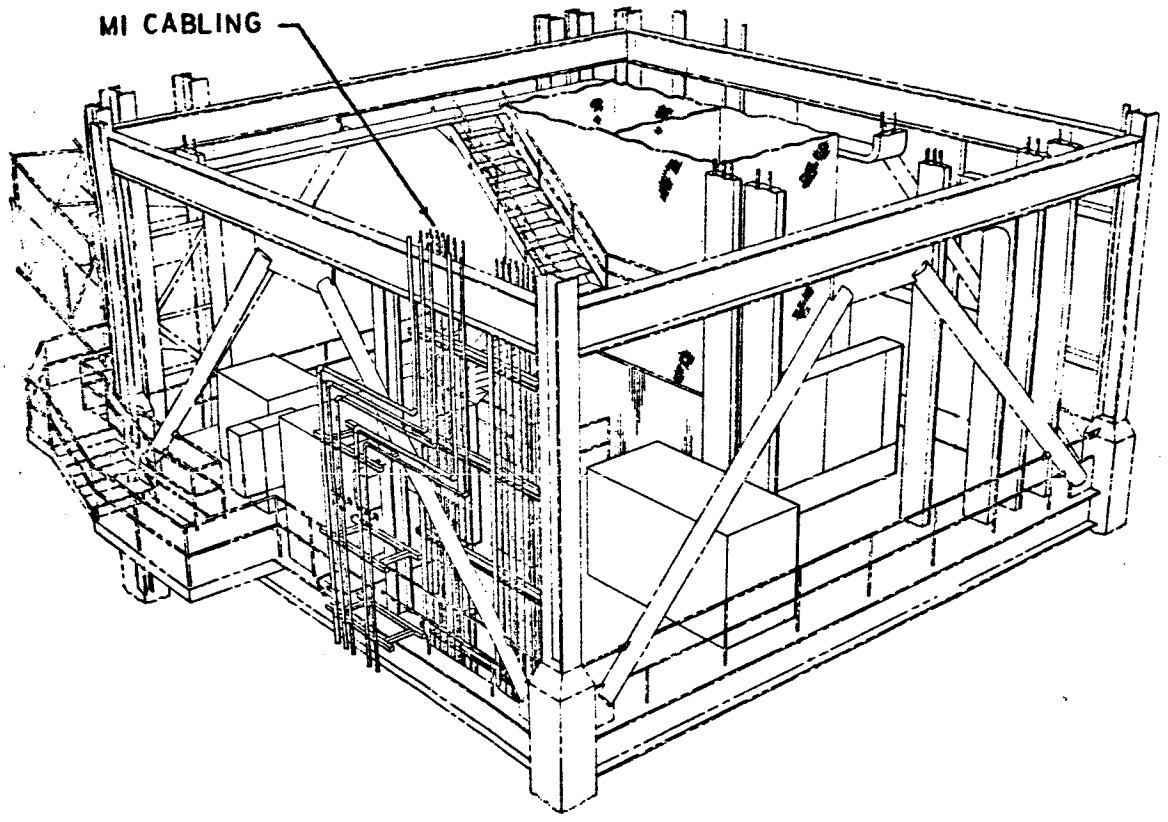


Figure 3-29 MI Cabling, Typical Mobile Launcher Level

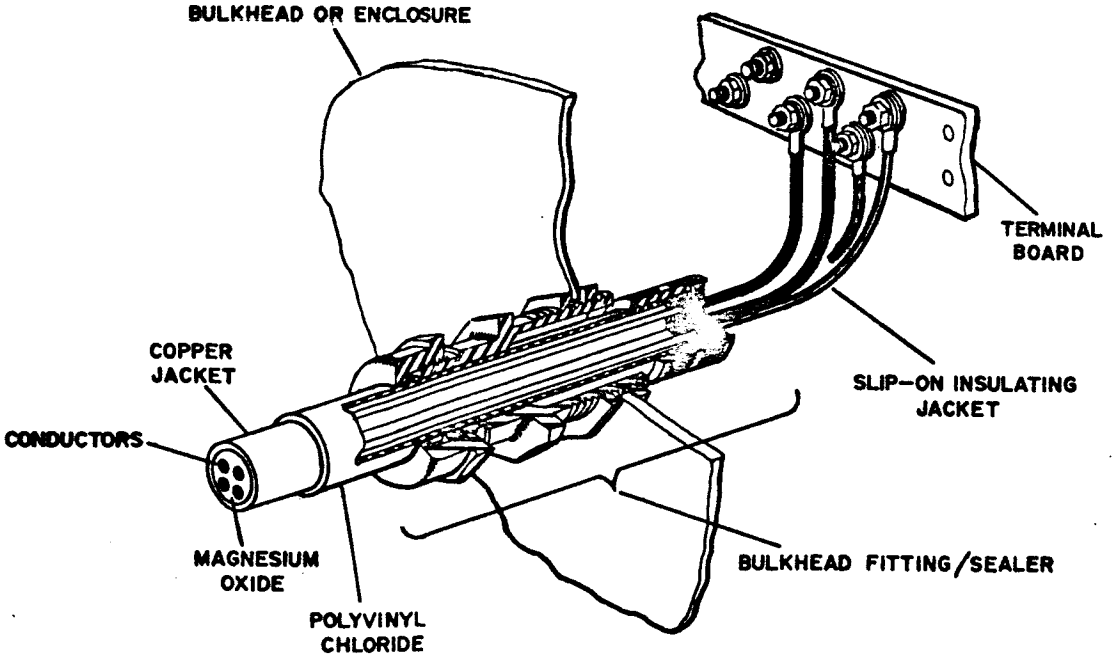


Figure 3-30 MI Cable, Typical Installation

3-28. TAIL SERVICE MASTS SUBSYSTEM.

3-29. Purpose of the Subsystem. This electrical subsystem provides system control, test, and monitor for tail service mast operation. The Tail Service Masts provide support for fuel, electrical and air conditioning lines which must enter the aft section of the S-IC vehicle.

3-30. Equipment for the Subsystem. The Tail Service Masts Subsystem uses the following equipment:

a. TSM 1-2 #6006, 3-2 #6007, and 3-4 #6005, Level 0
b. TSM Control Distributor #6009, TSM 1-2
c. TSM Control Distributor #6010, TSM 3-2
d. TSM Control Distributor #6008, TSM 3-4
e. Control Test and Monitor Consoles, LCC (TSM 1-2 #5420, TSM 3-2 #5421, TSM 3-4 #5422)
f. TSM Portable Test Set #7601, Level 0
g. Relay Racks, room 8-A. See Racks 18 and 19, figure 6-2
h. Power Distribution Rack #6422, room 8-A. See Rack 29, figure 6-2
i. Power Supply Rack #6421, room 8-A. See Rack 6, figure 6-2
j. Standby Battery Rack #6408, room 8-A. See Rack 5, figure 6-2
k. Terminal Distributor #9091, room 13-A
l. Terminal Distributor #9092, room 5-A
m. Terminal Distributor #9082, room 7-A
n. Portable DC Power Supply, Level 0

3-31. Description of the Subsystem. The Tail Service Masts (TSM) are operated by pneumatically pressurized hydraulic fluid and are electrically controlled. Each mast has 31 electrical and electro-mechanical components and an electrical control distributor located within its structure. Component control and monitoring signals are transferred into 60-conductor cables via these control distributors and routed through an interface plate and facility distributors to two Launcher Accessory Relay Distributors (6650 and 6651) located in Room 8-A of the Mobile Launcher.

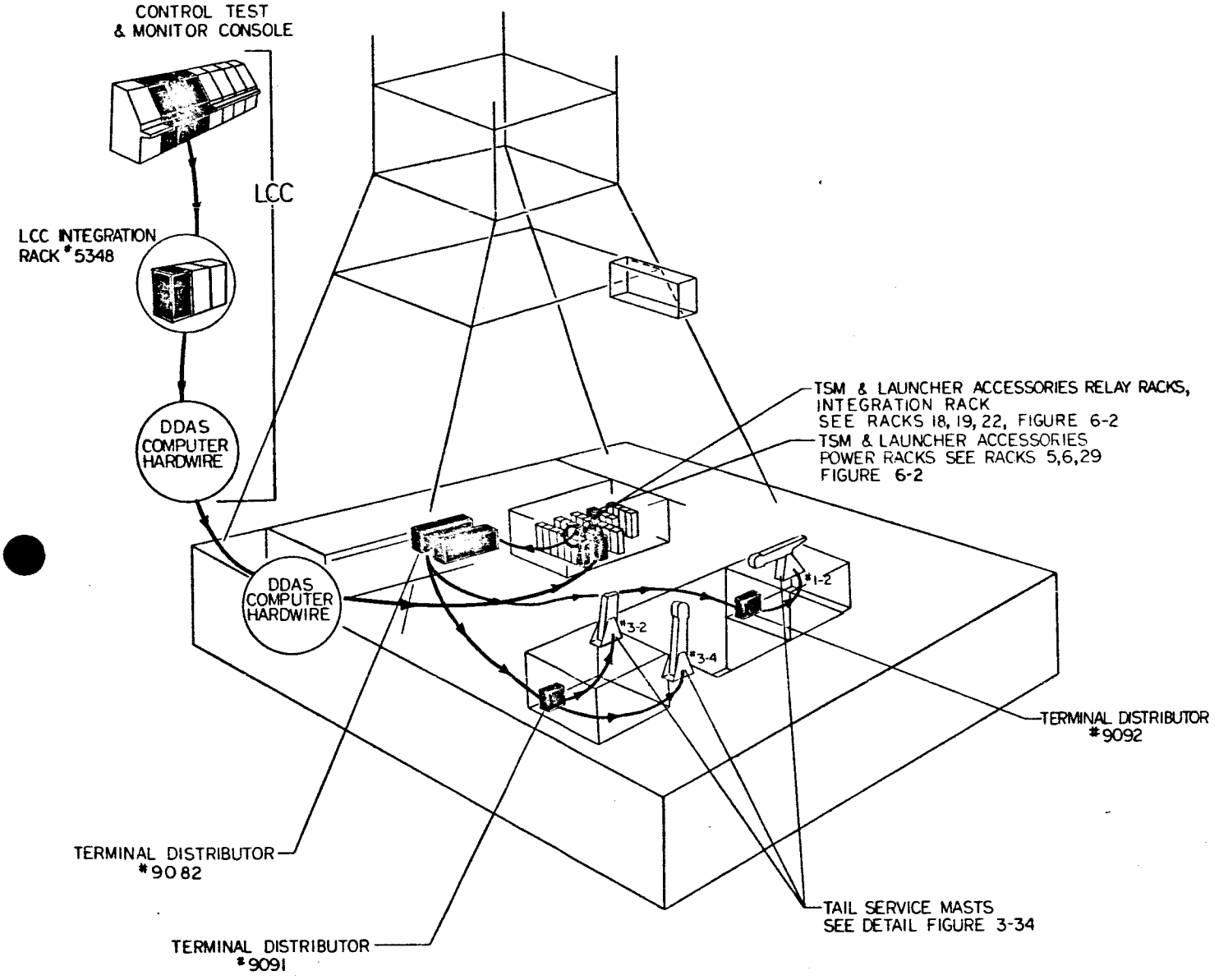


Figure 3-31 Tail Service Masts Subsystem

Relay closures in the relay distributors provide control logic and permit the transfer of 28 volts dc via the terminal and control distributors to limit and pressure switches and solenoid-operated valves within each TSM. Transducer excitation voltage (50 vdc) is transferred from the MSFC-Astrionics integration distributor through the relay distributor and the terminal and control distributors to the transducers. See figure 3-31.

The three control panels provide visual displays of all critical parameters for the TSM subsystem. These panels also provide controls for pneumatic and hydraulic charging and mast retract tests. The masts can be extended locally only by a control on the side of each mast or by a test set (a typical panel is illustrated in figure 3-32). Test and control functions may be programmed into the LCC Mobile Launcher computer, but all signals so programmed can be manually overridden from the control panel.

3-32. Local Testing of the Tail Service Masts. For local control and testing, a portable TSM Test Set (see figure 3-34) is employed. This is a special programming of the Universal Patchboard Test Set. The face panel of this test set is illustrated in figure 3-33. Two cables from the TSM Test Set replace cables from the base of the TSM Control Distributor. Power is supplied to the test set by a portable 28 volt dc supply, paragraph 4-12. By use of the test set, the masts may be individually retracted or extended and each electrical component within the masts may be controlled and monitored.

	LCC Control Pnl Dwg
Tail Service Mast 1-2	E75M09638
Tail Service Mast 3-2	E75M09639
Tail Service Mast 3-4	E75M09637

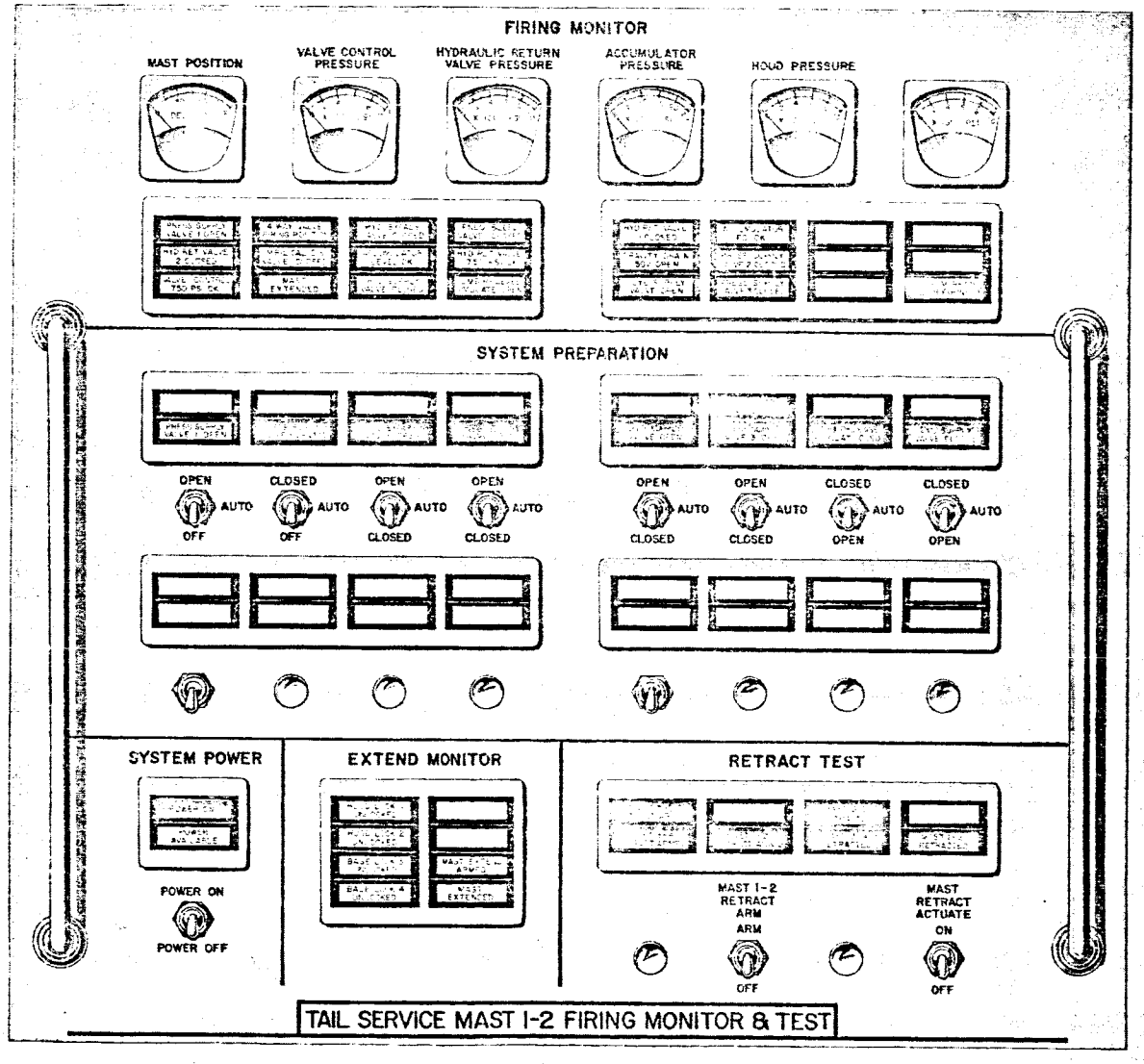


Figure 3-32 LCC Control Panel, Tail Service Mast

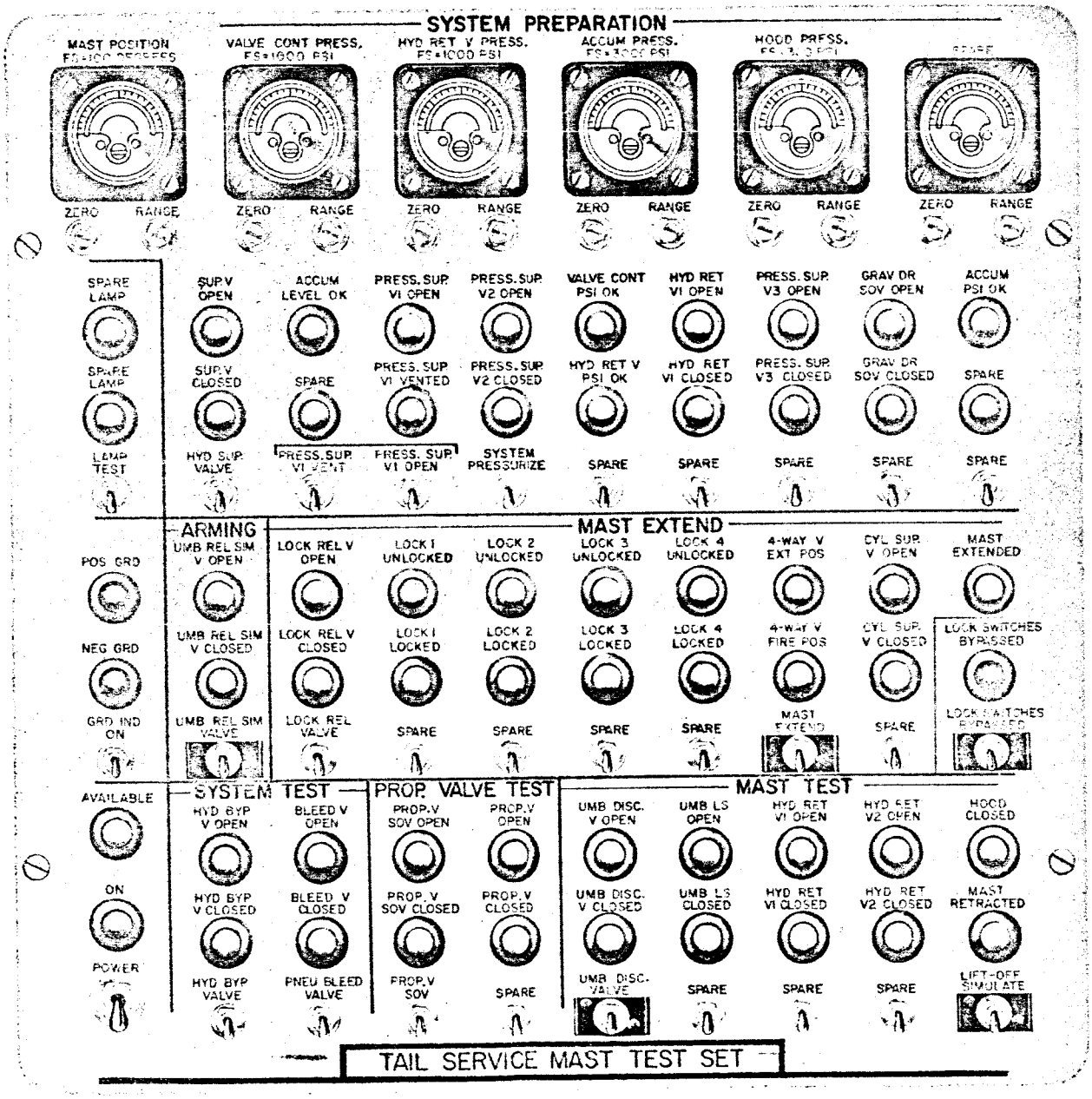


Figure 3-33 Face Panel, TSM Test Set E75M07658

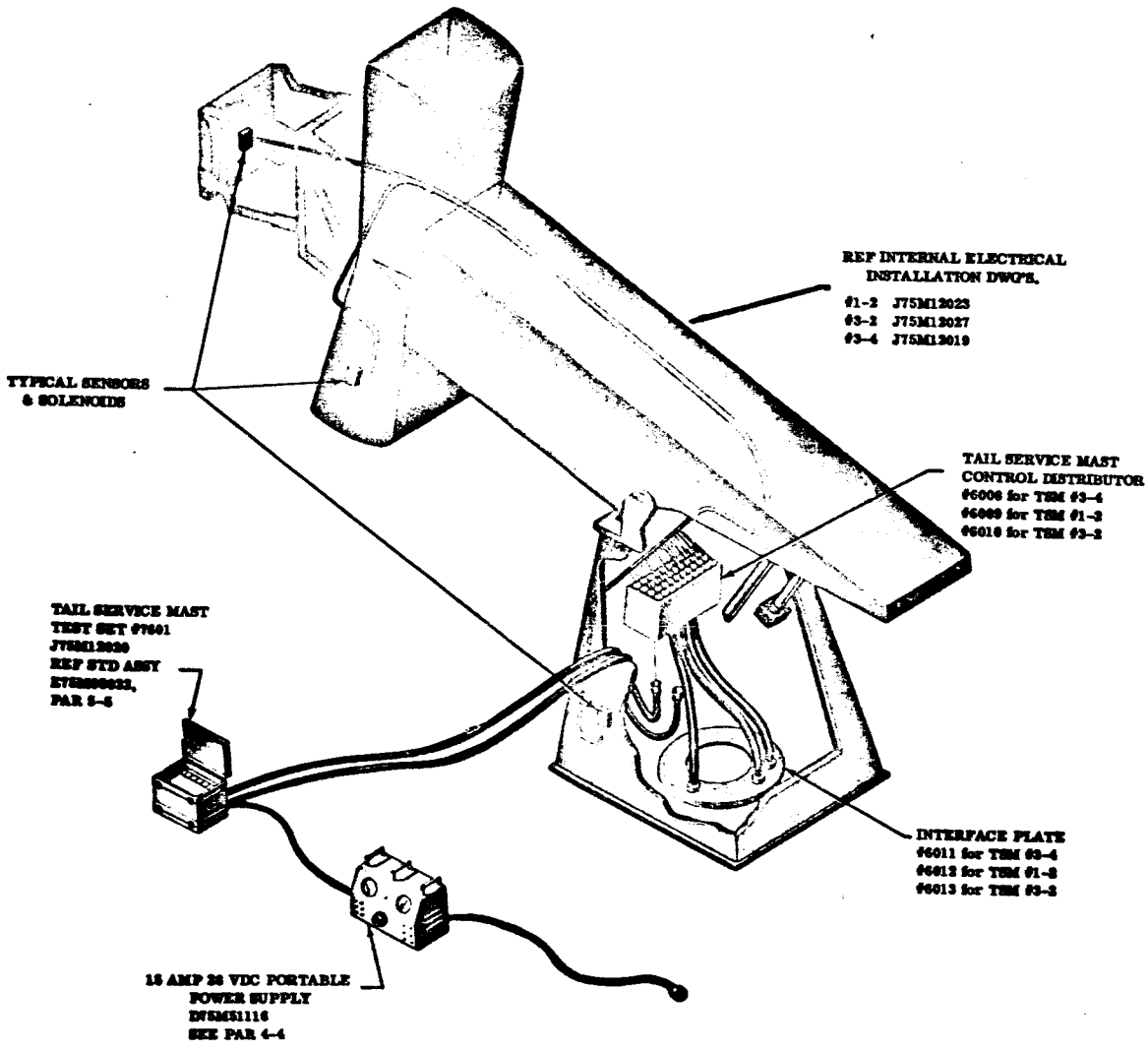


Figure 3-34 Typical Installation, TSM Test Set E75M12020

3-33. PNEUMATICS CONTROL AND DISTRIBUTION SUBSYSTEM.

3-34. Purpose of the Subsystem. The Mobile Launcher pneumatic electrical system provides electrical controls for operating valves and monitoring pressure and valve positions for the GN_2 and helium high pressure valving and panels, Valve Panel No.11 and Valve Panel No. 12, and also the purge valves. These panels and valves supply pneumatic pressure for the holddown arms, tail service masts, service arms, hydraulic checkout console, Q-ball, engine servicing and purge applications.

3-35. Equipment for the Subsystem. The following equipment is used by the Pneumatics Control and Distribution Subsystem:

a. Helium Control Panel #6404, room 1-B
b. GN_2 Control Panel #6405, room 1-B
c. High Pressure Pneumatics Control Distributor #3407, room -1B
d. Valve Panel No.11 #6605, room 12-A
e. Valve Panel No.11 Control Distributor #6667, room 12-A
f. Holddown Arm Control Distributor #6023, room 12-A
g. Valve Panel No.12 #6167, level 160
h. Valve Panel No.12 Control Distributor #6165, level 160
i. Relay Distributor #6651, Room 8-A. See rack 19, figure 6-2.
j. UB Instrumentation and Control Distributor #9016, level 160.
k. Terminal Distributor #9082, room 7-A
l. Terminal Distributor #9091, room 12-A
m. Terminal Distributor #9092, room 5-A
n. Control, Test and Firing Monitor Console, LCC

3-36. Description of the Subsystem. GN_2 and helium valves, valve positions, and pressures aboard the Mobile Launcher are controlled and monitored from the Pneumatic Distribution System Panel (figure 3-36). This panel interfaces with the Launcher Accessories Relay Distributor #6651 via the DDAS-Computer-Hardwire complex, figure 3-35. The relay rack provides the required logic for control and monitoring functions, and acts as an interface transfer unit. Terminal and control distributors connect this relay rack to the valve panels and valves for each of the following areas:

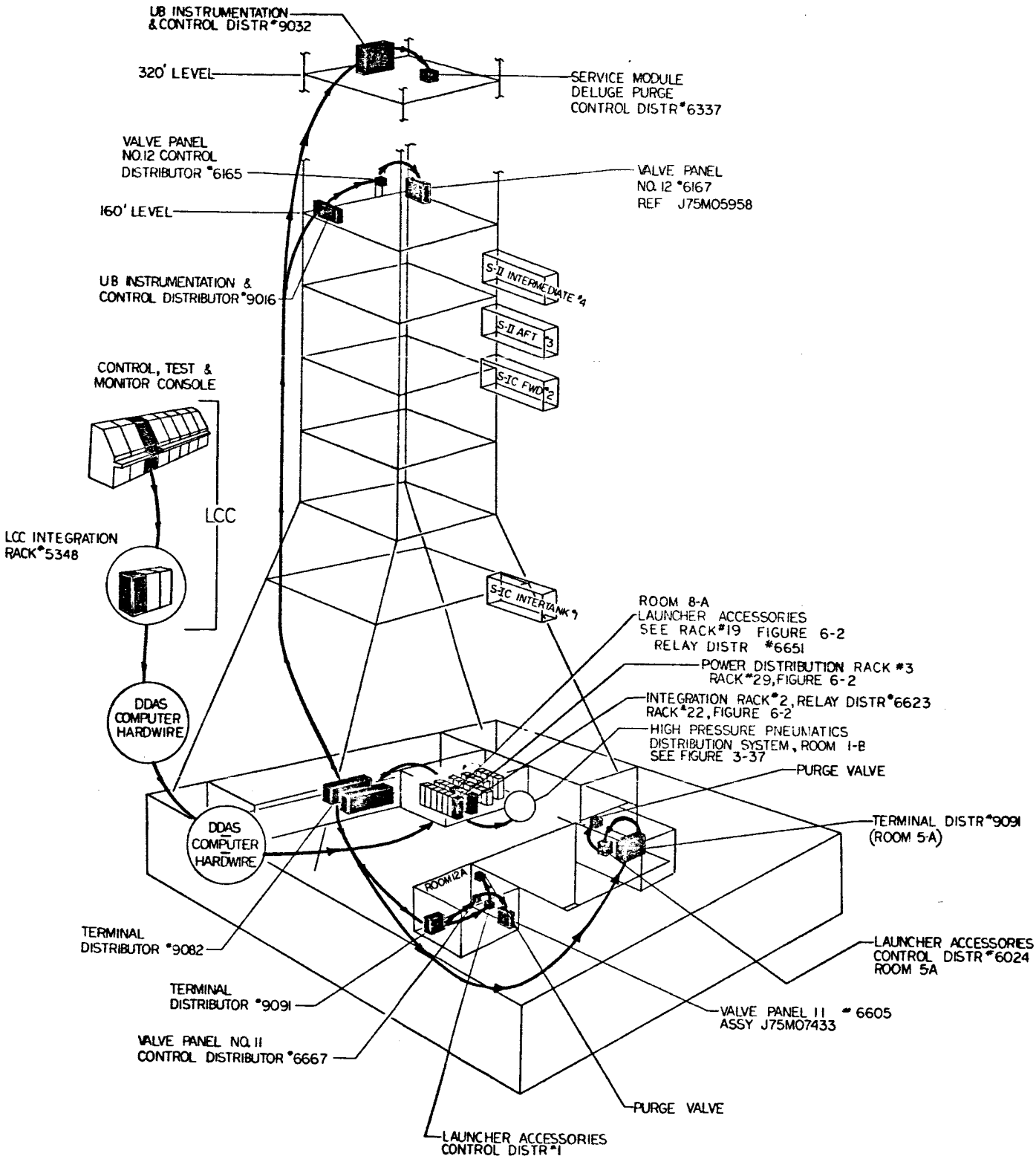


Figure 3-35 Pneumatics Control and Distribution Subsystem

a. High Pressure Pneumatics System

b. Valve Panel No. 11, J75M07433

c. Valve Panel No. 12, J75M05958

d. Deluge Purge Panel

e. Launcher Purge Valves

The High Pressure Pneumatics System, figure 3-37, consists of a manifold and valving system for distributing GN_2 and helium to valve panels and consoles throughout the Mobile Launcher.

Valve Panel No. 11 provides:

a. 3000 psi and 750 psi GN_2 for the Tail Service Masts and for checkout of the ground support hydraulics

b. 1000 psi GN_2 for engine servicing and cleaning

c. 1500 psi helium for the holddown arms pneumatics

d. 50 psi GN_2 for hazardous purge requirements

Valve Panel No. 12 provides:

a. 750 psi and 125 psi GN_2 for all service arm control pneumatics

b. 50 psi GN_2 for hazardous purge

3-37. Tests for the Subsystem. Two different test units are used within the Pneumatics Control and Distribution Subsystem for local testing:

a. Launcher Accessories Test Set No. 1 is a programming of the Universal Patchboard Test Set, figure 5-8. It measures pneumatic pressures, provides actuating test signals and monitors switch and valve positions for the High Pressure Pneumatics system (figure 3-37) and for Valve Panel No. 11 (figure 3-38). These functions are shown on the test set face panel, figure 3-39.

By plug swapping a test cable at the control distributor (#6407) and utilizing a portable power supply, the GN_2 and helium panels may be used for local control and monitoring.

b. Tower Test Set E75M14137 is a programming of the Miniaturized Universal Test Set, figure 5-6. It measures pneumatic pressures, provides actuating signals, and monitors switch and valve positions for Valve Panel No. 12, figures 3-40 and 3-41. It also provides control and monitor functions for the Q-Ball Cover Removal Subsystem, figure 3-43.

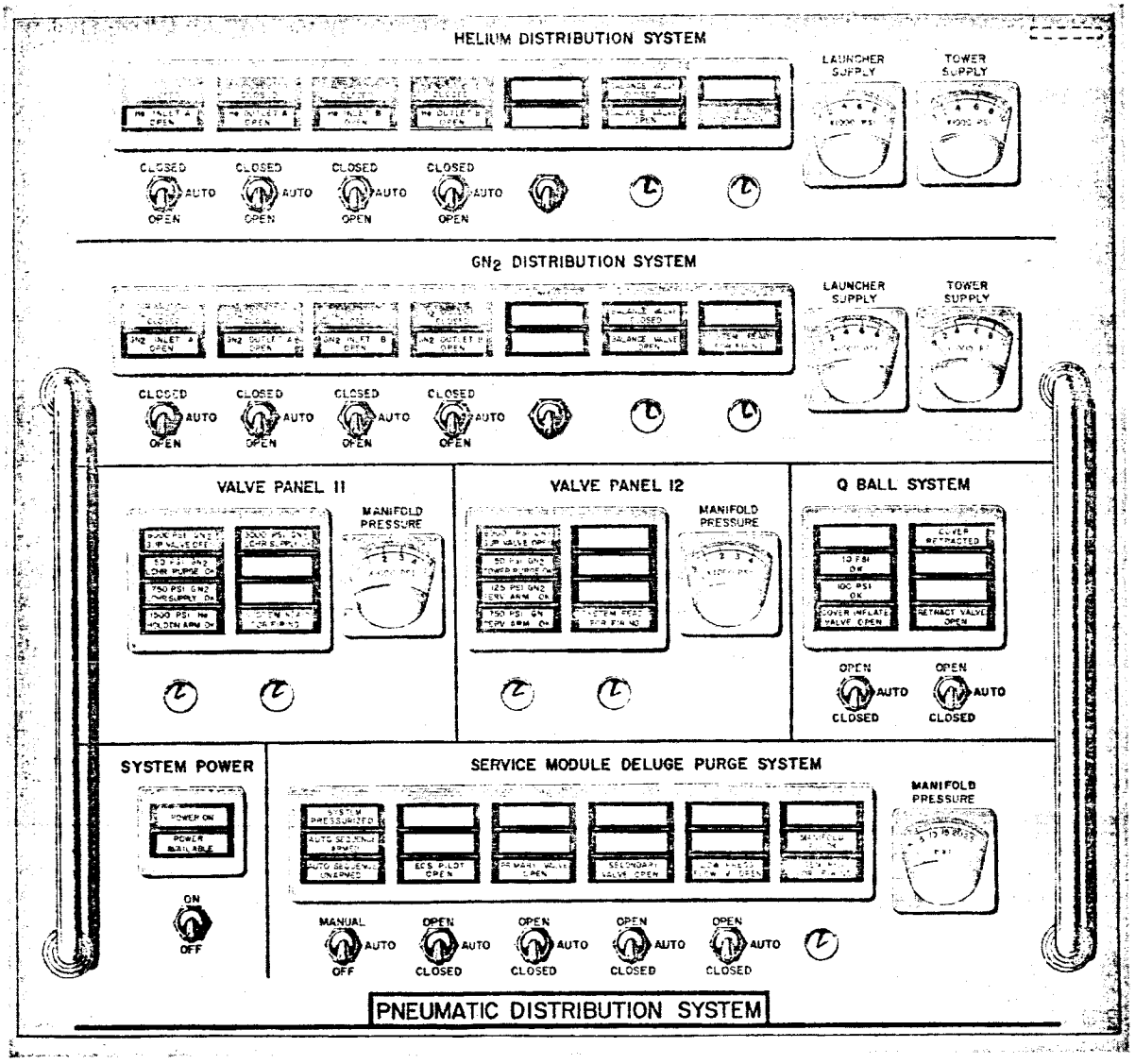


Figure 3-36 LCC Panel, Pneumatic Distribution System

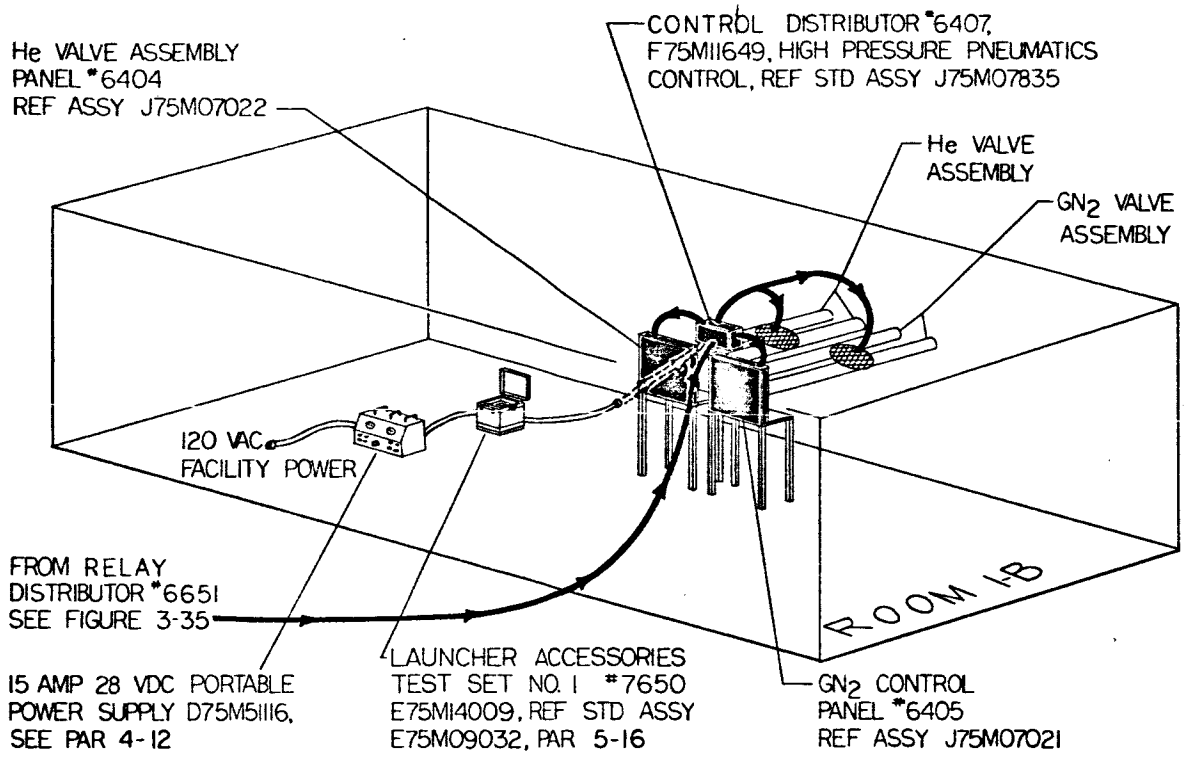


Figure 3-37 High Pressure Pneumatics System

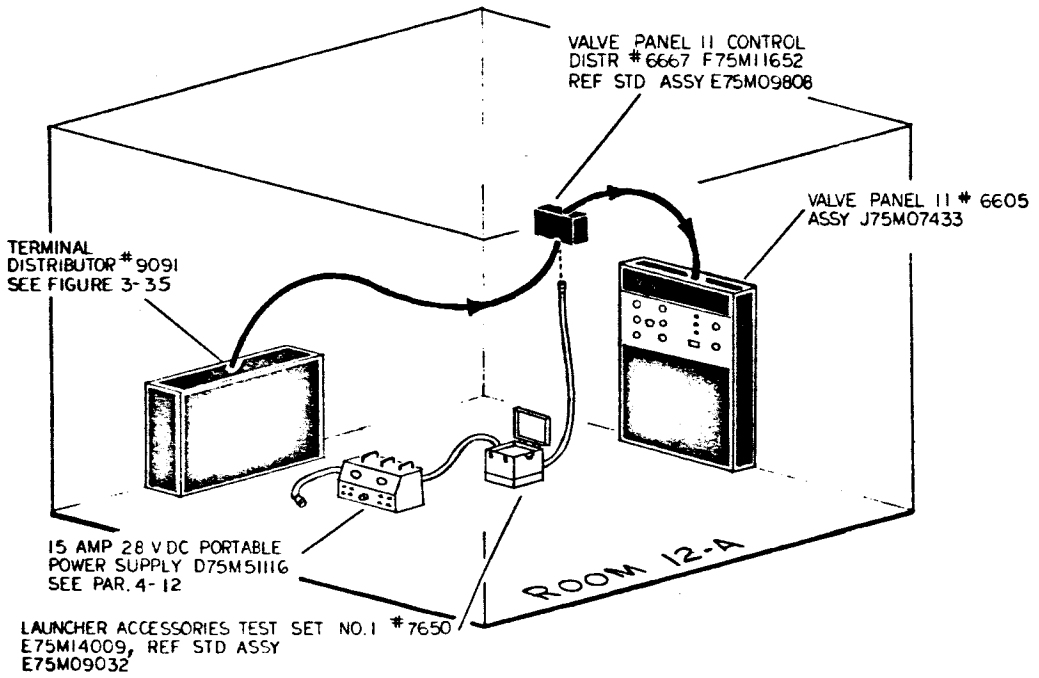


Figure 3-38 Typical Test Installation, Valve Panel 11

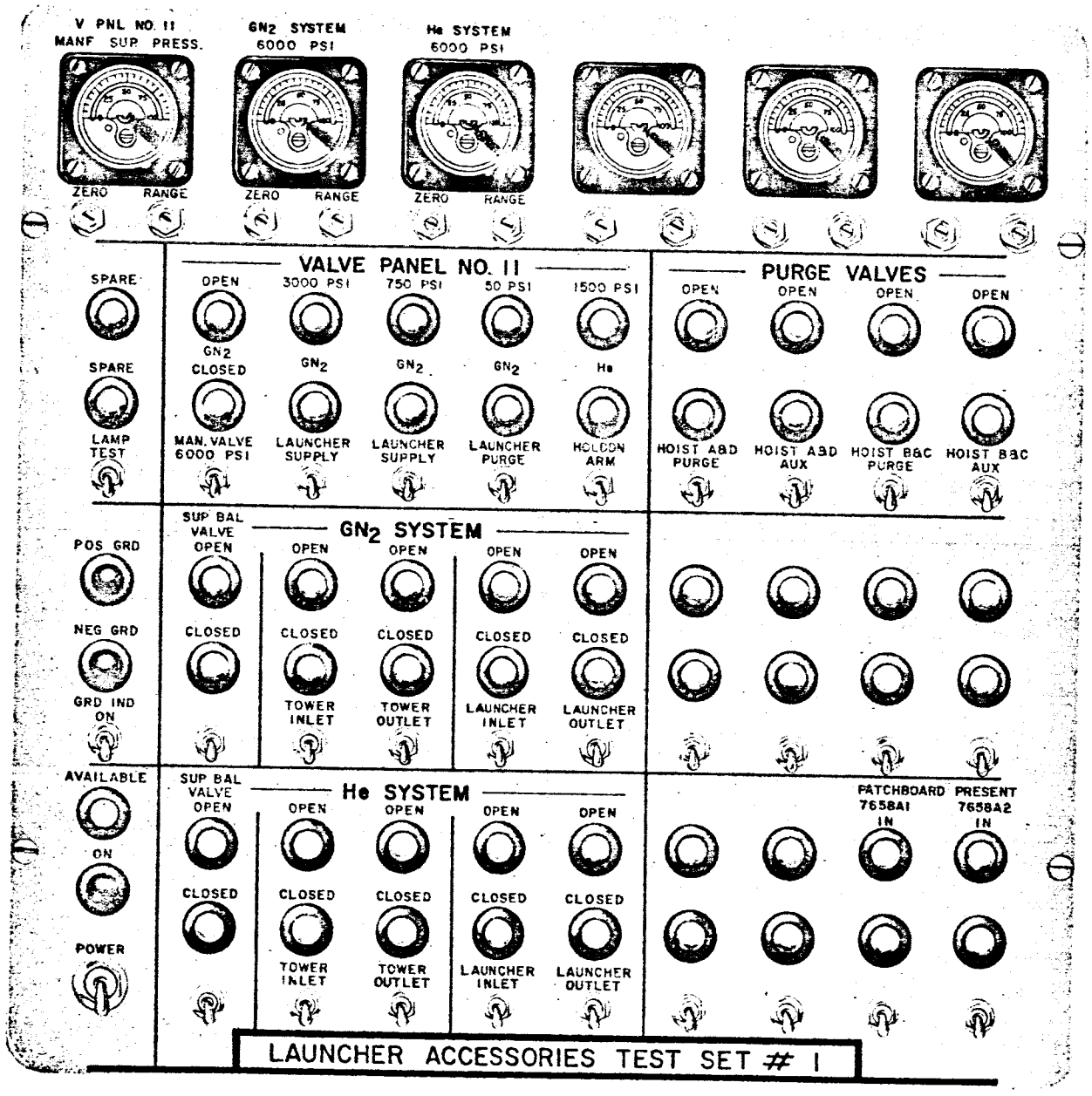


Figure 3-39 Face Panel, Launcher Accessories Test Set No. 1, E75M14009

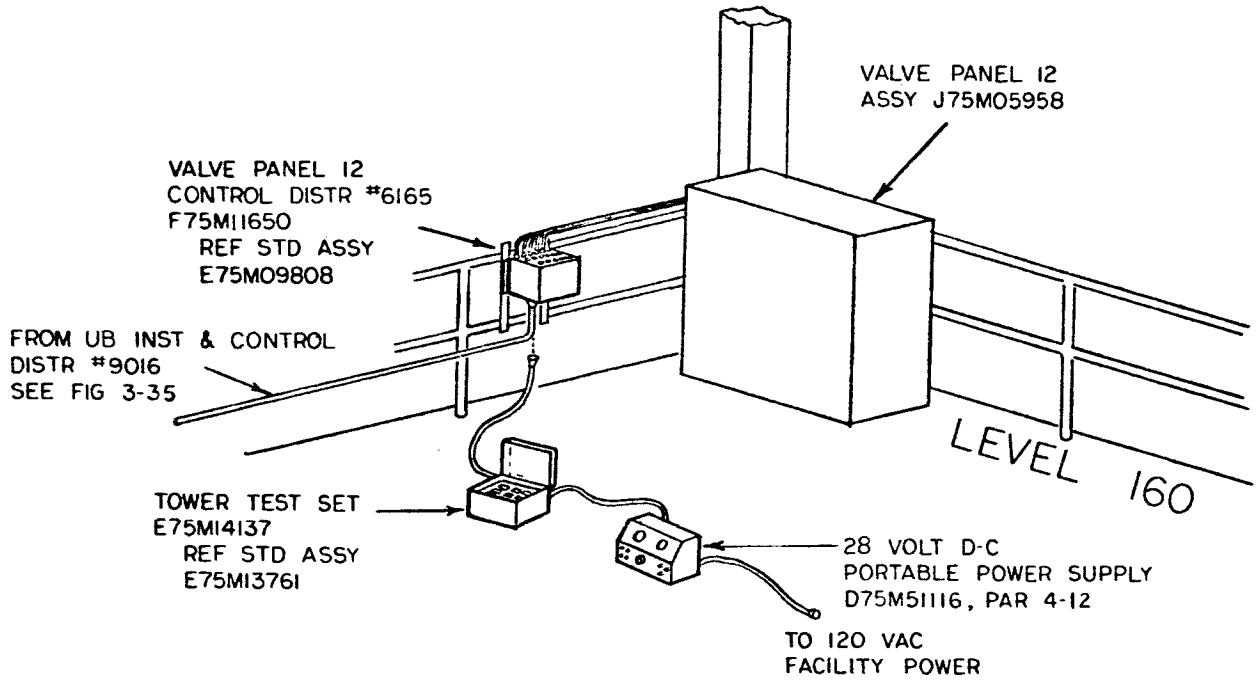


Figure 3-40 Typical Installation, Tower Test Set E75M14137

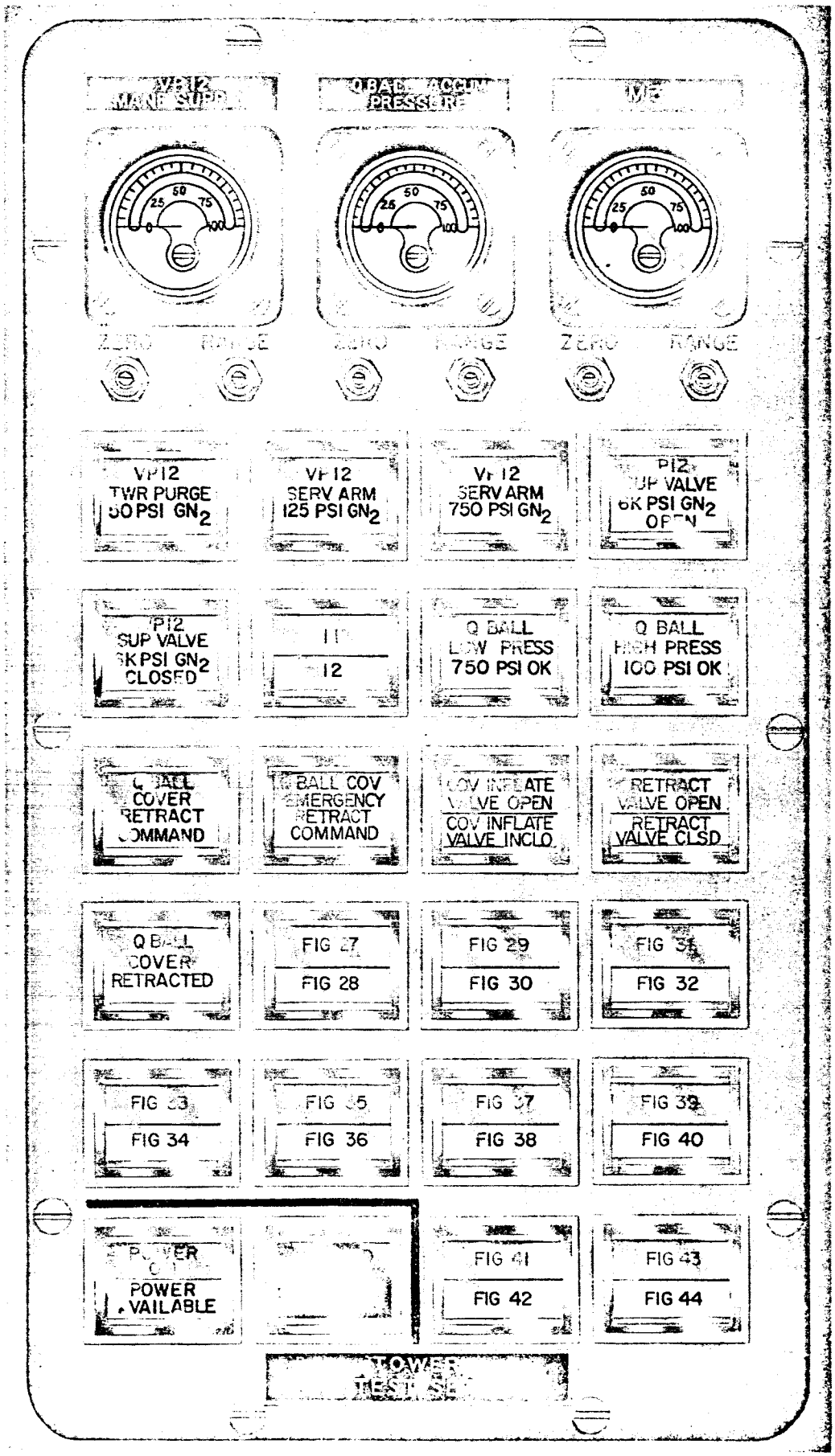


Figure 3-41 Face Panel, Tower Test Set E75M14137

3-38. Q-BALL COVER REMOVAL SUBSYSTEM

3-39. Purpose of the Subsystem. The Q-Ball Cover Removal Subsystem provides electrical control and monitoring of the Q-Ball cover mechanism.

3-40. Equipment for the Subsystem. The Q-Ball Cover Removal Subsystem employs the following equipment:

a. Hoist Assembly (J75M15383)

b. Pneumatic Assembly #6360 (J75M15388)

c. Q-Ball Cover Control Distributor #6361 (F75M13155)

d. UB Instrumentation and Control Distributor #9032

e. Terminal Distributor #9082A32

f. Relay Distributor #6651. See rack 19, figure 6-2.

g. Panel Assembly Pneumatic Distribution System, LCC Panel, (D75M09674)

3-41. Description of the Subsystem. The Q-Ball Cover is a fiberglass cover for vehicle guidance components in the tip of the Saturn V Launch Escape System rocket. Prior to launch, this cover is ejected by pressurized GN_2 (10 psi). It then is retracted from the vehicle by a Hoist Assembly consisting of a lanyard, a pneumatic motor, and a weight and pulley system (see figure 3-43).

Pneumatic pressure for cover removal is supplied by the pneumatic assembly (#6360) located beside the electrical control distributor (#6361) on the 360-foot tower level. This pneumatic assembly is controlled remotely from the LCC Pneumatic Distribution System Panel, as in figure 3-42.

Several minutes before vehicle liftoff, a manual cover inflation switch on the Pneumatic Distribution System Panel (figure 3-36) is closed, providing a signal routed through the DDAS-Computer-Hardwire Complex to Relay Distributor #6651 in room 8-A. Relay closure provides a 28 volt dc signal through distributor #9082A32

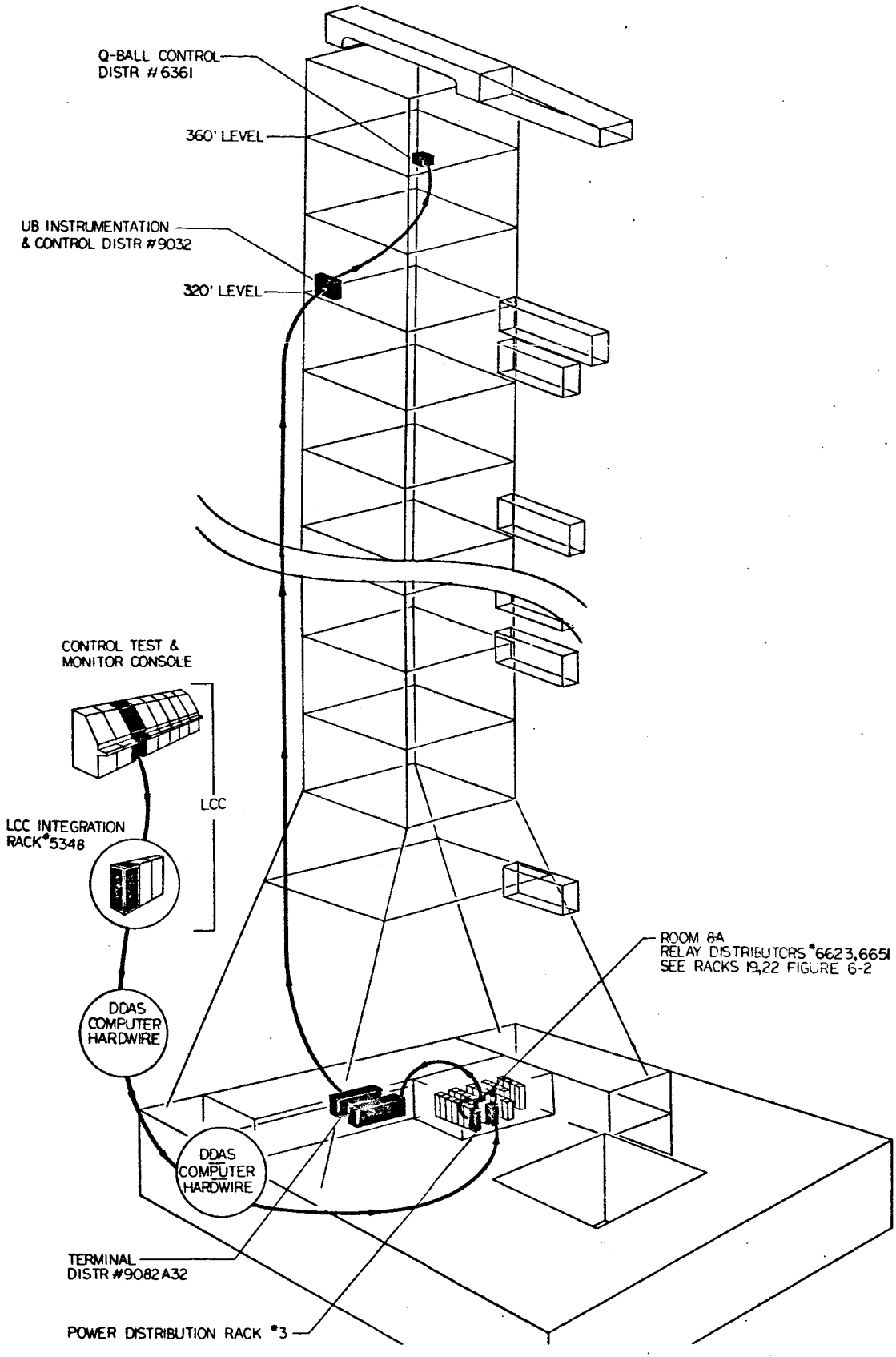


Figure 3-42 Q-Ball Cover Removal Subsystem

and #9032 to a cover inflation solenoid valve in the pneumatic assembly. The GN_2 (10 psi) is thus supplied through pneumatic hose to a nylon bladder in the Q-Ball Cover. The bladder inflates and raises the Q-Ball Cover.

As the Q-Ball Cover falls, a steel weight in the gravity retract system actuates a motor-start limit switch and energizes a relay. One contact closure energizes another relay in series with the motor-stop limit switch and another seals in the motor-start limit switch. A contact from the relay in series with the motor-stop limit switch energizes the second solenoid valve. This retract valve opens and allows nitrogen at 125 psi to actuate the pneumatic motor and wind up the lanyard. When a mechanical stop on the lanyard reaches the hoist assembly, the motor-stop limit switch is actuated, closing the retract valve. As the cover retracts fully, a limit switch returns a signal to the LCC along a path parallel to the command signals. After the lower limit switch is activated, a Q-Ball Cover retract lamp on the LCC control panel indicates full retraction.

Panel indicator lamps are illuminated whenever the retract valve is open, the cover inflate valve is open, the low pressure reaches 10 psi in the Q-Ball pneumatic assembly GN_2 accumulator, or the high pressure reaches 100 psi.

In case of emergency, a manual retract switch on the LCC pneumatic distribution system panel may be closed. This switch closure bypasses the relay logic and energizes the retract valve solenoid. The retract valve then opens, allowing 125 psi nitrogen to actuate the pneumatic motor, which in turn pulls a mechanical disconnect pin. This allows the Q-Ball Cover to open and be retracted by the counterweight.

3-42. Local Test. The Q-Ball Cover mechanism can be locally tested by use of Tower Test Set E75M14137. This test set is connected to Q-Ball Cover Control Distributor #6361 in place of the system cable, and provides control and monitor functions shown in figure 3-41.

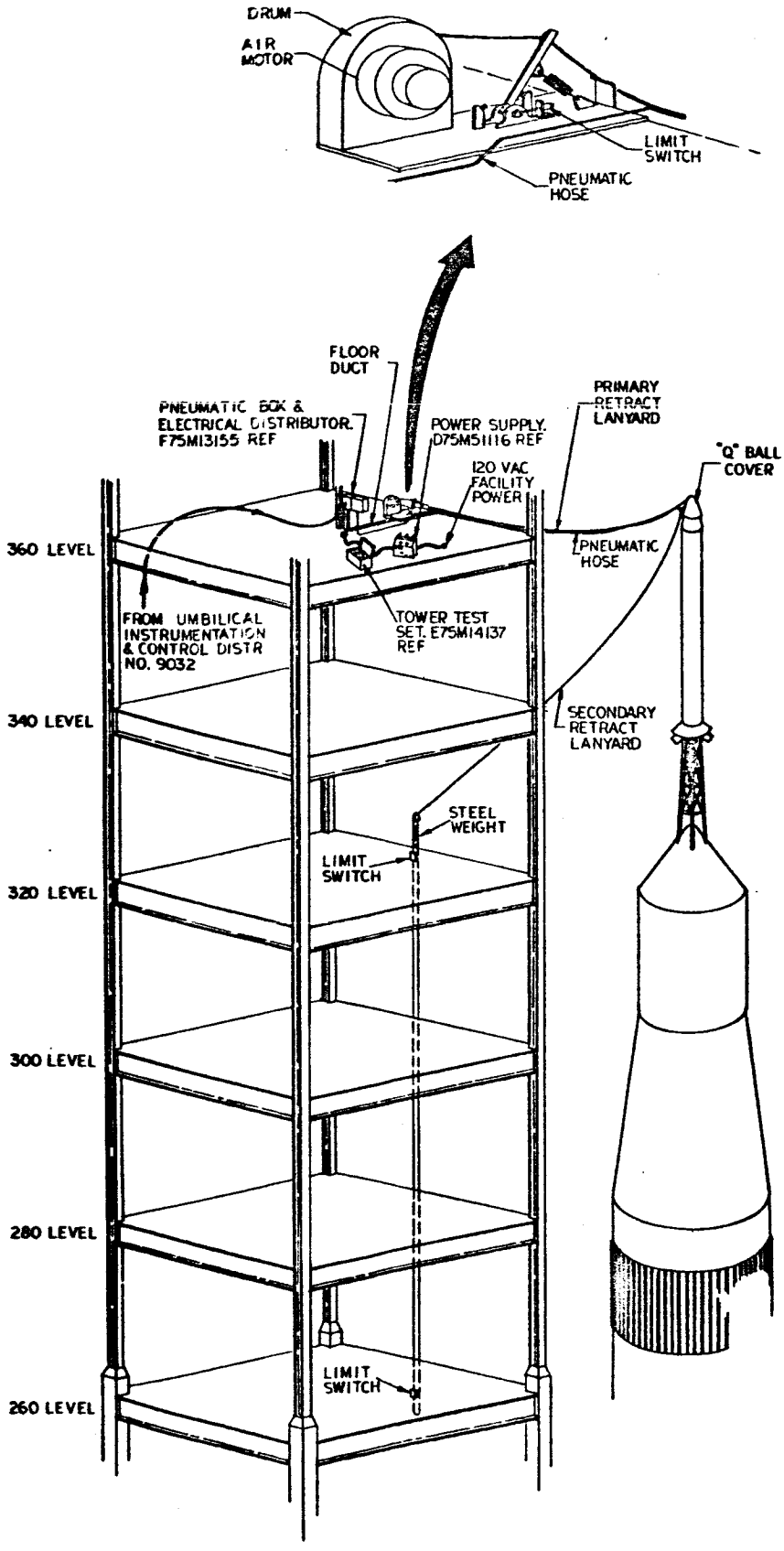


Figure 3-43 Q-Ball Cover Mechanism, Level 360

3-43. ESE POWER SUBSYSTEM.

3-44. Purpose of the Subsystem. This subsystem provides dc power to the ESE.

3-45. Equipment for the Subsystem. The ESE Power Subsystem uses the following equipment:

a. Relay Distributor #6620 (power distribution only).

b. Relay Distributors #6613 thru #6619, #6621, #6622, #6650, #6651 (Power distribution and other subsystems), figure 3-53.

c. Battery Rack #1172, figure 3-52.

d. Power Supply Rack #1162, figure 3-50.

e. Power Distribution Racks, figure 3-51. See Racks 7, 8, 29, figure 6-2.

f. UB Power Terminal Distributors #9042, #9044, #9054, #9017, #9023, #9027, #9029, #9046, and #9031 on various launcher levels as shown in figure 3-44.

g. Terminal Distributor #9082, Room 7-A.

h. Terminal Distributor #9073, Room 7-B.

i. Control Distributors #6008, #6009, #6010, #6023, #6024, #6063, #6064, #6122, #6124, #6142, #6144, #6162, #6202, #6203, #6204, #6222, #6223, #6224, #6262, #6263, #6264, #6265, #6302 #6303, #6304, #6667 and #6407 on various launcher levels, figure 3-44.

j. Power Control Console (Astrionics)

3-46. Description of the Subsystem. Power for ESE electrical equipment consists of (a) 28 volt monitor power, (b) 28 volt control power, and (c) power for DDAS and hardwire transmission. These three types of power are discussed separately below:

(a) 28 volt monitor power is applied to limit switches, pressure switches, and other components which monitor the state of the ESE subsystems. It is also applied to the ESE patch distributors where relay contacts monitor the state of the subsystems. Power in this category is generated in power supply 201-1162, and is distributed directly to the monitor switches and relay contacts without any command switching from a control panel. Monitor power for the service arms is shown in figure 3-44 and that for the service arms patch distributors in figure 3-45. Monitor power for the launcher networks and corresponding patch distributors is shown in figure 3-46.

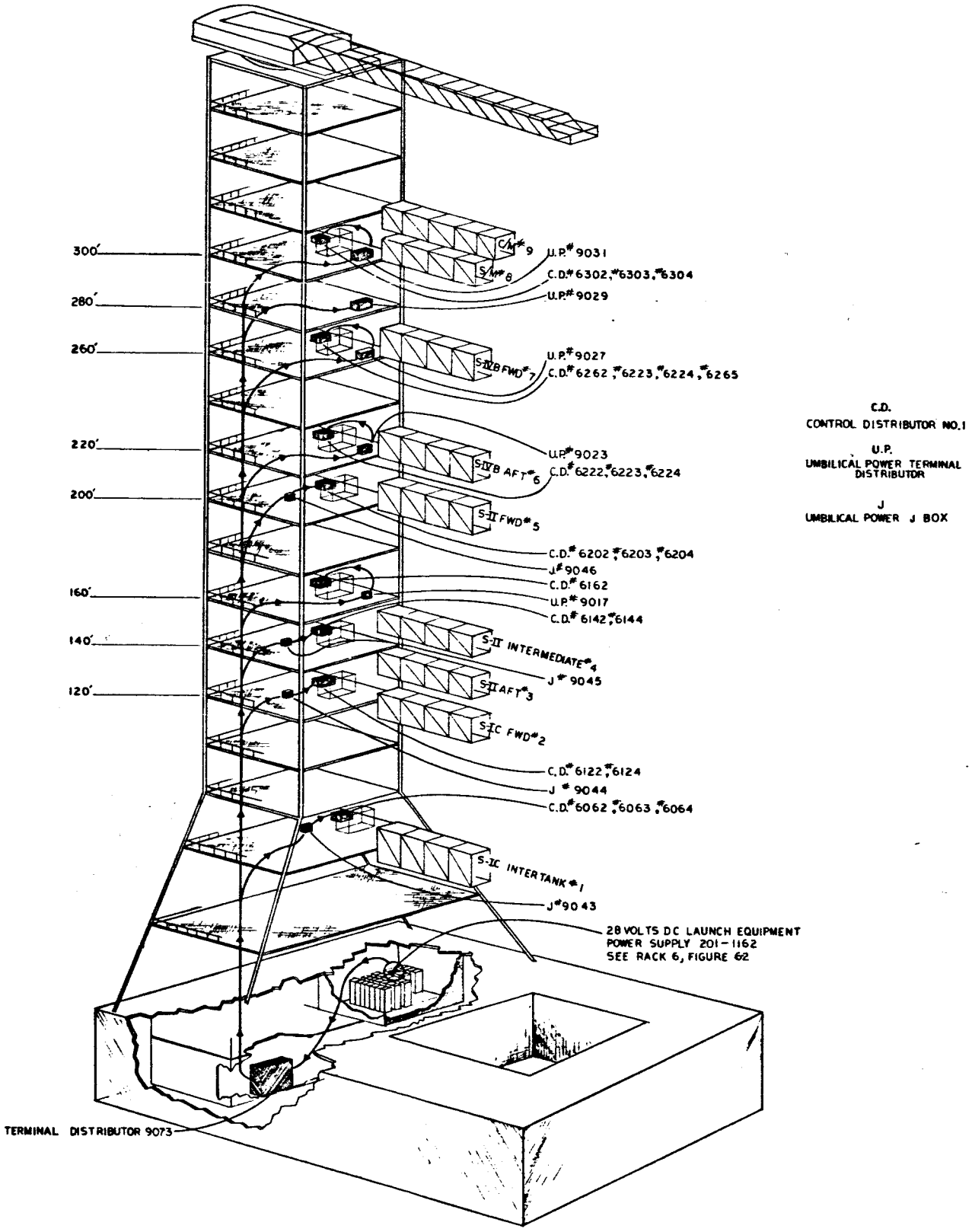


Figure 3-44 Monitor Power for Service Arms

(b) 28 volt control power is that power required for relays, solenoid-operated valves, and other components which effect actuation of the service arms, tail service masts, and launcher accessories. It is applied to buses in the patch distributors through power modules (contactors) which are controlled from the LCC control panels, as shown in figure 3-47. A similar control power is supplied to a bus in the MSFC-Astrionics signal conditioning equipment (figure 3-48) which returns the power through relay contact closures.

c. Power for DDAS and hardwire transmission as well as for the LCC control panels is supplied by Astrionics to buses in the integration racks and patch racks. See figure 3-49.

The source power for the system described above is supplied by MSFC and consists of a basic 500 amp power supply rack (#1162) and a standby battery rack (#1172). Operation of these racks is controlled from an LCC power control console also furnished by MSFC. See figure 3-55.

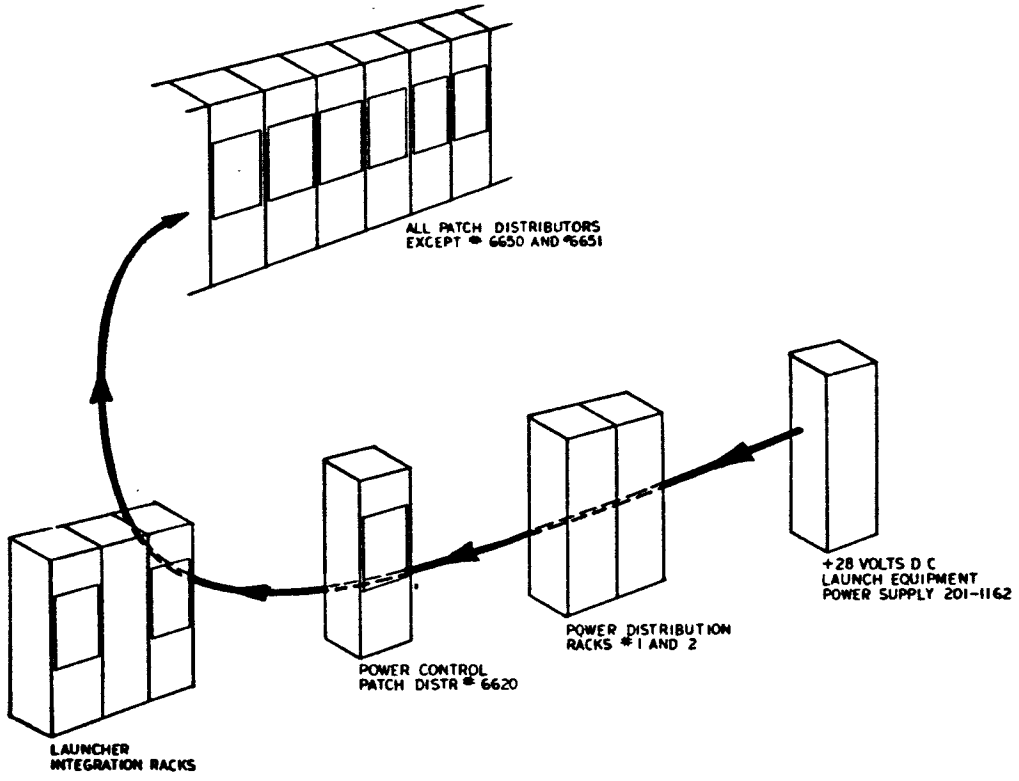


Figure 3-45 Monitor Power for Service Arms Patch Distributors

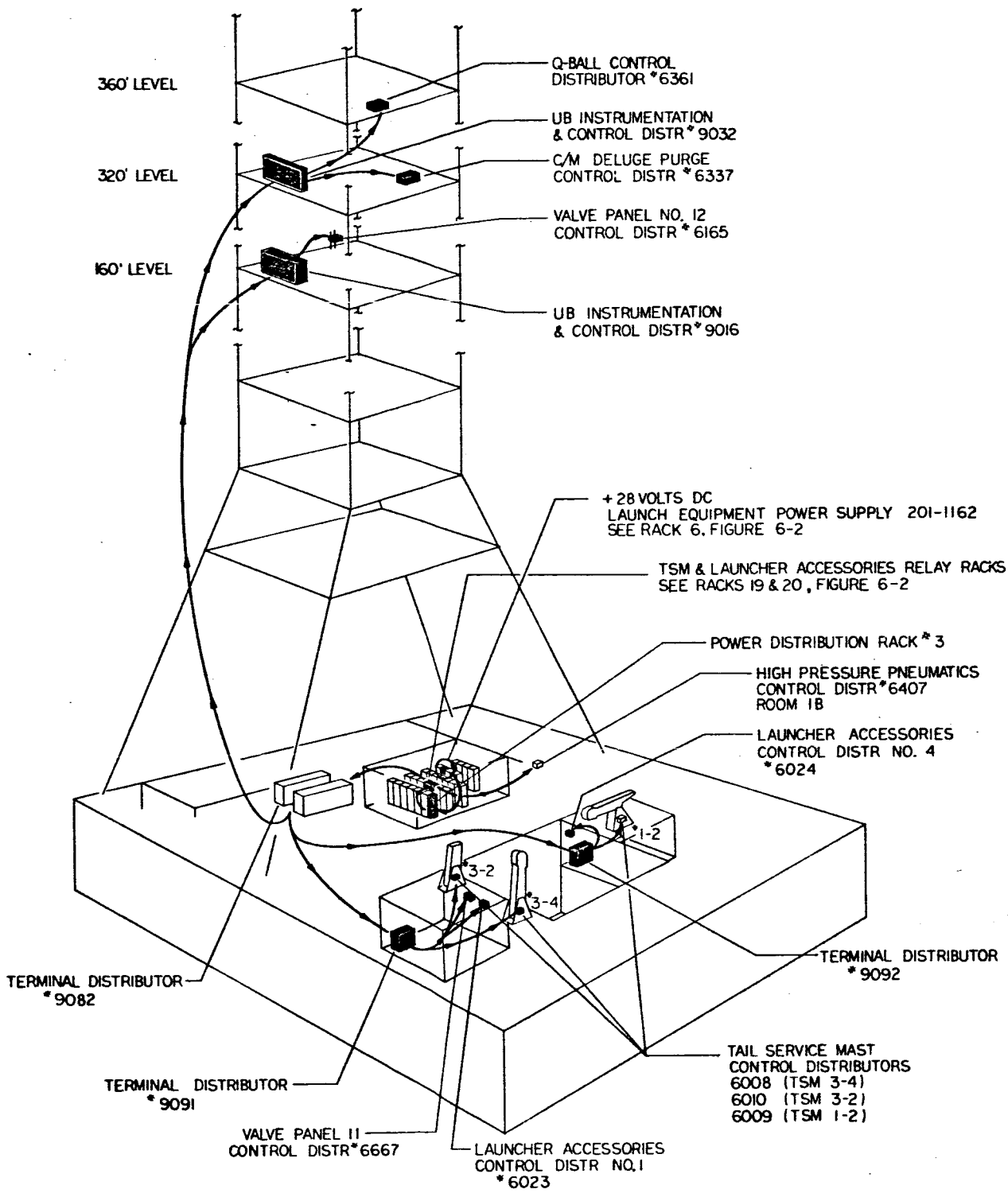
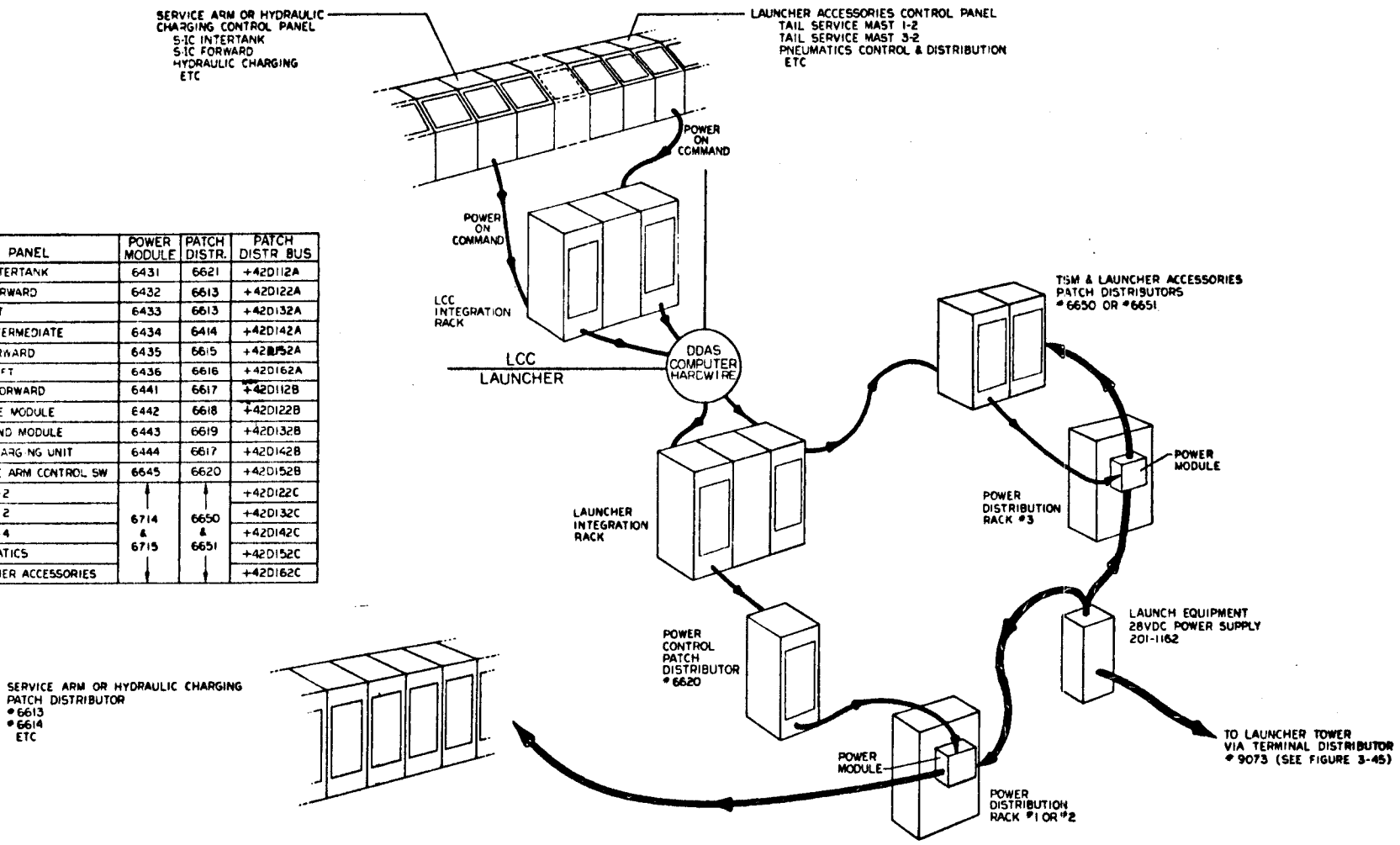


Figure 3-46 **Monitor Power for Launcher Networks and Patch Distributors #6650 and #6651**



LCC PANEL	POWER MODULE	PATCH DISTR.	PATCH DISTR BUS
S-IC INTERTANK	6431	6621	+42D112A
S-IC FORWARD	6432	6613	+42D122A
S-II AFT	6433	6613	+42D132A
S-II INTERMEDIATE	6434	6614	+42D142A
S-II FORWARD	6435	6615	+42D152A
S-IVB AFT	6436	6616	+42D162A
S-IVB FORWARD	6441	6617	+42D112B
SERVICE MODULE	6442	6618	+42D122B
COMMAND MODULE	6443	6619	+42D132B
HYD CHARG NG UNIT	6444	6617	+42D142B
SERVICE ARM CONTROL SW	6645	6620	+42D152B
TSM 3-2	6714 & 6715	6650 & 6651	+42D122C
TSM 1-2			+42D132C
TSM 3-4			+42D142C
PNEUMATICS			+42D152C
LAUNCHER ACCESSORIES			+42D162C

Figure 3-47 Control Power for ESE Patch Distributors

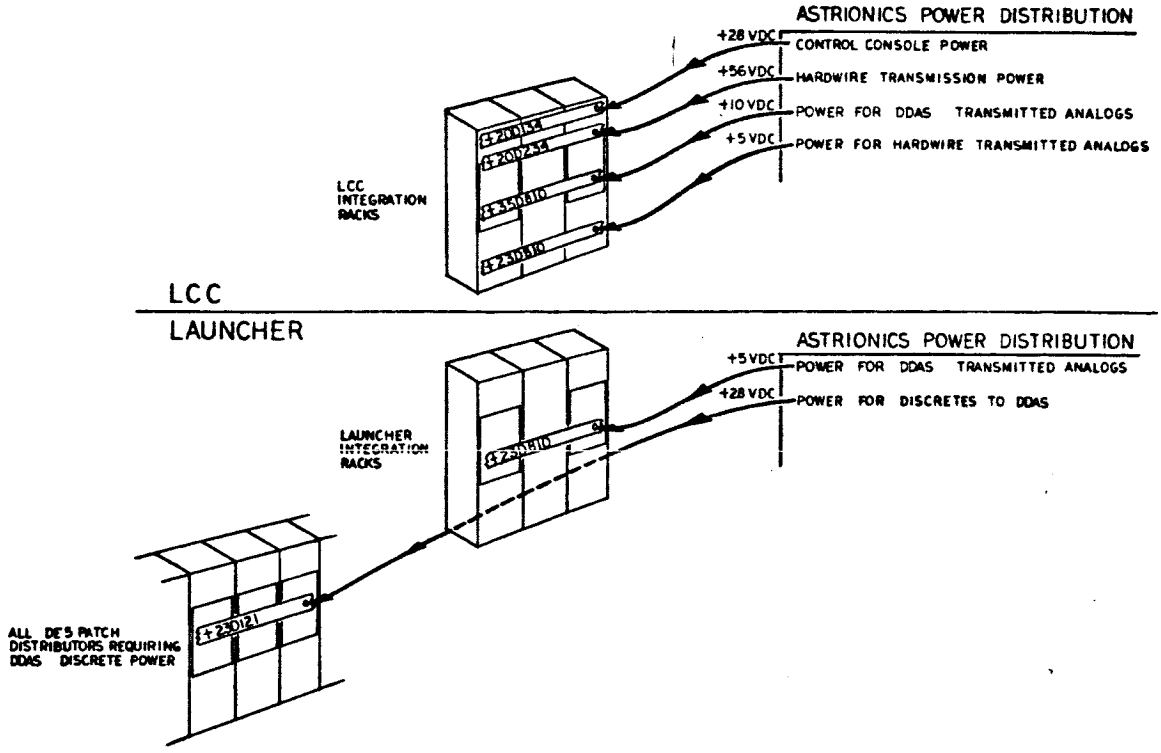


Figure 3-48 Control Power for Astrionics Signal Conditioning Equipment

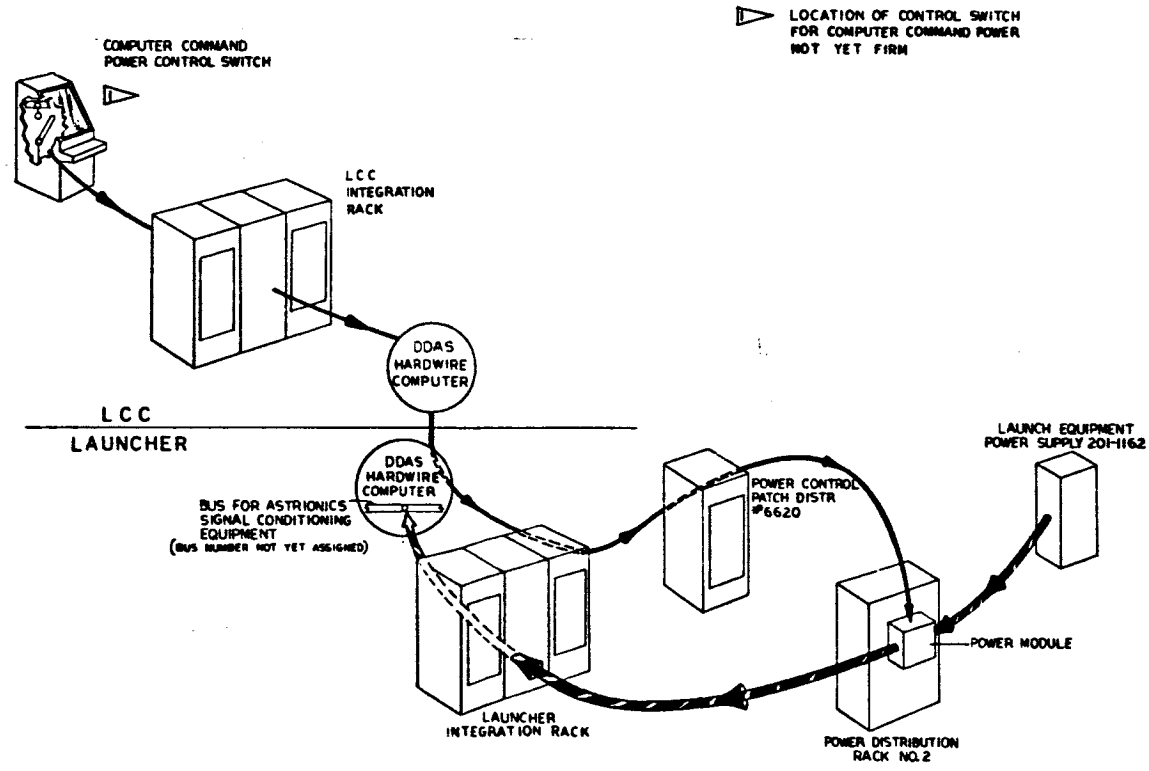


Figure 3-49 Power for Hardwire and DDAS Transmission

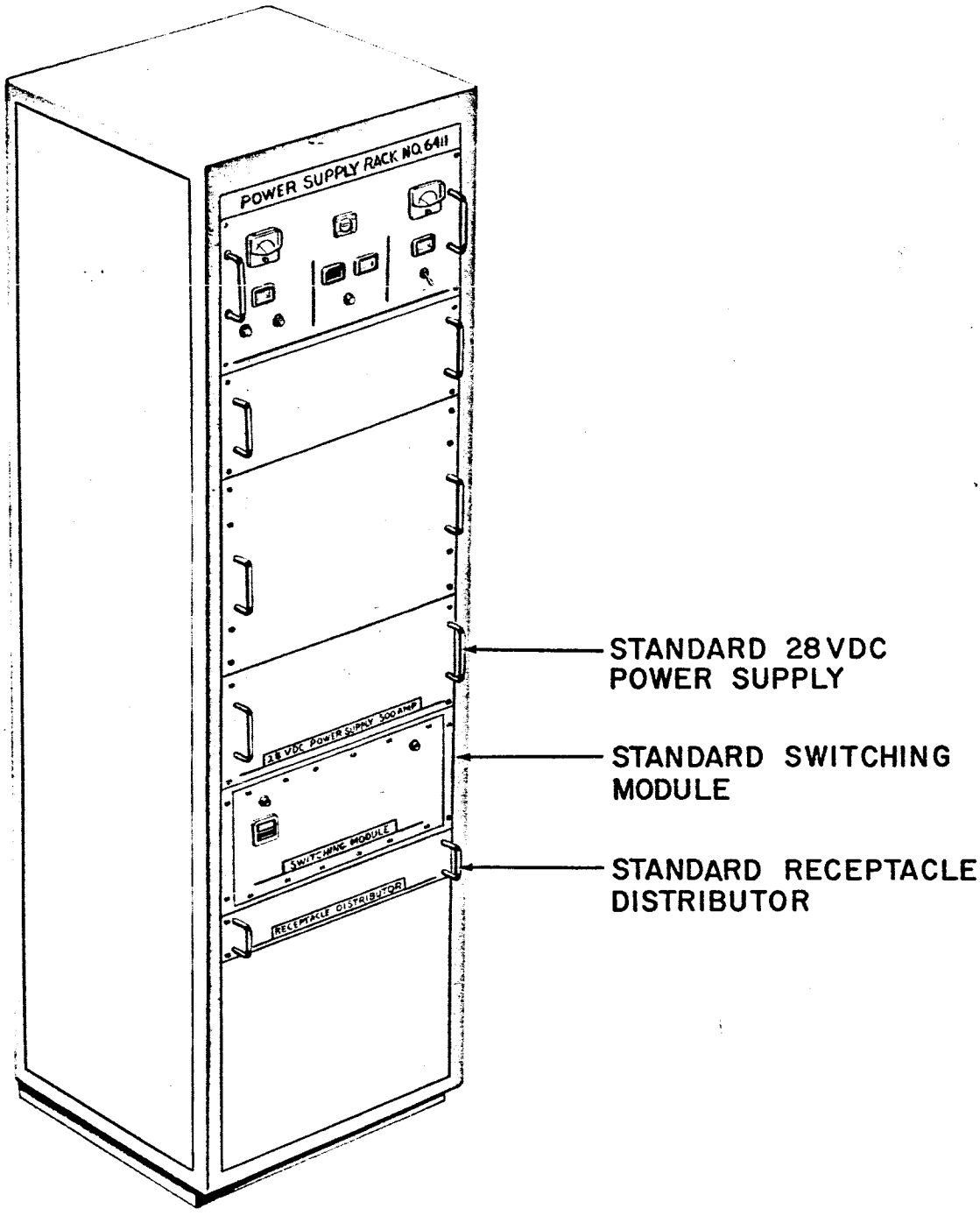


Figure 3-50 Power Supply Rack (Typical)

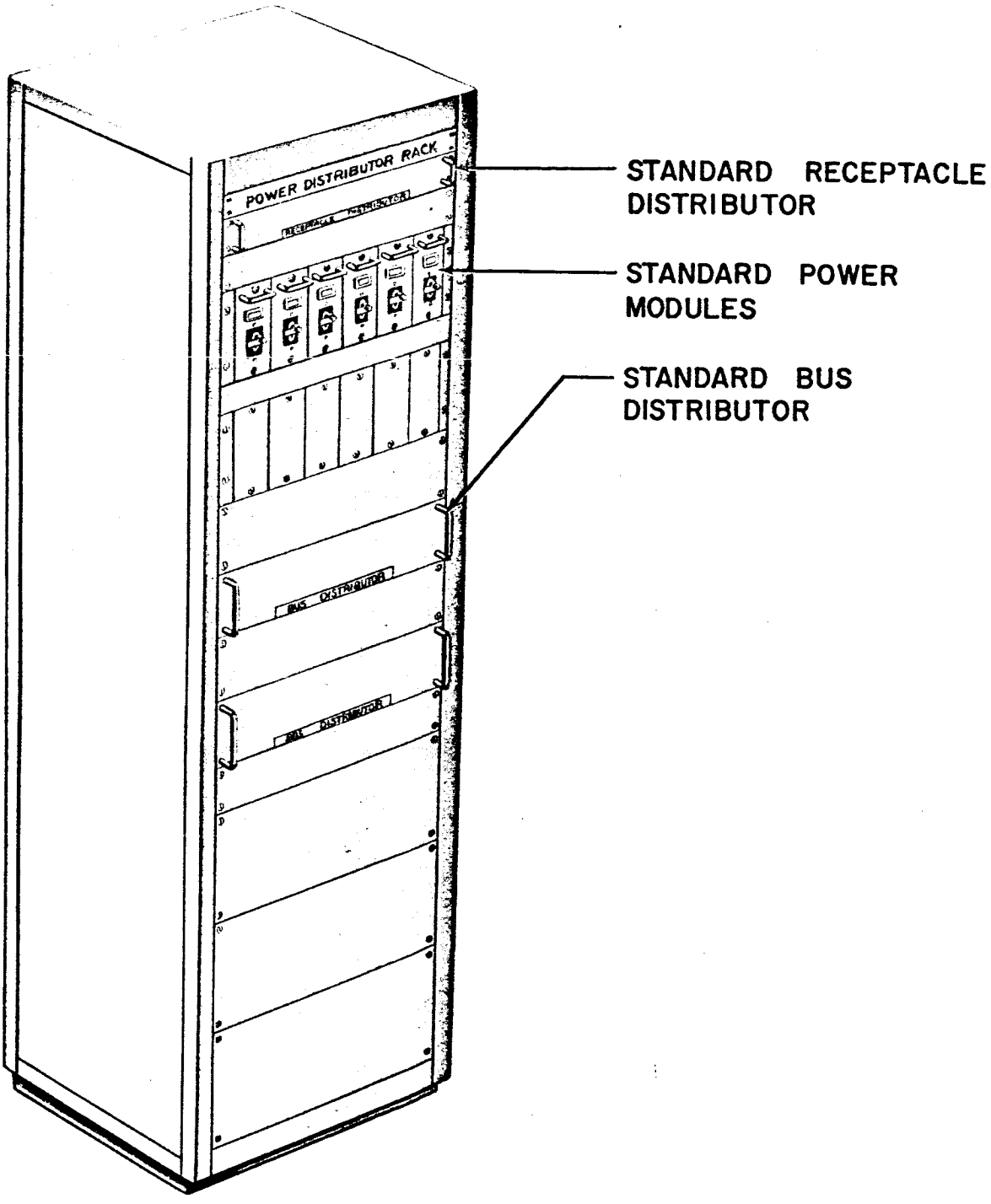


Figure 3-51 Power Distribution Rack (Typical)

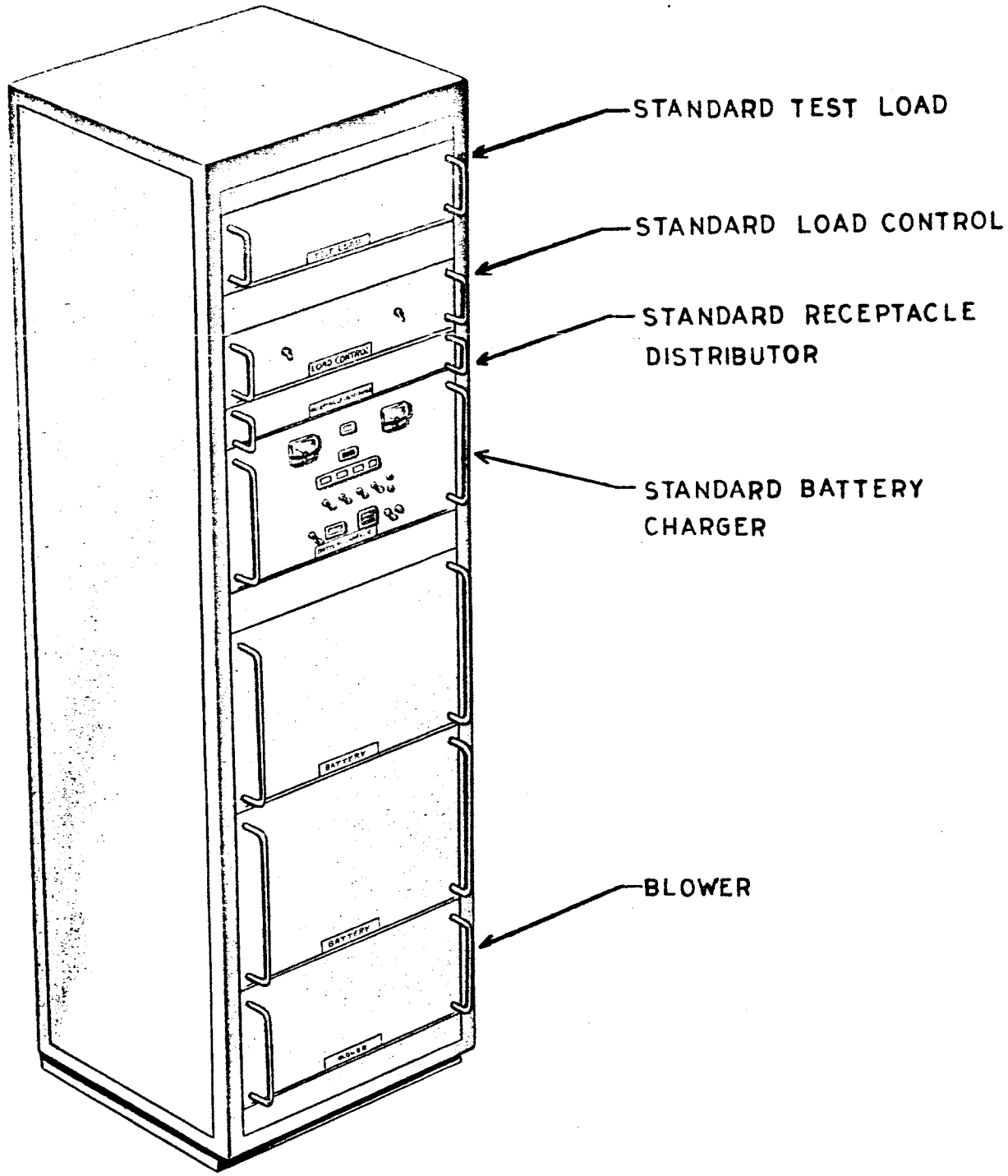


Figure 3-52 Battery Rack (Typical)

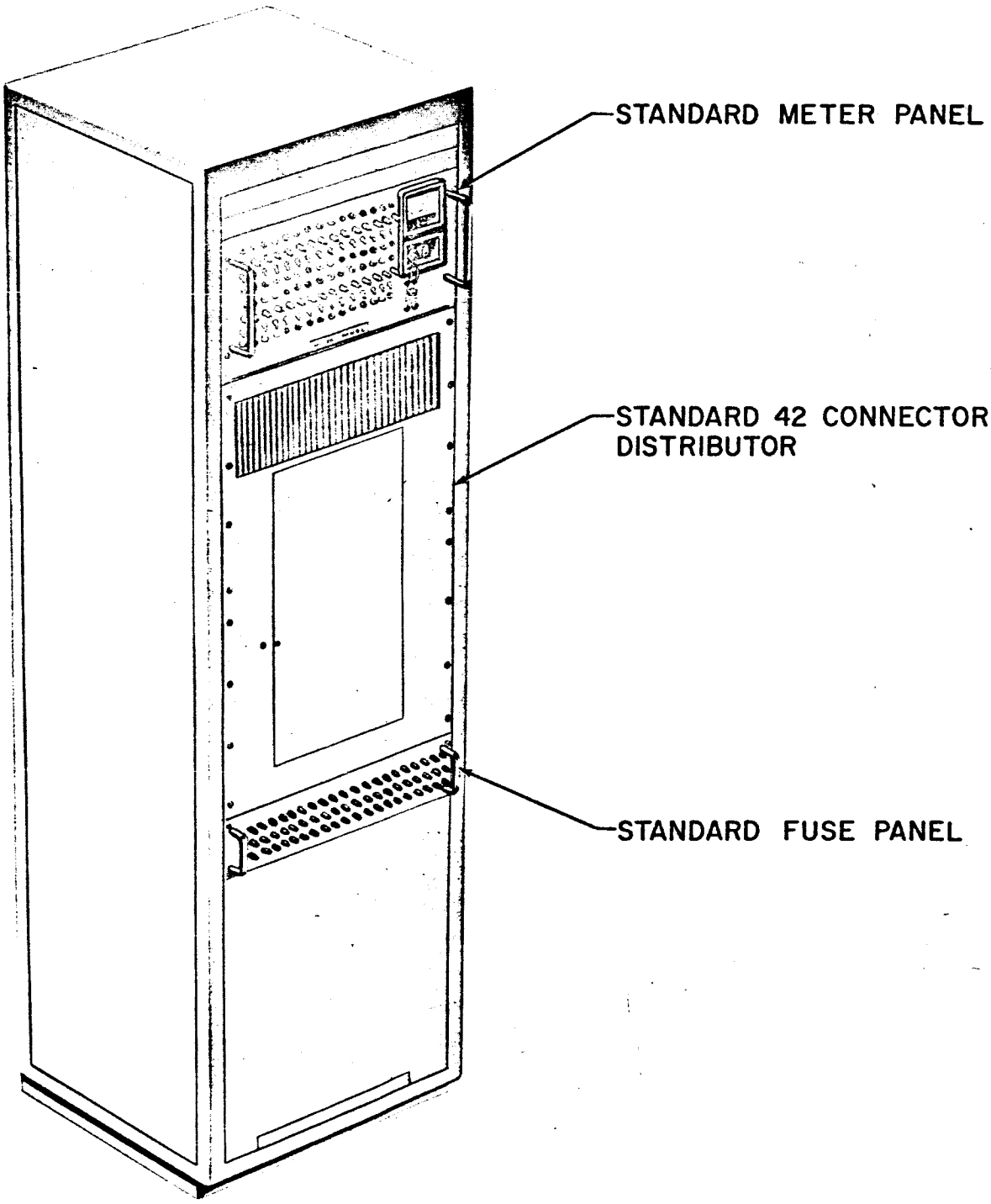


Figure 3-53 Relay Rack (Typical)

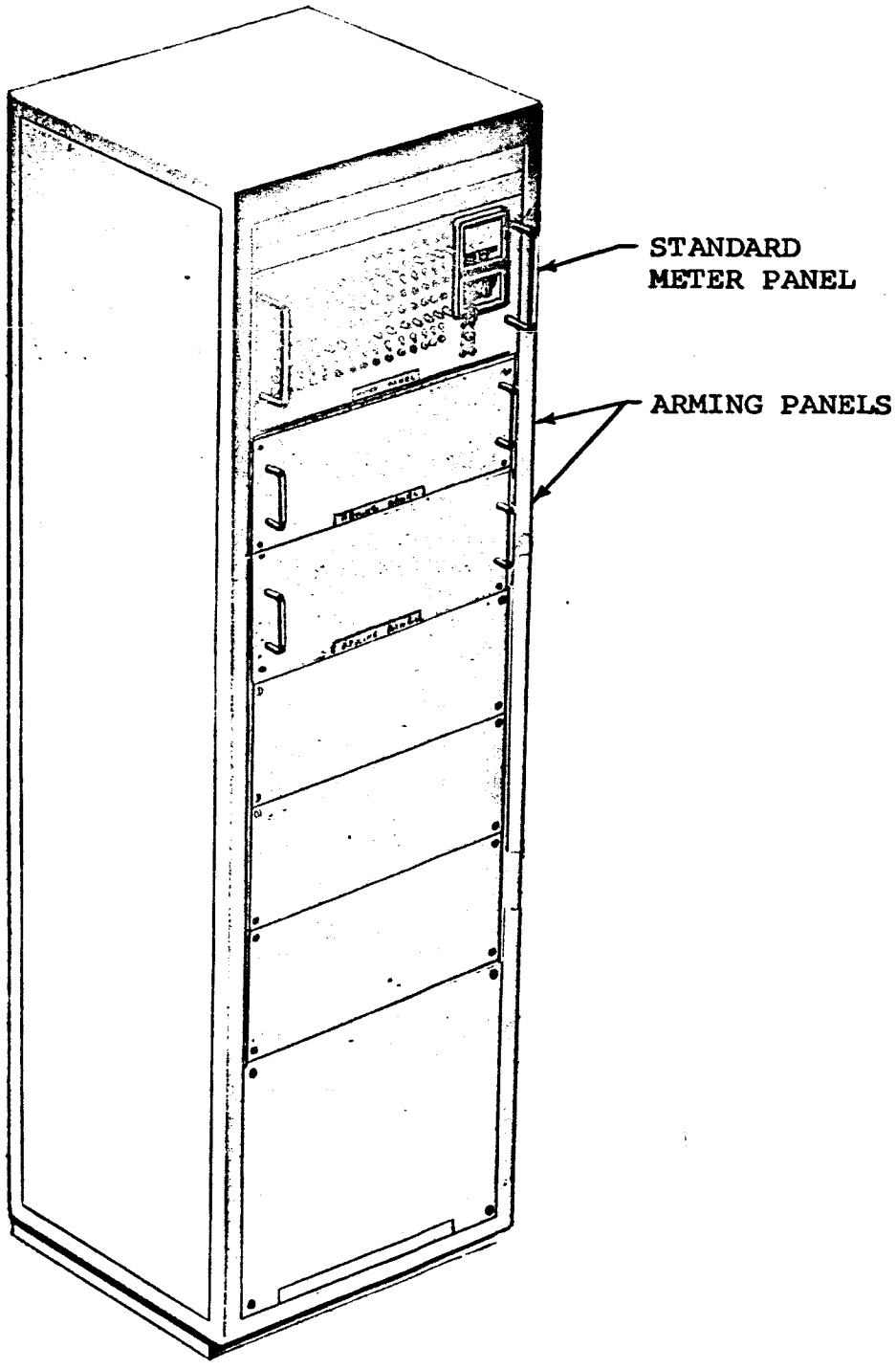


Figure 3-54 Arming Panel Rack (Typical)

TO BE PROVIDED

Figure 3-55 LCC Power Panel (Astrionics)

3-47. S-IC ENGINE SERVICING PLATFORMS SUBSYSTEM.

3-48. Purpose of the Subsystem. The S-IC Engine Servicing Platforms Subsystem controls the hoist assembly required to position any of the S-IC engine servicing platforms.

3-49. Electrical Equipment for the Subsystem. The S-IC Engine Servicing Platforms Subsystem uses the following equipment:

a. Relay Distributor #6606, room 2-A

b. Deck Distributor #6000, Level 0

c. Platform Distributor #7201 and #5089, Servicing Platform

d. Platform Controller #6000A1, Level 0

e. Level Sensor #7200A3 and 5088A3 Servicing Platform

f. Motor/Brake/Winch Assemblies #7853, #7852, #7851 and #7850, level 0

g. Warning Buzzer #7200A4 and #5088A4

h. Top Limit Switche . #7200A8, A9, A12, A13 and #5088A8, A9, A12, A13

i. Load Detector #7200A10, A11 and #5088A10, A11

j. Interlock Distributor #7200A1, A2 and #5088A1, A2

3-50. Description of the Subsystem. Three separate platforms are required at the VAB and launch pad for servicing the Saturn S-IC stage:

a. The Mobile Launcher Level Servicing Platform is a passive platform which provides servicing access to the S-IC stage at deck level 0.

b. The S-IC Engine Servicing Platform (Pad) services the engine area while the Mobile Launcher is at the launch pad. This platform has level sensors, interlocks, and other control equipment not contained in the Mobile Launcher Level Servicing Platform, and offers greater load capacity.

c. The S-IC Engine Servicing Platform (VAB) is used to service the engine area, install engine skirts or change an F-1 engine while the Mobile Launcher is in the VAB. It has the same control equipment as the S-IC Engine Servicing Platform (Pad), and still greater load capacity. See figure 3-57.

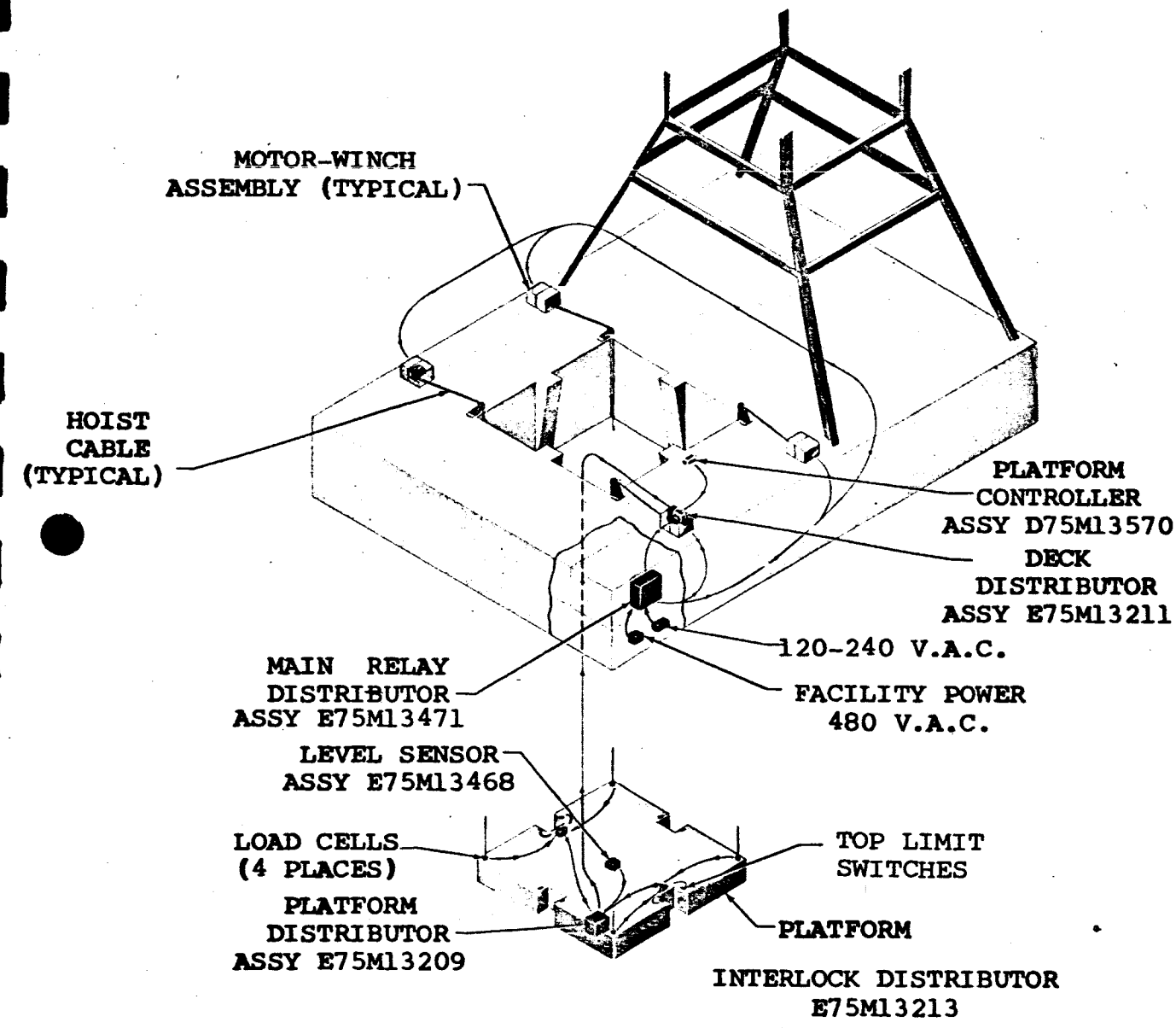


Figure 3-56 S-IC Engine Servicing Platforms Subsystem

These three platforms, represented by a single generalized platform in figure 3-56, are raised and lowered by a cable-hoist mechanism which is locally controlled by an operator on the Mobile Launcher deck. The electrical control system for this hoist is called the S-IC Engine Servicing Platforms Subsystem. See figure 3-58.

This subsystem normally employs four motor/winch assemblies operating simultaneously, giving it the capacity to lift a balanced platform loaded with one inboard F-1 engine. Step-control is achieved with two-speed motors.

Electrical power is also provided for a removable fifth motor/winch assembly. This assembly will provide additional hoist capacity for any platform corner raising an outboard F-1 engine.

The motor/winch assemblies are supported by several special equipments. These equipments and their functions are as follows:

a. The Relay Distributor (room 2-A) provides control logic and power to the motors and control system. This distributor uses direct cabling from the distributor to the motors and control elements. It is shown in figure 3-59.

b. The Deck Distributor (figure 3-60) located inside motor/winch housing "D" provides the means for connecting the platform controller to the system.

c. The Platform Controller, which is connected to the system via the deck distributor, provides on-off, speed, and direction control of the motors. The motors may be controlled either individually or all together. See figures 3-61 and 3-62.

d. The Platform Distributor routes interlock signals and distributes power to various platform locations.

e. The Level Sensor (figure 3-60) detects tilt of the platform and sends this information to the platform controller via the platform and deck distributors. The information is monitored by the operator for manual corrections.

f. A maximum-height interlock and cable-loading indicators are incorporated into the overall system. All exposed equipment is designed for protection against explosions and RFI.

Finally, it should be noted that the Platform Distributor, the Level Sensor, the maximum-height interlock, and the cable-loading indicators are not used on the Mobile Launcher Level Servicing Platform. This platform is positioned by an operator using the platform controller without signals from the platform itself.

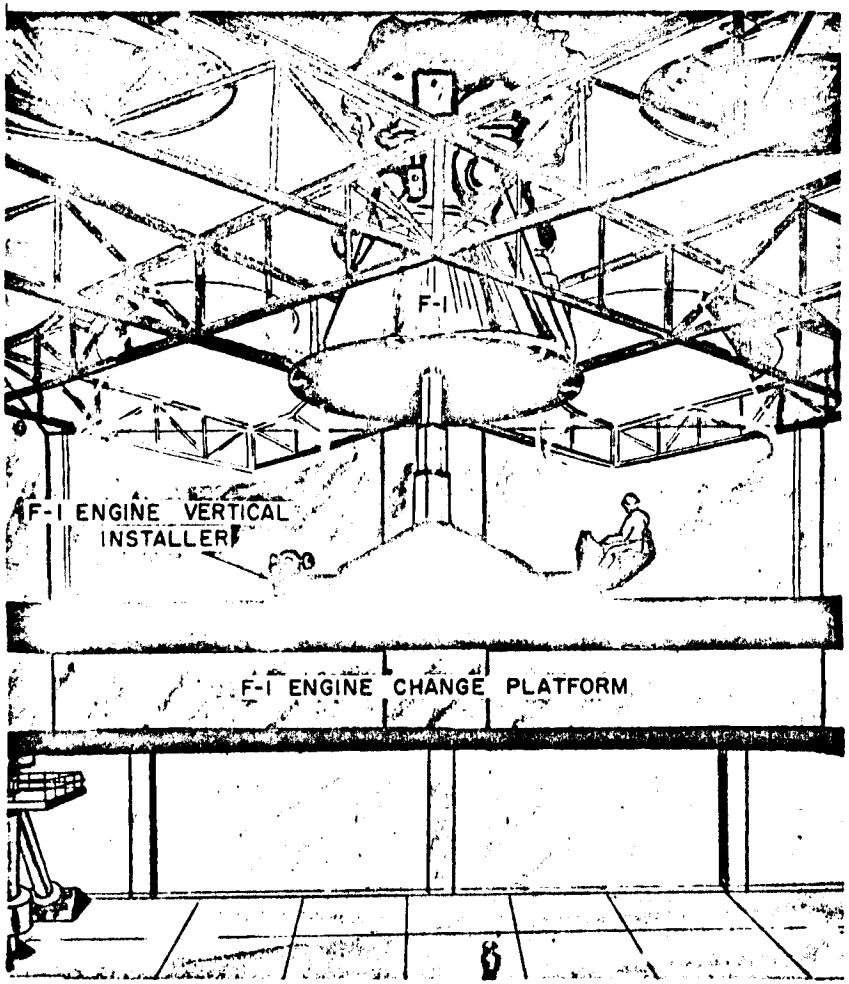


Figure 3-57 F-1 Engine Change

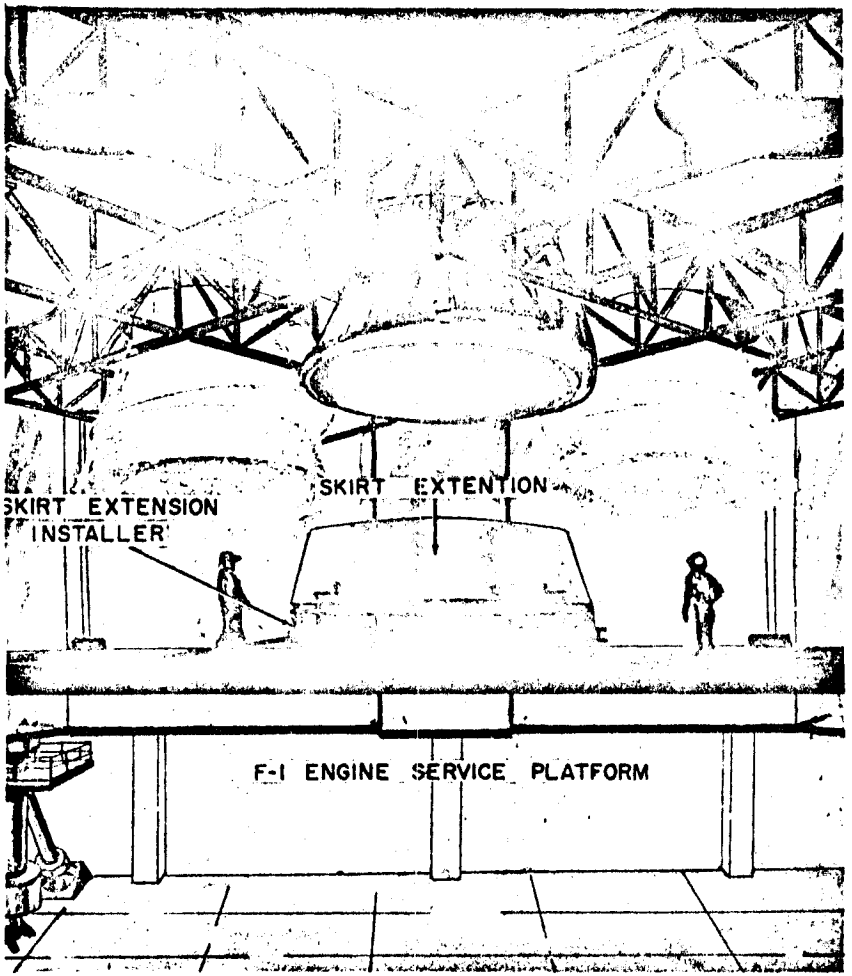


Figure 3-58 F-1 Engine Skirt Installation

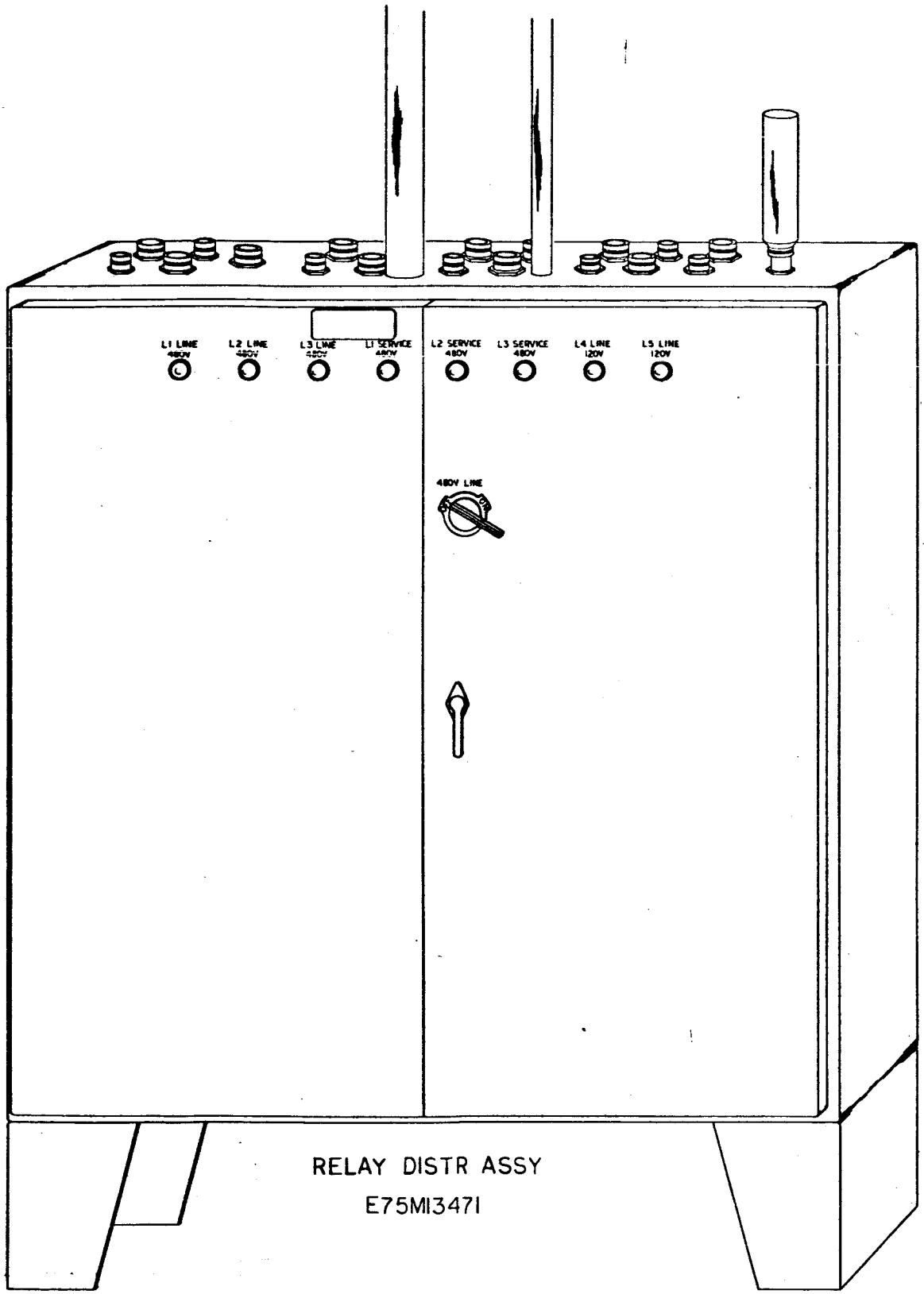


Figure 3-59 Relay Distributor, S-IC Engine Platforms Subsystem

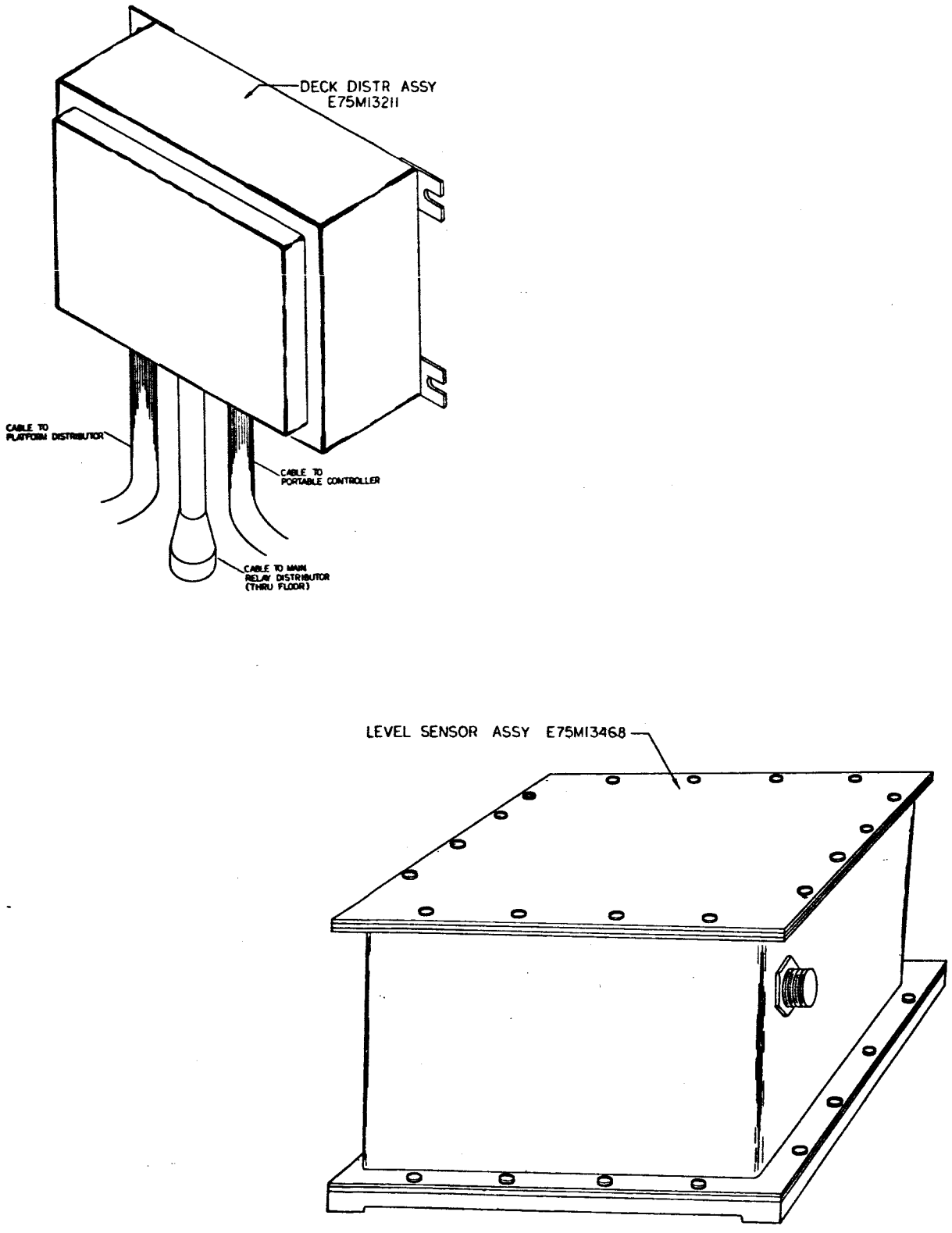


Figure 3-60 Electrical Equipment, S-IC Engine Platforms Subsystem

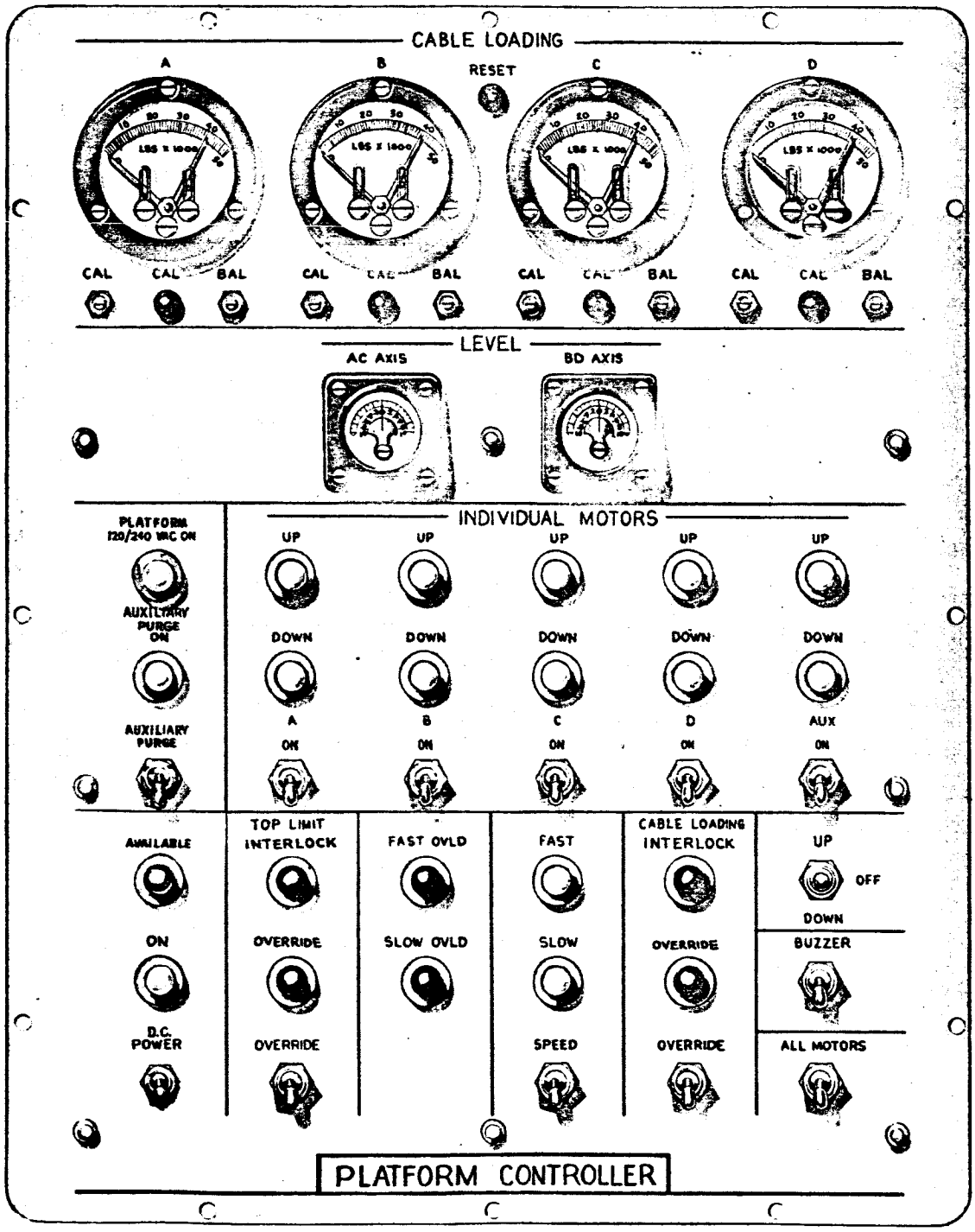


Figure 3-61 S-IC Engine Servicing Platform Controller E75M13570

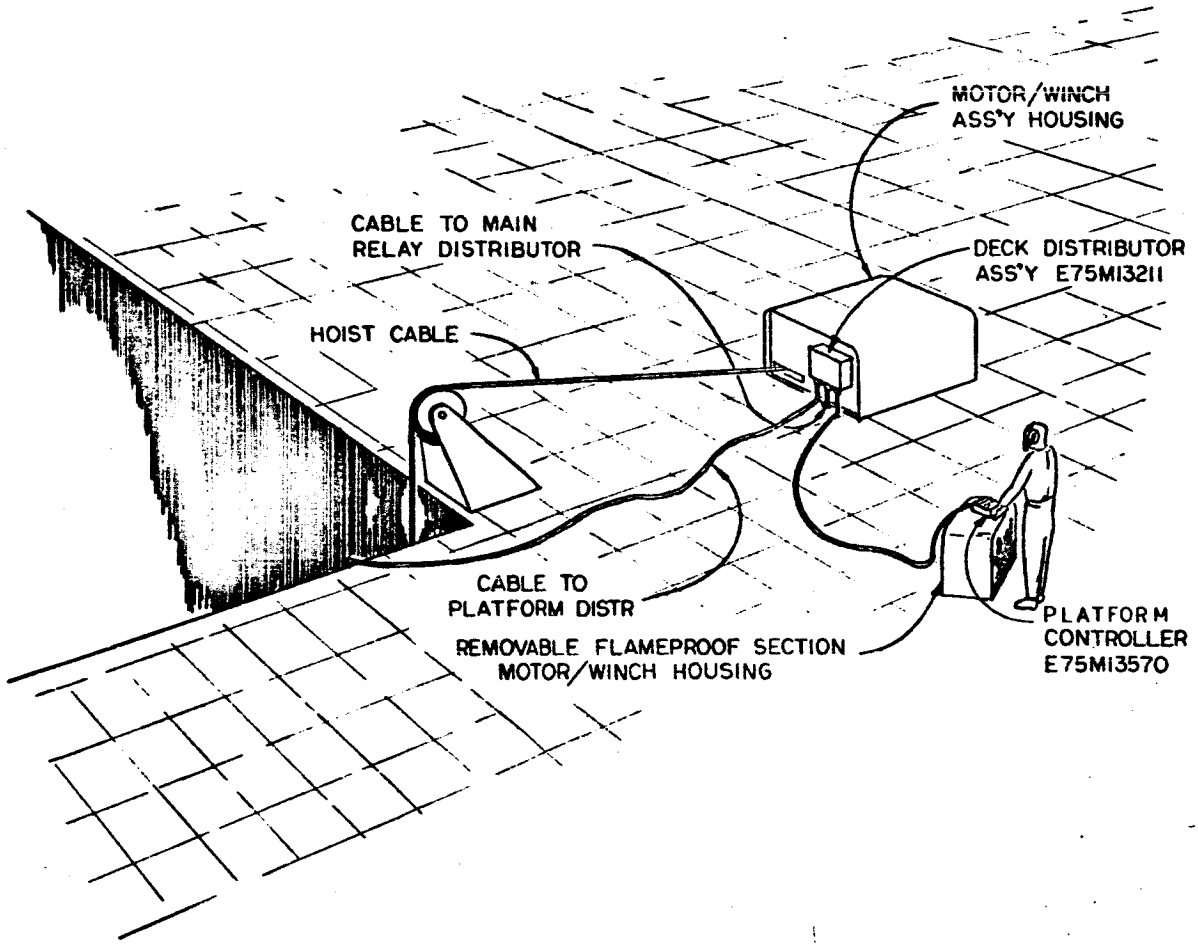


Figure 3-62 Typical Installation, Platform Controller

3-51. PLATFORM TRANSPORTER SUBSYSTEM.

3-52. Purpose of the Platform Transporter Subsystem. This equipment controls movement of the F-1 engine servicing platform transporter on the launch pad.

3-53. Electrical Equipment Employed. The following electrical equipment is included in the transporter subsystem:

a. Electric Motors (4)

b. Distribution Boxes (4)

c. Portable Controllers (2)

3-54. Description of the Subsystem. The Platform Transporter is a rail-borne carriage which positions the F-1 Engine Servicing Platform under the Mobile Launcher. It rides just above the launch pad flame trench.

The transporter is pulled underneath the Mobile Launcher by a pair of winch assemblies (figure 3-63) at the north end of the platform transporter rails. These two winches normally operate simultaneously, with a balanced load. Load balance is achieved by use of a single cable which is strung continuously between the winches, through pulleys on the transporter. Both winches are controlled from a single portable controller.

A similar pair of winches at the south end of the rails withdraws the transporter from the Mobile Launcher.

A typical winch assembly is shown in figure 3-64. It is driven by a 3 phase, 480 volt, induction motor which is totally enclosed and fan-cooled.

The motor is controlled through a Nema type 4 distribution box equipped with a motor circuit switch, a starter contactor, a transformer for the contactor, and three overload elements.

The motor circuit switch is for quick make and break operation. It is manually operated by a handle on the front of the distributor.

The starter contactor is a Nema type 2 contactor for carrying 480 volt, 60 cycle power. Its magnetic coil is operated by 120 volts, 60 cycles and is readily accessible for quick change. Power for the coil is provided by a stepdown transformer mounted inside the contactor enclosure.

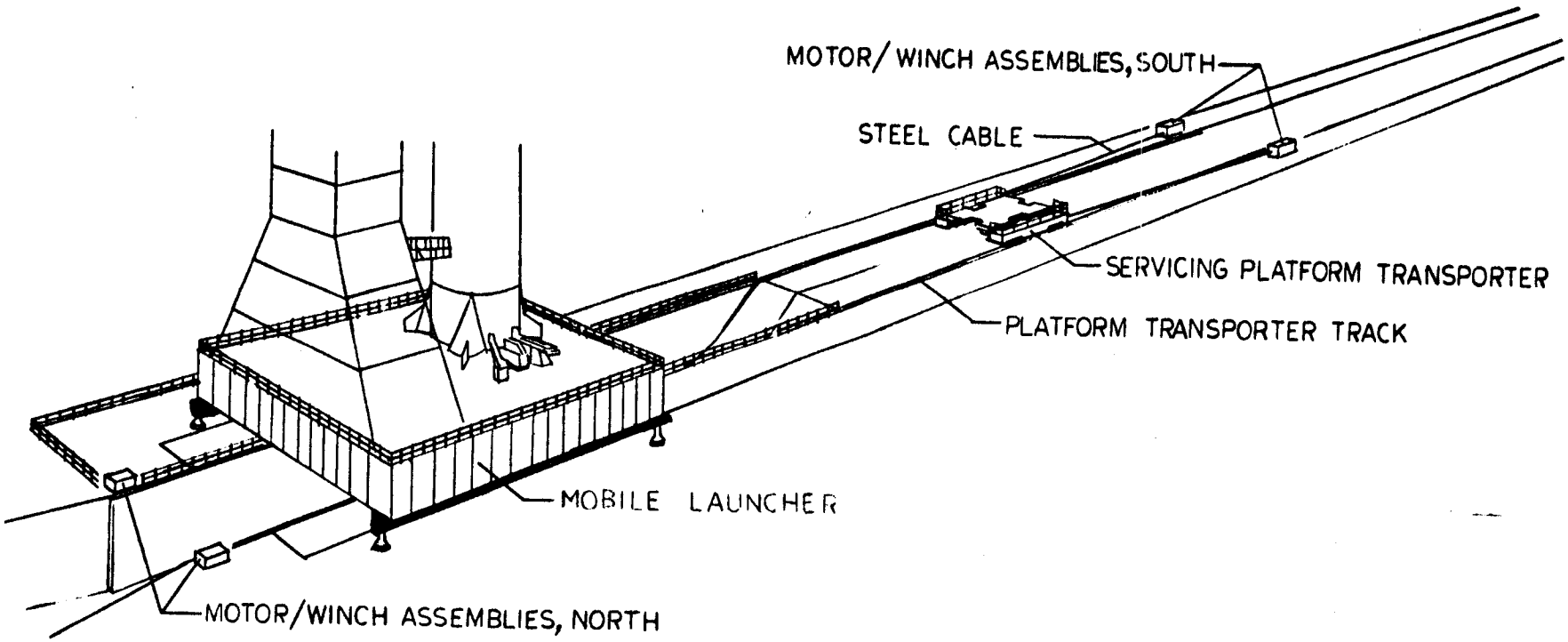


Figure 3-63 Servicing Platform Transporter Subsystem

Three overload elements in the distributor provide protection for the 3-phase motor. An overload on any line to the motor opens the starter contactor, thereby stopping the motor.

Control for the distributor box is provided by a portable controller, figure 3-64, which is capable of operating either of two winches individually or both simultaneously. One controller is used in conjunction with the north winches and another with the south winches. Each controller is encased in heavy-duty watertight stainless steel and weighs about ten pounds. It has magnetic reed-type push-button switch and two hand-operated selector switches equipped with watertight caps. Each controller operates under 120 volt, 60 cps power with a minimum contact rating of 2.0 amperes.

On launch pad A, the control cable interconnecting the two north-end motor winch assemblies is suspended over the flame trench by a steel rope. On future launch pads this control cable is carried in conduit through the concrete pad structure. All other control cables and all power lines are permanently installed in embedded conduit.

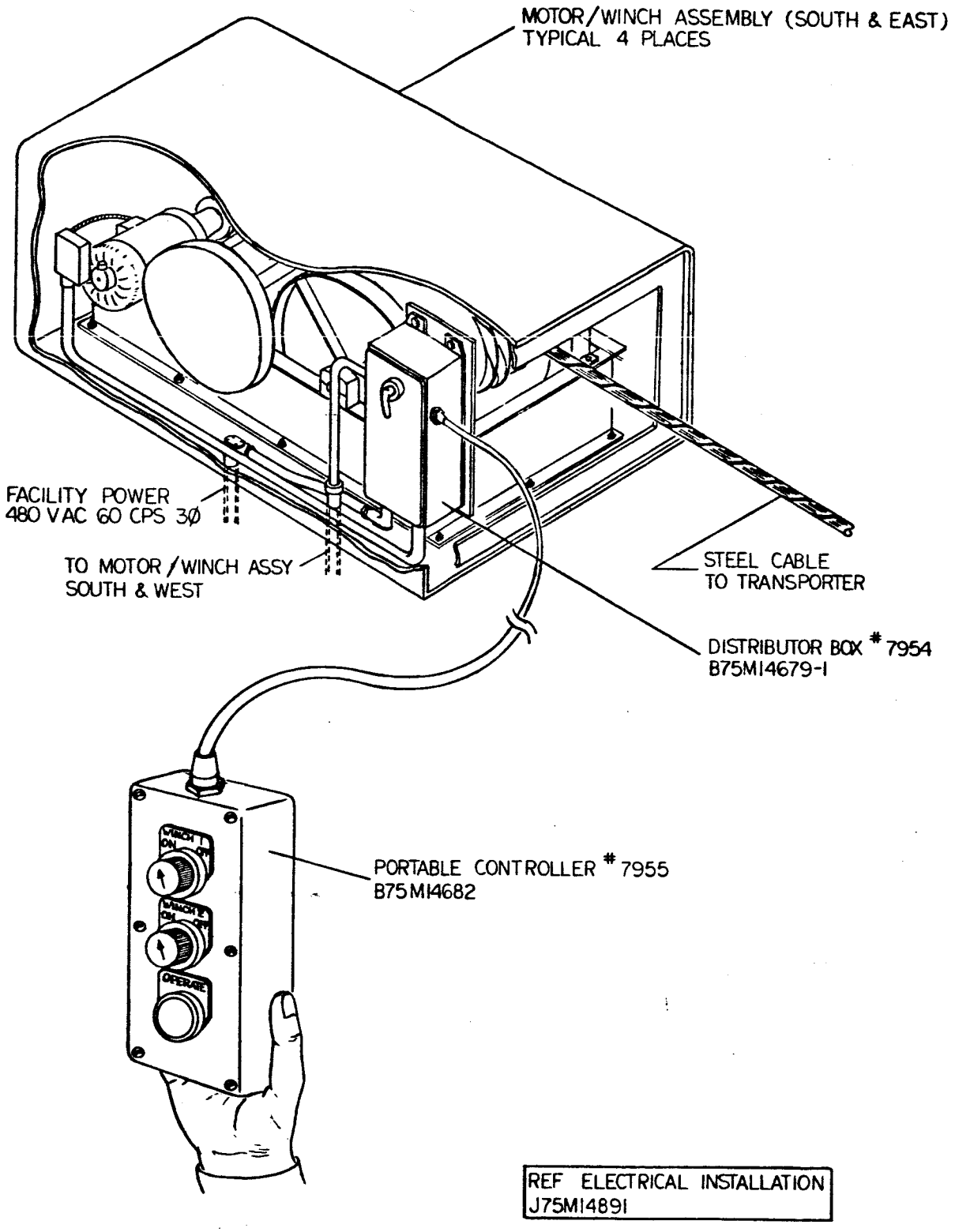


Figure 3-64 **Motor/Winch Assembly, Platform Transporter Subsystem**

3-55. S-II AND S-IVB ENGINE SERVICING PLATFORM SUBSYSTEM.

3-56. Purpose of the Subsystem. This subsystem provides electrical control for raising and lowering the S-II and S-IVB engine servicing platform.

3-57. Electrical Equipment for the Subsystem. The S-II and S-IVB Engine Servicing Platform Subsystem includes the following equipment:

a. Motor/winch assemblies 7204A1, A2, A3 and A4.

b. Electrical junction boxes 7205, 7206, 7207, and 7208.

c. Distribution box 7204.

d. Hand control unit 7204A5.

3-58. Description of the Subsystem. In the Vehicle Assembly Building, a special transporter (figure 3-65) is provided for Saturn V stages S-II and S-IVB. The vehicle stage is positioned on this transporter over a circular cutout. Personnel then gain access to the stage engines by means of a vertically movable platform, which is controlled by the electrical system herein called the S-II and S-IVB Engine Servicing Platform Subsystem.

The platform is raised and lowered by four winches, figure 3-66. Each winch is driven by one squirrel-cage induction motor which is totally enclosed and fan-cooled. This 3-horsepower motor is operated by 3 phase, 480 volt, 60 cps power. Full load current at 3500 rpm will not exceed 4.5 amperes. It is equipped with one 480 volt single-phase space heater that is capable of maintaining motor temperature at 5 to 8 degrees above ambient. Limit switches are provided to override motor operation when reel-in or reel-out limits are reached.

The electrical junction box attached to each motor/winch assembly has a Nema type 4 watertight enclosure. It is equipped with three overload elements (one for each phase) and a non-fused ac reversing starter. The starter is a commercial Nema size 0, open-type, with contacts for carrying 400 volts, 60 cycles. Its 120 volt, 60-cycle magnet coil is easily accessible for quick change.

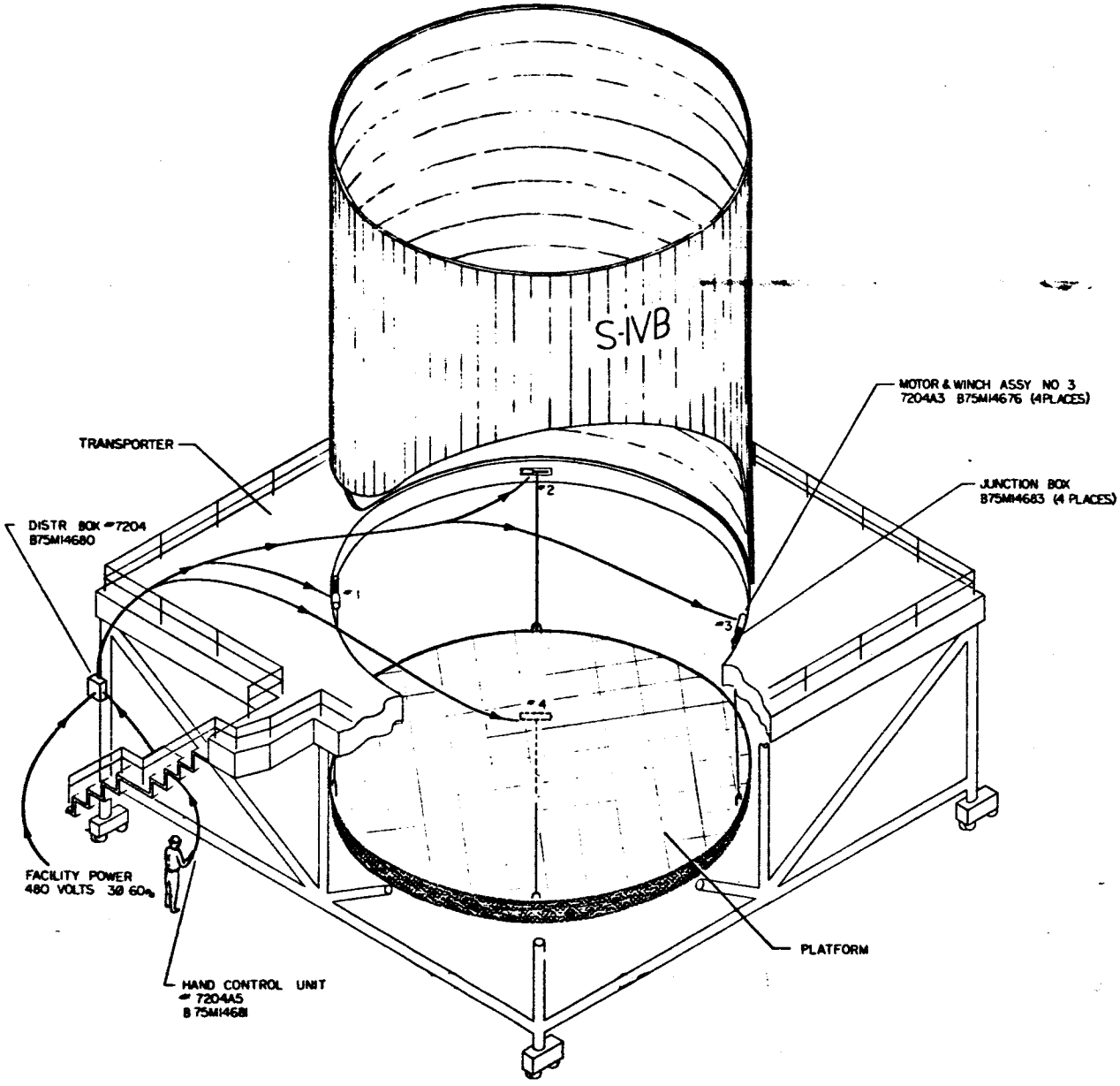


Figure 3-65 S-II and S-IVB Engine Servicing Platform Subsystem

Voltage for this coil is supplied by a step-down transformer in Distribution Box #7204. The 0.5 kva, single phase transformer receives 480 volt facility power and has two 115 volt outputs for the motor heaters and motor-starter coils. Distribution Box #7204, a Nema type 4 watertight enclosure, also has terminal blocks for distributing power to the transformer, motors, and hand control unit.

Operation of the four winches is actuated and controlled by means of hand control unit No. 7204A5. This unit has a separate select switch for each winch so that any combination of switches can be operated simultaneously. REEL-IN and REEL-OUT commands are actuated by pushbutton switches. All switches are magnetic reed type. The unit weighs approximately 10 pounds. See figure 3-66.

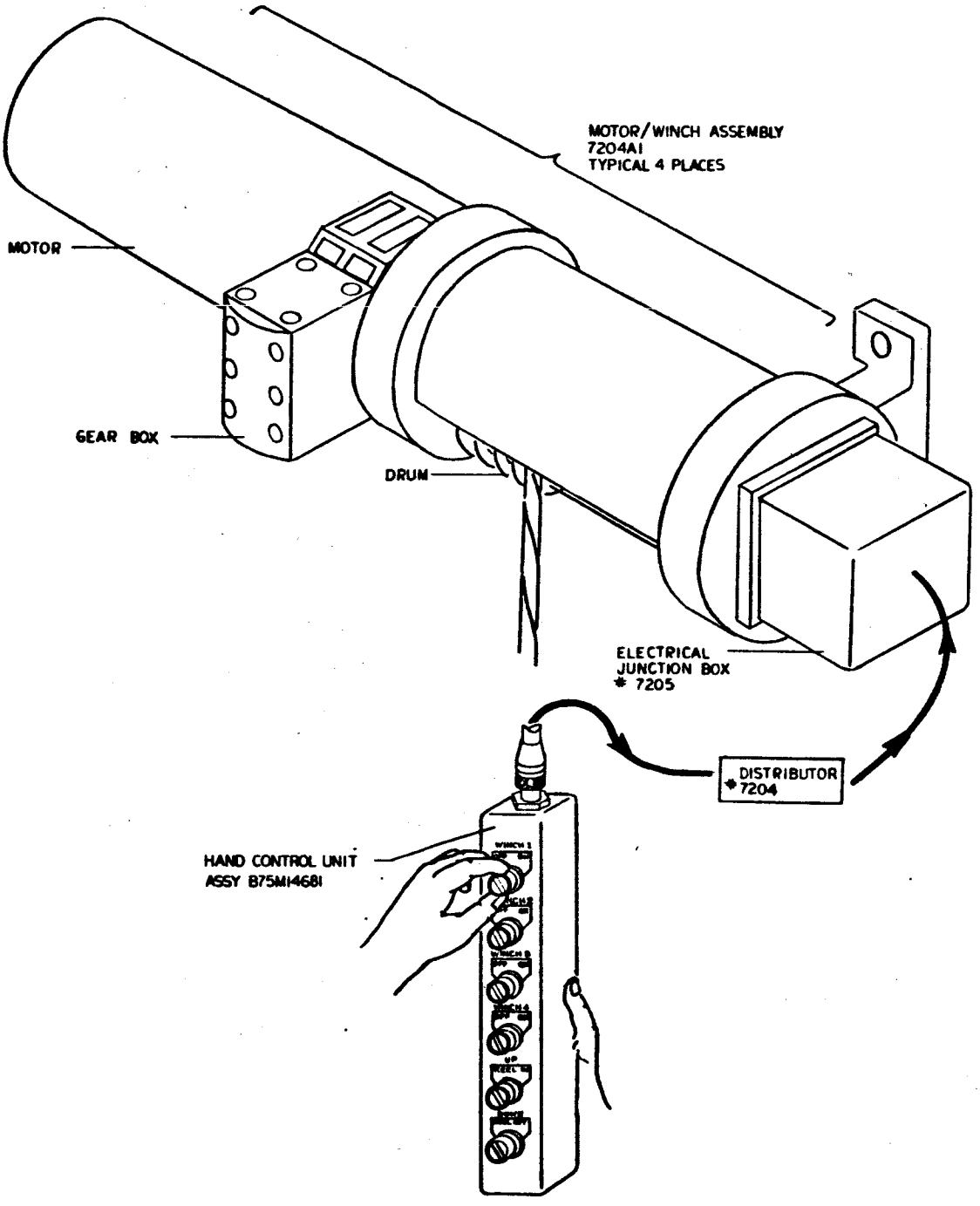


Figure 3-66 Motor/Winch Assembly B75M14676

3-59. LAUNCH EQUIPMENT CONTROL AREA, LCC

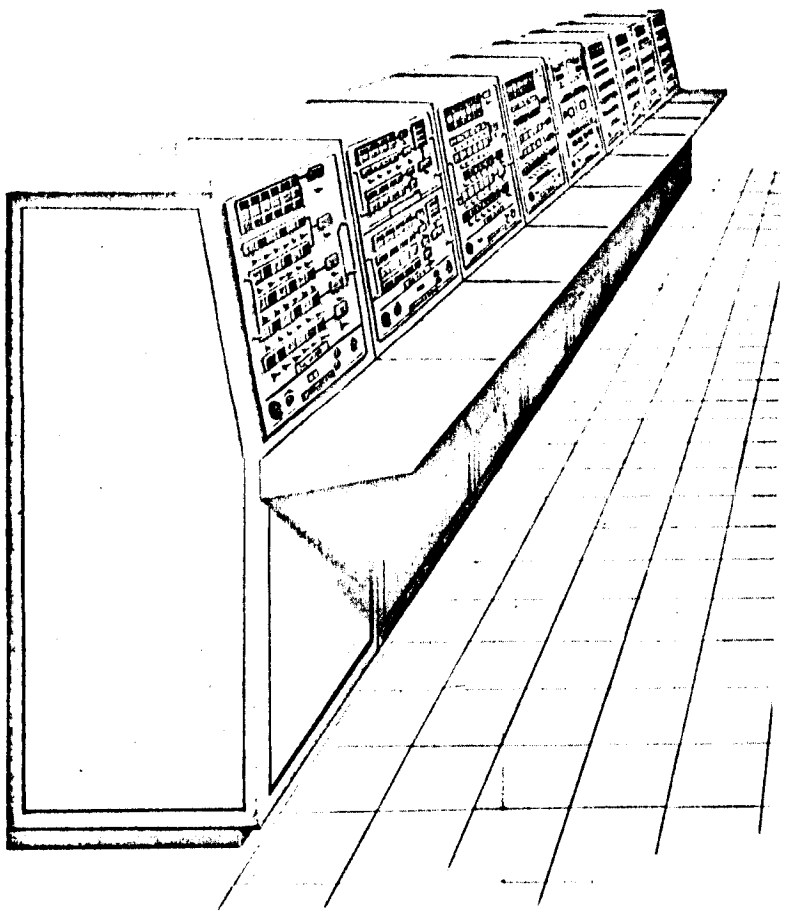
In the Launch Control Center sixteen consoles (figure 3-67) are assigned for control, test, and monitor of eight of the twelve ESE subsystems. These eight subsystems and their corresponding control panels are:

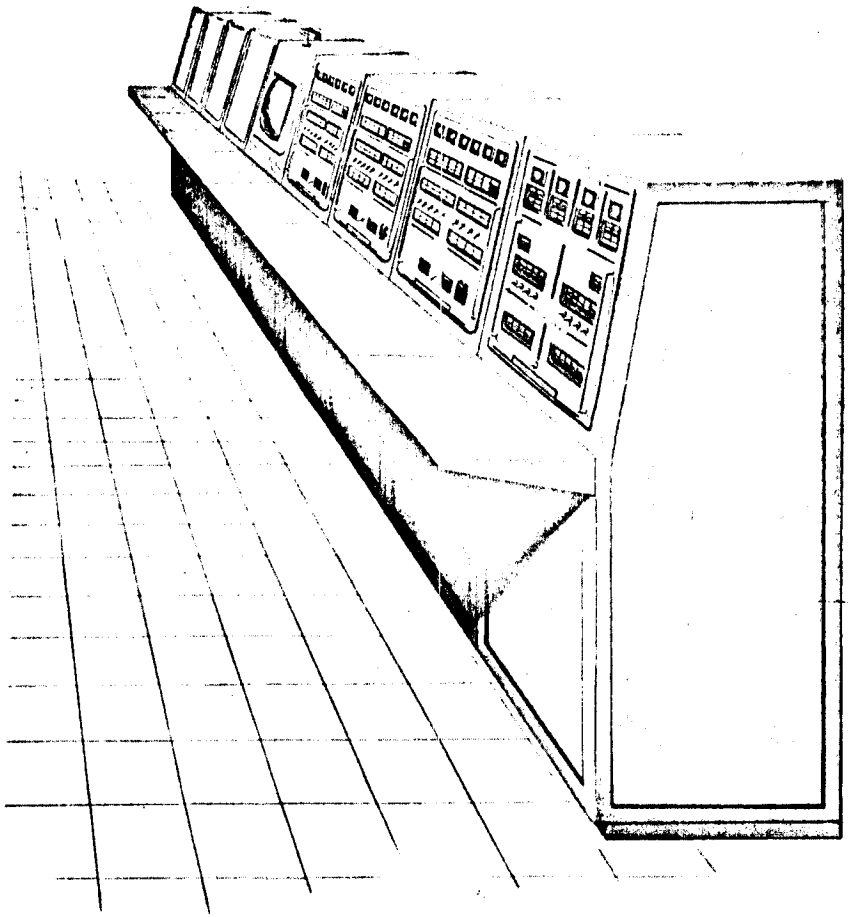
a. Service Arms Subsystem	S-IC Intertank thru Service Module (eight panels).
b. Apollo Access Arm Subsystem	Command Module
c. Pneumatic Control and Distribution Subsystem	Q-Ball and Pneumatic Distribution
d. Q-Ball Cover Removal Subsystem	Q-Ball and Pneumatic Distribution
e. Hydraulic Charging Unit Subsystem	Hydraulic Charging Unit
f. Tail Service Masts Subsystem	TSM 1-2, TSM 3-2, TSM 3-4
g. Launch Equipment Firing Circuits Subsystem	Holddown Arms & Purge Valves and Service Arm Control Switches
h. ESE Power Subsystem	Launch Equipment Power Panel (Astrionics)

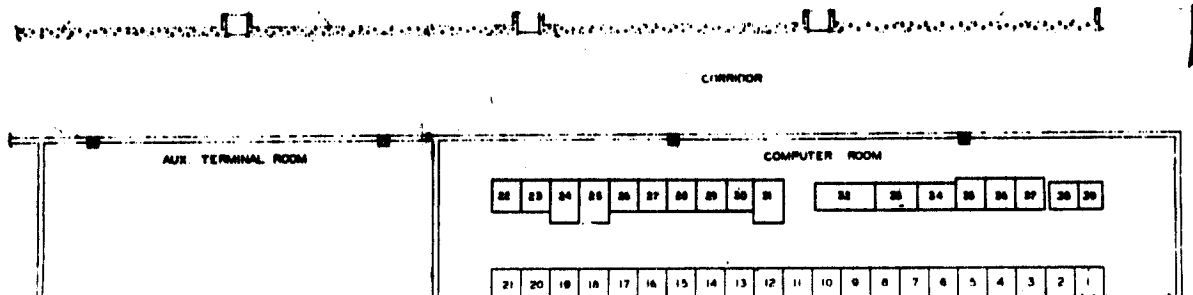
The Status Panel provides monitoring for the eight Service Arms, the Command Module, Pneumatic Distribution, the Hydraulic Charging Unit, the three Tail Service Masts, the Holddown Arms and the Service Arm Control Switches.

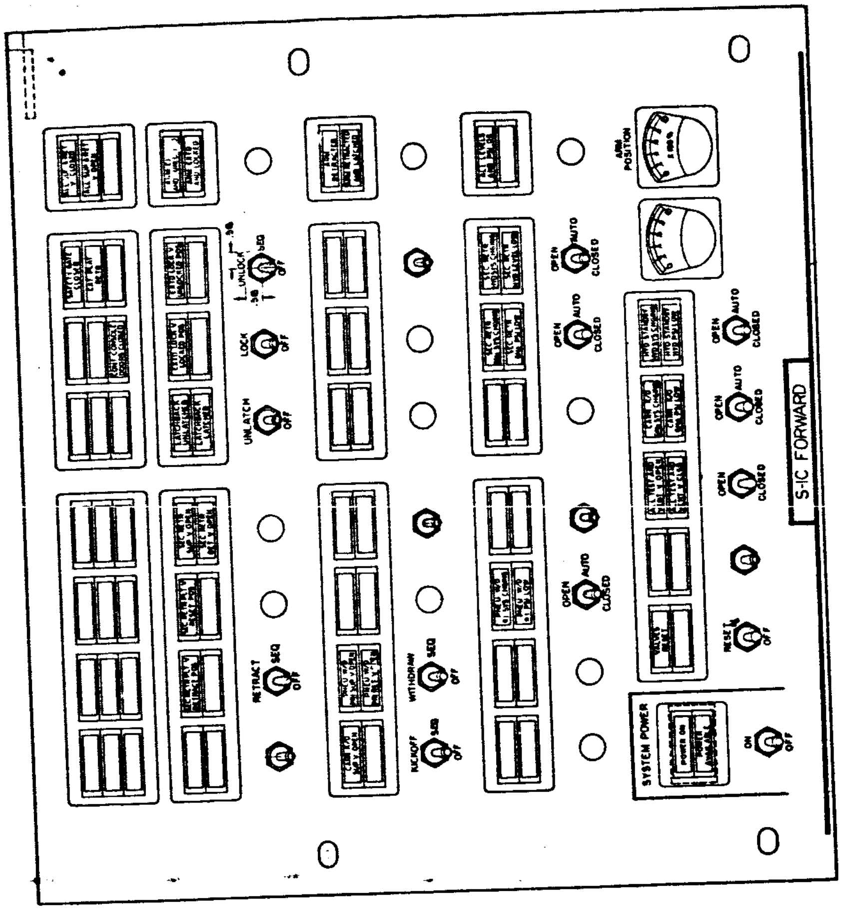
Control, test, and monitor signals for these subsystems are transmitted between the LCC and Mobile Launcher via the DDAS, Mobile Launcher/LCC computers, and hardwire installations.

The basic enclosure for these LCC consoles is described in paragraph 4-102.






CORRIDOR
AUX. TERMINAL ROOM
COMPUTER ROOM



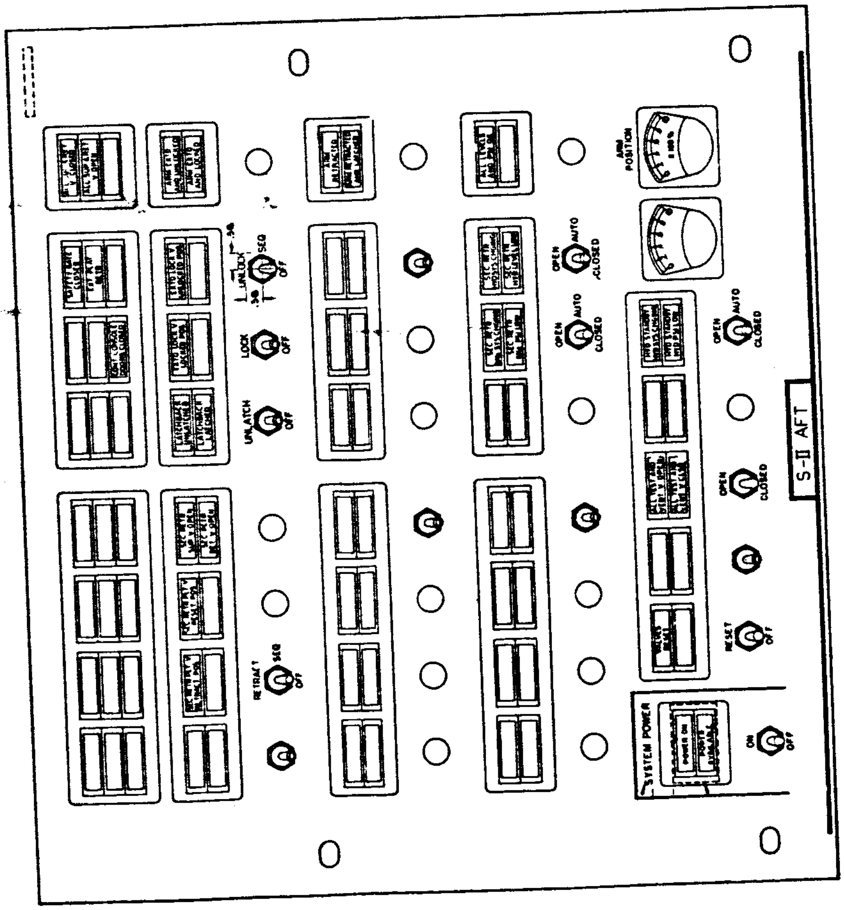
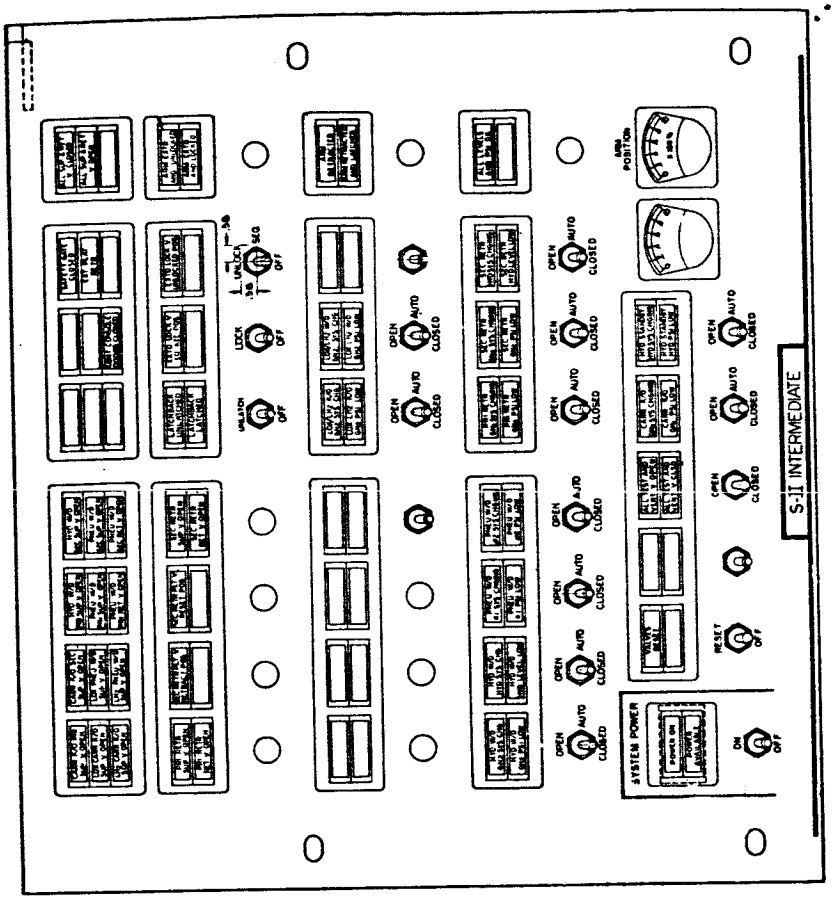


Figure 3-67 Launch Equipment Control Area, LCC (C



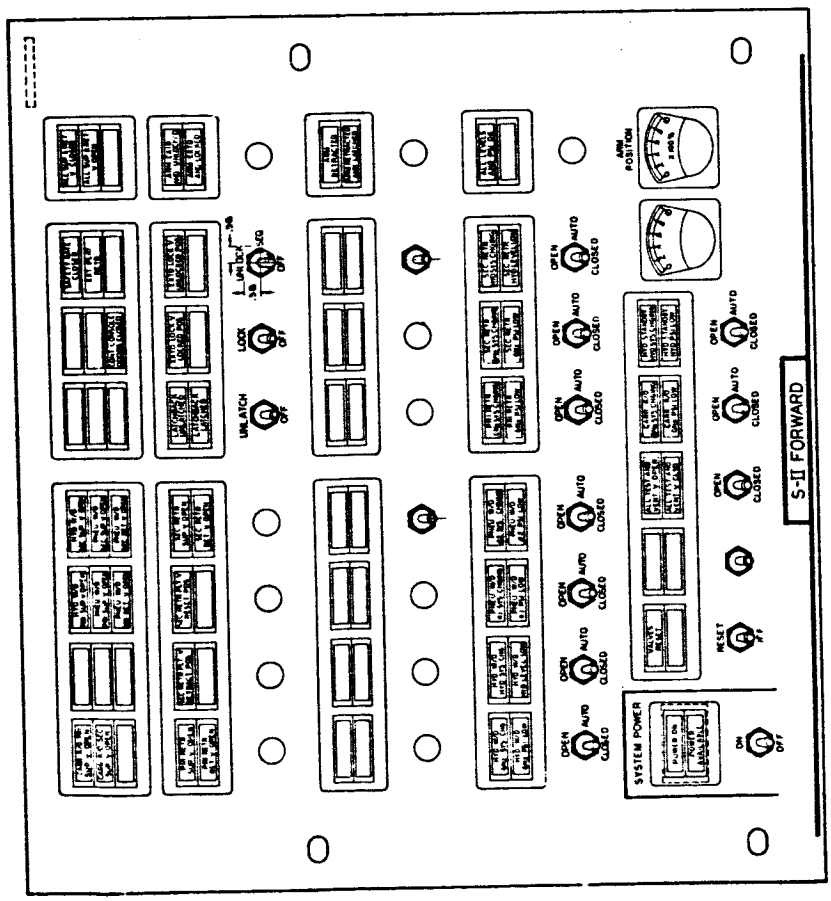
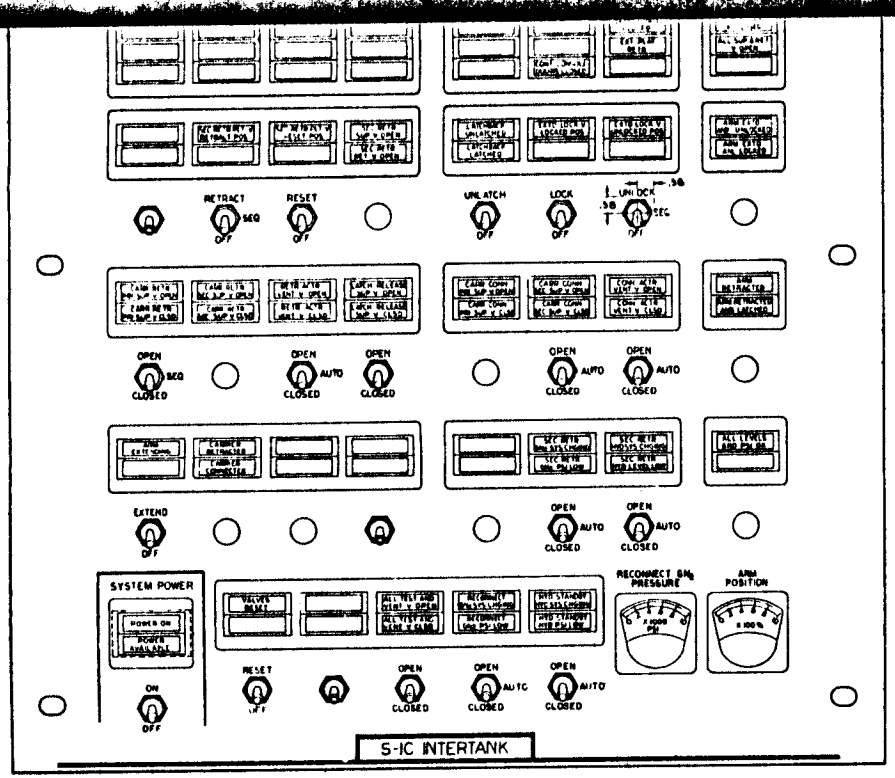
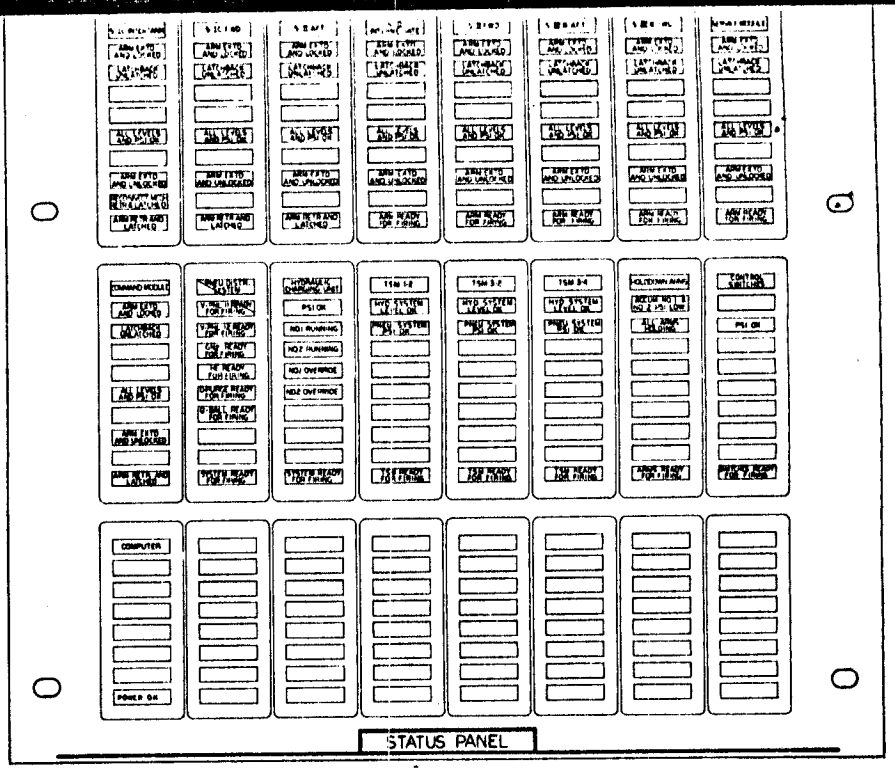


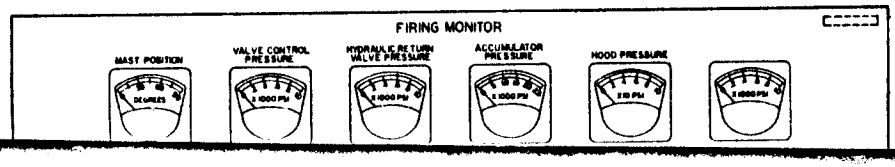
Figure 3-67 **Launch Equipment Control Area, LCC**

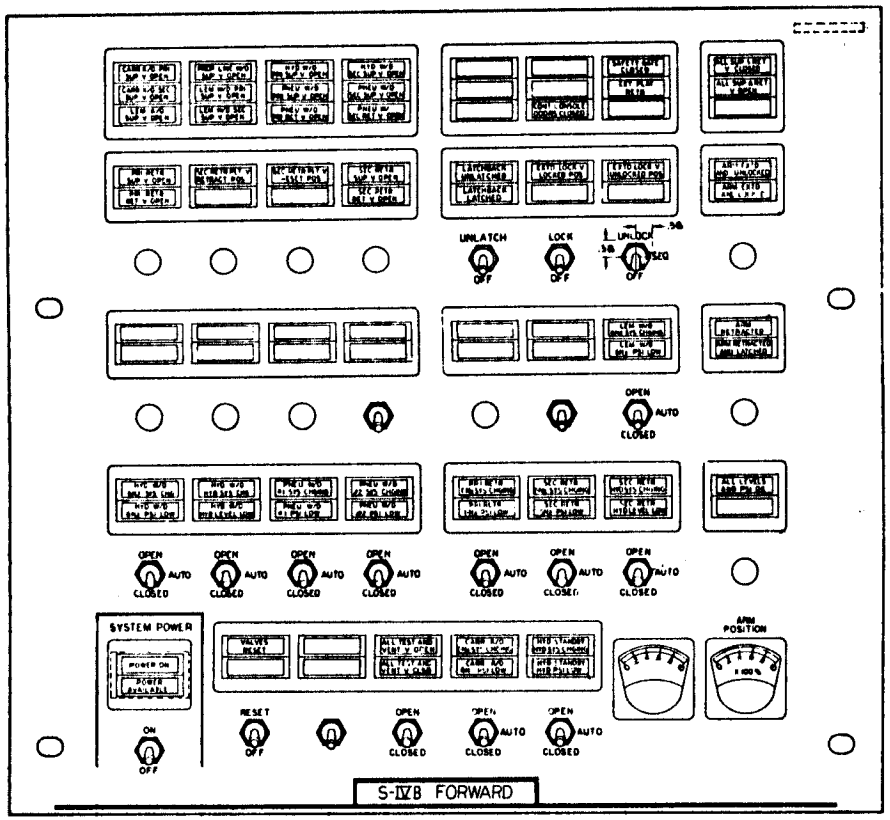
ontinued)

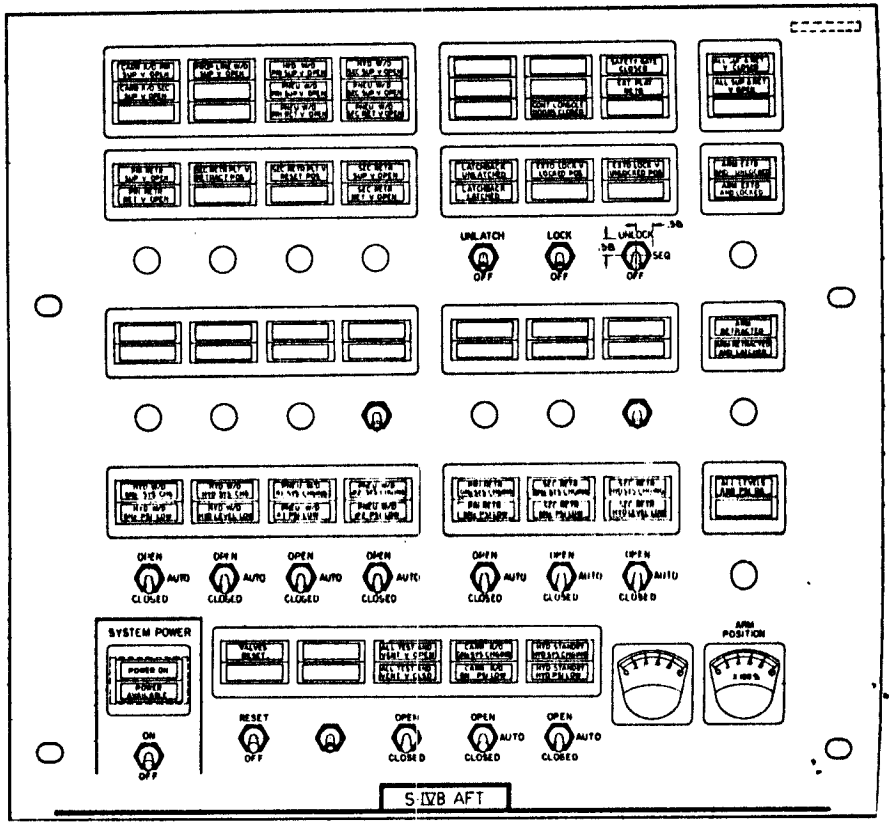
3-90-2



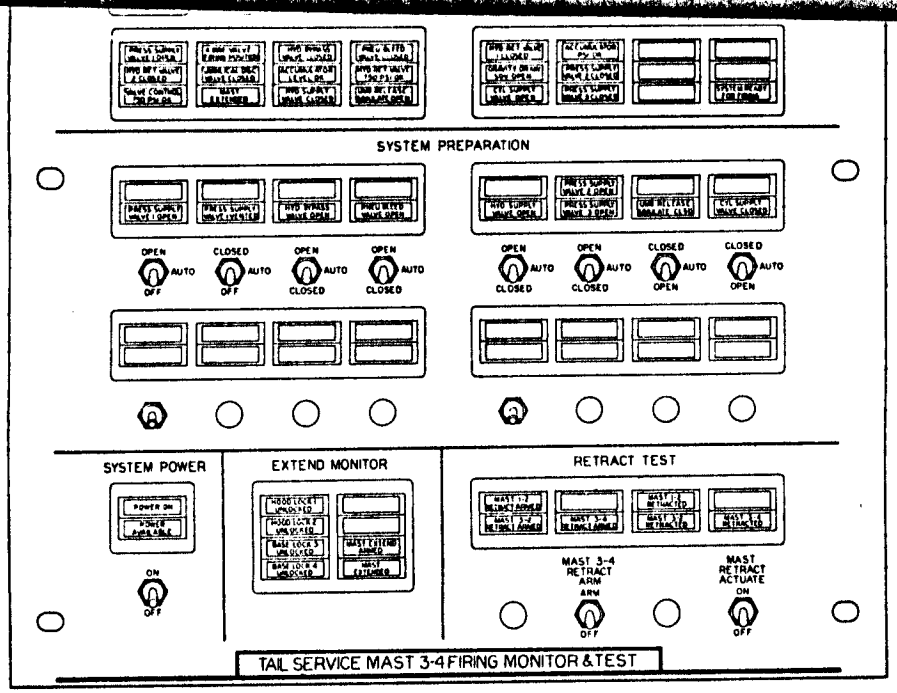


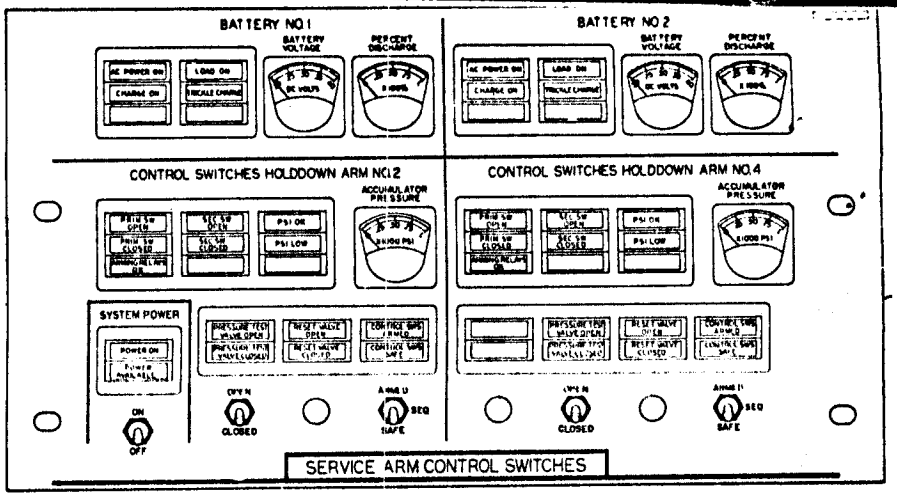


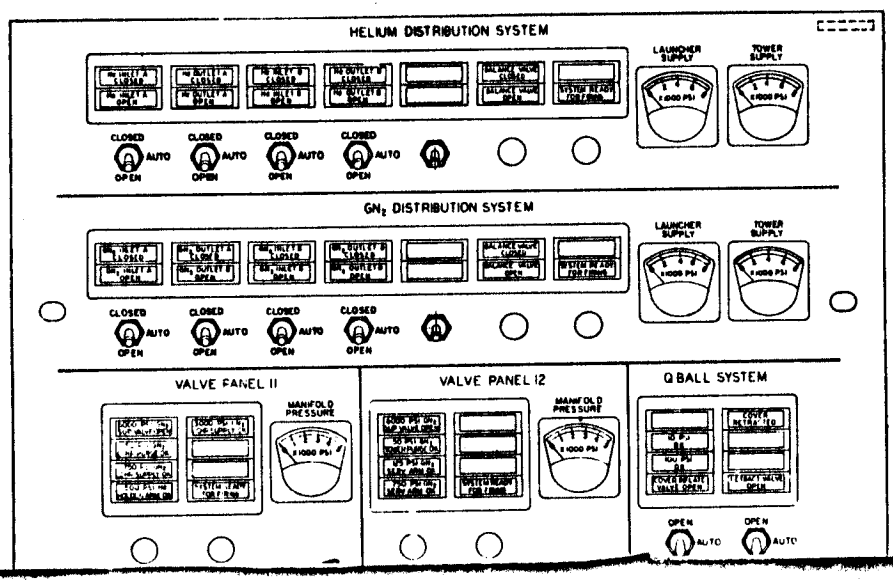

SYSTEM POWER
POWER ON
POWER
ON
OFF
VALVES RESET
RESET
OFF
ARM POSITION
UNLATCH
LOCK
UNLOCK
SEQ
OPEN
AUTO
CLOSED
S-IVB FORWARD

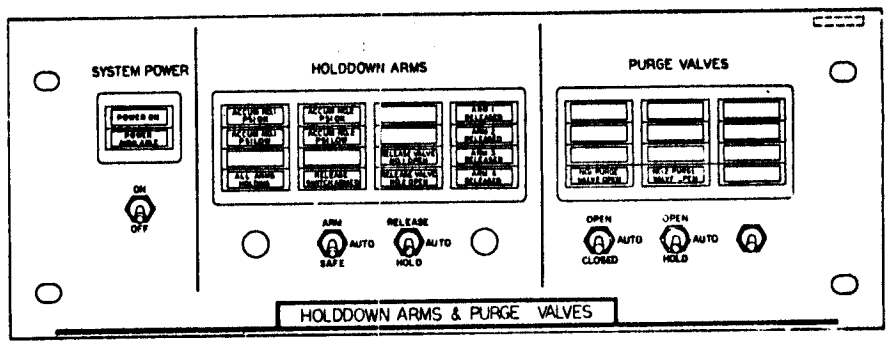

SYSTEM POWER
POWER ON
POWER
ON
OFF
VALVES RESET
RESET
OFF
ARM POSITION
UNLATCH
LOCK
UNLOCK
SEQ
OPEN
AUTO
CLOSED
S-IVB AFT

4-SA-2

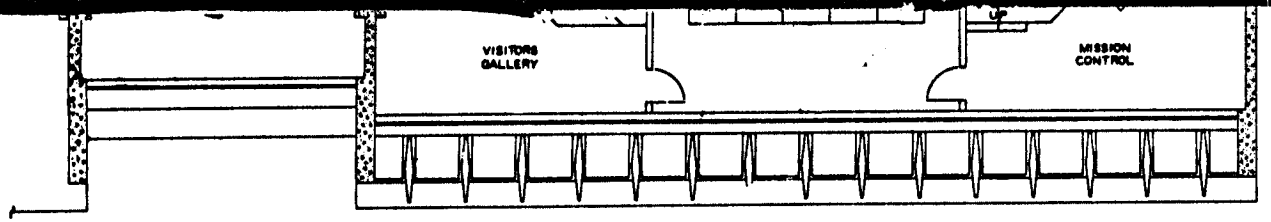

SYSTEM PREPARATION
SYSTEM POWER
EXTEND MONITOR
RETRACT TEST
MAST 3-4 RETRACT ARM
MAST RETRACT ACTUATE
TAIL SERVICE MAST 3-4 FIRING MONITOR & TEST


BATTERY NO.1
BATTERY NO.2
BATTERY VOLTAGE
PERCENT DISCHARGE
CONTROL SWITCHES HOLDDOWN ARM NO.2
CONTROL SWITCHES HOLDDOWN ARM NO.4
ACCUMULATOR PRESSURE
SYSTEM POWER
SERVICE ARM CONTROL SWITCHES

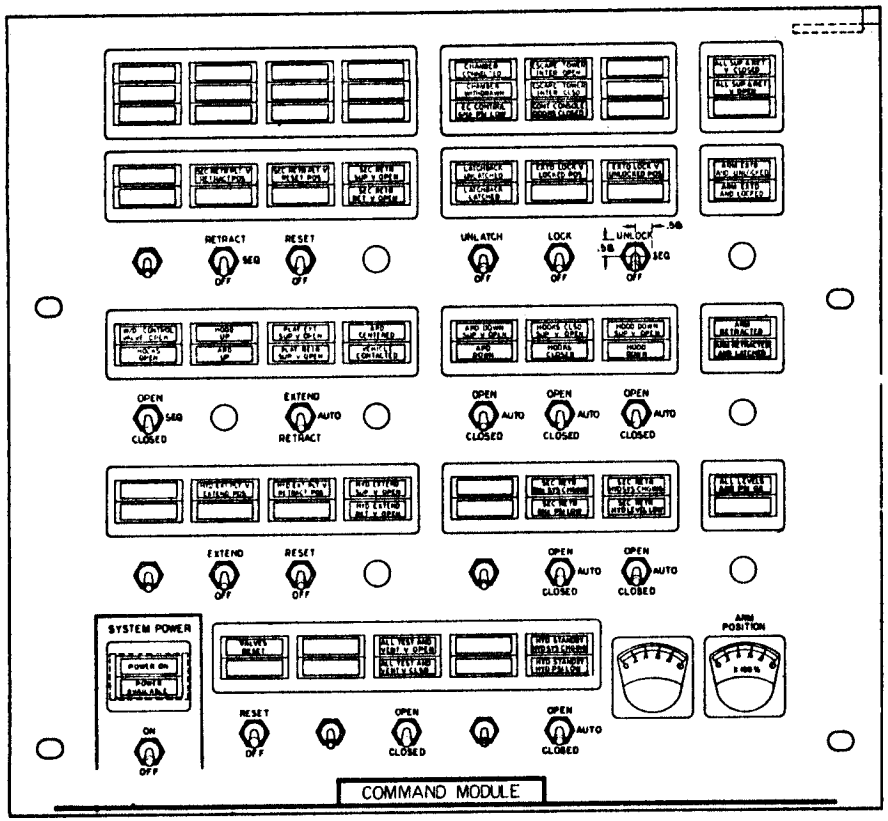

HELIUM DISTRIBUTION SYSTEM
LAUNCHER SUPPLY
TOWER SUPPLY
GN2 DISTRIBUTION SYSTEM
VALVE PANEL I1
VALVE PANEL I2
MANIFOLD PRESSURE
Q BALL SYSTEM

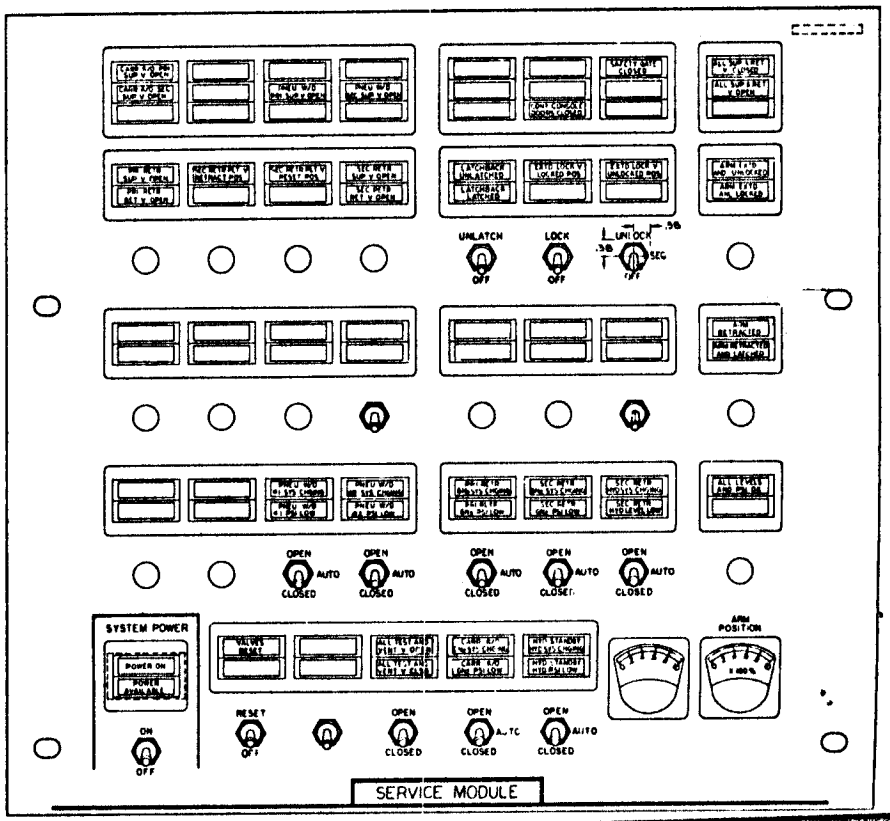

SYSTEM POWER
HOLDDOWN ARMS
PURGE VALVES
HOLDDOWN ARMS & PURGE VALVES

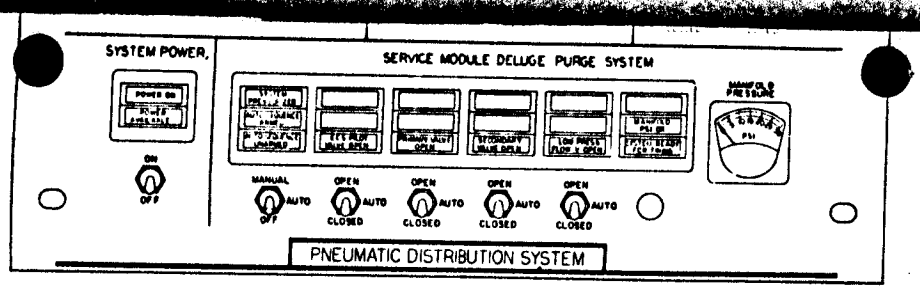

UNIT NO.1
UNIT NO.2
HYD PRESSURE

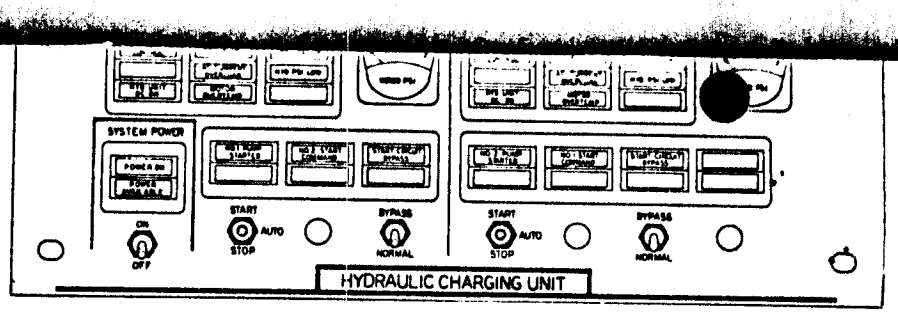


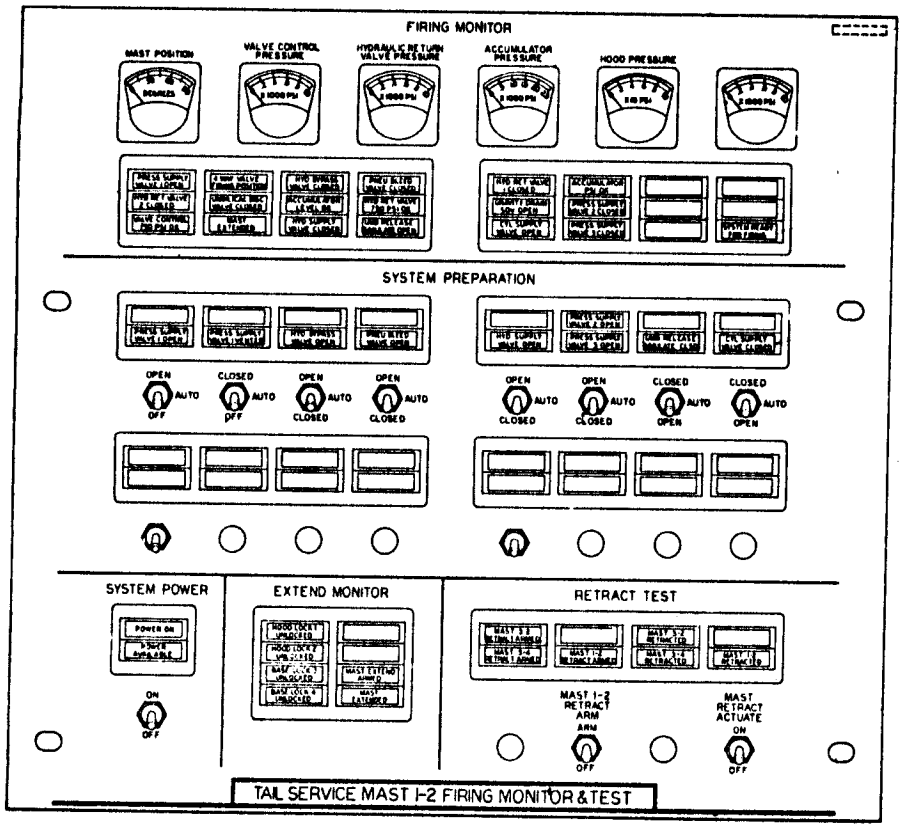
FIRING ROOM NO.1
LAUNCH CONTROL CENTER LC-39

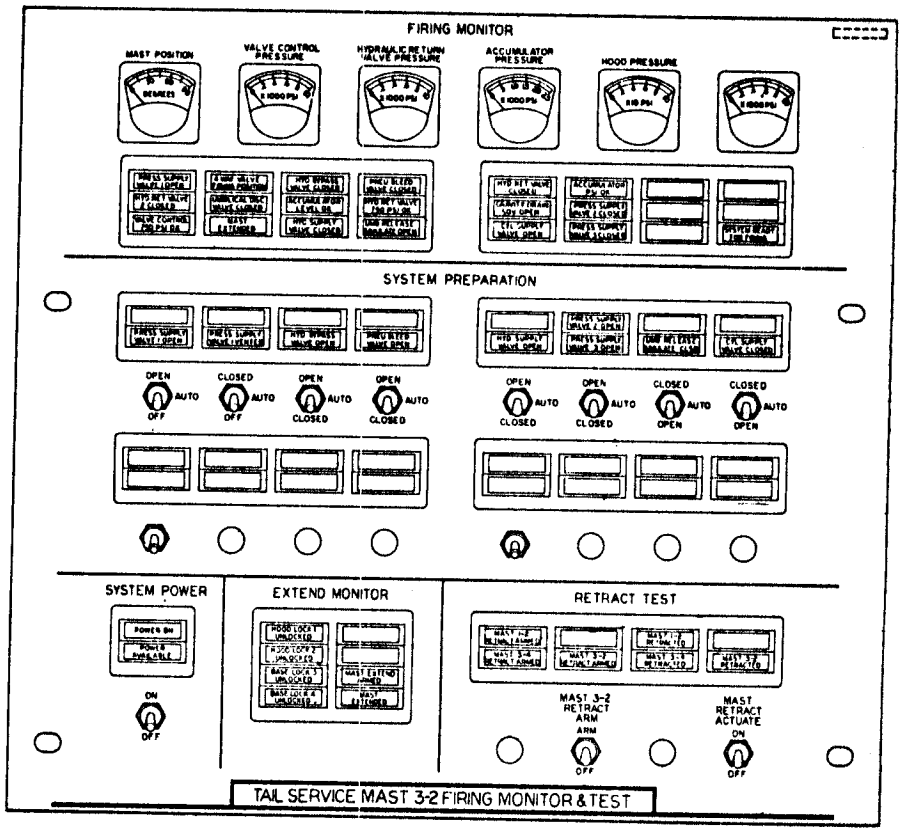




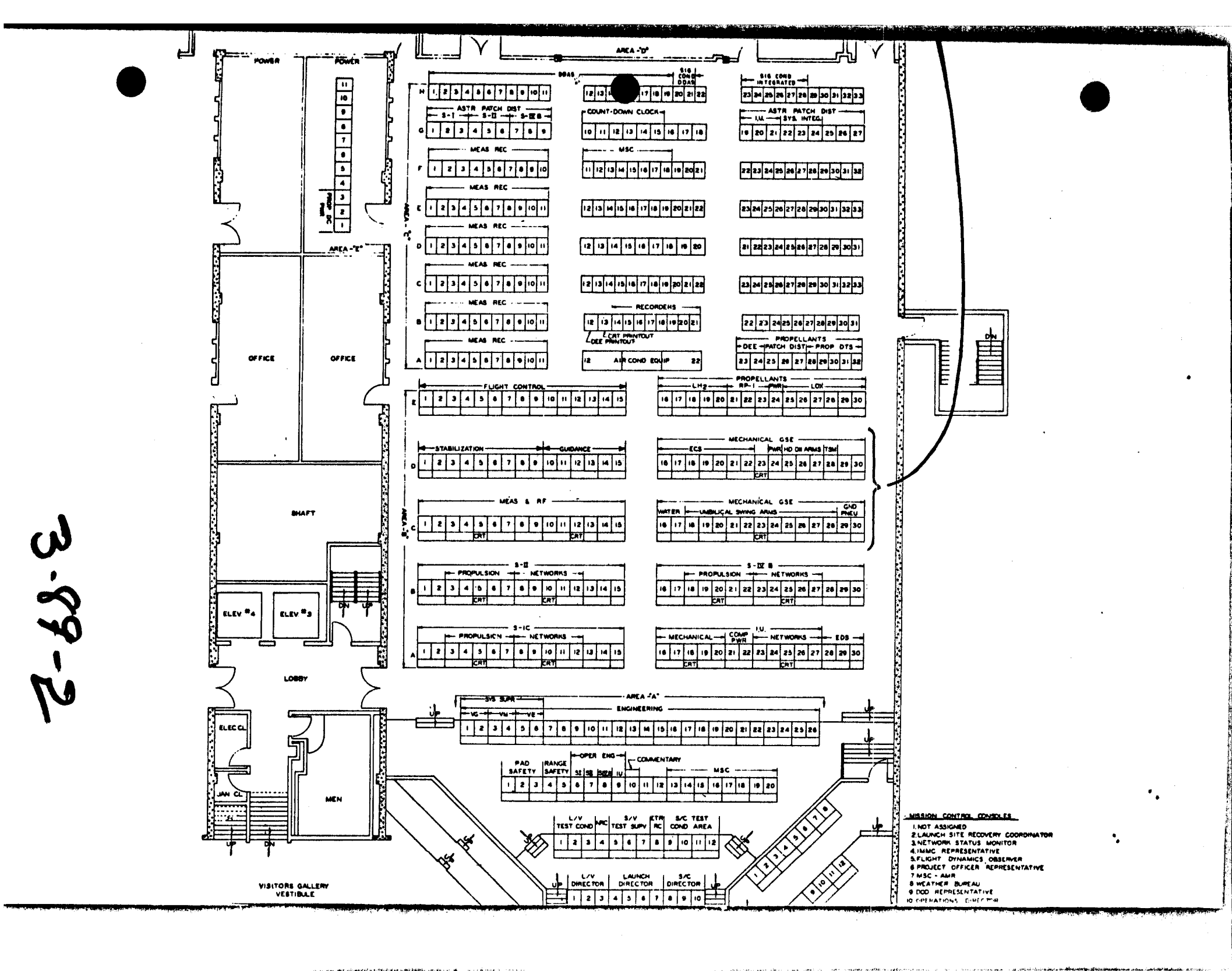

SYSTEM POWER
SERVICE MODULE DELUGE PURGE SYSTEM
PNEUMATIC DISTRIBUTION SYSTEM


SYSTEM POWER
START
BYPASS
HYDRAULIC CHARGING UNIT


FIRING MONITOR
MAST POSITION
VALVE CONTROL PRESSURE
HYDRAULIC RETURN VALVE PRESSURE
ACCUMULATOR PRESSURE
HOOD PRESSURE
SYSTEM PREPARATION
SYSTEM POWER
EXTEND MONITOR
RETRACT TEST
MAST 1-2 RETRACT ARM
MAST RETRACT ACTUATE
TAIL SERVICE MAST 1-2 FIRING MONITOR & TEST


FIRING MONITOR
MAST POSITION
VALVE CONTROL PRESSURE
HYDRAULIC RETURN VALVE PRESSURE
ACCUMULATOR PRESSURE
HOOD PRESSURE
SYSTEM PREPARATION
SYSTEM POWER
EXTEND MONITOR
RETRACT TEST
MAST 3-2 RETRACT ARM
MAST RETRACT ACTUATE
TAIL SERVICE MAST 3-2 FIRING MONITOR & TEST

3-80-4


POWER
POWER
AREA "D"
AREA "E"
OFFICE
OFFICE
SHAFT
ELEV #4
ELEV #3
DN
UP
LOBBY
ELEC CL
JAN CL
MEN
UP
DN
VISITORS GALLERY
VESTIBULE
DDAS
SIG COND DDAS
SIG COND INTEGRATED
ASTR PATCH DIST
S-I
S-II
S-IV B
COUNT-DOWN CLOCK
I.U.
SYS. INTEG.
MEAS REC
MSC
RECORDERS
E.CRT PRINTOUT
DEE PRINTOUT
AIR COND EQUIP
PROPELLANTS
DEE
PATCH DIST
PROP DTS
FLIGHT CONTROL
PROPELLANTS
LH2
RP-1
PWR
LOX
STABILIZATION
GUIDANCE
MECHANICAL GSE
ECS
PWR
HD DR ARMS
TSM
MEAS & RF
MECHANICAL GSE
WATER
UMBILICAL SWING ARMS
GND PNEU
S-II
PROPULSION
NETWORKS
S-IV B
PROPULSION
NETWORKS
S-IC
PROPULSION
NETWORKS
I.U.
MECHANICAL
COMP PWR
NETWORKS
EDS
CRT
AREA "A"
SYS SUPR
ENGINEERING
VG
VM
VE
PAD SAFETY
RANGE SAFETY
OPER ENG
S2
S2B
S4B
IU
COMMENTARY
MSC
L/V TEST COND
ARC
S/V TEST SUPV
ETR RC
S/C TEST COND AREA
L/V DIRECTOR
LAUNCH DIRECTOR
S/C DIRECTOR
UP
MISSION CONTROL CONSOLES
1. NOT ASSIGNED
2. LAUNCH SITE RECOVERY COORDINATOR
3. NETWORK STATUS MONITOR
4. IMMC REPRESENTATIVE
5. FLIGHT DYNAMICS OBSERVER
6. PROJECT OFFICER REPRESENTATIVE
7. MSC - AMR
8. WEATHER BUREAU
9. DOD REPRESENTATIVE
10. OPERATIONS DIRECTOR

2-89-2

SECTION IV

ESE STANDARD COMPONENTS

4-1. GENERAL.

The standard Launch Equipment Branch assemblies shown in figure 4-1 are individually delineated in paragraphs 4-2 through 4-116 following.

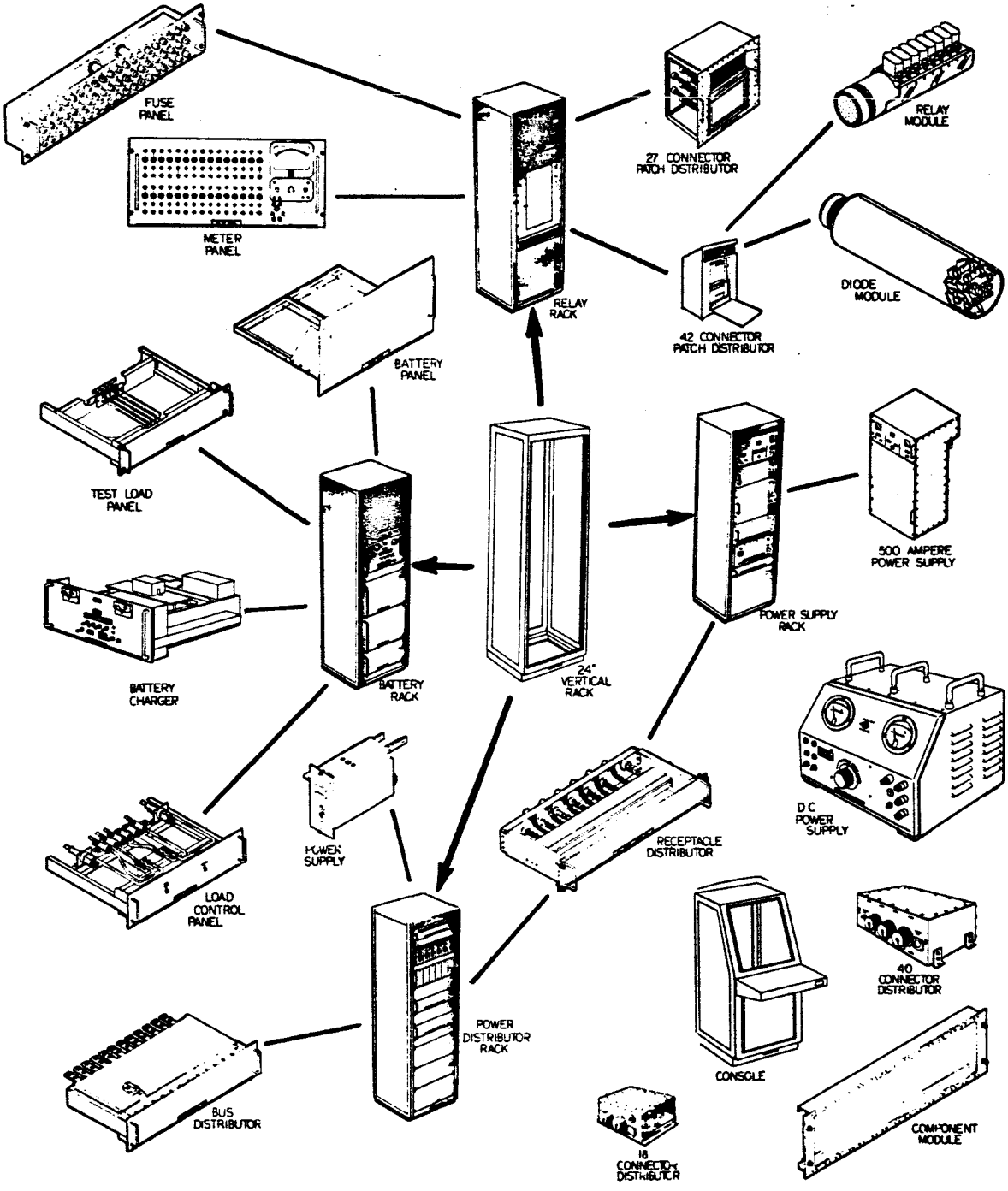


Figure 4-1 Standard Assemblies for ESE

4-2. STANDARD ELECTRICAL DISTRIBUTOR E75M07835.

4-3. Description of Distributor. Standard Electrical Distributor E75M07835 (figure 4-2) is a pressurizable enclosure 7.5 inches high, 18 inches wide, and 12 inches deep. It contains forty 7-pin connectors (Cannon BFR16S-1S or equal), one 5-pin connector (Bendix 71-323940-75P or equal) and two 61-pin connectors (Bendix 71-323940-73P or equal). All connectors are wired to terminal boards using standard solder terminals (Cambion X1782-D or equal), and patching between terminal boards is required to complete the interface between input and output connectors.

This basic distributor is normally mounted with angle brackets, but is also available for mounting in a standard rack panel.

4-4. Use of Distributor. Distributor J75M07835 is used for electrical control of the Mobile Launcher service arms, tail service masts, high pressure pneumatics system, and holddown arms. At each location it gathers electrical lines from individual components and consolidates them into two cables for further transmission. The distributor also contains positive and negative power buses for supplying power to relays, solenoid-operated valves, and other dc components within the service arms and masts.

4-5. Locations of Distributor. Distributor J75M07835 appears in approximately 28 places in the Launch Equipment Branch ESE. The distributors, although not precisely located in the illustration, are:

a. Control Distributors 1, 2, 3	Service Arms Subsystem See figures 3-2 and 3-3
b. Tail Service Mast Distributor	Tail Service Masts Subsystem, See figure 3-31
c. Holddown Arm Control Distributor	Launch Equipment Firing Circuits, Room 12-A See figure 3-22
d. High Pressure Pneumatics Control Distributor	Pneumatics Control and Distribution Subsystem See figure 3-37

4-6. Design Organization. Distributor J75M07835 was designed by the Electrical Section, Launch Equipment Branch, KSC.

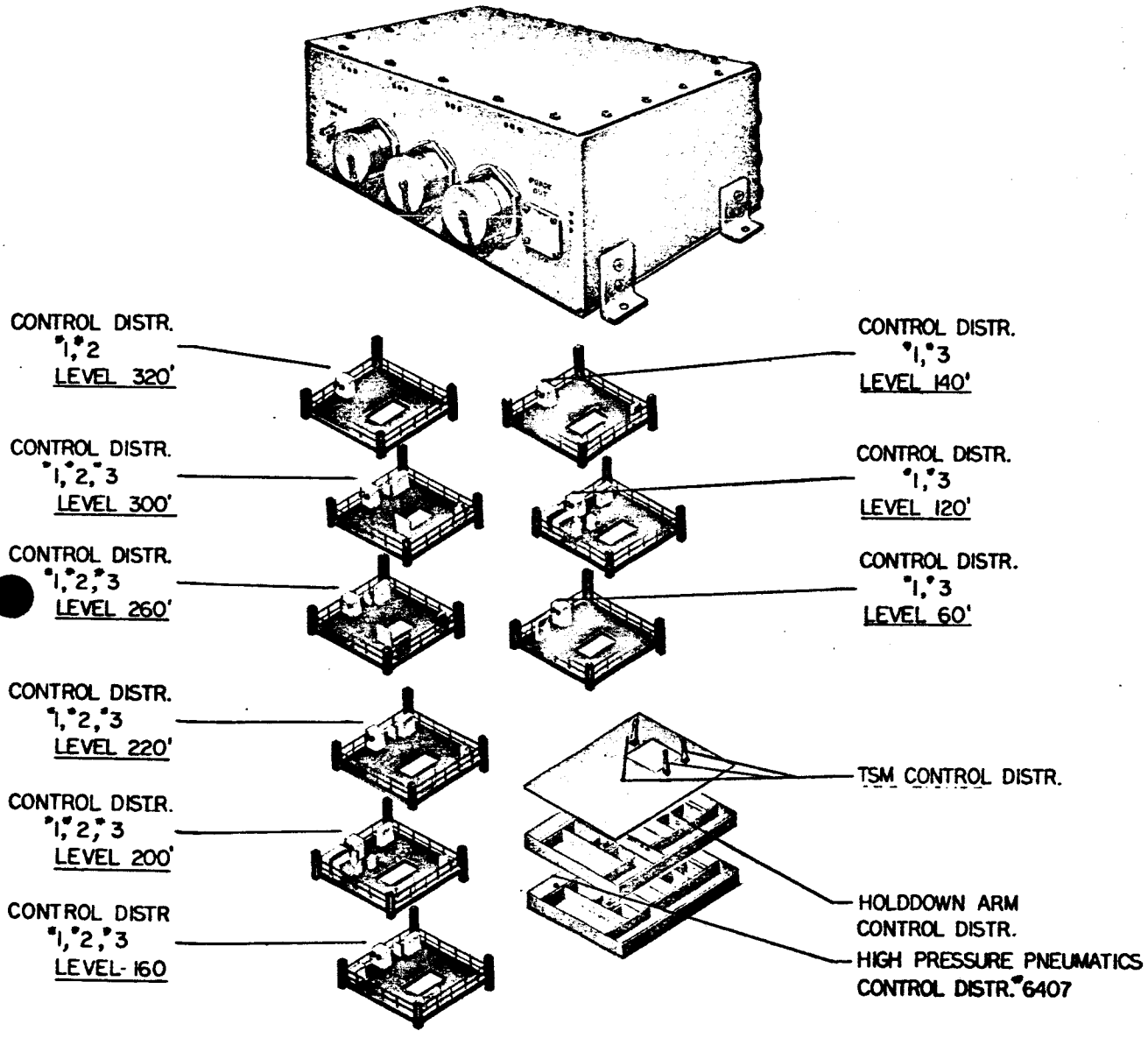


Figure 4-2 Standard Electrical Distributor J75M07835

4-7. STANDARD ELECTRICAL DISTRIBUTOR E75M09808.

4-8. Description of Distributor. Standard Electrical Distributor E75M09808 (figure 4-3) is a pressurizable stainless steel unit 7.5 inches high, 11.5 inches wide, and 12.75 inches deep. On the back are eighteen 7-pin connectors (Cannon BFR16S-1S or equal). On the front are a 5-pin connector (Bendix 71-323940-75P or equal) and a 61-pin connector (Bendix 71-323940-73P or equal). All connectors are wired to terminal boards using standard solder terminals (Cambion X1782-P or equal), and patching between terminal boards is required to complete the interface between input connectors.

This distributor is outfitted with anchor nuts and angle brackets for cabinet or panel mounting.

4-9. Use of Distributor. Distributor E75M09808 is used in the Water Glycol Control System, Service Arm Control Switch Test System, Q-Ball and Deluge Purge, Valve Panel No.11 and Valve Panel No. 12. At each location it gathers electrical lines from individual components and consolidates them into one cable for further transmission. The distributor also contains positive and negative power buses for supplying power to relays, solenoid-operated valves, and other dc components within the systems it serves.

4-10. Locations of Distributor. Distributor E75M09808 appears in approximately six places in the Launch Equipment Branch ESE. See figure 4-3.

a.	Valve Panel 11 Distributor	Pneumatics Control and Distribution. See figure 3-38
b.	Valve Panel 12 Distribitor	Pneumatics Control and Distribution. See figure 3-40.
c.	Service Arm Control Switch Test Distributor	Firing Circuits. See figure 3-26.
d.	Water Glycol Control Distributor	
e.	Q-Ball Purge Control Distributor	Q-Ball Cover Removal Subsystem. See figure 3-42.
f.	Deluxe Purge Control Distributor	Pneumatics Control and Distribution. See figure 3-35.

4-11. Design Organization. Distributor E75M09808 was designed by the Electrical Section, Launch Equipment Branch, KSC

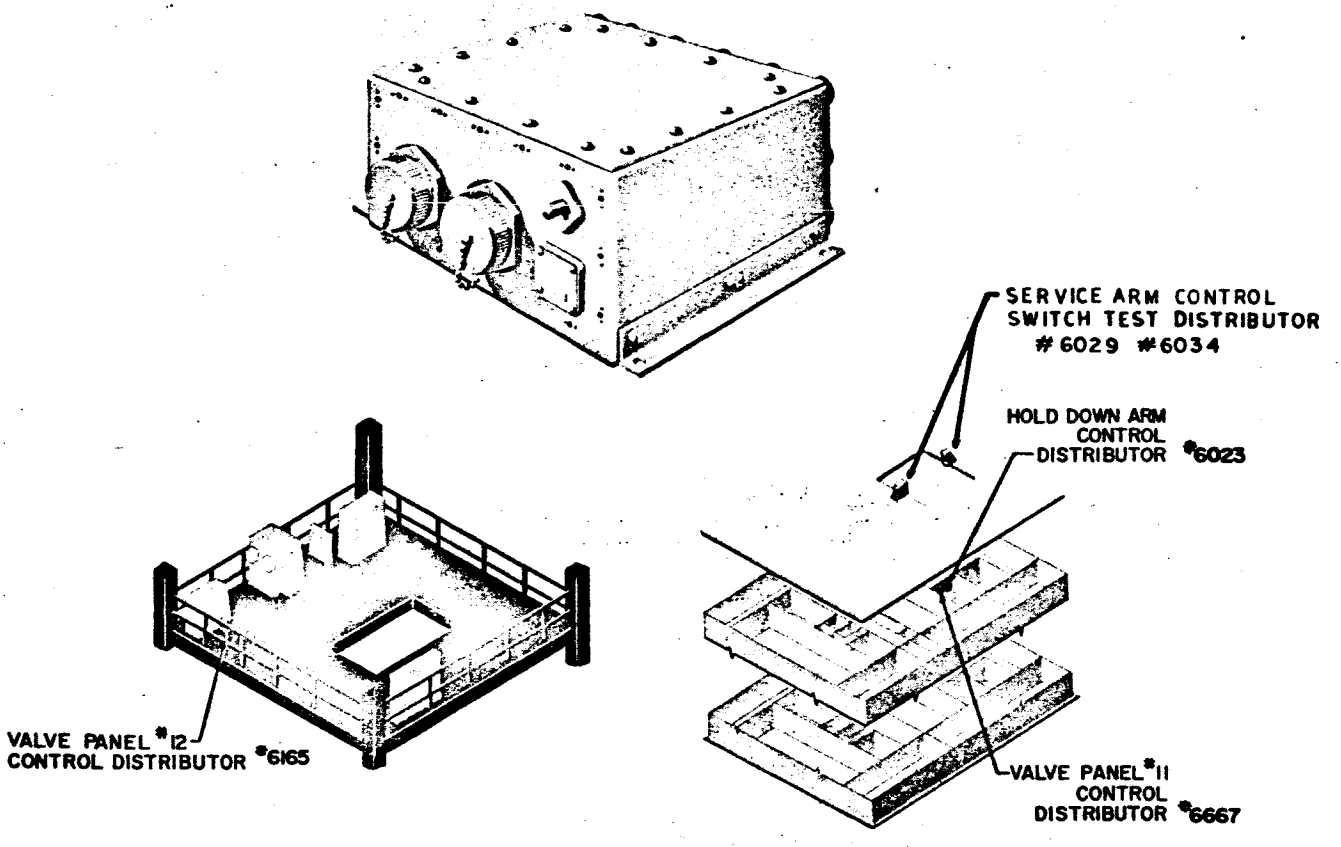


Figure 4-3 Standard Electrical Distributor J75M09808

4-12. PORTABLE DC POWER SUPPLY D75M51116.

4-13. Description of Supply. Portable Power Supply D75M51116 (figure 4-4) is packaged in a hand-carry case 13 inches high, 14 inches wide, and 13 inches deep. It provides unregulated dc in the ranges 0-18 volts or 18-36 volts, controlled by a range select switch and rheostat. Maximum output load is 15 amperes. Both voltage and load are displayed on front-panel meters.

Output power is supplied from front and rear binding posts, or from a rear-mounted cable connector (MS3102E-22-2S). Input power, 120 volts, 60 cps, is supplied through a rear-mounted standard 3-pin ac panel connector.

A positive and negative ground-detector circuit is actuated by a switch on the front panel.

4-14. Use of Supply. Power Supply D75M51116 can be easily hand carried about the Mobile Launcher to provide dc power where requirements do not exceed 36 volts, 15 amperes and 1 volt ripple/noise. It is used to provide power to the Tail Service Mast Test Set, Launcher Accessories Test Set No. 1, Launcher Accessories Test Set No. 2, and Tower Test Set.

4-15. Locations of Supply. See figures 3-22, 3-26, 3-34, 3-37, 3-38, 3-40.

4-16. Design Organization. Power Supply D75M51116 was designed by the Electrical Section, Launch Equipment Branch, KSC.

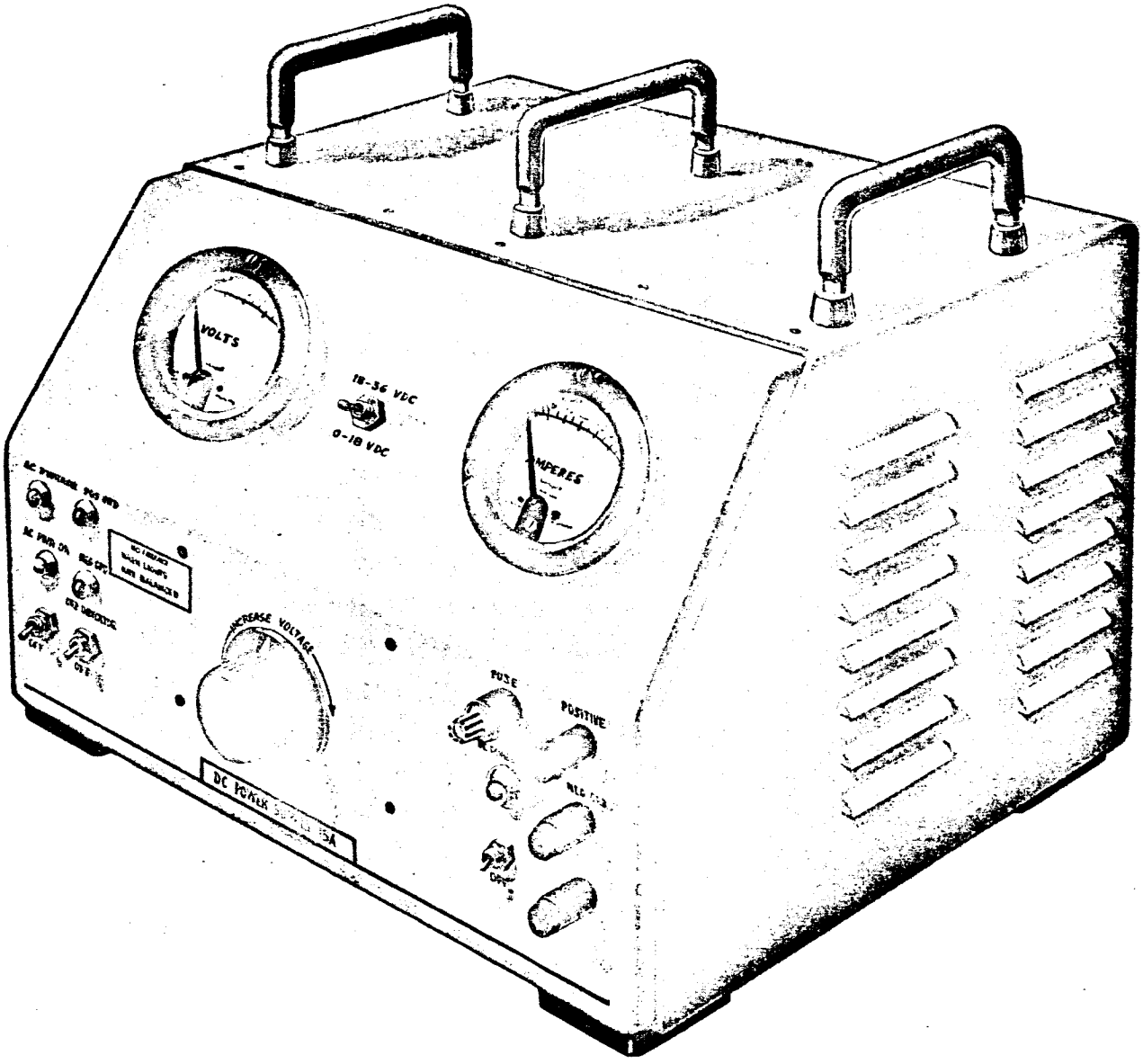


Figure 4-4 Portable DC Power Supply D75M51116

4-17. STANDARD 24 INCH VERTICAL RACK E64-KN-F-260-10.

4-18. Description of the Vertical Rack. Standard 24 Inch Vertical Rack E64-KN-F-260-10 is an R.F.I. shielded enclosure 86.25 inches high, 26.06 inches wide and 30.56 inches deep. It is designed to house standard 24 inch component panels. See figure 4-5.

Panels may be mounted either front or rear, and may be individually shielded. The rack base, side panels, and cable entry (at the enclosure bottom) are removable.

4-19. Use of the Vertical Rack. Standard 24 inch racks for the ESE house seven types of assemblies:

a. Nine service arm relay racks, figure 3-53.

b. Two TSM & launcher accessories relay racks containing an internal fuse panel in lieu of Fuse Panel J75M10163.

c. Four standby battery racks and firing batteries, figure 3-52.

d. Three power distribution racks, figure 3-51.

e. Two power supply racks (one spare), figure 3-50.

f. One arming panel rack, figure 3-54.

g. Four integration racks and two cable entrance racks.

Spare racks will be assigned as required.

4-20. Locations of Vertical Rack. The ESE employs approximately twenty-four racks in Mobile Launcher room 8-A and three in the LCC. See figure 6-2.

4-21. Design Organization. The Standard 24 Inch Vertical Rack is commercial equipment purchased to KSC/MSFC specifications.

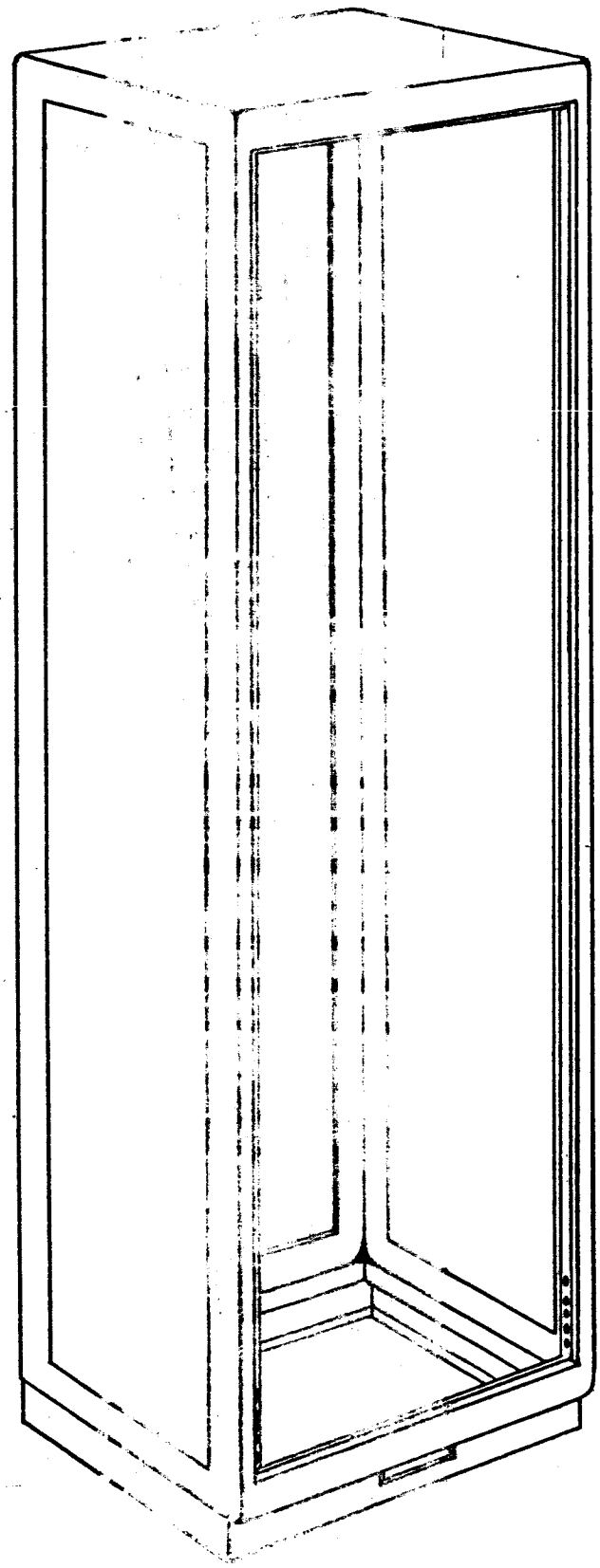


Figure 4-5 Standard 24-Inch Vertical Rack E64-KN-F-260-10

4-22. STANDARD PATCH DISTRIBUTOR F75M04681 (42 CONNECTOR).

4-23. Description of the Distributor. Standard Patch Distributor F75M04681 is an enclosure 12.5 inches deep, 36.73 inches high and 24 inches wide. It may be mounted in a standard 24 inch rack. On the back of the enclosure, mounted on two hinged plates, are forty-two 61 pin connectors (Bendix PT0SE-24-61P or equal).

Patching between these connectors is provided by the following patchboard assembly, which is accessible through the front panel door:

a. Frame & Spring Assembly (Anderson Electric Co. BT 2560 or equal)

b. Removable 2560-pin patchboard (Anderson Electric Co. IPB2560S or equal)

Above the front panel door is a row of 84 taper-pin blocks. These are two types, mounted alternately; 42 blocks (AMP 480107-6 or equal) and 42 blocks (AMP 480107-9 or equal). Each taper-pin block has 30 female test jacks wired to the patchboard.

4-24. Use of the Patch Distributor. The standard patch distributor is employed in various 24-inch relay racks used in the ESE. In these locations, the distributor provides monitoring and flexible distribution of signals. It also accommodates standard relay modules (paragraph 4-37) and standard diode modules (paragraph 4-42), which may be patched into the ESE systems as required.

4-25. Locations of Patch Distributor. The ESE employs approximately eleven standard patch distributors located in the relay racks, room 8-A. See figure 4-6.

4-26. Design Organization. Patch Distributor F75M04681 was designed by MSFC-Astrionics and adopted by KSC-Launch Equipment Branch.

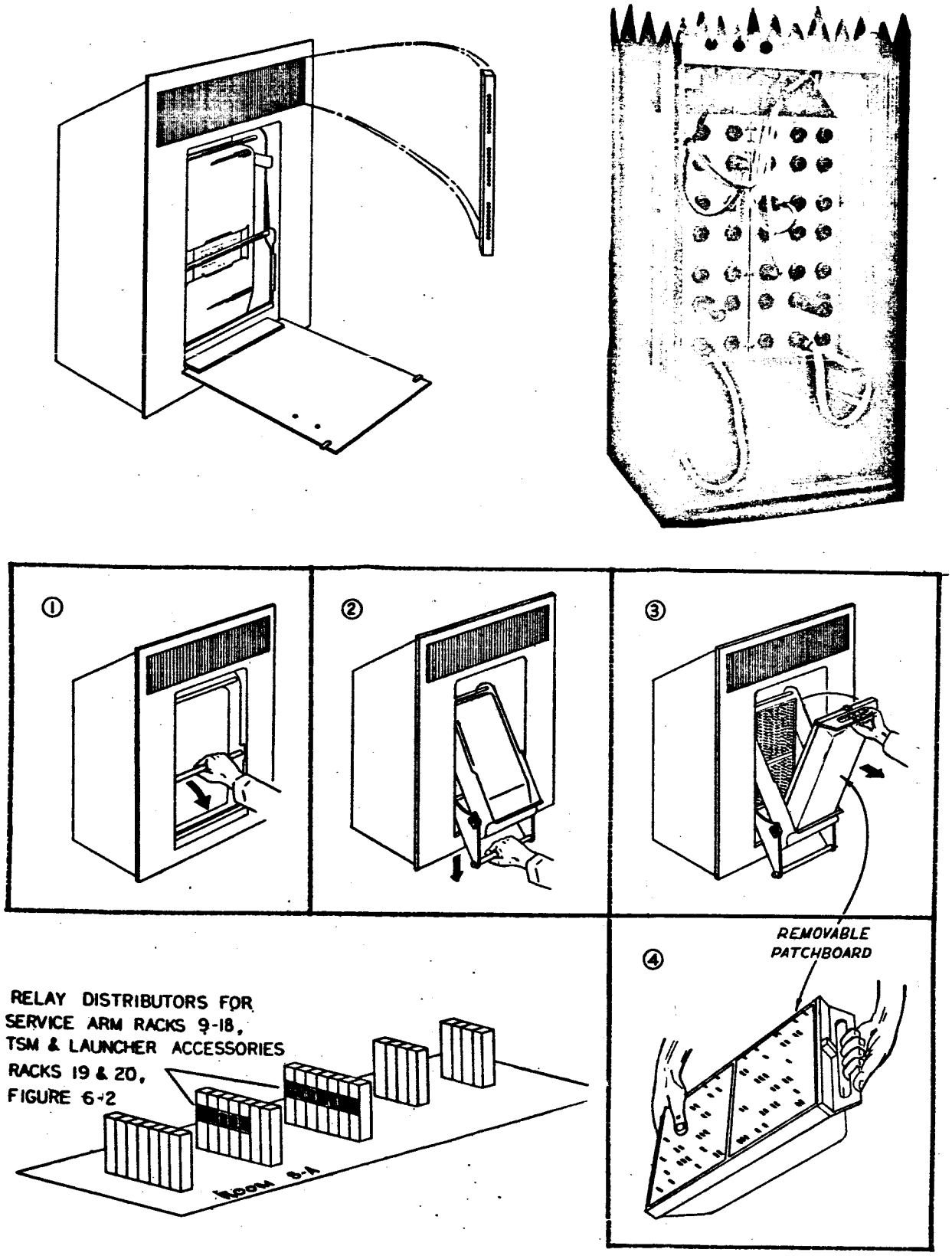


Figure 4-6 **Standard Patch Distributor (42 Connector) F75M04681**

4-27. STANDARD PATCH DISTRIBUTOR F75M04681 (54 CONNECTOR).

4-28. Description of the Distributor. Standard Patch Distributor F75M04681 is an enclosure 15.12 inches deep, 48.47 inches high and 24 inches wide. It may be mounted in a standard 24 inch rack. On the back of the enclosure, mounted on two hinged plates, are fifty-four 61 pin connectors (Bendix PT07SE-24-61P or equal).

Patching between these connectors is provided by the following patchboard assembly, which is accessible through the front panel door:

a. Frame & Spring Assembly (AMP Inc. 420050-2 or equal)

b. Removable 3254-pin patchboard (AMP Inc. 420051-2 or equal)

Above the front panel door are 2 rows of 54 taper-pin blocks each. These are two types, mounted alternately; 27 blocks (AMP 480107-6 or equal) and 27 blocks (AMP 480107-9 or equal) in each row. Each taper-pin block has 30 female test jacks wired to the patchboard. See figure 4-7.

4-29. Use of the Patch Distributor. The standard patch distributor is employed in various 24-inch relay racks used in the ESE. In these locations, the distributor provides monitoring and flexible distribution of signals. It also accommodates standard relay modules (paragraph 4-37) and standard diode modules (paragraph 4-42), which may be patched into the ESE systems as required.

4-30. Locations of Patch Distributors. The ESE employs approximately four standard patch distributors; two are located in the Integration Racks, room 8-A and one each is located in the Integration Racks in the LCC.

4-31. Design Organization. Patch Distributor F75M04681 was designed by MSFC-Astrionics and adopted by KSC-Launch Equipment Branch.

TO BE PROVIDED

Figure 4-7 Standard Patch Distributor (54 Connector)

4-32. STANDARD PATCH DISTRIBUTOR D75M09313 (27 CONNECTOR).

4-33. Description of the Distributor. Standard Patch Distributor D75M09313 (figure 4-8) has an enclosure 22.5 inches high, 21.0 inches wide, and 13.06 inches deep. On the back of this enclosure are twenty-seven 61-pin connectors (Bendix PTO7SE-24-61P or equal). Patching between these connectors is provided by the following patchboard assembly:

a. Frame & Spring Assembly (AMP, Inc. 420048-4 or equal)

b. Patchboard (AMP, Inc. 420049-3 or equal)

Above the front opening is a row of 54 taper-pin blocks, mounted alternately: 27 blocks (AMP 480107-6 or equal) and 27 blocks (AMP 480107-9 or equal). Each taper-pin block has 30 female test jacks wired to the patchboard.

4-34. Use of the Patch Distributor. This patch distributor provides monitoring and flexible distribution of signals. It also accommodates standard relay modules (paragraph 4-37) and standard diode modules (paragraph 4-42), which may be patched into any system using the distributor. It is presently used in the Portable Arm Control Console.

4-35. Locations of Patch Distributor. See Portable Arm Control Console, figure 5-12.

4-36. Design Organization. Patch Distributor D75M09313 was designed by the Electrical Section, Launch Equipment Branch, KSC.

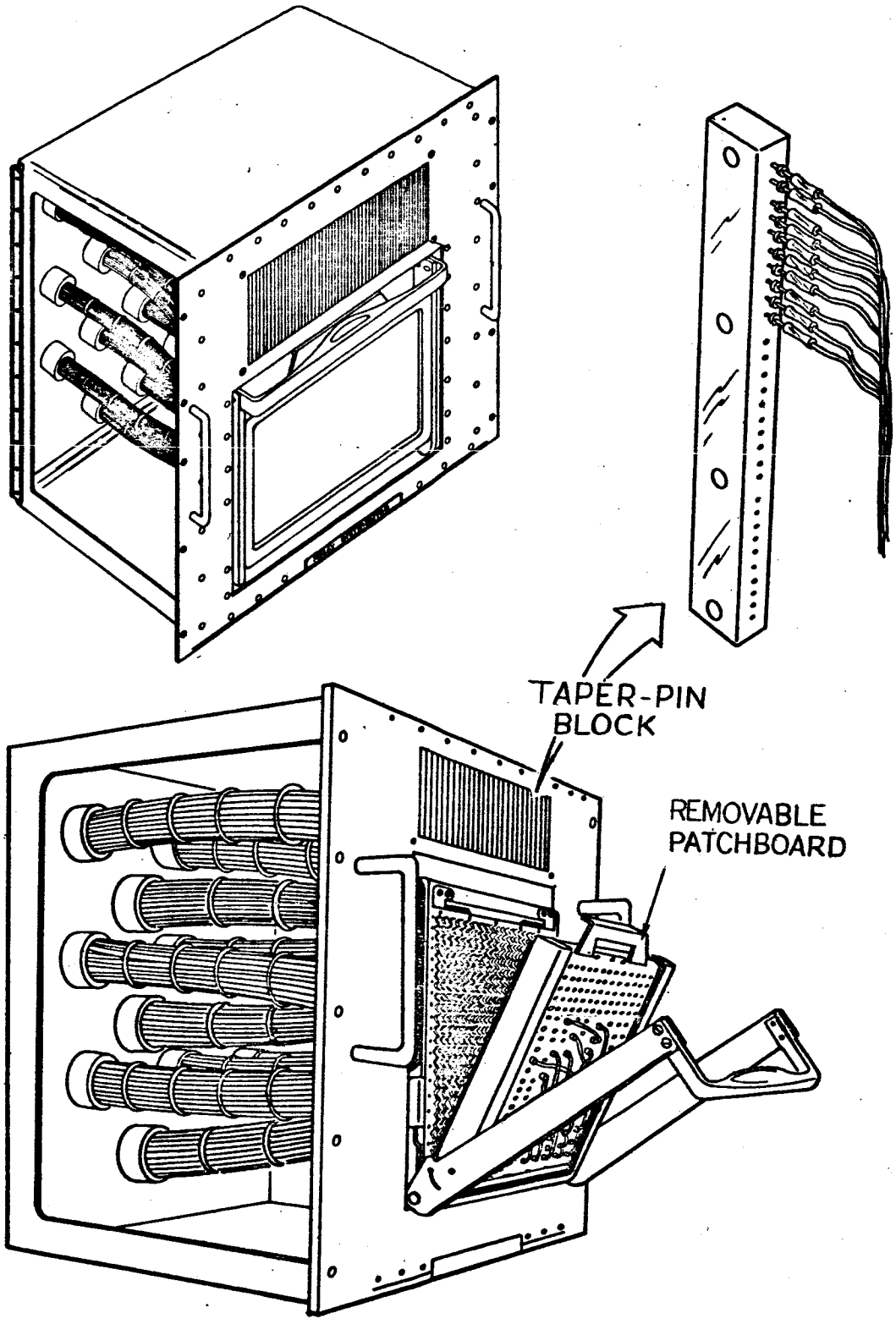


Figure 4-8 Standard Patch Distributor (27 Connector) D75M09313

4-37. STANDARD RELAY MODULE D75M50348.

4-38. Description of the Relay Module. Standard Relay Module D75M50348 (figure 4-9) is an assembly 2.43 inches high and 5.87 inches long, and weighs 14 ounches. It contains:

a. 8 relays	Per MSFC-SPEC-339/53 (DPDT 28 volts dc relay, coil resistance 600 ohms, contact rating 2.0 amperes at 28 volts dc resistive load)
b. 8 bases	Burndy Engineering Co. MT9R-2 or equal 72 base contacts (Burndy RC16Y-1-F59 or equal)

Each relay contact is wired to one pin in the 61-pin connector (Bendix PTO6P-24-61S or equal). For four of the relays, each side of the dc coil is independently wired to a connector pin. In the remaining four relays, one side of each dc coil is wired to a common bus.

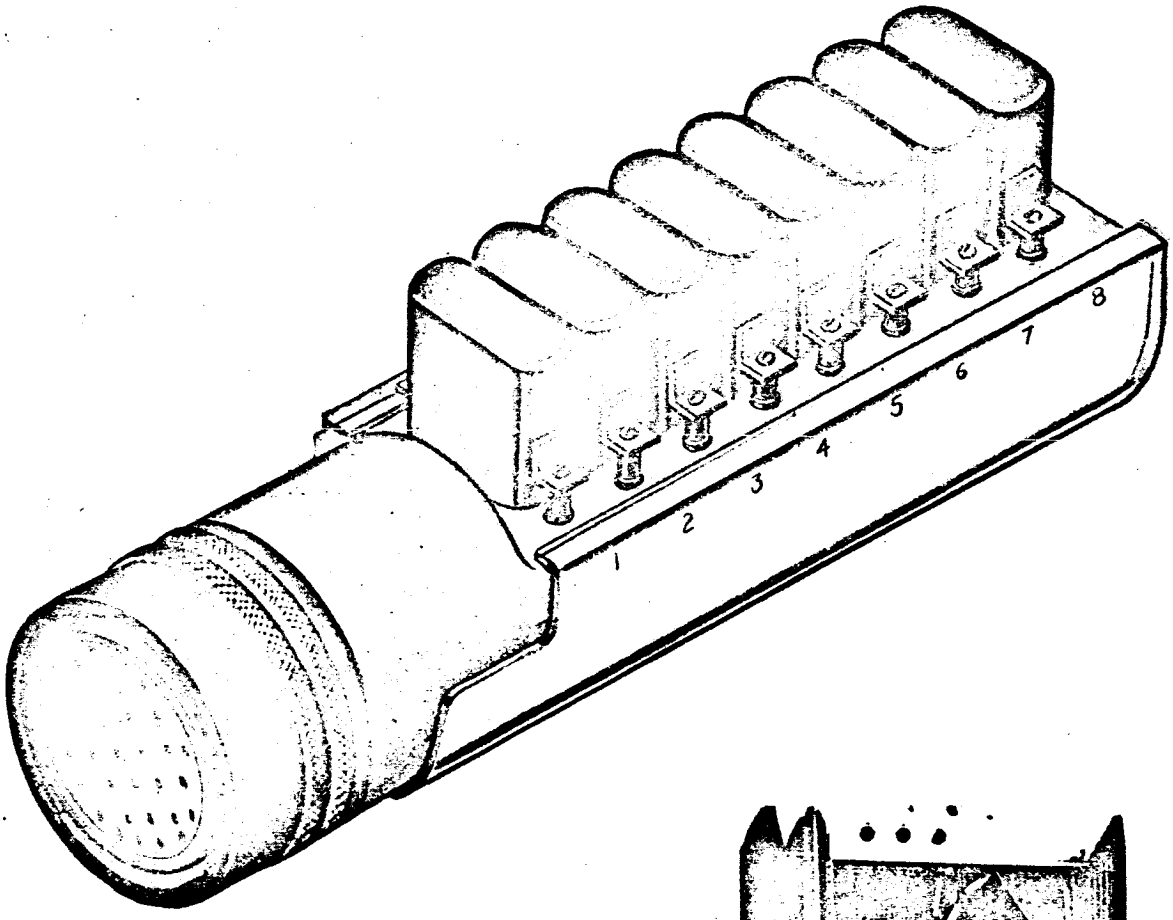
4-39. Use of the Relay Module. The 2-ampere relay contacts in this module are adequate both for logic circuits and for control, since no solenoid valve in the ESE control systems required more than 1.5 amperes.

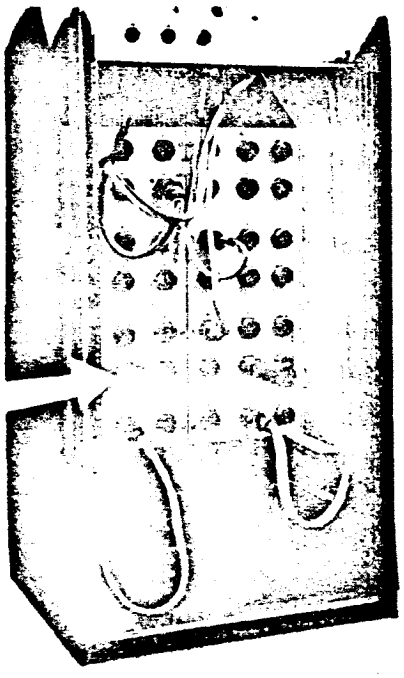
In the ESE, these relays are used as logic and control elements in the control systems for the service arms, tail service masts, firing circuits and others. They are also used as transfer elements for interface separation so that no control subsystem uses dc power from another.

In the Launcher Ground Equipment Test Set (Launcher GETS), standard relay modules simulate switches and relays in the ESE. They also close indicator lamp circuits within the GETS.

4-40. Locations of Relay Module. In the ESE, about 150 relay modules are connected to various patch distributors in the relay racks in room 8-A and in the Launcher GETS.

4-41. Design Organization. Relay Module D75M50348 was designed by MSFC-Astrionics and adopted by KSC-Launch Equipment Branch.





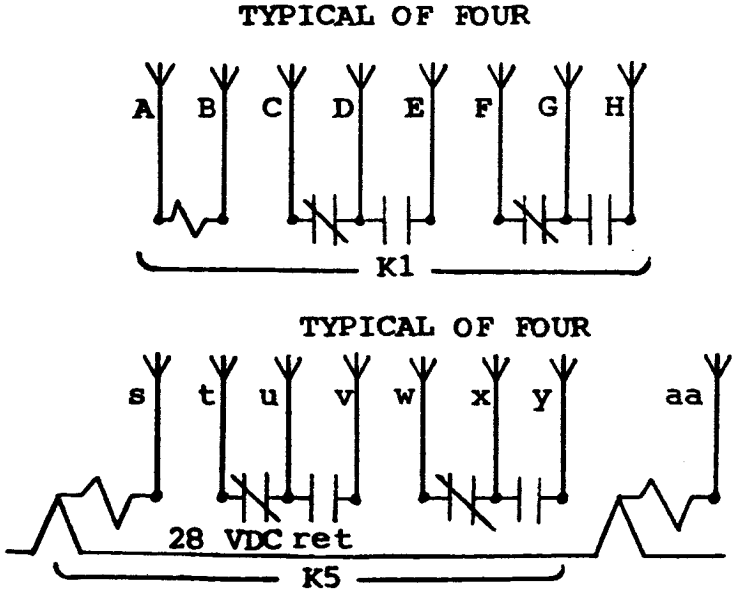


Figure 4-9 Standard Relay Module D75M50348

4-42. STANDARD DIODE MODULE D75M50364.

4-43. Description of the Diode Module. Standard Diode Module D75M50364 is 2.75 inches in diameter and 10.25 inches long, including connector. It weighs 2.25 pounds.

Inside are thirty diode-fuse pairs, each series-wired to two pins in the 61-pin connector (Bendix PT06P-24-61S or equal). The diodes are type 1N540 (Texas Instruments or equal); the fuses are Bussman GLD-1 or equal.

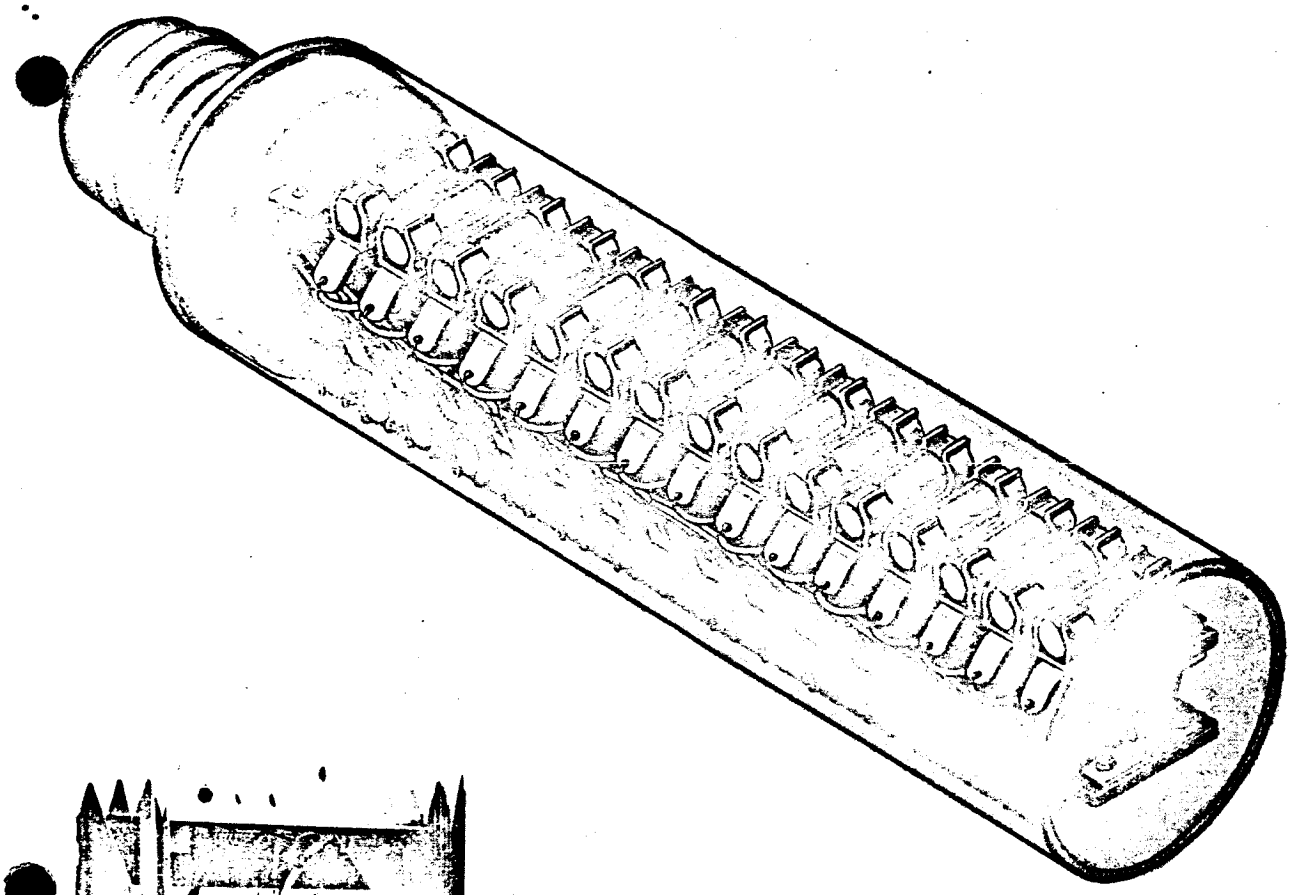
All fuse clips are mounted together on two fuse boards, and all diodes are mounted on a single board in between. All wiring at the adapter end is potted.

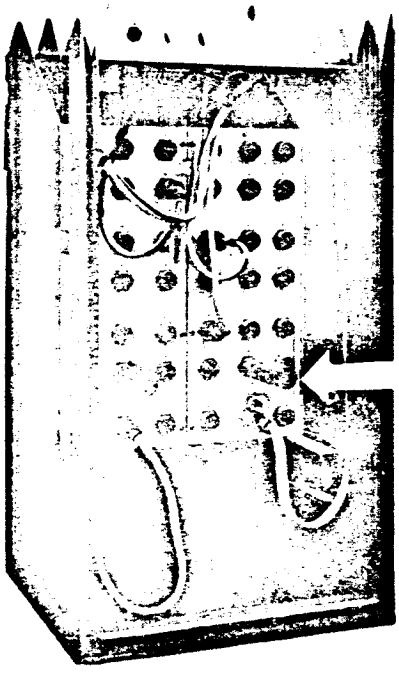
4-44. Use of the Diode Module. Standard Diode Module D75M50364 can be used with any electrical distributor mating with the connectors named above, and is presently used with the Standard Patch Distributors. See figure 4-10.

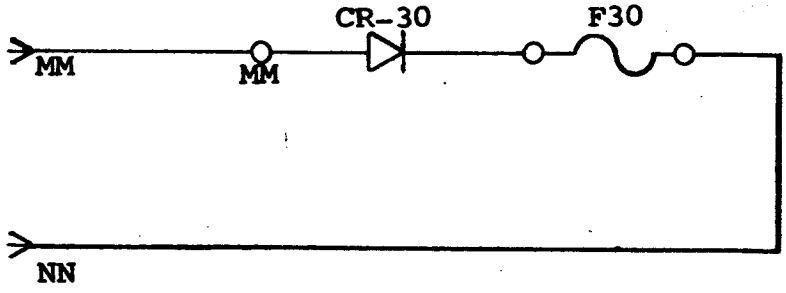
In the ESE, the diodes in this module are used to suppress arcing between relay contacts.

4-45. Locations of Diode Module. About 50 diode modules are used in Electrical Support Equipment, including the Launcher GETS and the relay racks in room 8-A.

4-46. Design Organization. Diode Module D75M50364 was designed by the Electrical Section, Launch Equipment Branch.







TYPICAL CIRCUIT

Figure 4-10 Standard Diode Module D75M50364

4-47. STANDARD METER PANEL J75M10165.

4-48. Description of the Meter Panel. Standard Meter Panel J75M10165 (figure 4-11) is designed for placement in the standard 24-inch rack. It is 10.5 inches high and approximately 3 inches deep. The panel has:

a. 30 fuses	Bussmann GLD-1 or equal Bussman Fuseholder HLD or equal
b. 30 switches	Toggle T-2150, Control Co. of America or equal
c. 60 jacks	E. F. Johnson Co. or equal 108-901 thru 108-913 (assorted colors)
d. 1 multimeter	Simpson Model 270 or equal

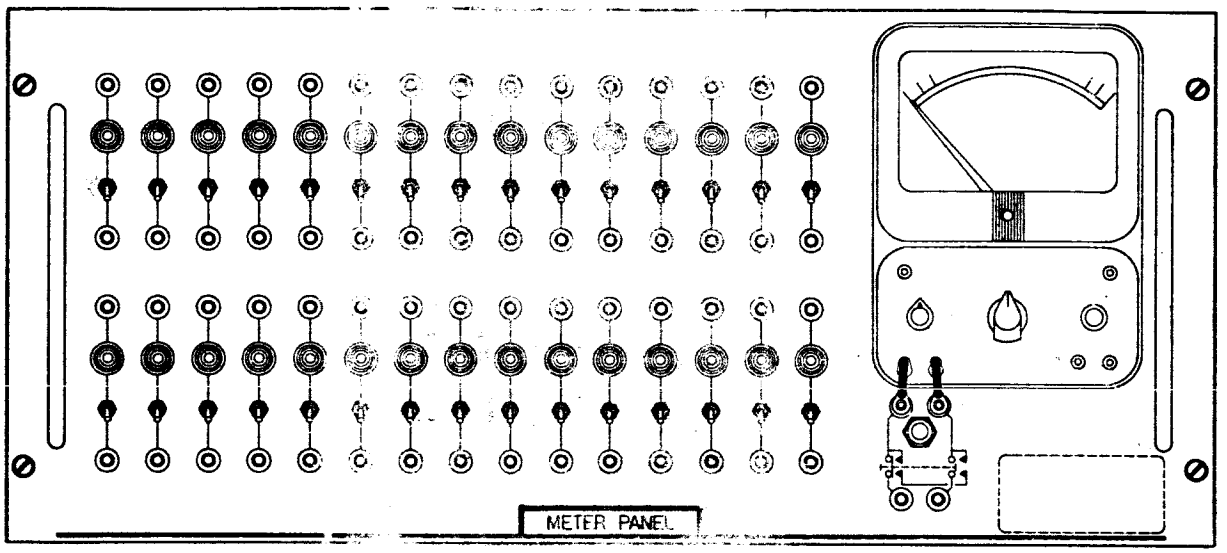
Interconnections of these components are shown on the front panel silkscreen. Note that a shorting switch is added to the multimeter input for zeroing the ohmmeter scale.

4-49. Use of the Meter Panel. In the ESE, this meter panel is employed in the relay and power racks in room 8-A. In each case, test leads will normally be connected to test pin blocks in a patch distributor. See figure 4-8.

Standard Meter Panel J75M10165 is normally used to measure resistance and dc voltage.

4-50. Locations of Meter Panel. Approximately seven standard meter panels are used in the Mobile Launcher relay racks and arming panel racks, room 8-A.

4-51. Design Organization. Standard Meter Panel J75M10165 was designed by the Electrical Section, Launch Equipment Branch.



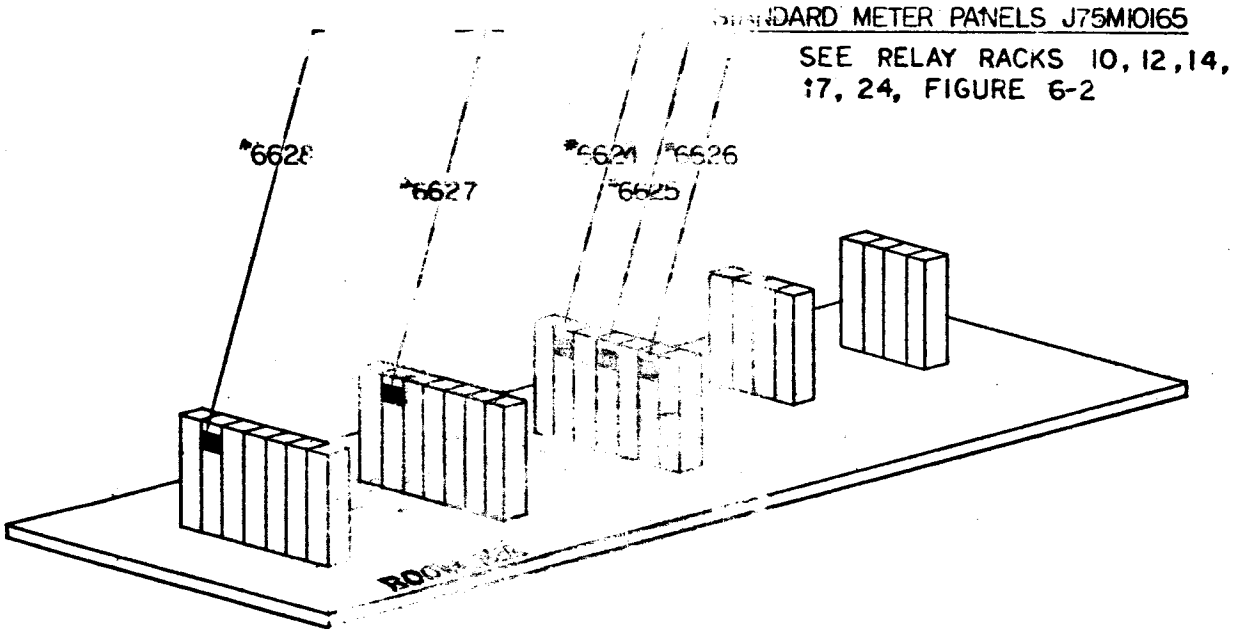


Figure 4-11 Standard Meter Panel J75M10165

4-52. STANDARD FUSE PANEL J75M10163.

4-53. Description of the Fuse Panel. Standard Fuse Panel J75M10163 (figure 4-12) is designed for placement in the standard 24 inch rack. It is 5.25 inches high and 6 inches deep.

Sixty 3-ampere indicator fuses (Bussman GBA-3 or equal) are connected to two 61-pin connectors (Bendix PTO7SE-24-61P or equal). All signals enter one connector and leave through the other.

4-54. Use of the Fuse Panel. From one to three fuse panels are used in each relay rack in room 8-A. Signals passing through the relay racks are routed through this fuse panel, so that cabling is protected during tests and exercises.

Prior to launch, the fuse panel is bypassed by disconnecting its two cable connectors and mating them to each other.

4-55. Locations of Fuse Panel. Approximately 15 fuse panels are used in the relay racks and GETS, as in figure 4-12.

4-56. Design Organization. Standard Fuse Panel J75M10163 was designed by the Electrical Section, Launch Equipment Branch.

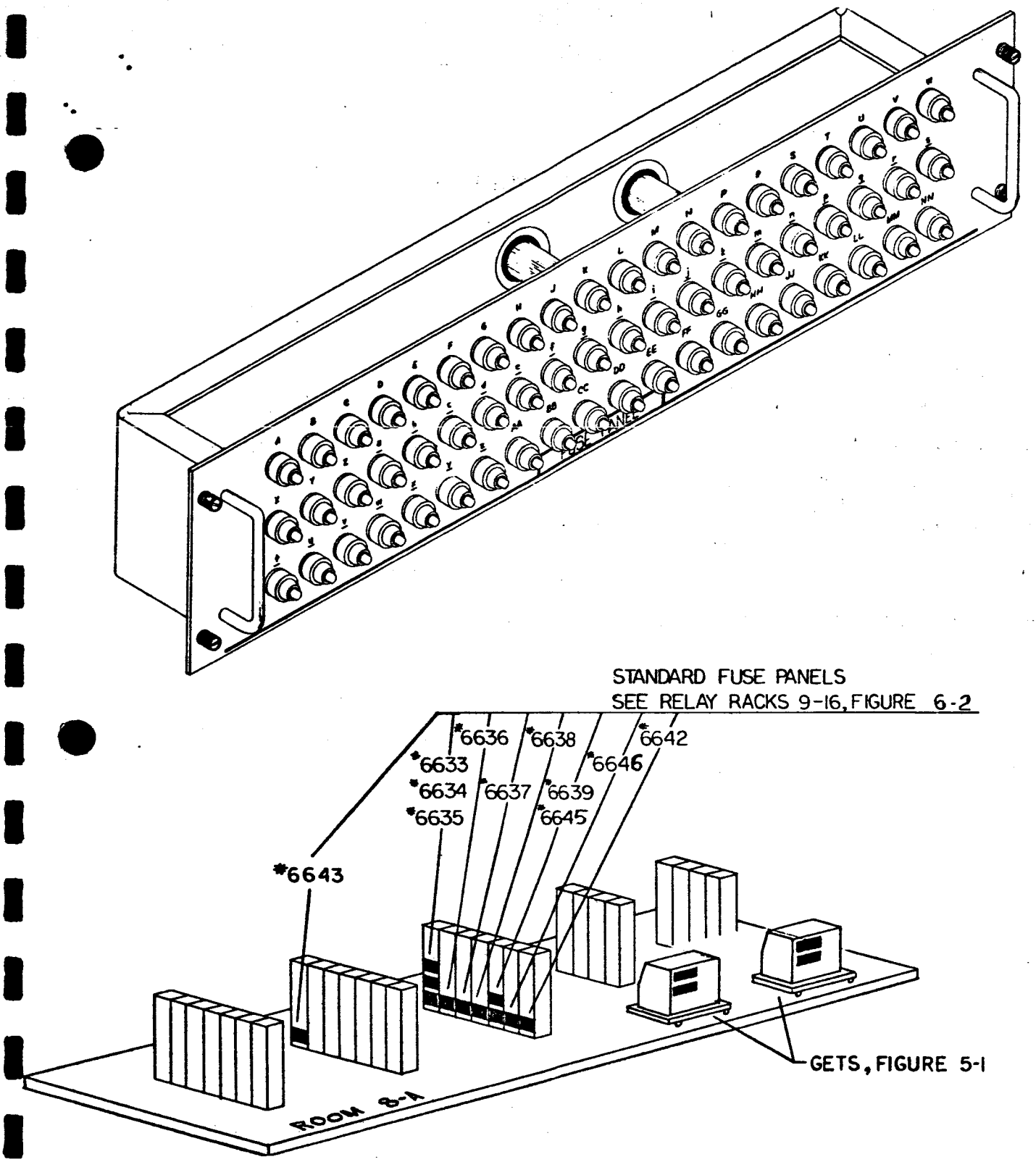


Figure 4-12 Standard Fuse Panel J75M10163

4-57. STANDARD MODULE FRAME J75M10432.

4-58. Description of the Module Frame. Standard Module Frame J75M10432 (figure 4-13) is designed for placement in the back of the standard 24-inch vertical rack. It is approximately 7 inches high and 2 inches deep.

4-59. Use of the Module Frame. The module frame accommodates a variety of components to be connected to the standard patch distributor, as illustrated in figure 4-13. These are normally components other than diodes or relays, since standard relay and diode modules are already available.

A typical use of the frame is shown in figure 4-13, where three electronic timers are mounted in a component module assembly D75M10433, which is mounted to the Standard Module Frame.

4-60. Locations of Module Frame. At present the module frame is not used in the ESE.

4-61. Design Organization. The Standard Module Frame J75M10432 was designed by MSFC-Astrionics and adopted by KSC-Launch Equipment Branch.

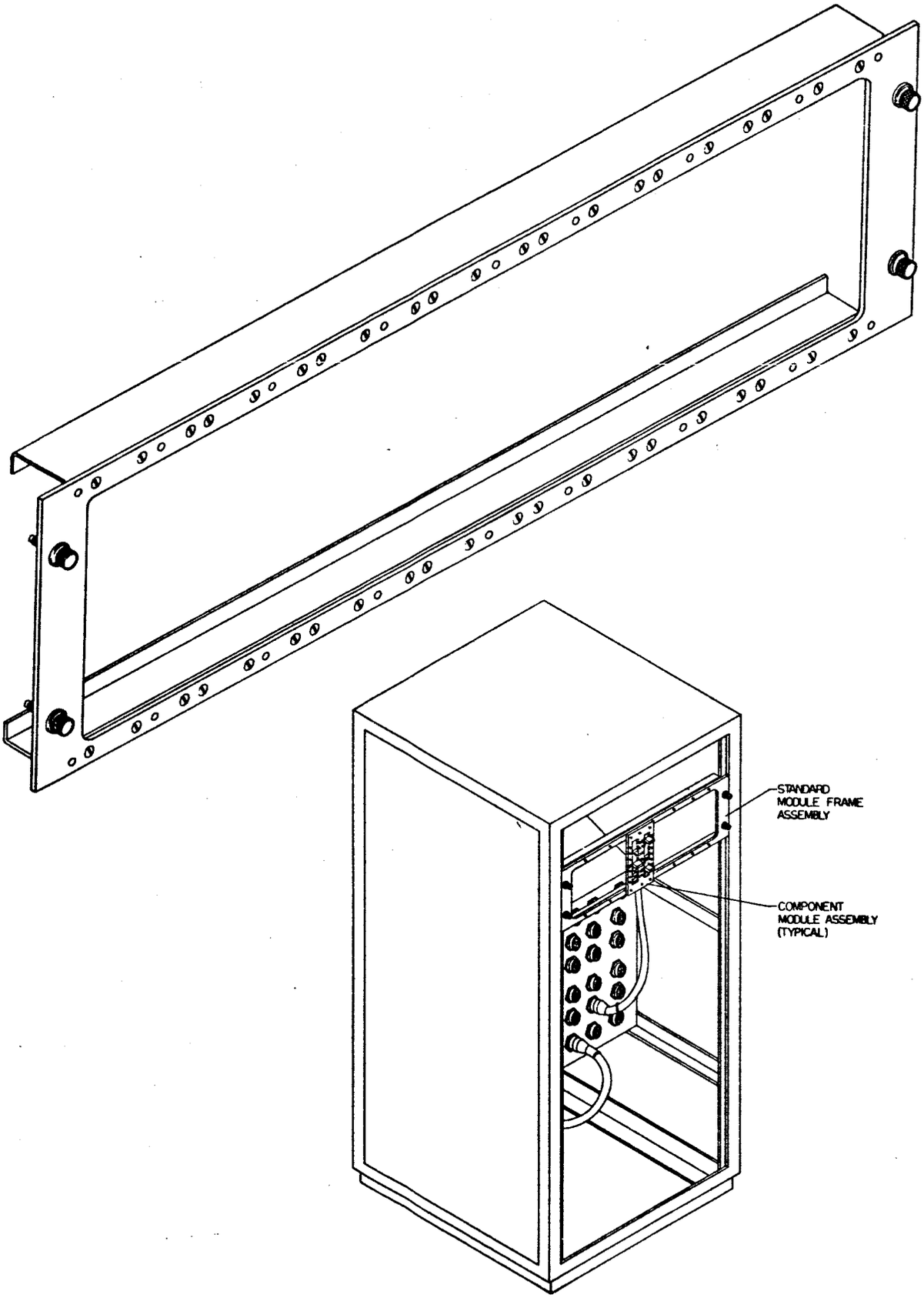


Figure 4-13 Standard Module Frame J75M10432

4-62. STANDARD 500 AMPERE POWER SUPPLY.

4-63. Description of the Power Supply. The 500 Ampere Power Supply (figure 4-14) is designed for placement in a standard 24-inch rack. It is 47.25 inches high and 24 inches deep. Electrical connections to this supply are provided as follows:

a. AC Input Connector	Bendix 323340-57P or equal
b. Remote Sensing Connector	Bendix PT07SE-20-39S or equal
c. DC Output	Bus bars extending from rear of unit

The front panel of the supply contains:

a. Panel meters for dc output voltage and current

b. Switches POWER ON and START-STOP

c. Control for voltage output level

d. Meter indicating elapsed time

This supply is designed for a maximum output current of 500 amperes and a nominal output voltage of 28 volts dc, adjustable from 24 volts to 36 volts. Output ripple is less than 0.1 volts peak to peak.

The input power required is 220/440 volts, 3-phase, 60 cycle. A stepdown transformer with a three-phase, full-wave semiconductor bridge is used for the ac to dc conversion. The output voltage level is controlled by silicon control rectifiers.

4-64. Use of the Power Supply. The standard 500-ampere power supply is the prime source of 28 volt dc power for all electrical functions on the service arms other than battery-operated devices. It is also used to provide 28 volt power for the Tail Service Masts, Launcher Accessories, and other ESE Subsystems.

4-65. Location of Power Supply. Two 500 ampere power supplies are located in room 8-A of the Mobile Launcher. One is currently a spare.

4-66. Design Organization. The standard 500 ampere power supply was designed by MSFC-Astrionics. For LC-39, it is furnished by MSFC and used by KSC-Launch Equipment Branch.

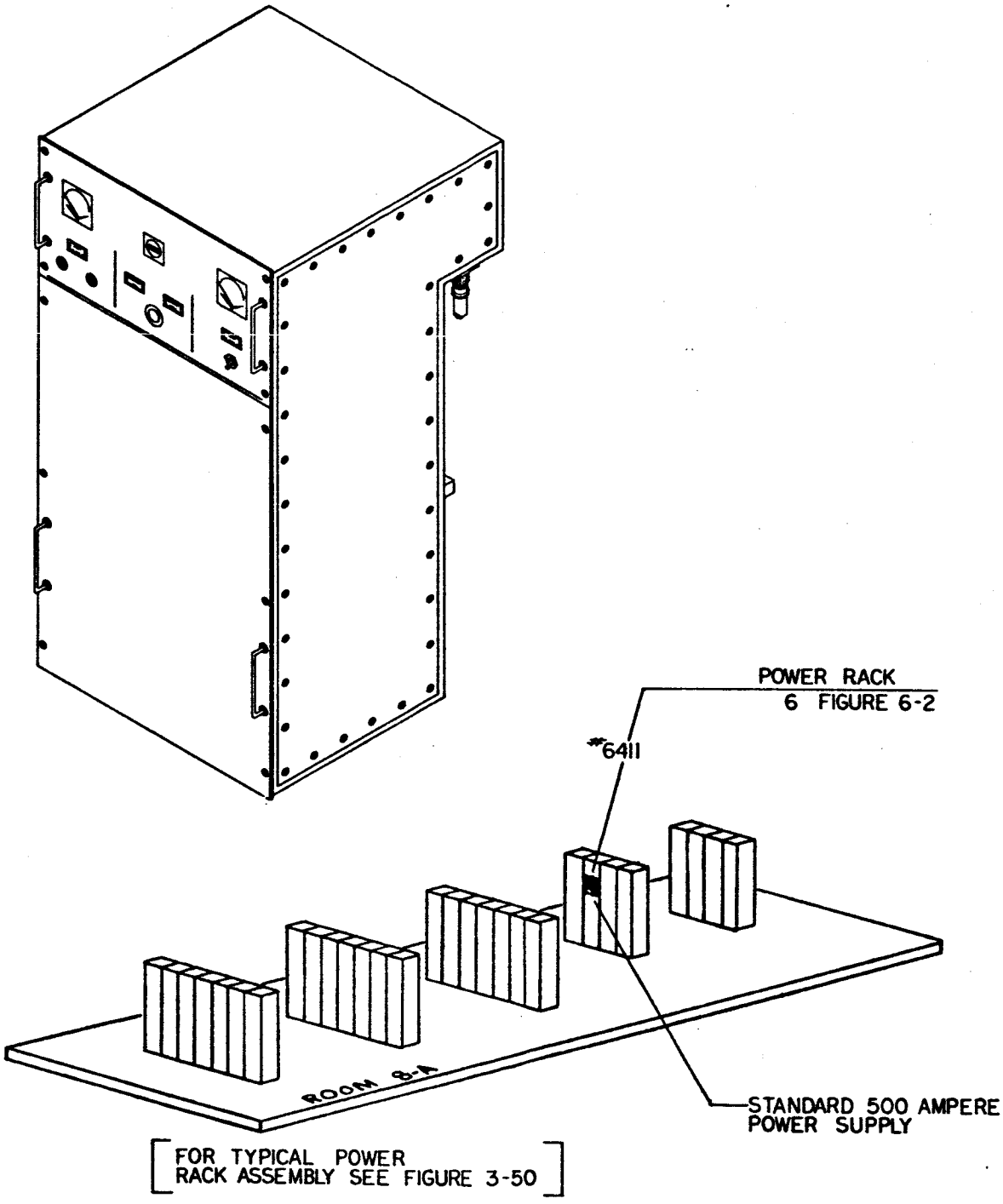


Figure 4-14 Standard 500 Amp Power Supply A40M03709

4-67. STANDARD TEST LOAD E40M03971.

4-68. Description of the Test Load. Test Load Assembly E40M03971 is designed for placement in the standard 24-inch rack. It is 5.15 inches high and 18 inches deep.

It contains four resistance elements (Chromalox 4-43209 or equal, 30 volts, 300 watts) connected in parallel by bus bars at the rear of the chassis. The buses are connected to input cables by terminal lugs.

4-69. Use of the Test Load. Test Load Assembly E40M03971 is a part of the standby battery racks and firing battery racks. It serves as a test load for the batteries and may be connected to the batteries by the Load Control Panel, figure 4-16.

4-70. Locations of Test Load. See figure 4-15.

4-71. Design Organization. Standard Test Load E40M03971 is designed by MSFC-Astrionics. For LC-39, it is furnished by MSFC and used by KSC-Launch Equipment Branch.

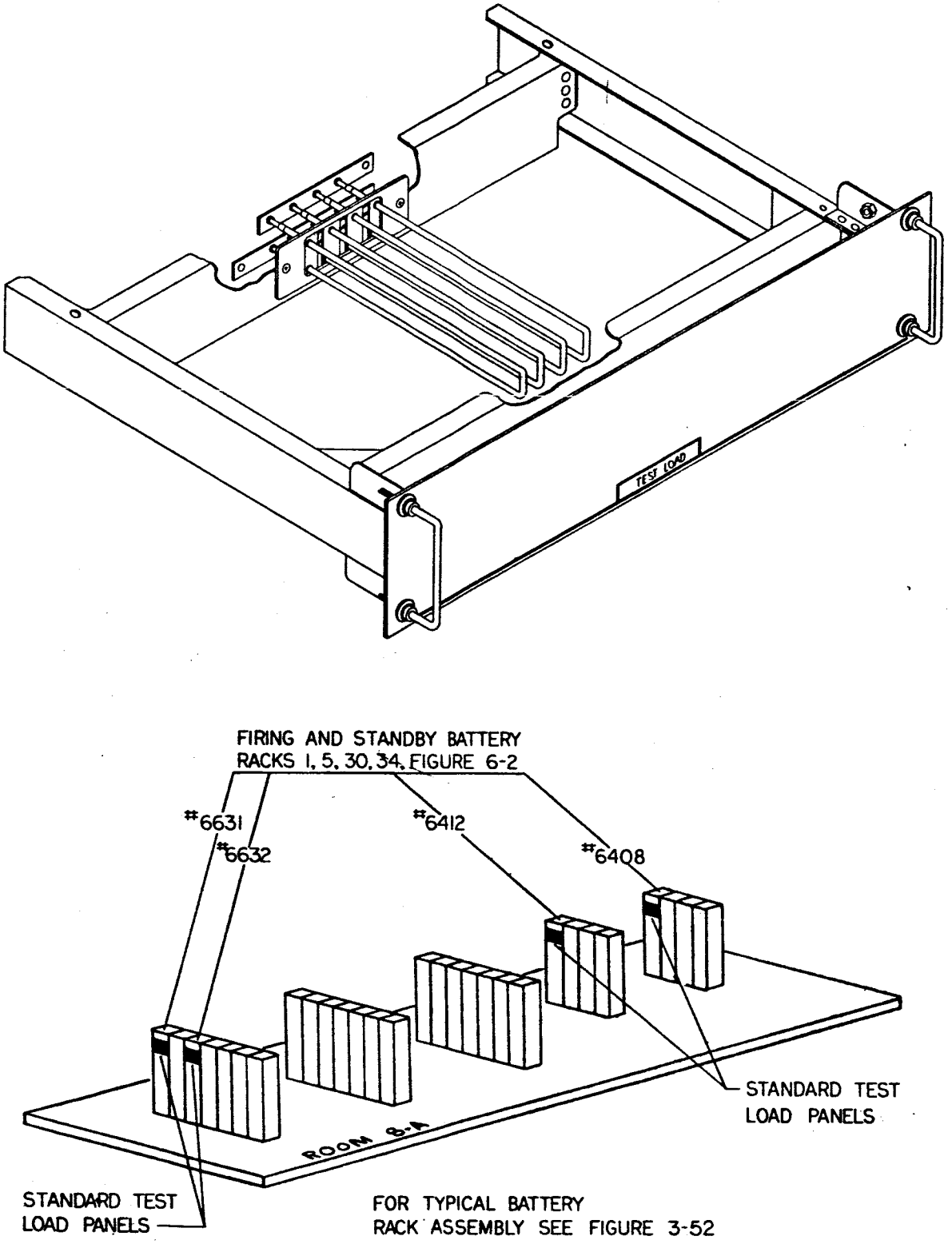


Figure 4-15 Standard Test Load E40M03971

4-72. STANDARD LOAD CONTROL PANEL E40M03535.

4-73. Description of the Load Control Panel. Load Control Panel E40M03535 is designed for placement in the standard 24 inch rack. It is 7 inches high and 20.25 inches deep.

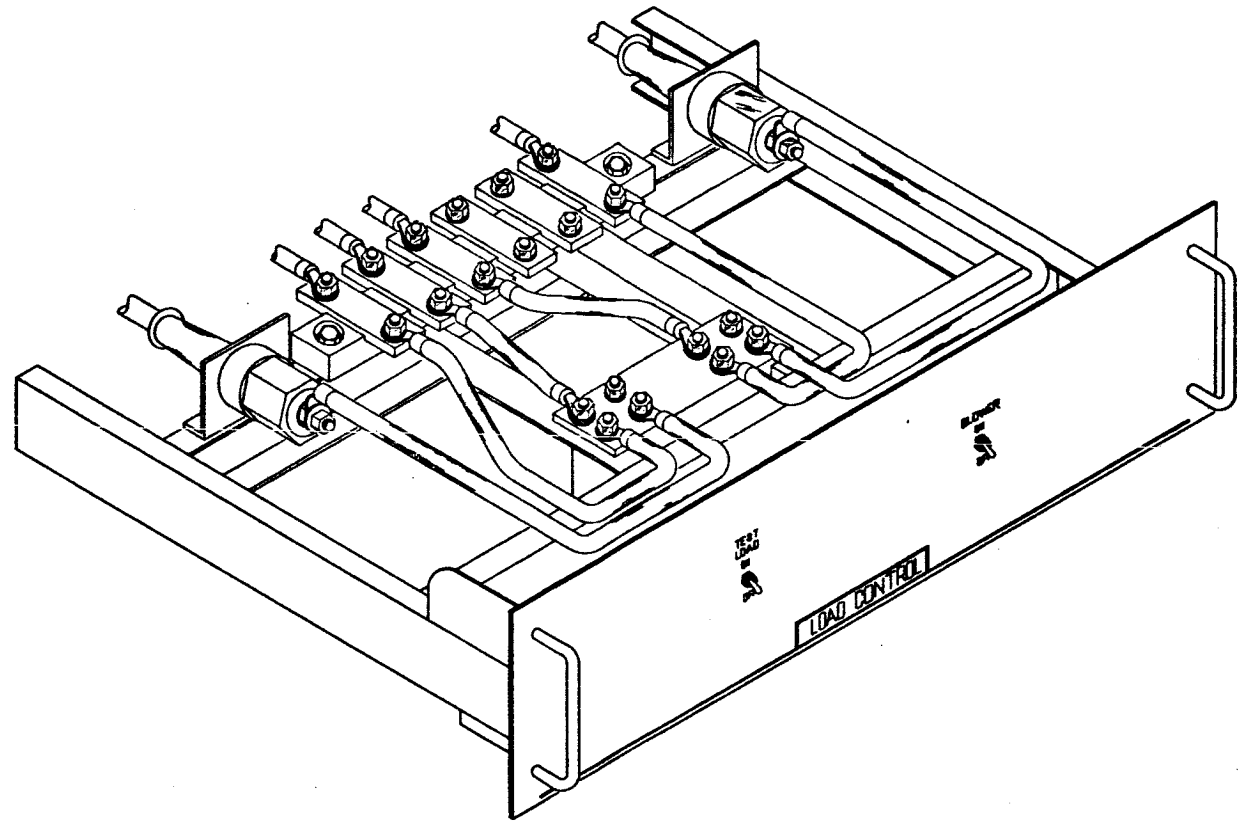
It contains a DPDT contactor (Hartman A-848K or equal) controlled by a front-panel switch. The contactor is actuated by a 28-volt dc coil. The normally open contacts are rated at 200 amperes, and the normally closed contacts at 300 amperes.

The dc power controlled by the contactor is supplied through two single-pin connectors (Superior RS250GB, RS250GR or equal) and is routed through contacts to a group of bus bars.

4-74. Use of the Load Control Panel. In the ESE, a Load Control Panel is located in each standby battery rack and firing battery rack. It is used to disconnect the normal circuits from the batteries in these racks and to connect the standard test load, figure 4-15.

4-75. Locations of Load Control Panels. Four Load Control Panels are used in room 8-A as shown in figure 4-16.

4-76. Design Organization. The Standard Load Control Panel E40M03535 is designed by MSFC-Astrionics. It is furnished by MSFC and used by KSC-Launch Equipment Branch.



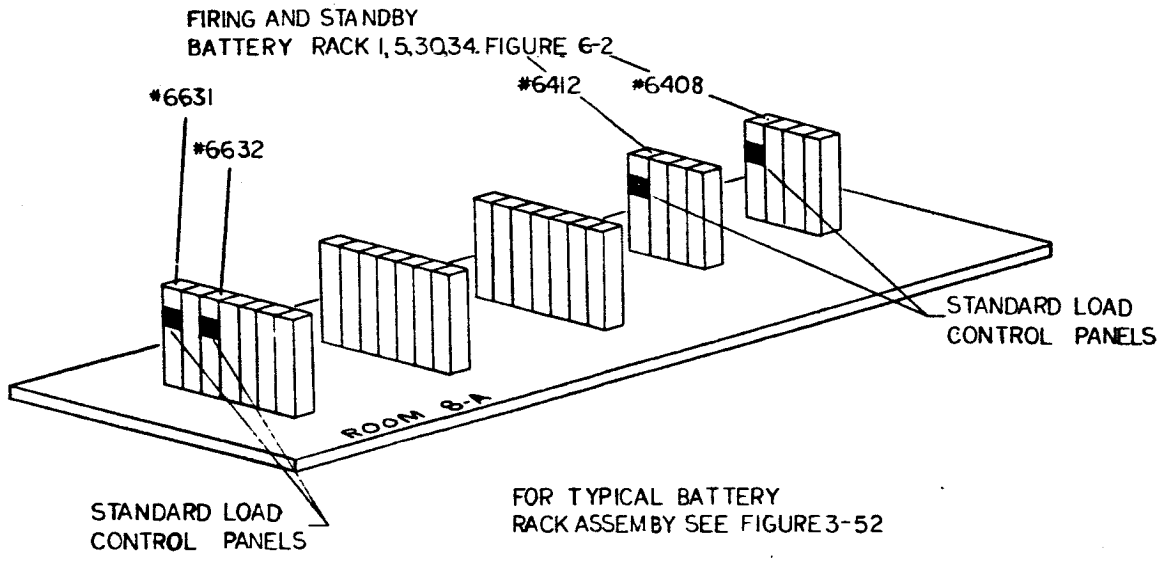


Figure 4-16 **Standard Load Control Panel E40M03535**

4-77. STANDARD BATTERY CHARGER.

4-78. Description of the Battery Charger. The Standard Battery Charger (figure 4-17) is designed for placement in a standard 24-inch rack. It is 12.25 inches high and 24 inches deep.

Input power to the charger is 220/440 volts, 3-phase 60-cycle. A terminal strip is provided for this input. A connector is provided for remote-readout and control-function cabling. DC output cables to the battery load are connected by terminal lugs fixed to bus bars.

The front panel of the charger contains:

a. Switch-lights which indicate Power ON-OFF, Load Charge, Reset, Temperature Alarm, and Cells Charging

b. Panel meters showing charger dc voltage and current

c. Digital readouts for percent discharge, peak discharge, and charge cycle.

The dc power for battery charging is obtained by transforming and rectifying the three-phase line voltage. Semiconductors are used for rectifying, some of which are Silicon Control Rectifiers (SCR) which also control load current. The SCR's are gated by magnetic amplifiers whose input is a comparison of battery voltage to a Zener reference.

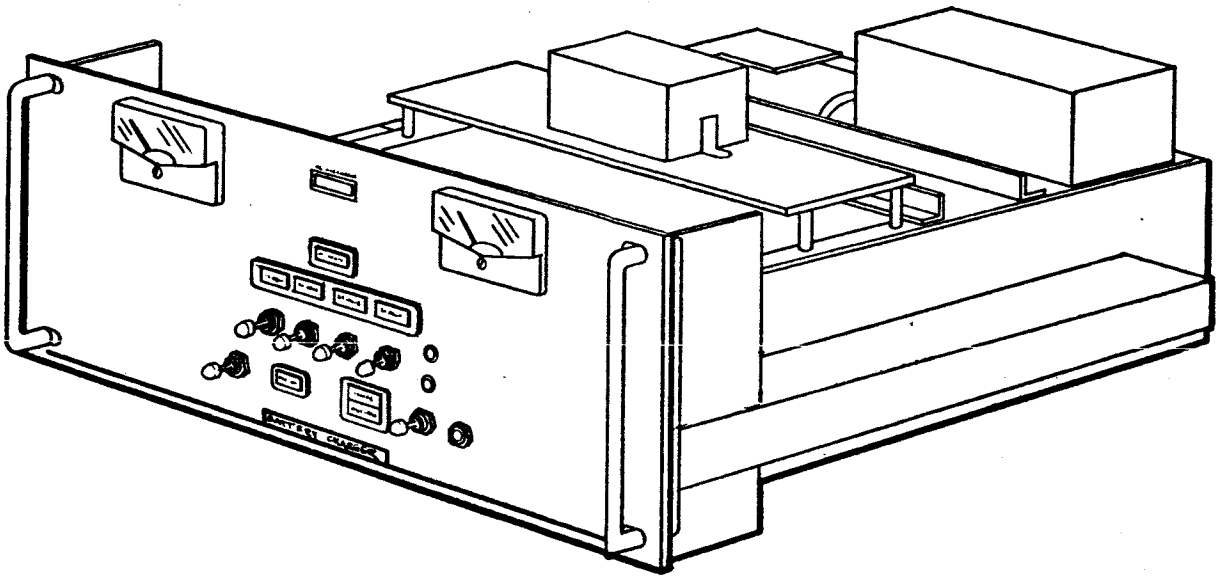
4-79. Use of the Battery Charger. To maintain battery charge, one battery charger is used in each ESE battery rack. These are:

a. Two firing battery racks used in the service arms firing circuit, paragraph 3-25.

b. Two standby battery racks which provide power supply backup.

4-80. Locations of Battery Chargers. The ESE uses four Standard Battery Chargers as in figure 4-17.

4-81. Design Organization. The Standard Battery Charger was designed by MSFC-Astrionics. It is furnished by MSFC and used by KSC-Launch Equipment Branch.



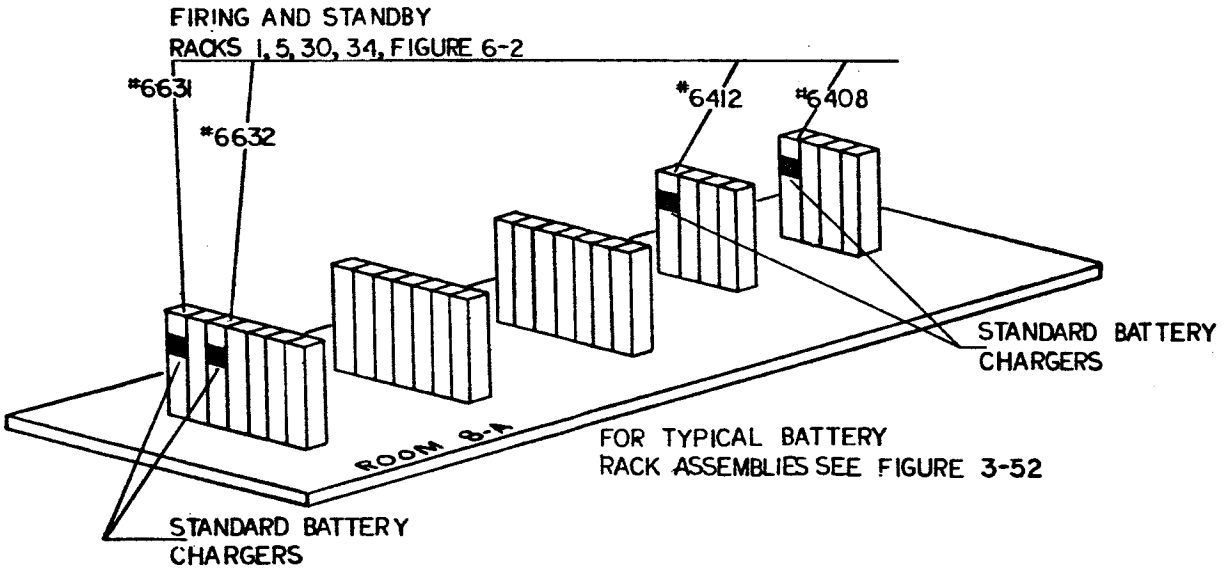


Figure 4-17 Standard Battery Charger

4-82. STANDARD BATTERY PANEL J40M03605.

4-83. Description of the Battery Panel. Standard Battery Panel J40M03605 (figure 4-18) is designed for placement in the standard 24-inch rack. It is 15.72 inches high and approximately 19 inches deep, excluding front handles.

The panel is designed for a maximum load of 240 pounds (120 pounds per battery module, 2 modules maximum).

4-84. Use of the Battery Panel. Standard Battery Panel J40M03605 accommodates batteries for the Firing Batteries and Standby Battery Racks.

4-85. Locations of Battery Panels. Eight battery panels are used for the ESE in room 8-A.

4-86. Design Organization. Standard Battery Panel J40M03605 was designed by the Electrical Section, Launch Equipment Branch.

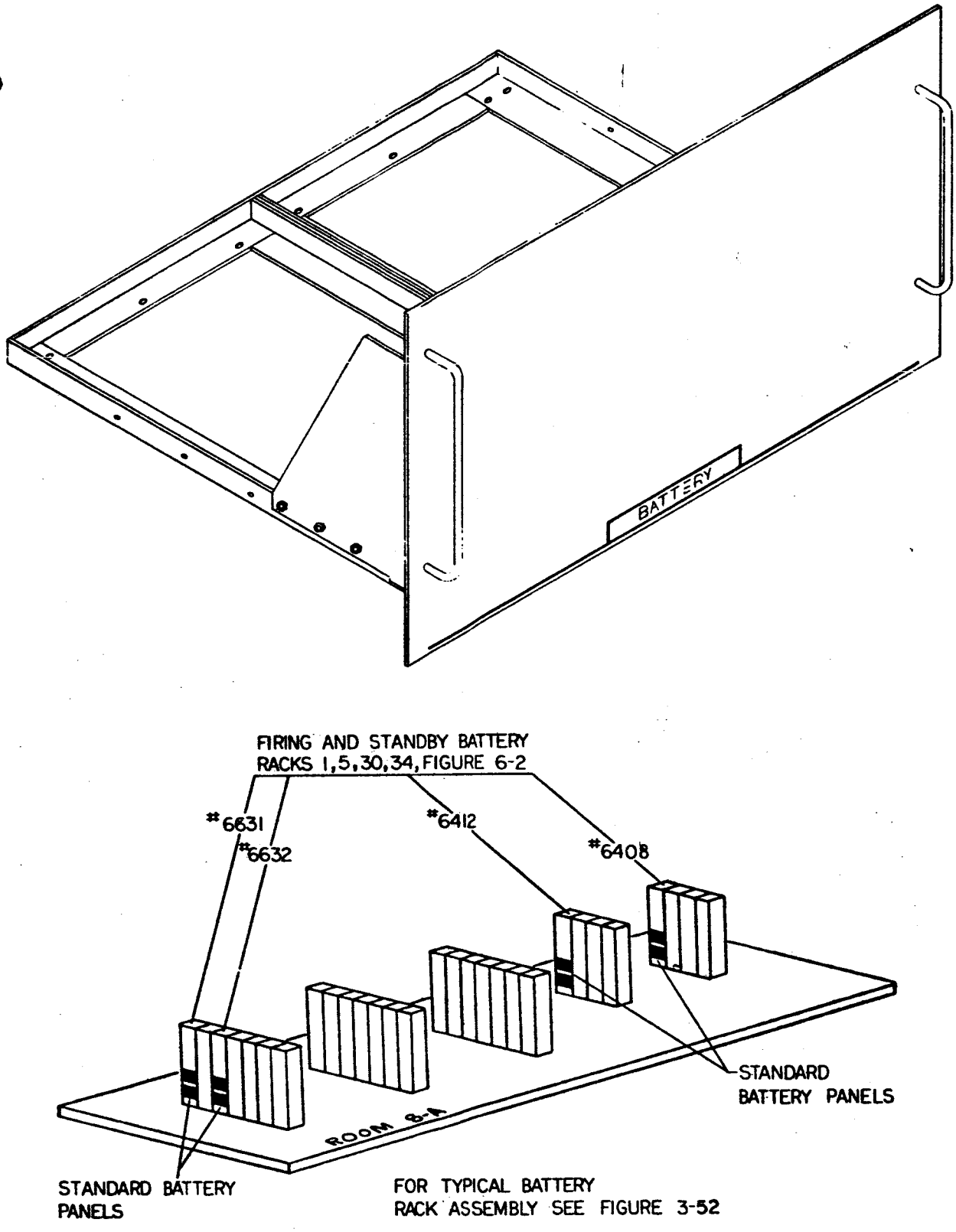


Figure 4-18 Standard Battery Panel J40M03605

4-87. STANDARD POWER MODULE TYPE IIA J75M12295.

4-88. Description of the Power Module. Standard Power Module J75M12295 (figure 4-19) is 8.5 inches high, 4 inches wide, and 14 inches deep. These modules are mounted in a Standard DC Power Frame Type II E75M12301, which in turn mounts in the standard 24-inch rack. Each power module contains:

a. 1 4-pin connector	Bendix HUS-KEY 10-323332-17S or equal
b. 1 10-pin connector	Bendix PT07SE-12-10S or equal
c. 1 circuit breaker	Heinemann Electric Co. AM1510-70 Single-pole, 70 amperes or equal
d. 1 contactor	Cutler-Hammer 6042-H119 or equal
e. 1 shunt	Empro Mfg. Co. 1242-11-50 75 amperes or equal
f. 1 indicating light	

A circuit breaker and contactor are series-wired to provide both overload protection and remote control capability. A shunt is provided for current measurement.

4-89. Use of the Power Module. All power modules are mounted in the ESE power distributor racks. A power module is provided for each of the nine Service Arms, the Hydraulic Charging Unit, Computer Command Functions and the Service Arm Control Switch Assembly (liftoff switch pneumatics). One module is used for the three Tail Service Masts and another for the Pneumatics Control and Distribution Subsystem.

4-90. Locations of Power Modules. There are 18 power modules used in the ESE. Power Distribution Racks #6413, #6414 and #6719 contain six each. All are in room 8-A of the Mobile Launcher base.

4-91. Design Organization. Standard Power Module Type IIA was designed by MSFC-Astrionics and is used by KSC-Launch Equipment Branch.

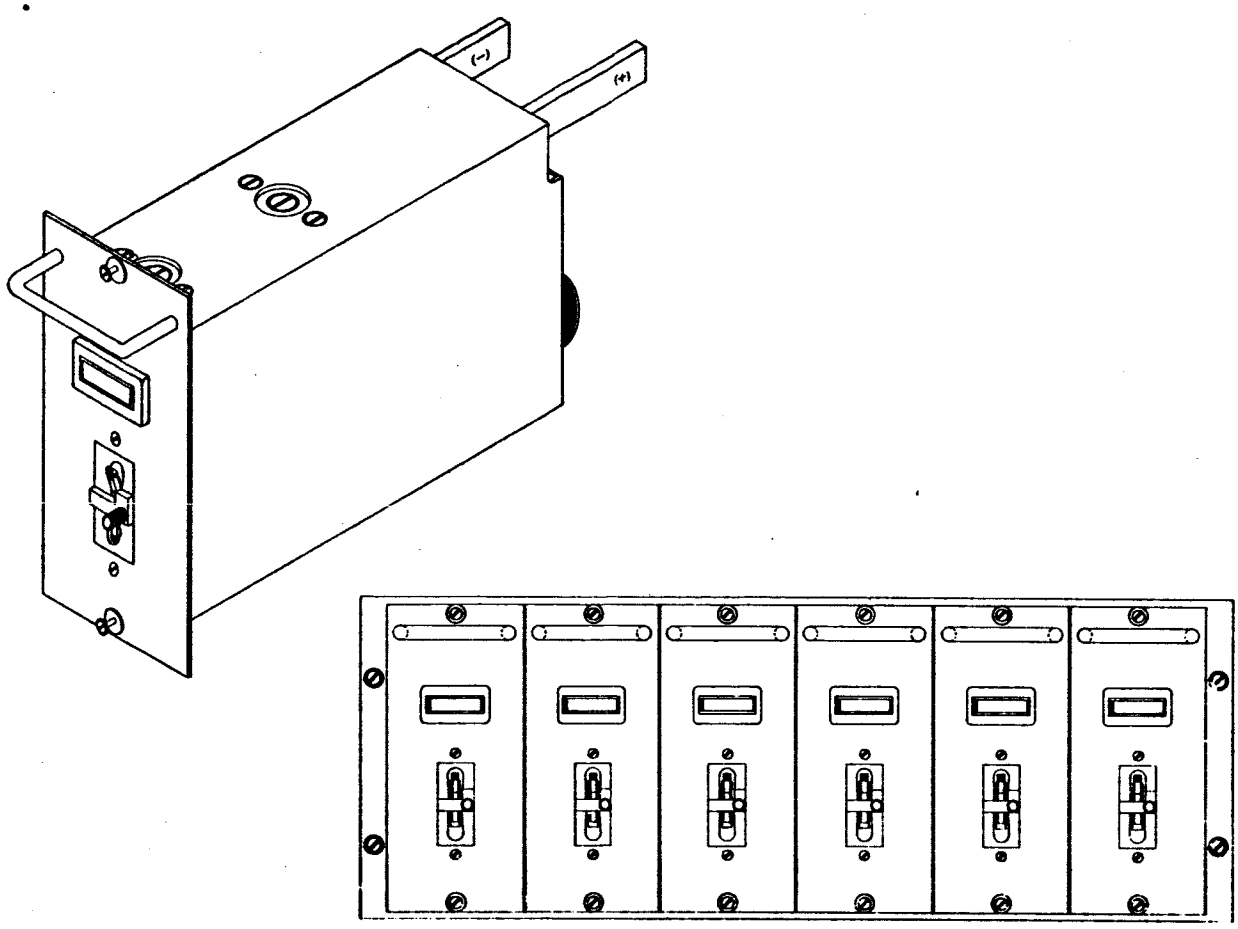


Figure 4-19 **Standard Power Module Type IIA J75M12295 and Standard Frame Assembly E75M12301**

4-92. STANDARD RECEPTACLE DISTRIBUTOR TYPE I E75M12316.

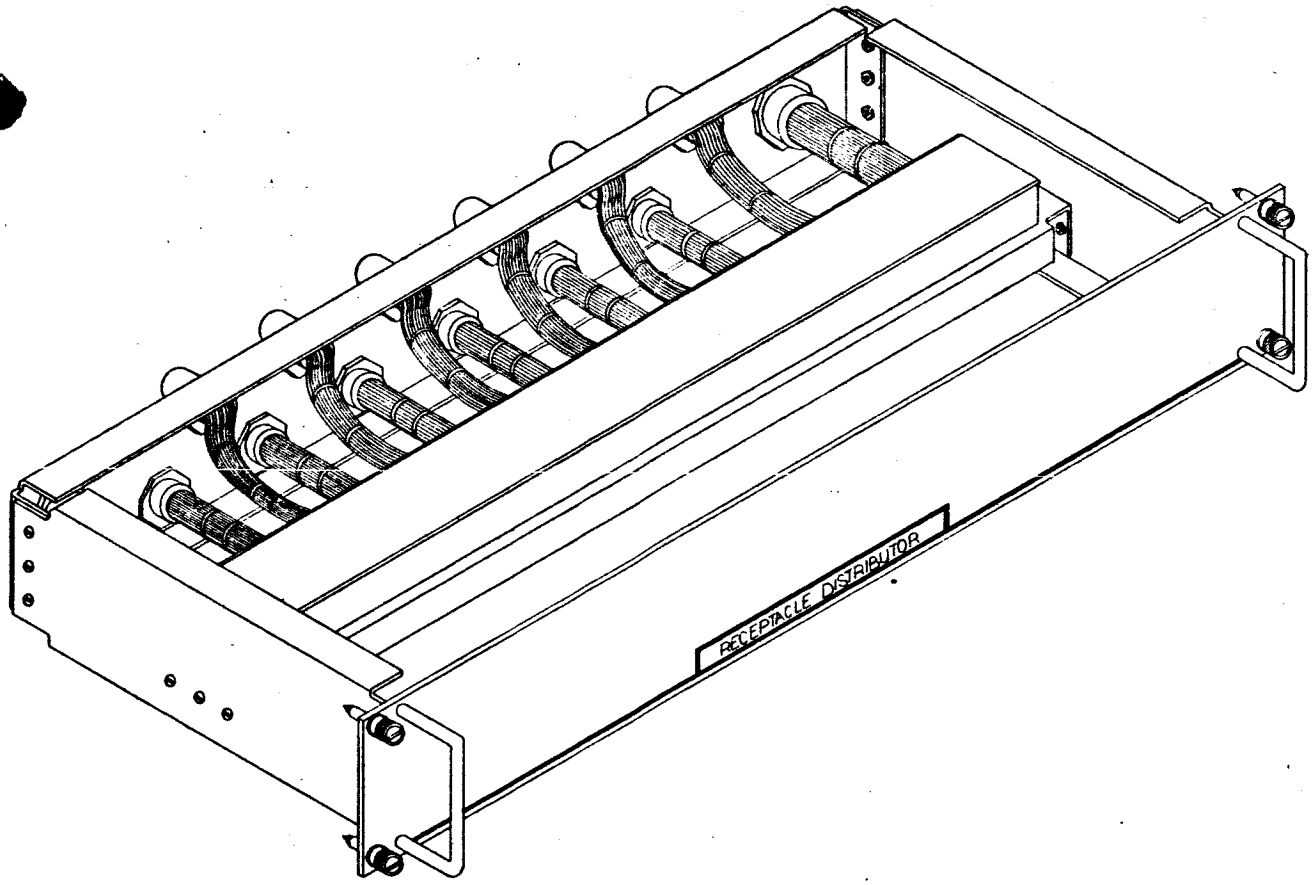
4-93. Description of the Receptacle Distributor. Standard Receptacle Distributor Type I E75M12316 is designed for placement in a standard 24-inch rack. It is 3.6 inches high and 12 inches deep (see figure 4-20).

It contains twelve 10-pin connectors (Bendix PT07SE-12-10P or equal) and two 61-pin connectors (Bendix PT07SE-24-61S or equal). One of the 61-pin connectors is wired to six of the 10-pin connectors, and the other 61-pin connector is wired to the remaining 10-pin connectors.

4-94. Use of the Receptacle Distributor. The Receptacle Distributor Type I is used in the Power Distribution Racks (figure 3-51) to route the 28 volt control and monitoring signals from individual power modules to the relay racks. It combines the twelve 10-conductor cables from the power modules into two 61 conductor cables.

4-95. Locations of Receptacle Distributors. Three type I receptacle distributors are used in the ESE: one each in Power Distribution Racks #6413, #6414, and #6719. All are in room 8-A of the Mobile Launcher base.

4-96. Design Organization. Standard Receptacle Distributor Type I E75M12316 was designed by MSFC-Astrionics and used by KSC-Launch Equipment Branch.



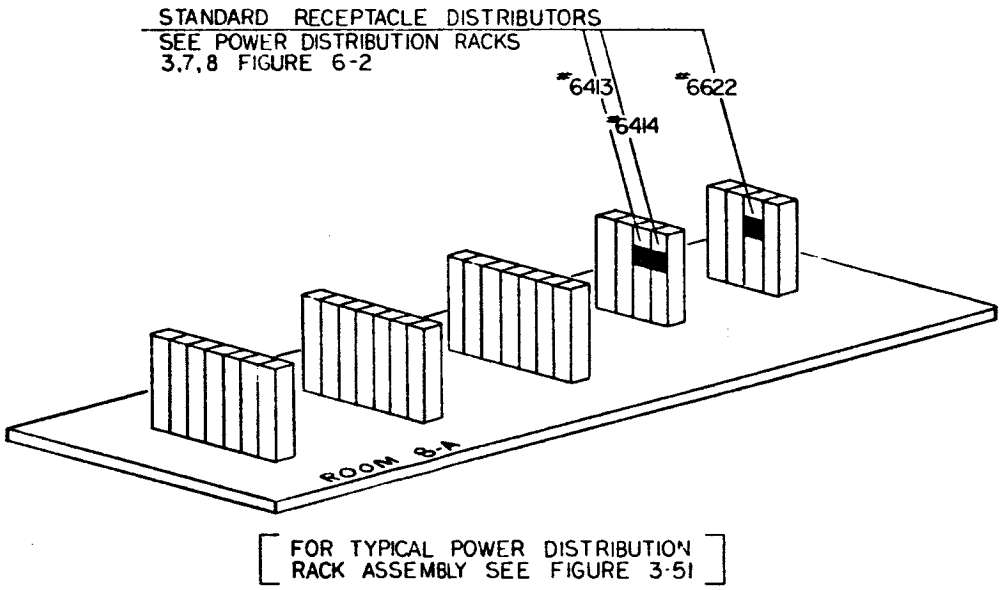


Figure 4-20 Receptacle Distributor E75M12316

4-97. STANDARD BUS DISTRIBUTOR E75M12323.

4-98. Description of the Bus Distributor. Standard Bus Distributor E75M12323 (figure 4-21) is designed for placement in the standard 24 inch rack. It is 5.25 inches high and 14 inches deep. This distributor contains twelve 0.25 inch x 0.75 inch bus bars, each designed for terminating one #4 conductor. The twelve bus bars are divided into six adjacent pairs, with each pair connected to one 61-pin connector (Bendix PT07SE-24-61S or equal).

4-99 Use of the Bus Distributor. The Bus Distributor is used in power distribution racks to distribute dc power from individual power modules to individual 61-pin connectors. For ESE use both bus bars of a given pair have the same polarity, so that all pins of any one 61-pin connector are of the same polarity. It is through these connectors that power is distributed to the ESE systems.

4-100. Locations of Bus Distributors. The Bus Distributors are in Power Distribution Racks #6413, #6414, and #6719, located in room 8-A, (see figure 4-21).

4-101. Design Organization. Bus Distributor E75M12323 was designed by MSFC-Astrionics and is used by KSC-Launch Equipment Branch.

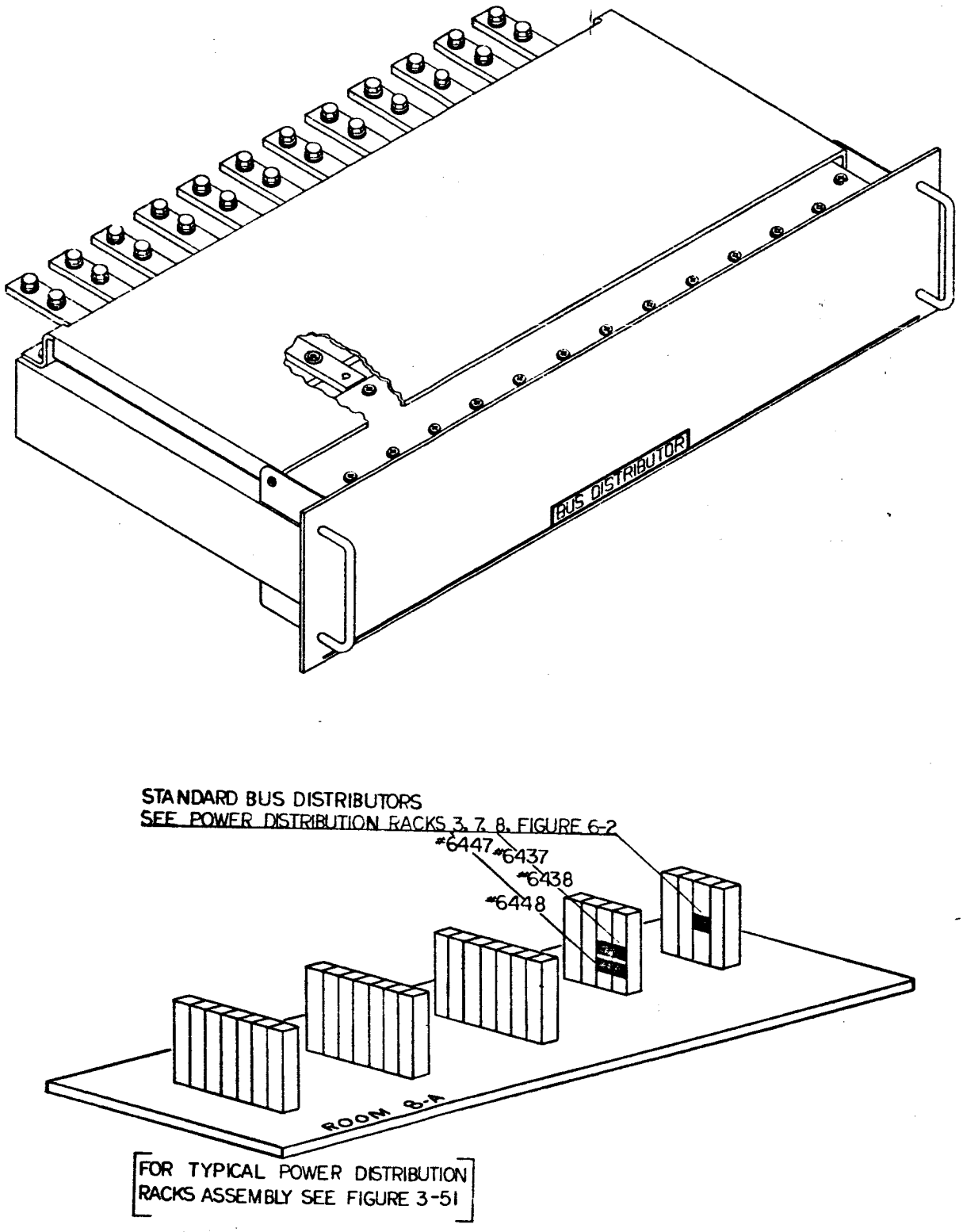


Figure 4-21 Standard Bus Distributor E75M12323

4-102. STANDARD CONSOLE E64-KN-F-261-4.

4-103. Description of the Console. Standard Console E64-KN-F-261-4 (figure 4-22) is a radio frequency interference (R.F.I.) shielded enclosure 53 inches high, 26.06 inches wide, and 30.56 inches deep, with a 19 degree sloping front. The console is designed to house 19-inch component panels on its upper front.

The enclosure base, side panels, and cable entry (enclosure bottom) are removable.

4-104. Use of the Console. These consoles house the LCC control panels which provide remote control, test, and monitor functions for the ESE.

4-105. Location of Consoles. The consoles are in the firing rooms, third floor, Launch Control Center.

4-106. Design Organization. Standard Console E64-KN-F-261-4 is commercial equipment purchased to KSC/MSFC specifications.

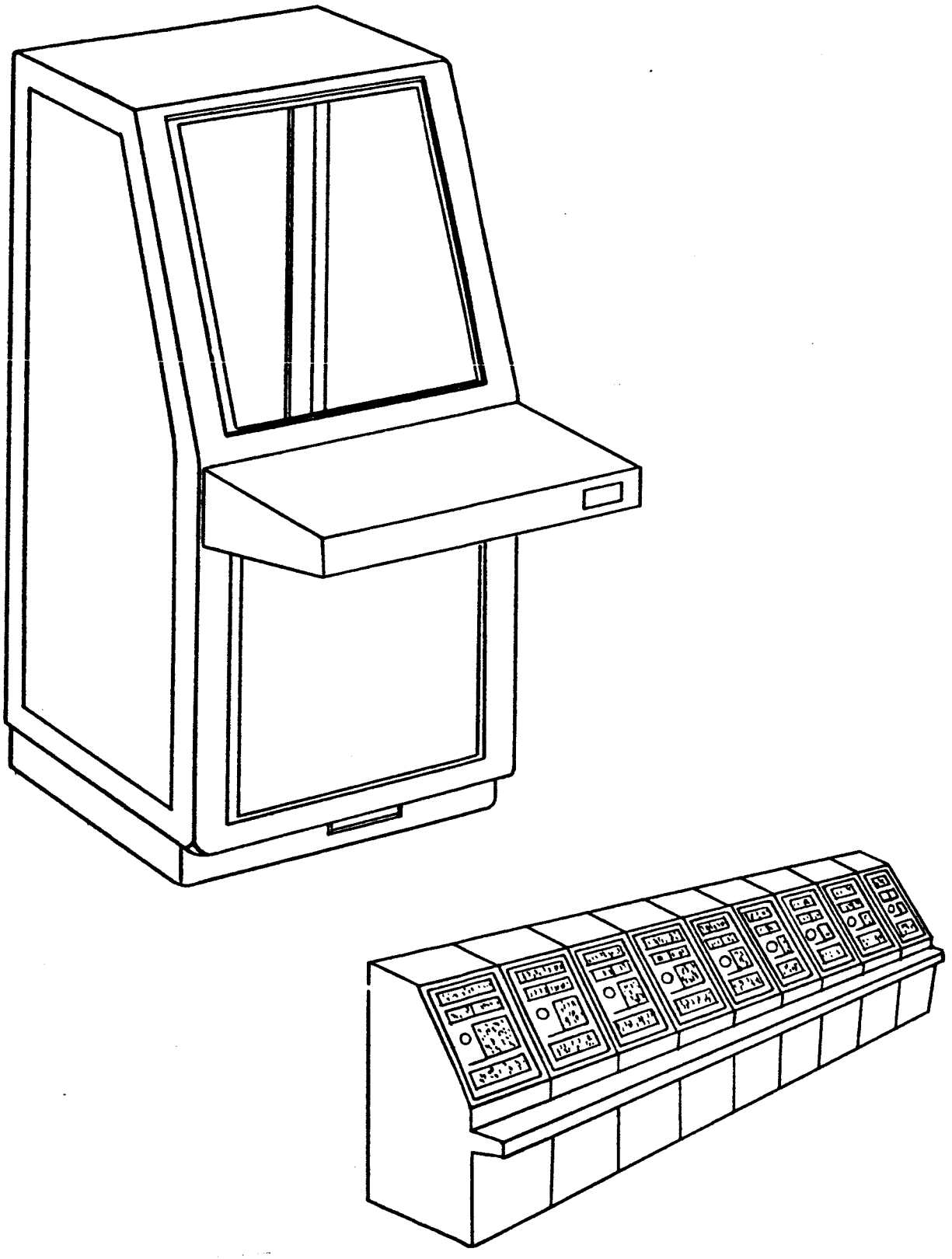


Figure 4–22 Standard Console E64-KN-F-261-4

4-107. INTEGRATION RACK.

4-108. Description of the Integration Rack. The integration rack basically consists of a standard 24-inch vertical rack (Para. 4-17) installed with a standard 54-connector patch distributor (Para. 4-27). Since the base entrance plate to the standard rack can accommodate a maximum of 25 connector entrances, it is necessary to incorporate a side entrance plate to meet the total capacity of the 54-connector distributor.

To provide side cable access, an entrance rack is placed between two integration racks. It will also be used to mount ancillary equipment such as meter panels and communication panels. The entrance rack is a standard 24-inch vertical rack with the side panels removed. (See figure 4-23).

4-109. Use of the Integration Rack. The integration rack is used as an interface between various relay distributors, communication links and control consoles. Its purpose is to gather related signal functions (i.e., commands, analogs, discrete indications, etc.) which emanate from various sources and, by means of patching, route these functions to specific cables which interface with communications hardware. In this way, the total number of interface cables can be reduced by maximum use of available circuits in each cable.

4-110. Locations of Integration Racks. There is an integration rack set located both in room 8-A of the mobile launcher and in each firing room of the launch control center. A set consists of two basic integration distributor racks and one entrance rack.

4-111. Design Organization. The integration rack was designed by the Electrical Section, Launch Equipment Branch.

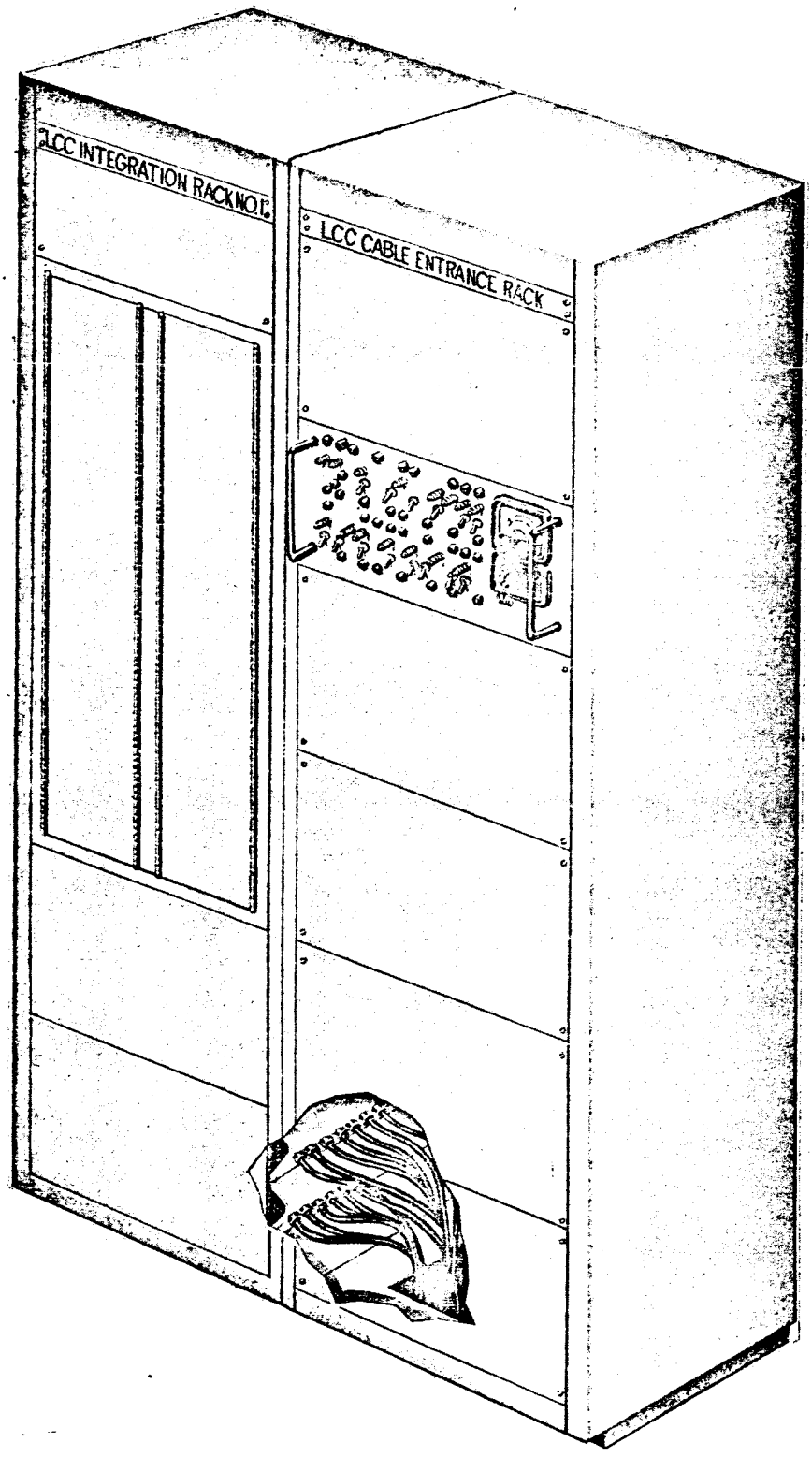


Figure 4-23 Integration and Cable Entrance Racks

4-112. STANDARD LATCHING RELAY MODULE D75M05895.

4-113. Description of the Latching Relay Module. Standard Latching Relay Module (Figure 4-24) is an assembly 2.43 inches high and 5.87 inches long, and weighs approximately 13 ounces. It contains:

a. 7 Relays — Per MSFC-SPEC-339/63 (DPDT 28 vdc relay)
Coil resistance - 800 ohms
Contact rating - 2.0 amperes at 28 volts dc resistive load

b. 7 Bases — Burndy Engineering Co. MT9R-2 or equal, including 72 base contacts (Burndy RC 16Y-1-F59 or equal)

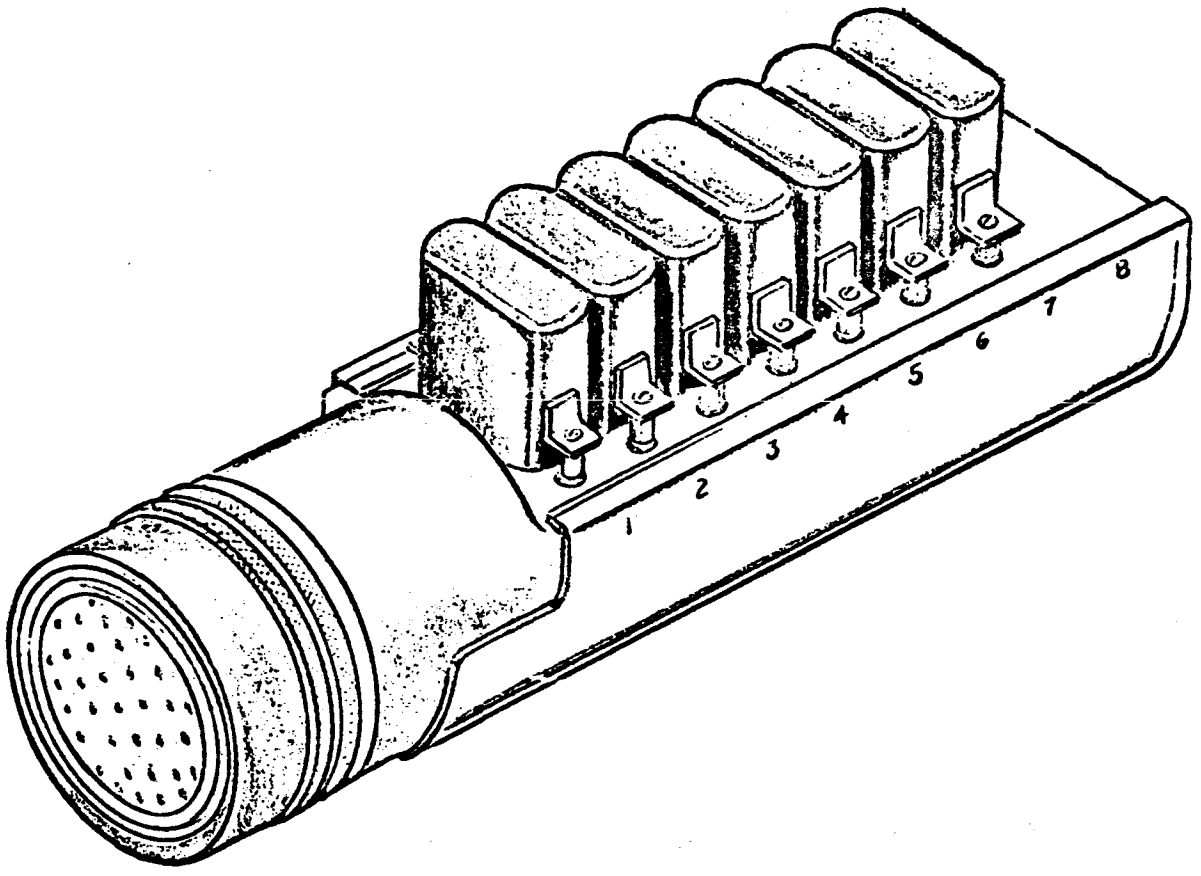
Each relay contact is wired to one pin in the 61-pin connector (Bendix PT06P-24-61S or equal). In all cases, the two coils associated with a specific relay are tied to a common return. For six of the seven relays, two adjacent relays also share a common return for their four coils.

The contacts of the relay are magnetically locked into a specific position when the coil is activated. They remain in this position, even after voltage drop-out. The opposite coil must be activated to switch the contacts.

4-114. Use of the Latching Relay Module. In the ESE, these relays are used as logic and control elements in the control systems when the source signal is of a momentary nature or when the system logic calls for locking out certain functions which are no longer required in series with system operations.

4-115. Location of Latching Relay Modules. In the ESE, these relay modules are connected as required to various patch distributors in the relay racks in room 8-A.

4-116. Design Organization. Standard Latching Relay Module D75M05895 was designed by the Electrical Section, Launch Equipment Branch.



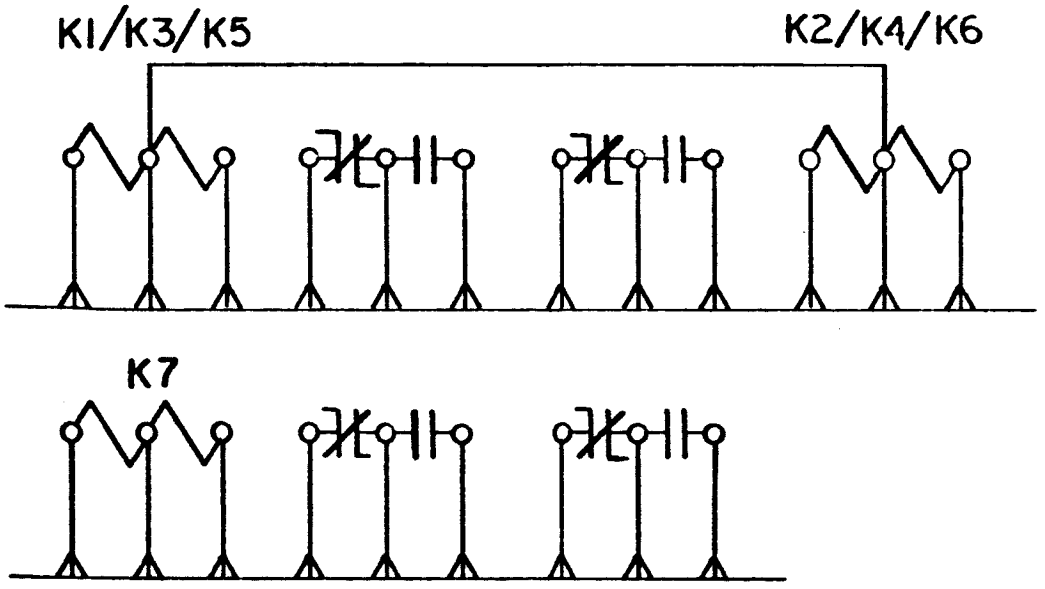


Figure 4-24 Standard Latching Relay Module D75M05895

SECTION V

TEST EQUIPMENT

ELECTRICAL SUPPORT EQUIPMENT

5-1. GENERAL.

Section V describes the four basic test units which are used to test or simulate the ESE. Among these units, three are patchboard-programmable assemblies which satisfy several test functions, and can be readily programmed for testing other similar systems.

Also included in this section is a description of the swing arm and tail service mast qualification test site at MSFC, where certain of the test equipments will be first employed.

5-2. LAUNCHER GROUND EQUIPMENT TEST SET E75M13286.

5-3. Description of the Test Set. The Launcher Ground Equipment Test Set (GETS) (figure 5-1) is a roll-around portable test console approximately 57 inches high, 53 inches wide, and 28 inches deep. It contains:

a. 1 standard 60-connector patch distributor

b. 1 standard 40-connector patch distributor

c. 250 indicator lamp modules (JAY-EL P/N10182 or equal)

d. 90 meters Triplett model .5E or equal

e. 90 analog potentiometers

f. 300 switches (Cutler Hammer 8867K1 or equal

g. 2 standard fuse panels

h. 1 standard communication panel

i. 1 power monitor panel

This test set has provision for 20 function-cable connections and four power-cable connections. These cables enter the console through a hinged door in the console base. Two doors on the front of the console provide access for connecting cables, diode modules, and relay modules to the patch distributor.

Two drawers with writing surfaces are provided for the operator.

5-4. Use of the Launcher GETS. For the purpose of checkout and test of the ESE subsystems, two Launcher GETS are employed as in figure 5-3. One is programmed as a control and monitor unit which generates all signals normally provided to the ESE subsystems from the LCC. At the same time, it simultaneously displays all discrete and analog signals arising in the particular subsystem under test. See figures 5-4 and 5-5. As a control and monitor unit, the Launcher GETS uses up to 10 diode modules (paragraph 4-42) in conjunction with the components listed above.

The other Launcher GETS is connected to system cables coming from the LCC. It is thus a simulator, and is programmed to simulate the electrical-mechanical control and monitor components within a given ESE subsystem. These are mainly solenoids, pressure transducers, and pressure switches in the service arms, tail service masts, and Mobile Launcher base. Programmed as a

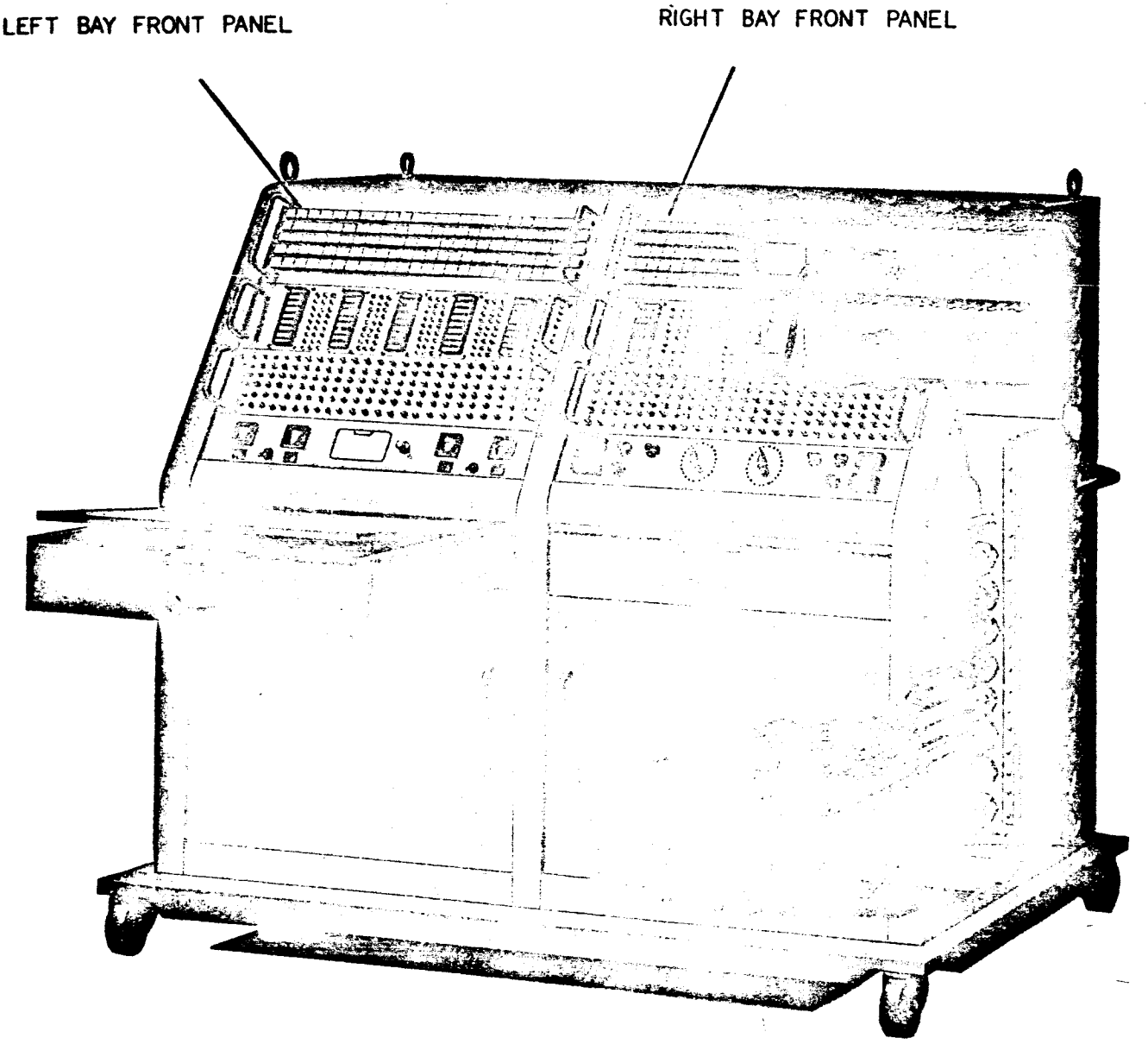


Figure 5-1 Ground Equipment Test Set E75M13286

simulator the Launcher GETS uses up to 36 relay modules (paragraph 4-37) along with its other test components.

Both the GETS control unit and the simulator unit interface with the ESE subsystems at the relay racks in room 8-A. The control unit is connected to the relay racks in place of systems cables from the LCC; the monitor unit is connected to the LCC cables themselves.

For these purposes, pre-installed test cables from the relay racks are routed beneath the deck to a deck plate in room 8-A. During tests the GETS is placed near the deck plate and connected to appropriate test cables.

5-5. Location of the Launcher GETS. The Launcher GETS is used in room 8-A.

5-6. Design Organization. The Launcher GETS was designed by the Electrical Section, Launch Equipment Branch.

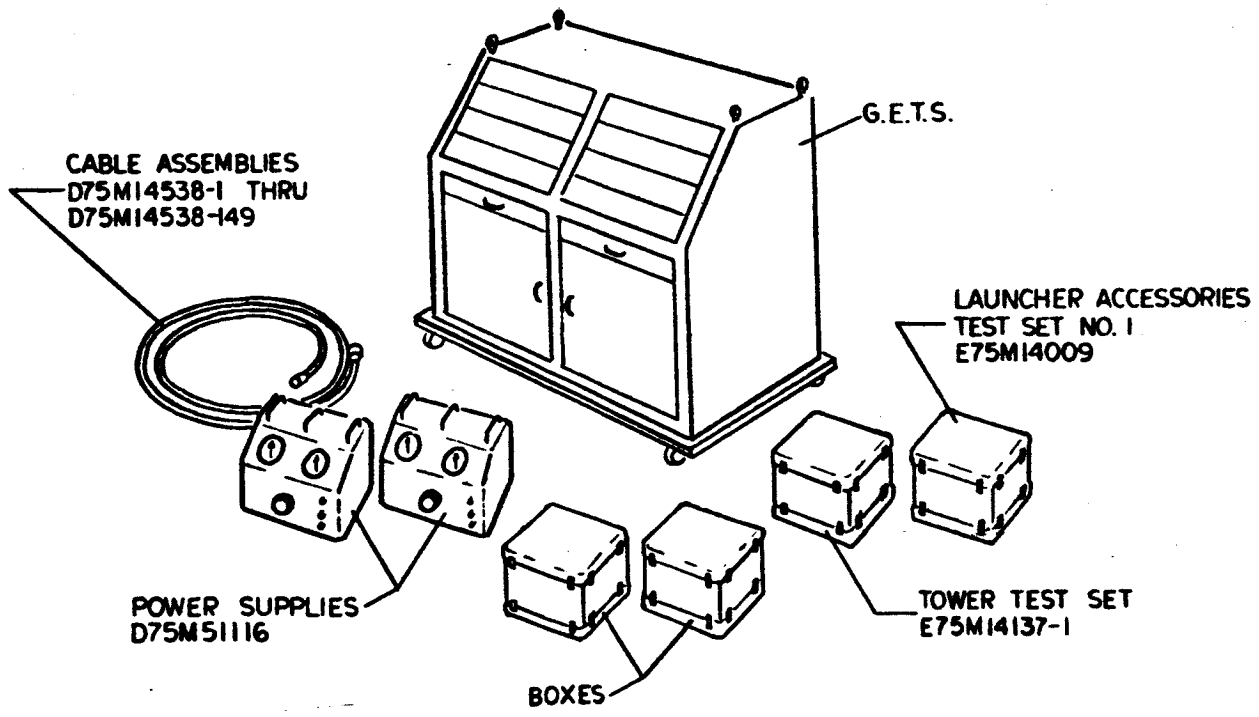


Figure 5-2 GETS Auxiliary Equipment

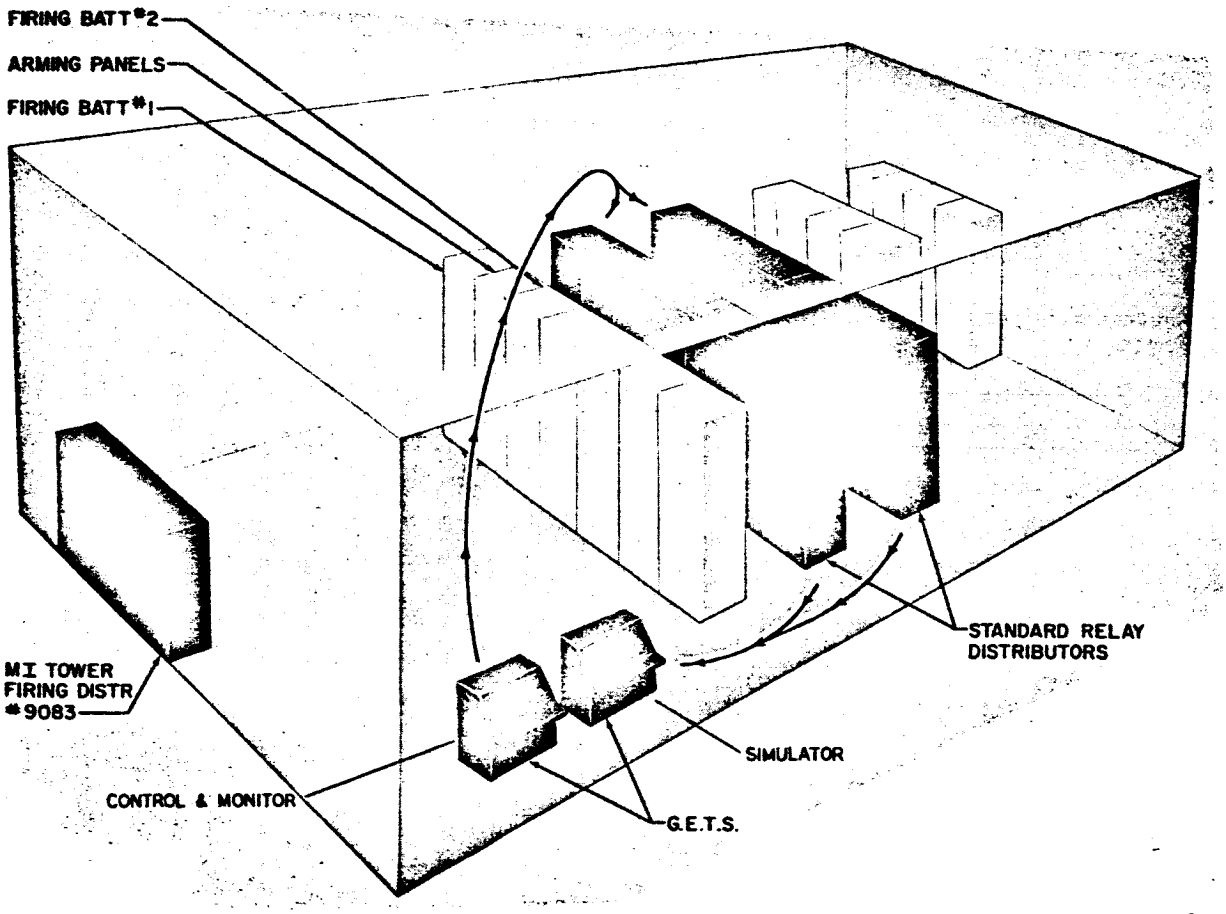
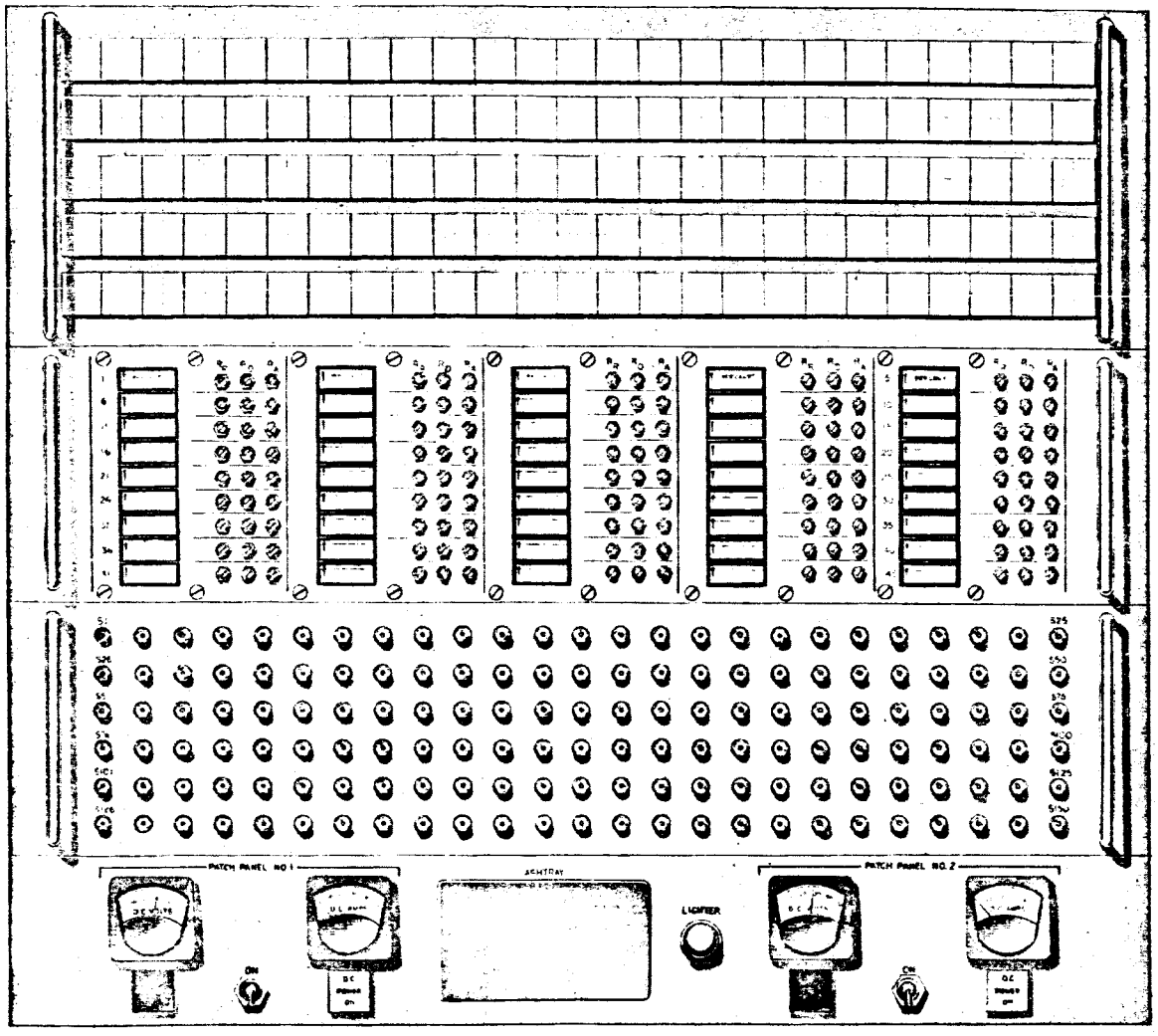
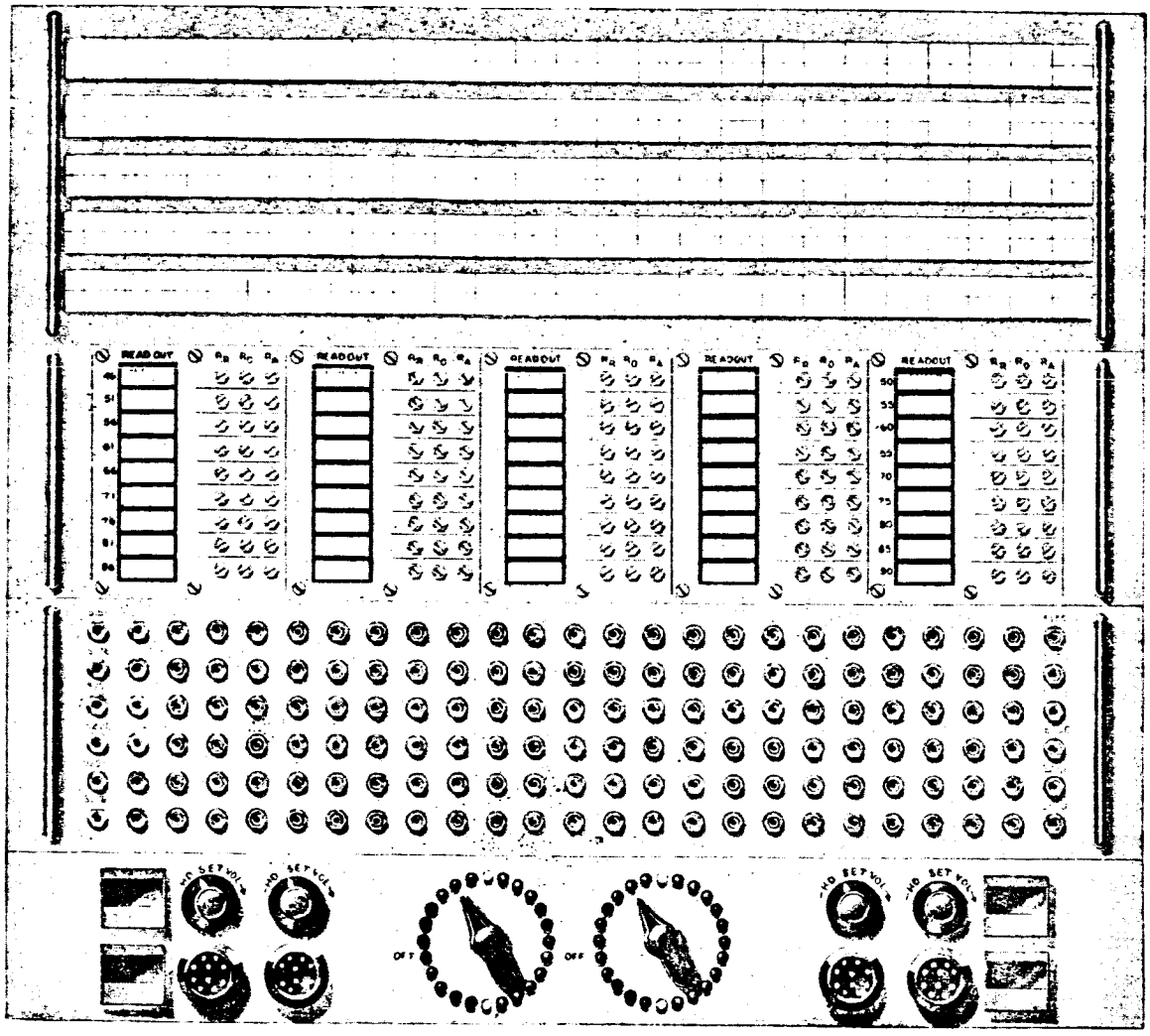


Figure 5-3 GETS Control, Monitor and Simulation



1	LIGHT PANEL ASSY.	E75MI3292
2	ANALOG PANEL ASSY.	E75MI3294
3	SWITCH PANEL ASSY.	E75MI3296
4	POWER MONITOR & CONTROL PANEL ASSY.	E75MI3298

Figure 5-4 Left Bay Front Panel, Launcher GETS



1	LIGHT PANEL ASSY.	E75MI3293
2	ANALOG PANEL ASSY.	E75MI3295
3	SWITCH PANEL ASSY.	E75MI3297
4	COMMUNICATIONS PANEL ASSY	E75MI3299

Figure 5-5 Right Bay Front Panel, Launcher GETS

5-7. MINIATURIZED UNIVERSAL TEST SET (MUTS) E75M13761.

5-8. Description of the MUTS. The Miniaturized Universal Test Set (figure 5-6) is a portable test unit 8 inches high x 13.5 inches wide x 11.5 inches deep, and weighs approximately 35 pounds. It contains these components:

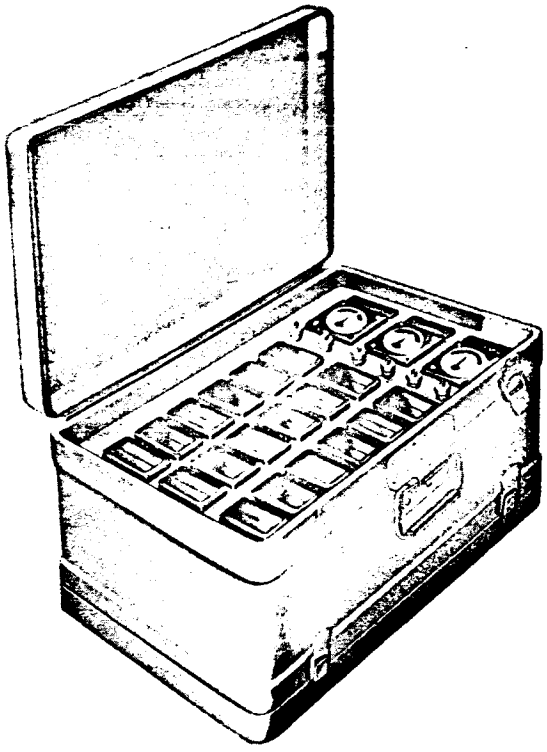
a. 3 meters	Weston Model 3911, 50 microamperes or equal
b. 24 Twist-Lites	Series 10/E; horizontally split display DPDT switch combinations
c. 16 relay sockets	Burndy MTR-92 or equal
d. 19 taper pin blocks	AMP 53 series, 30 pins or equal
e. 16 relays	MSFC-SPEC-339/53

The program of the MUTS is carried to the controlled unit by one or two 61-conductor cables using a pigmy connector (Bendix PT07P-24-61S or equal). Input 28 volts dc is supplied through one 3-pin connector (Cannon BFR22-2P or equal). For self-checks, the MUTS contains a transistorized ground indicator circuit, a POWER AVAILABLE indicator, and a POWER ON indicator.

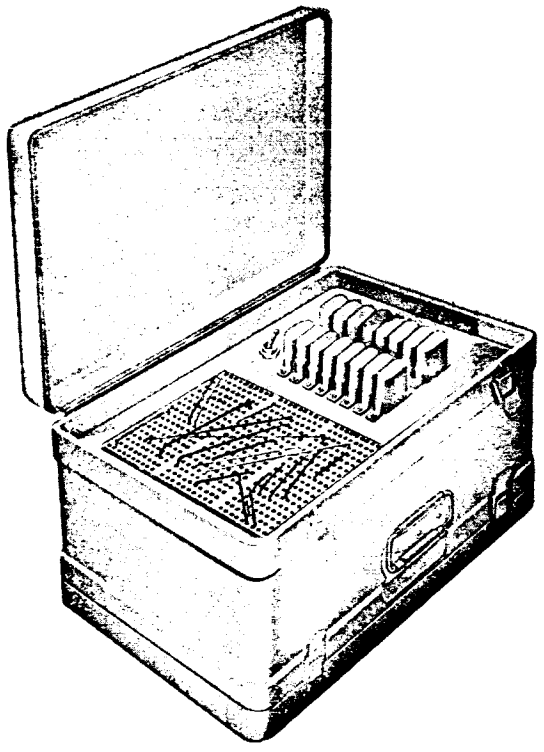
5-9. Use of the MUTS. The MUTS can be patched to check pneumatic pressures and the operation or position status of valves and relays, and in addition can be hand carried about the Mobile Launcher by test personnel. It is presently used as the Tower Test Set for the Q-Ball Cover Removal Subsystem and for Valve Panel #12.

5-10. Locations of MUTS. The MUTS tests the Q-Ball cover mechanism on level 360 (figure 3-43), and Valve Panel 12 on level 160 (figure 3-40).

5-11. Design Organization. The MUTS was designed by the Electrical Section, Launch Equipment Branch.



TOP VIEW



BOTTOM VIEW

Figure 5-6 Miniaturized Universal Test Set E75M13761

5-12. PORTABLE ARM CONTROL CONSOLE J75M07542.

5-13. Description of the Console. The Portable Arm Control Console (figure 5-7) is a roll-around portable test console approximately 50 inches high, 45 inches wide, and 28 inches deep. It contains its own dc power supply, and so can use either 28 volts dc or 115 volts ac input. The console's arm control panel has the following components:

a. 103 indicator lamps	Lamps Control of America (Series L3000) or equal
b. 1 meter	Minneapolis-Honeywell HS2F, 0-50 ua. or equal
c. 39 switches	Cutler Hammer 8833-K4 & 8821-K6 or equal

Its charging control panel has these components:

a. 108 indicator lamps	Lamps Control of America (series L3000) or equal
b. 54 switches	Cutler Hammer 8825-K6 or equal

The console also contains a 27-connector patch distributor (paragraph 4-32), plus the following connectors for power and control-function connections:

a. 24 Cannon Connectors	TBFR 16S-1PS or equal
b. 7 Cannon Connectors	TBFR 24-10PS or equal
c. 1 Cannon Connector	TBFR 22-2PS or equal
d. 5 Cannon Connectors	TBFR 22-22PS or equal
e. 1 Bendix Connector	10-248454-75PS or equal
f. 6 Bendix Connectors	10-248454-73PS or equal

5-14. Use of the Console. The Portable Arm Control Console may be programmed to control, test, and monitor the Apollo access arm and any of the eight service arms. Test programs are altered by changing patchboards in its patch distributor. The console is positioned on the tower level associated with the arm under test, and its test cables are connected to distributors and electro-mechanical components as required.

5-15. Locations of Console. The Portable Arm Control Console is used on tower levels 60, 120, 140, 160, 200, 220, 260, and 300.

5-16. Design Organization. The Portable Arm Control Console was designed by the Electrical Section, Launch Equipment Branch.

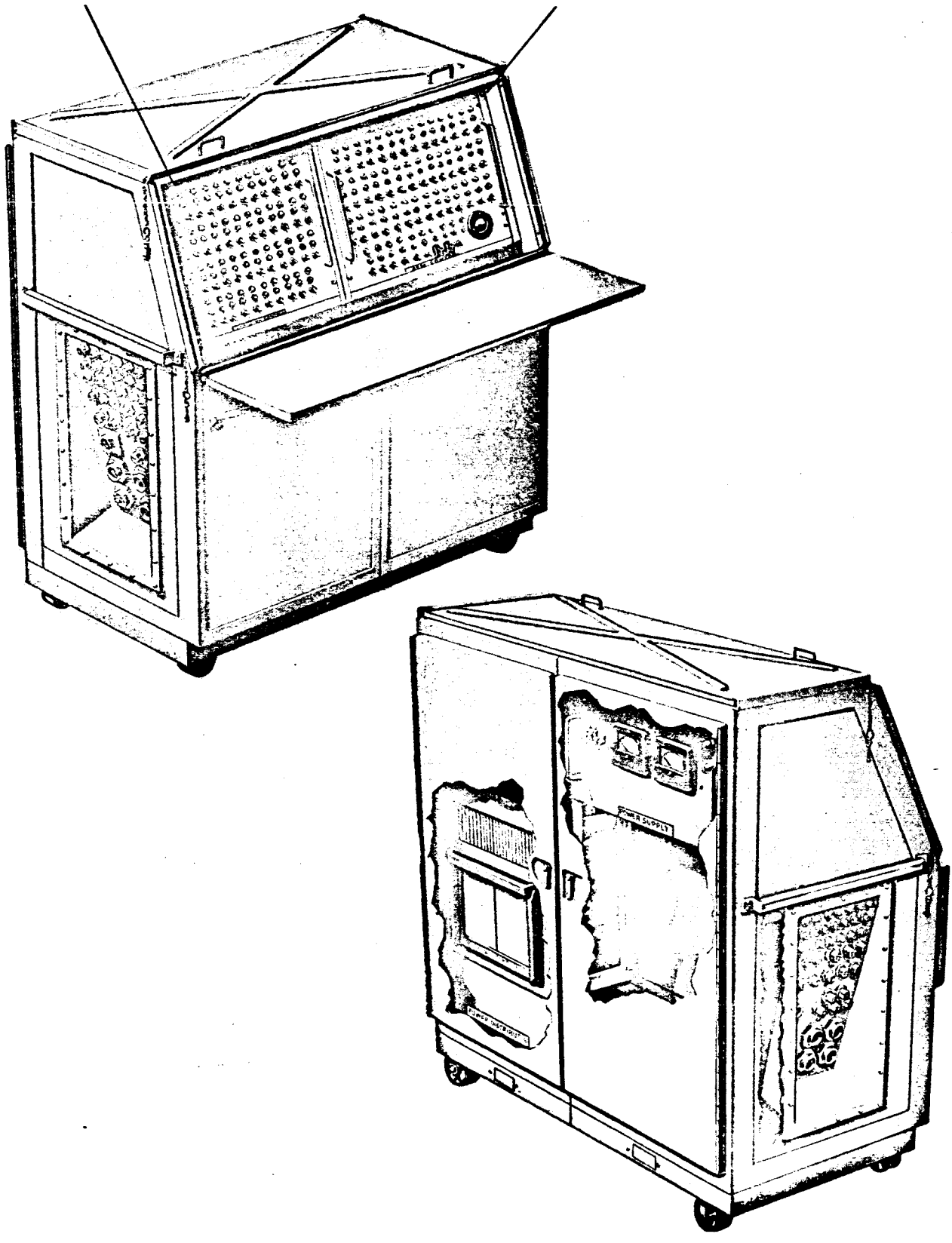


Figure 5-7 Portable Arm Control Console J75M07542-1

5-17. UNIVERSAL PATCHBOARD TEST SET E75M09032.

5-18. Description of the Test Set. The Universal Patchboard Test Set (figure 5-8) E75M09032 is a portable test unit approximately 16 inches x 16 inches x 14.9 inches high, weighing about 50 pounds. It contains these test components:

a. 6 Meters	Weston Model 3911, 50 microampere dc or equal
b. 54 Lights	Dialco Socket 101-8430W-975; lamps ASA 327 or equal
c. 27 Switches	Cutler-Hammer 8867K6 or equal
d. 28 Relay Sockets	Burndy MTR-92 or equal
e. 1 Patchboard Assy.	AMP P816D, 695081-3 Frame & Spring or equal AMP 595005-2 Removable Board or equal

The program from the Universal Patchboard Test Set is carried to the controlled unit by one or two 61-conductor cables using pygmy connectors (Bendix PT07P-24-61S or equal). Input 28 volts dc is supplied through one 3-pin connector (Cannon BFR22-2P or equal). For self-checks, the test set contains a ground indicator circuit, a lamp filament test switch, POWER ON and POWER AVAILABLE indicators, and a test socket and switch for individual lamp tests.

5-19. Use of the Test Set. The Universal Patchboard Test Set can be programmed to measure pneumatic pressures and check the operation or position status of various valves and relays. It can be hand carried about the Mobile Launcher by test personnel. At present, the test set has three separate programmings:

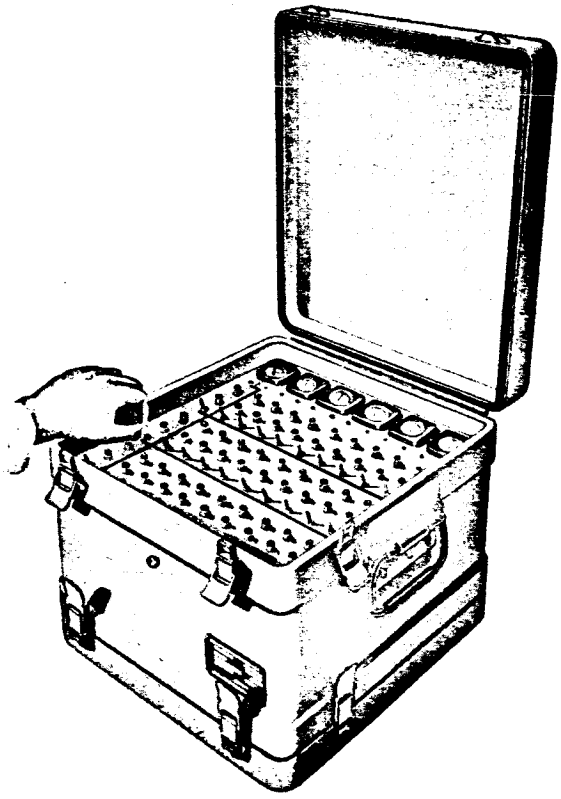
a. Tail Service Mast Test Set, figures 3-33 and 3-34

b. Launcher Accessories Test Set No. 1, figures 3-37 and 3-38

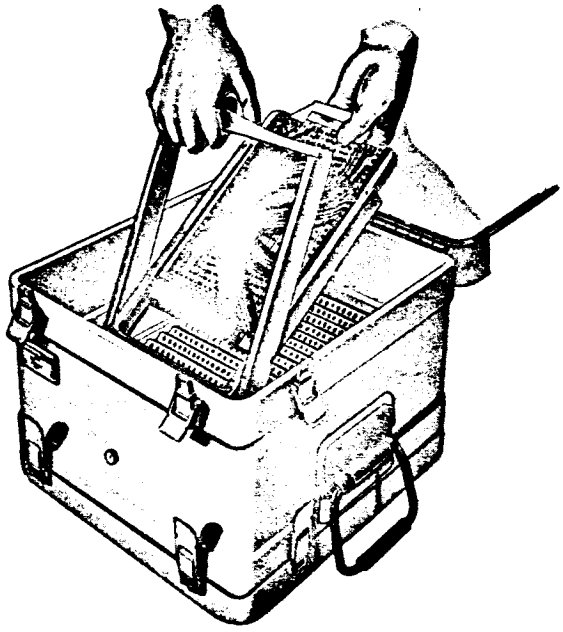
c. Launcher Accessories Test Set No. 2, figures 3-22 and 3-26

5-20. Locations of Test Set. The Universal Patchboard Test Set is used on levels 0, A, and B.

5-21. Design Organization. The Universal Patchboard Test Set was designed by the Electrical Section, Launch Equipment Branch.



TOP VIEW



BOTTOM VIEW

Figure 5-8 Universal Patchboard Test Set E75M09032

5-22. MSFC SERVICE ARM/TAIL SERVICE MAST TEST SITE.

5-23. Purpose of the Test Site. The MSFC Test Site is used to functionally test and qualify for operational use each service arm and tail service mast in conjunction with its associated control equipment. The tests simulate launch conditions and are performed on the equipment prior to delivery to KSC.

5-24. Equipment for the Test Site. The Test Site at Marshall Space Flight Center (figure 5-9) is a test facility comprised of ten test stands, a tail service mast pad, and a block house.

5-25. Service Arm Test Stands. There are nine swing arm test stands, four of which contain preflight vehicle simulators and five of which contain vehicle liftoff simulators. All swing arm test stands contain power and signal distributors, mounting facilities for equipment tested and closed-circuit television for visual monitoring of tests. Four of the test stands also share cryogenic handling equipment and nine stands share an engine exhaust pressure simulator.

On each swing arm test stand there is one service arm which is to be functionally tested before it is installed on a Mobile Launcher at LC-39. Also available for test are the swing arm related control cabinets No.1 and No. 2, and hydraulic/pneumatic actuators. This equipment will be provided with the swing arm on delivery to LC-39.

Certain electrical distributors used on the Mobile Launcher for service arm control are facility end items; on the test stands they are replaced by special permanently installed distributors. Hence, each Umbilical Instrumentation and Control Distributor is replaced by a test site Tower Terminal Box. Each Mineral Insulated Firing Distributor is replaced by a special test site Firing Distributor. In addition, a test site Vehicle Receptacle Box on each inflight test stand connects the liftoff switches to the arm control system.

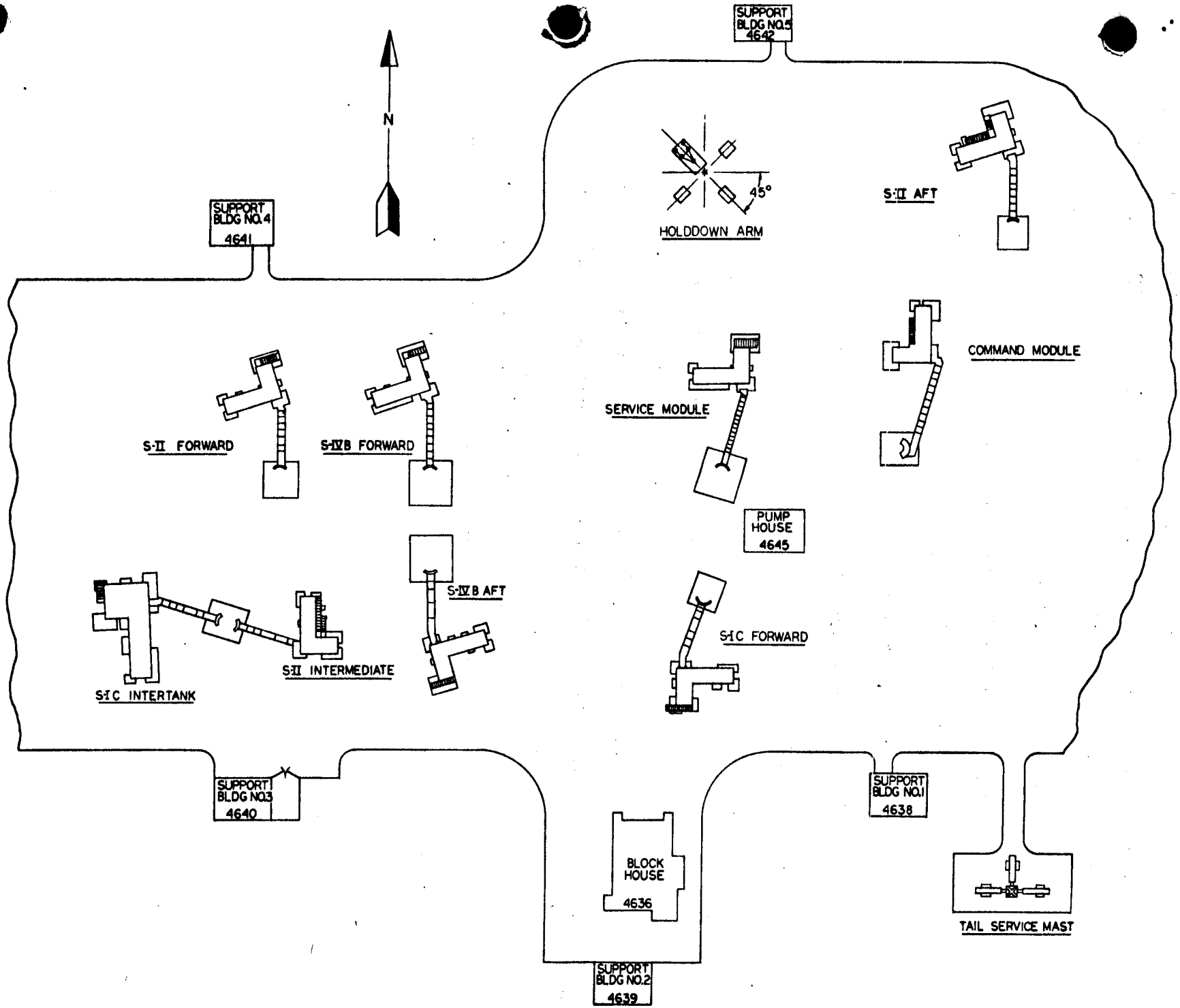


Figure 5-9 MSFC Service Arm/Tail Service Mast Test Site

Some of the electrical equipment needed for control and monitoring of the service arm is shown in figure 5-11. Equipment supplied by the Electrical Section, Launch Equipment Branch, includes:

a. Blockhouse control rack assemblies (4)

b. Blockhouse distribution rack assemblies (5)

c. Firing distributors (5)

d. Tower terminal boxes (9)

e. Vehicle receptacle boxes (5)

f. Integration rack (1)

5-26. Electrical Control for the Service Arms. Primary control and monitoring of the service arm under test is conducted from the second floor of the blockhouse. Four control racks (figures 5-11 and 5-12) provide test functions shown on the typical control rack overlay (figure 5-10). There is one overlay for each of the nine arms, one for the liftoff switches, and one for the hydraulic charging unit and holddown arm control.

The control panel overlay shows that the electrical control system can be programmed to allow the swing arm to perform as a complete, automatic system. Alternately, many discrete mechanical functions can be tested separately.

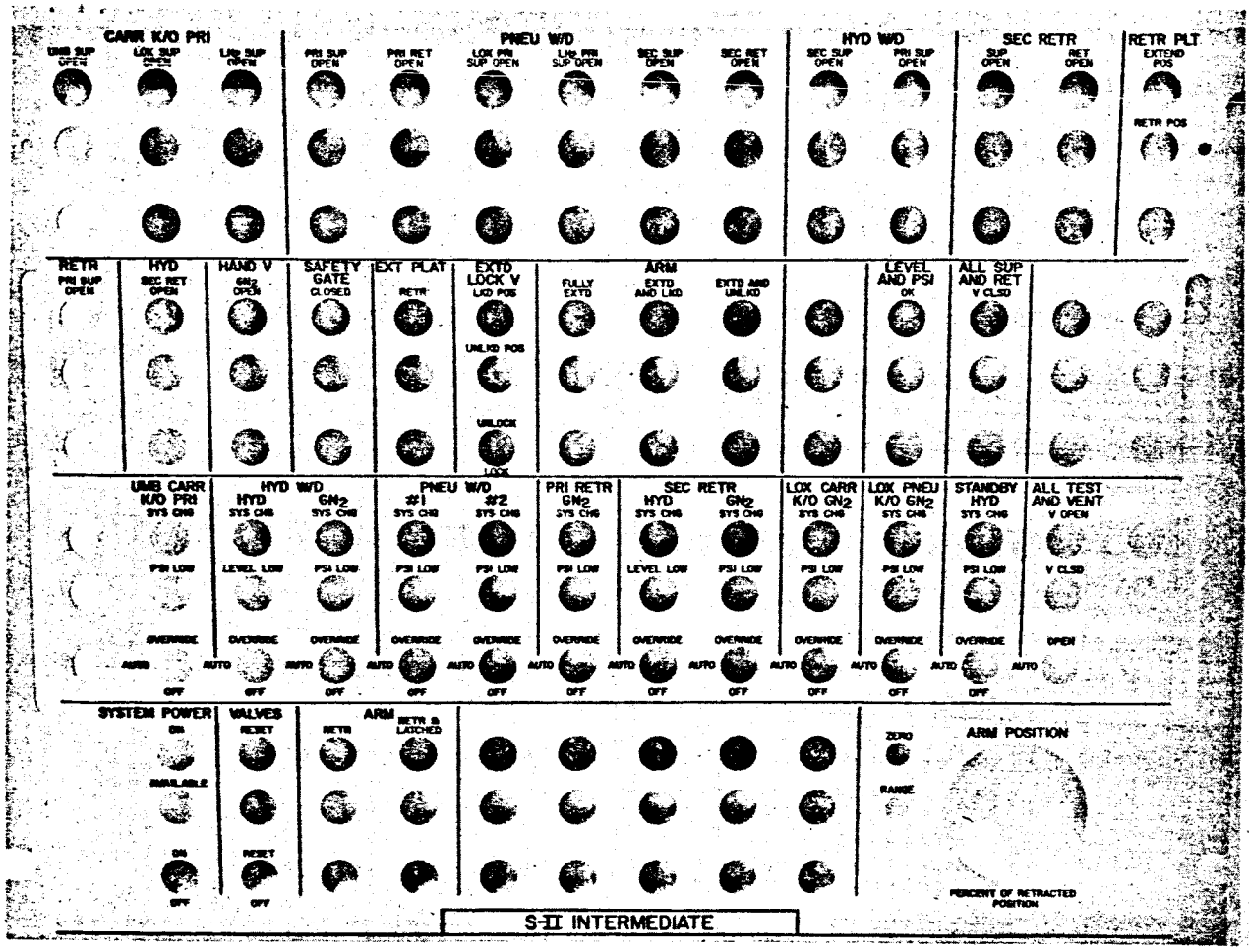


Figure 5-10 Typical Control Panel, Service Arms Test Site

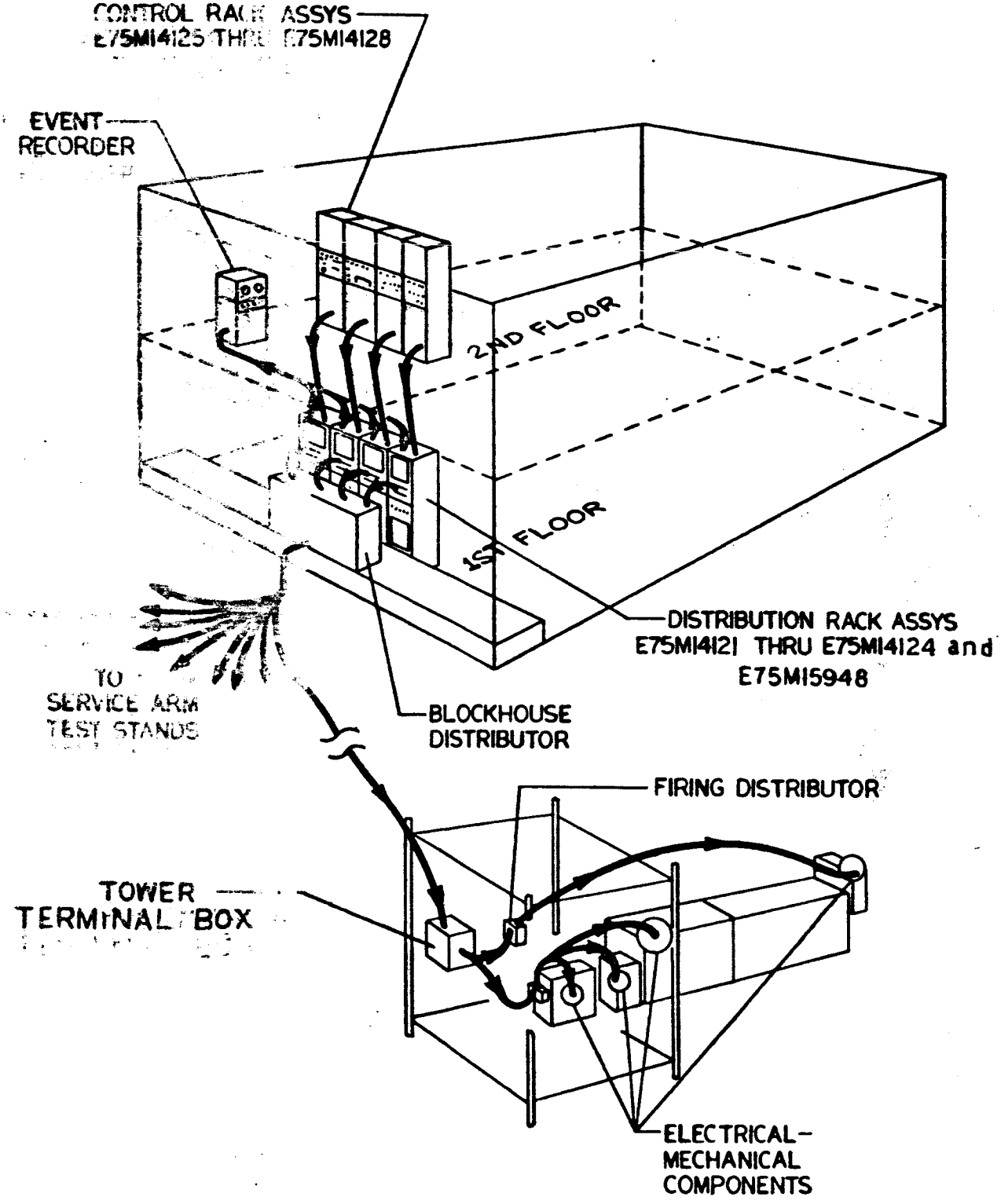


Figure 5-11 ESE Equipment, Service Arms Test Site

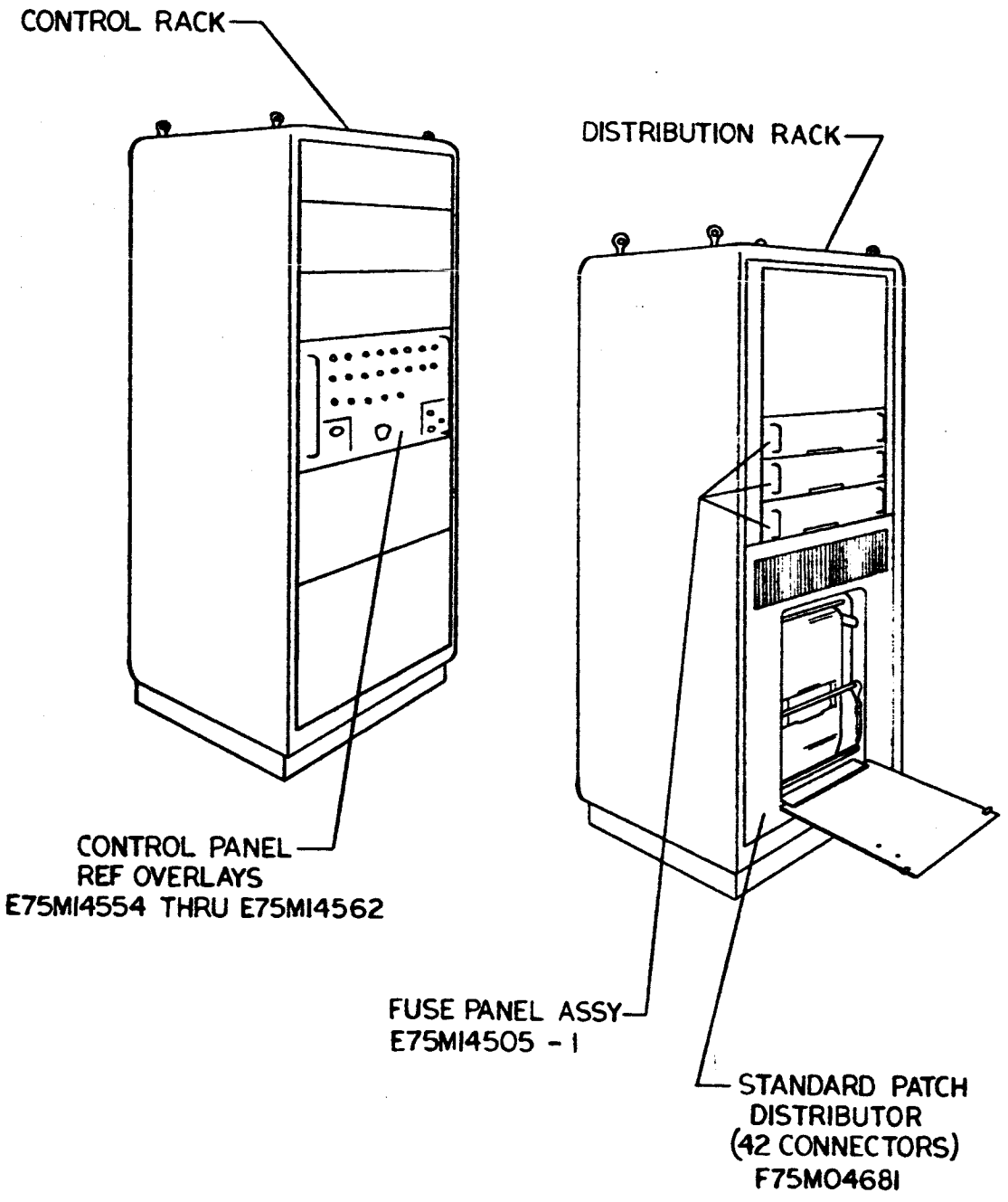


Figure 5-12 Control and Distribution Racks, Service Arms Test Site

5-27. Tail Service Masts Test Pad. The tail service masts (TSM) test pad (figure 5-13) has one to three tail service masts, hydraulic and pneumatic systems for the masts, a GN_2 storage tank, a vehicle lifoff simulator, and a control room separate from the swing arm control blockhouse.

Testing of the tail service mast is controlled primarily from the Firing Monitor and Test Panels in the control room. These panels are functionally similar to the TSM control panels in the Launch Control Center at LC-39. They provide control and monitor functions for that portion of the tail service mast system which is furnished by the Electrical Section, Launch Equipment Branch. Other equipment provided by the Electrical Section includes:

a. Tail Service Mast 1-2 #6006 (Internal Cables)

b. TSM 1-2 Control Distributor #6009

c. Tail Service Mast 3-2 #6007 (Internal Cables)

d. TSM 3-2 Control Distributor #6010

e. Tail Service Mast 3-4 #6005 (Internal Cables)

f. TSM 3-4 Control Distributor #6008

g. Tail Service Mast Distribution Rack #T6650

h. Firing Monitor and Test Panel 1-2

i. Firing Monitor and Test Panel 3-2

j. Firing Monitor and Test Panel 3-4

Control power (28 volts dc) and an event recorder are furnished by the MSFC test facility.

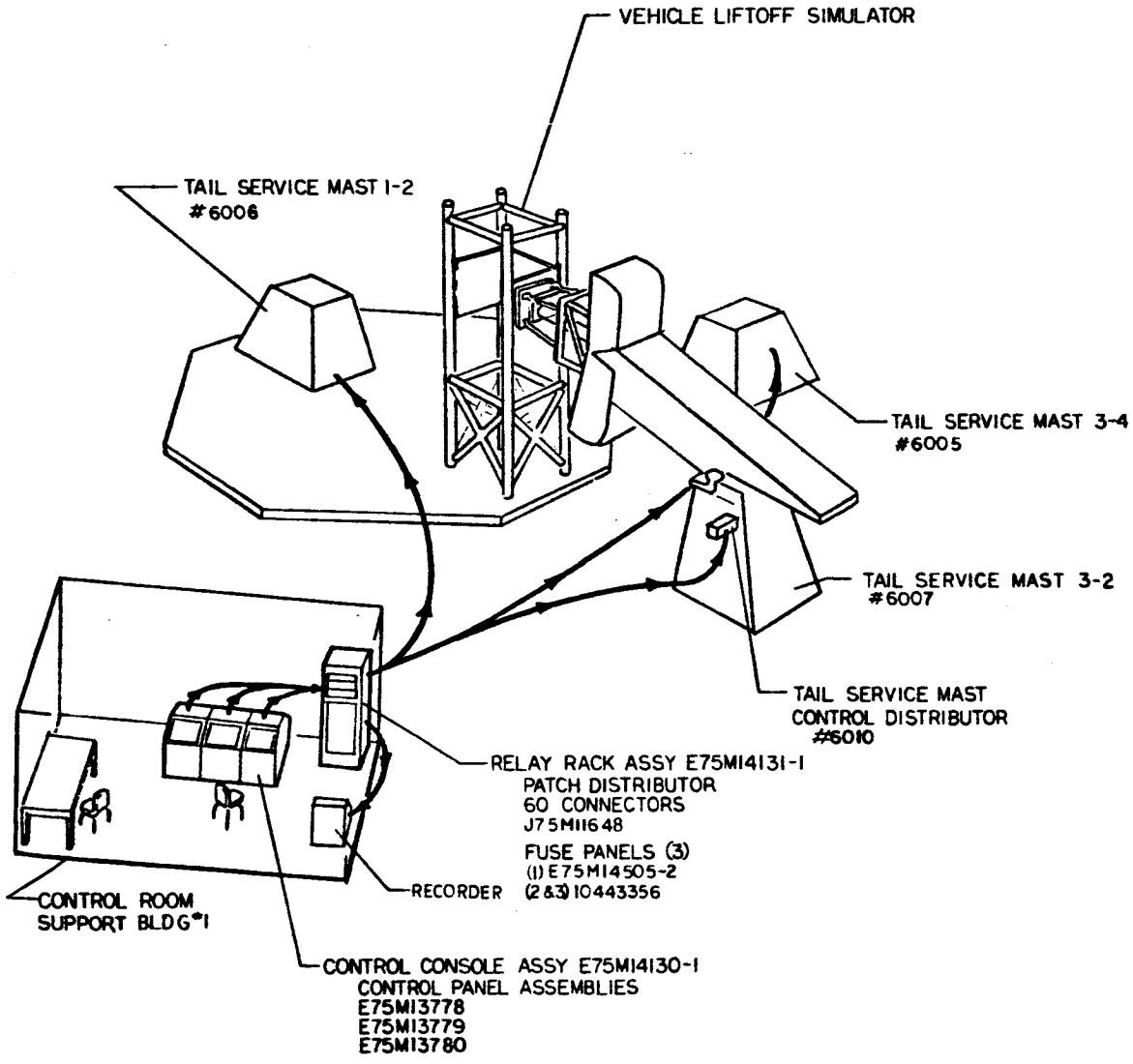


Figure 5-13 Tail Service Masts Test Site, MSFC

5-28. Electrical Control for the Tail Service Masts. Before a tail service mast is tested, pneumatic and hydraulic accumulators for its actuators are charged and vented, and appropriate lines are bled. Some of these preparations require adjusting various pneumatic and hydraulic valves by hand. Other valves in the system are actuated by solenoids, and are therefore electrically controlled and monitored from the Firing Monitor and Test Panel, figure 5-14. When the monitor lamps and meters on this panel indicate that all conditions are ready, the mast extension operation can be started.

By the use of the MAST LOCK RELEASE and MAST EXTEND switches on the tail service mast, an operator now gradually extends the mast toward the vehicle liftoff simulator. He is in communication with a control room technician who monitors lamps and meters on the Firing Monitor and Test Panel. Final connection of the mast's umbilical carrier to the vehicle liftoff simulator is completed manually.

The mast retract test is then conducted from the Firing Monitor and Test Panel. Closure of the MAST RETRACT PRESET and MAST RETRACT ACTUATE switches retracts any one mast or any combination of the three, as required. Switch closure provides a 28 volt dc signal to relay rack #T6650, which in turn performs all necessary relay logic and transmits control signals to appropriate components in the mast. All such events are recorded by instrumentation equipment.

Alternately, the mast can be armed for retract and actuated by motion of the vehicle liftoff simulator. The simulator itself is MSFC test facility equipment, and is not controlled by the KSC Firing Monitor and Test Panel.

As the mast retracts, all major movements of the mast and its actuators are detected by transducers, limit switches, and potentiometers. Signals from these components return to relay distributor #T6650 and subsequently to lamps on the control panel. All such events are also recorded by instrumentation equipment.

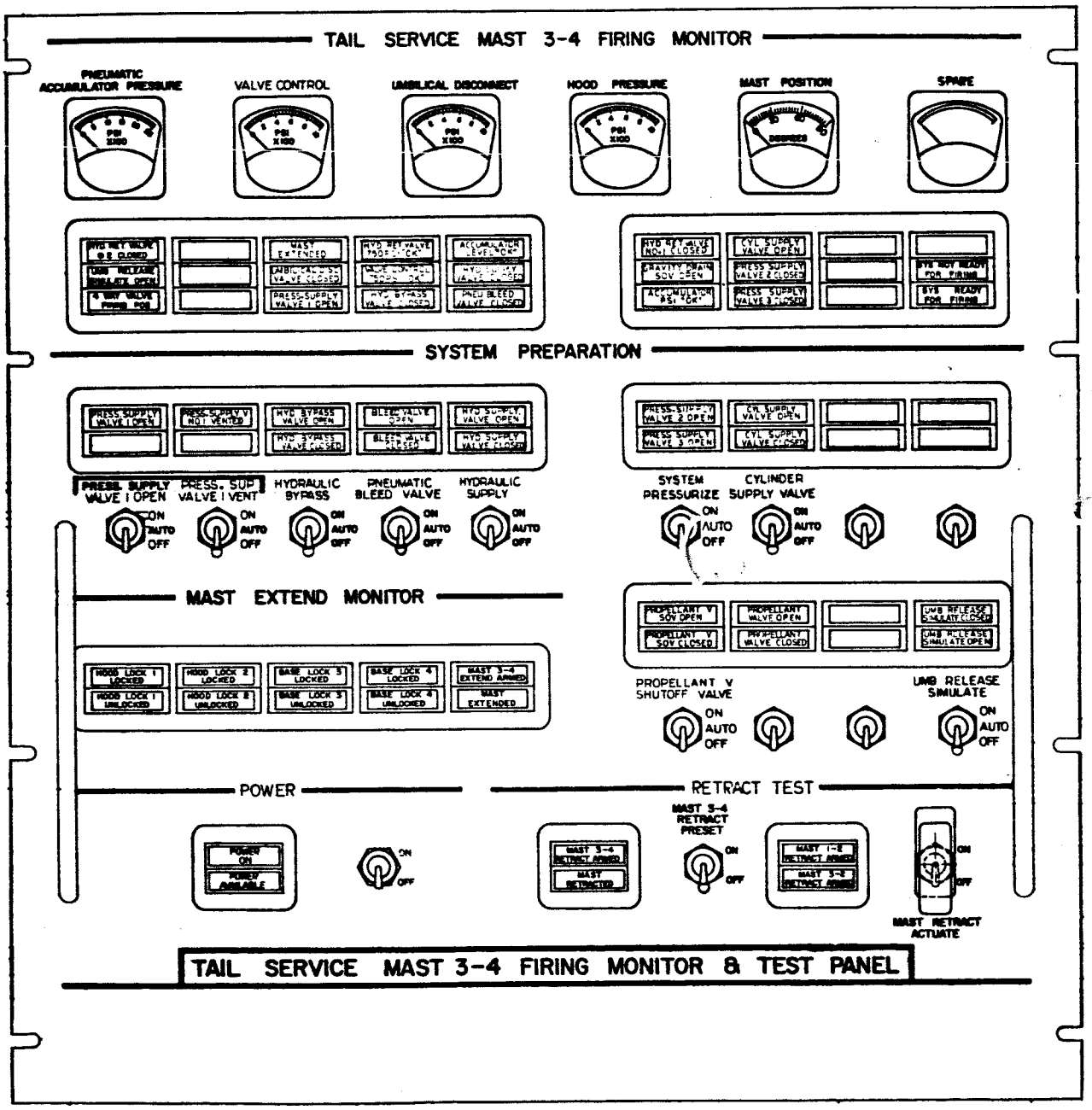


Figure 5-14 TSM Test Site Control Panel E75M13780

SECTION VI

REFERENCE INFORMATION

ELECTRICAL SUPPORT EQUIPMENT

6-1. ESE FAMILY TREE OF DRAWINGS.

The ESE Family Tree of Drawings illustrates, by generation breakdown, that Electrical Launch Support Equipment (ELSE) which is the responsibility of the Launch Equipment Branch, EDV-15. The tree contains the following branches:

LC-39 Ground Support Equipment	J75M05970
Off LUT Installation LUT-1	J75M05971
Launcher Installation LUT-1	J75M05972
Launcher Deck Installation LUT-1	J75M05973
Tower Supply Installation LUT-1	J75M05974
Tower Platforms Installation LUT-1	J75M05975
LC-39 GSE Test Equipment	———
F-1 Engine Servicing Equipment	J75M13482

The ESE Family Tree of Drawings may be found in Volume II of this ESE Electrical Reference Handbook.

6-2. REFERENCE SPECIFICATIONS.

The documents listed in Table 6-1 will be used by contractors for Launch Equipment Branch fabrication and installation. Table 6-2 contains substitutions and deletions of specifications and procedures. Abbreviations for cable specifications are listed in Table 6-3.

Table 6-1 REFERENCE SPECIFICATIONS

DOCUMENT NUMBER	DESCRIPTION
	KENNEDY SPACE CENTER DOCUMENTS
KSC-S-101	Semiconductor Devices, General Specification
KSC-S-101/1	Diode, Zener, Silicon, Power, Type K1N2970B
KSC-S-101/2	Transistor, NPN Switching, Type K2N914
KSC-S-101/3	Transistor, NPN, General Purpose, Type K2N2192A
KSC-S-101/4	Transistor, PNP Switching, Type K2N2905A
KSC-S-101/5	Transistor, Power, NPN Silicon, Type K2N1724
KSC-S-101/6	Transistor, NPN, Dual, Silicon, .K2N2060
KSC-S-101/7	Diode, Silicon, High Speed Switching, Type K1N4153
KSC-S-101/8	Diode, Silicon, General Purpose, Type K1N645
KSC-S-101/9	Diode, Zener, Silicon, Type K1N967B
KSC-S-101/10	Diode, Silicon, Power Rectifier, Type K1N250C
KSC-S-101/11	Transistor, NPN, Switching, Type K2N2846
KSC-S-101/12	Transistor, NPN, Silicon, Power, Type ZN2811
KSC-S-101/13	Diode, Zener, Silicon, Power, Type K1N2814A, K1N2827A, K1N2828A
KSC-S-101/14	Transistor, NPN, Silicon, Power, Type K2N3265
KSC-S-101/15	Diode, Rectifier, Silicon, Power, Fast Recovery, Type K1N3902
KSC-S-101/16	Transistor, PNP Silicon, Power, Type K2N3026
KSC-S-101/17	Transistor, PNP, Silicon, Power, Type K2N3026
KSC-S-101/18	Transistor, PNP, Silicon, Type K3516
KSC-S-101/19	Transistor, NPN, Silicon, Power, Type K2N2658
KSC-S-101/20	Transistor, PN, Silicon, Unijunction, Type K2N493
KSC-S-101/21	Transistor, PNP, Silicon, Type K2N2276
KSC-S-101/22	Transistor, NPN, Silicon, High Power, Type K2N2746
KSC-S-101/23	Transistor, NPN, Silicon, Type K2N2432
KSC-S-101/24	Diode, Temperature Compensated Reference, Sub-miniature, Type K1N825A
KSC-R-102	Resistors, Fixed, Film (High Stability) (Styles KRN 55/60/65/70C)

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	KENNEDY SPACE CENTER DOCUMENTS (Continued)
KSC-R-103	Resistors, Fixed, Film (High Stability) (Styles KRL 07/20/32/42)
KSC-R-104	Resistor, Fixed, Power, Wirewound (Chassis Mount) (Style KRE 65/70/75)
KSC-R-105	Resistors, Fixed, Wirewound (Insulated) (Style KRW 67/68/69)
KSC-C-106	Capacitor, Fixed, Glass Dielectric, High Reliability (Styles CYER 10/15/20/30)
KSC-C-107	Capacitors, Fixed, Tantalum (Polarized, Etched Foil) (Style KCL 21)
KSC-C-108	Capacitors, Fixed, Tantalum Non-Polar Etched Foil (Style KCL 23)
KSC-C-109	Capacitors, Fixed, Tantalum (Polarized, Plain Foil) (Style KCL 31)
KSC-C-110	Capacitors, Fixed, Tantalum (Nonpolarized, Plain Foil) (Style KCL 33)
KSC-C-111	Capacitors, Fixed, Solid, Tantalum (Style KCS13)
KSC-C-112	Capacitors, Fixed, Plastic Dielectric, (Nonmetallic Case) (Style KCTM)
KSC-C-113	Capacitors, Fixed, Polarized, Tantalum Foil (Style KCL 51 and KCL 53)
KSC-C-114	Capacitors, Fixed, Paper or Paper-Plastic (Style KCVP09)
KSC-P-116	Packaging and Marking for Cables and Harnesses, Procedure for
KSC-STD-132	Potting and Molding Cable Assembly Termination
KSC-W-151	Solderless Wrap Process, Electrical Connections, Specification for
KSC-STD-152-1	Graphical Symbols for Drawings, Part 1 - Electrical and Logic Symbols
KSC-STD-152-2	Graphical Symbols for Drawings, Parts, Mechanical Symbols
KSC-E-153	Enclosures, Modular, Radio Frequency Interference Shielded, Specification for
KSC-STD-164	Environmental Test Methods for Ground Support Equipment Installations at John F. Kennedy Space Center
KSC-E-165	Electrical Ground Support Equipment Fabrication
KSC-W-167	Wiring Programming System Patchboards, Procedure for
KSC-STD-169	Marking of Ground Support Equipment
SP-4-28-D	Design Test Data, Mechanical and Electro-Mechanical Components

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	KENNEDY SPACE CENTER DOCUMENTS (Continued)
SP-4-38-D	Shock and Vibration Environments and Test Specification Levels, Ground Support Equipment, Launch Complex 39
SP-80-D	Guide for Environmental Protection When Using Electrical Ground Equipment Within the Areas of Saturn Complexes Where Hazardous Areas Exist
SP-82-D	Electrical and Electro-Mechanical Components for Saturn Launch Complexes
10M01671	Cleanliness Levels, Cleaning, Protection and Inspection Procedures for Parts, Assys., Sub-systems, and Systems for Pneumatic Use in Support Equipment, Specification for
A10430105	Sealing Compound
A75M00100	Pneumatic and Mechanical Components, Electrical Spec for
B75M012383	Ring Nut (for Cannon 40 Shell Size Connectors)
B75M02122	Cable Plug Assy (2-3/8 Thd)
B75M02123	Plug Hull (for Cannon 40 Shell Size Connectors)
B75M02124	Nut (for Cannon and Bendix 40 Shell Size Connectors)
B75M02177	Boot (for Banana Plug)
B75M02183	Ring Nut (for Bendix 40 Shell Size Connectors)
C75M02196	Adapter
C75M02197	Protection Cap (Umbilical)
C75M02197-1	Boot
B75M02943	Cable Plug Assy (2-5/16 Thd)
B75M02944	Plug Hull (for Bendix 40 Shell Size Connectors)
A75M03589	Application of Heat and Blast Resistant Coating of Cables, Proc for
B75M04097-X	Adapter (Connector to Conduit) (Refer to dwg. for dash no.)
F75M05218	Cast Chassis, Complex 39
A75M05668	Solderless Electrical Connections, Proc for
A75M05875	Fabrication and Installation of Tube Assemblies and Installation of Fitting and Fitting Assemblies, Spec for
A75M07450	MI Cable Terminations, Proc for
B75M07830	Adapter
A75M09397	Electrical Cable Assembly, Spec for
A75M09465	Splicing and Serving Lifting Cable, Procedure for
A75M09467	Hydraulic System Components and Hydraulic Fluids for Ground Support Equipment (GSE) Cleaning, Testing, and Handling Procedure
A75M09468	Sealing of Electrical Components, Spec for

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	KENNEDY SPACE CENTER DOCUMENTS (Continued)
A75M09470	Welding Stainless Steel and Invar Pipe, Specification for
A75M09946	Welding of Aluminum Alloy Pipe, Specification for
A75M11300	Tape, Marker (Green -1, Red -2)
A75M12110	Heat and Blast Protective Coating
A75M13302	Connector Inspection Specifications
C75M13303	Molding Adapter General Purpose Connector
C75M13304	Potting Adapter General Purpose Connector
C75M13676	Shield Rings
A75M13965	Flash Evaporation Method of Determining Non-Volatile Residue Content in Freon and Trichloroethylene Solvents, Procedure for
B75M50703	Adapter (Flexible Armored Cable)
A75M51074	Electrical Spec. Ground Support Equipment Installation
A75M10180	6 Cond. 16 AWG OS 6 UNSH
A75M10181	60 Cond. 16 AWG OS 60 UNSH
A75M10182	60 Cond. 16 AWG OS 60 SS
A75M10183	60 Cond. 16 AWG OS 30 PTSI
A75M10184	60 Cond. 16 AWG OS 20 TTSI
A75M10185	60 Cond. 16 AWG OS 15 QTSI
A75M10186	60 Cond. 16 AWG OS 60 SSI
A75M10187	60 Cond. 14 AWG OS 2TTSI, 3PTSI, 48UNSH
A75M10188	60 Cond. 14 AWG OS 3TTSI, 3PTSI, 45SSI
A75M10189	7 Cond. 8 AWG OS 7 UNSH
A75M10190	60 Cond. 20 AWG OS 60 UNSH
A75M10191	60 Cond. 14 AWG OS 60 UNSH
A75M10192	60 Cond. 14 AWG OS 60SS
A75M10193	60 Cond. 14 AWG OS 30 PTSI
A75M10194	60 Cond. 14 AWG OS 20 TTSI
A75M10195	60 Cond. 14 AWG OS 15 QTSI
A75M10196	10 Cond. 16 AWG OS 10 UNSH
A75M10197	6 Cond. 8 AWG OS 6 UNSH
A75M10198	4 Cond. -- OS 3#8, 1#16
A75M10199	5 Cond. 12 AWG -- 5 UNSH
A75M10200	4 Cond. 0 OS 4 UNSH
A75M10201	61 Cond. 20 AWG -- 61 UNSH
A75M10202	32 Cond. 20 AWG OS 32 UNSH
A75M10203	3 Cond. 8 AWG -- 3 UNSH
A75M10204	6 Cond. -- OS 4RG214/U, 1RG62A/U, 1#12

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION				
	KENNEDY SPACE CENTER DOCUMENTS (Continued)				
A75M11003	40 Cond.	—	OS	5 QTSI#10, 20UNSH#14	
A75M11004	52 Cond.	--	OS	4PTSI#7, (11TTSI, 5PTSI, 1SSI#14)	
A75M11005	60 Cond.	14 AWG	OS	5PTSI, 50SSI	
A75M11006	33 Cond.	—	OS	3#0, 3#4, 13PTSI#14, ISSI#14	
A75M11007	29 Cond.	--	OS	4#2, 9#6, 16#14	
A75M11008	40 Cond.	14 AWG	OS	20 PTSI	
A75M11009	60 Cond.	14 AWG	OS	4TTSI, 12PTSI, 24SSI, ABLATIVE SHEATH	
A75M11010	60 Cond.	14 AWG	OS	5PTSI, 50 UNSH	AB
A75M11011	60 Cond.	14 AWG	OS	2TTSI, 3PTSI, 48 UNSH	AB
A75M11012	60 Cond.	14 AWG	OS	6TTSI, 17PTSI, 8SSI	AB
A75M11013	60 Cond.	14 AWG	OS	15 OTSI	AB
A75M11014	60 Cond.	14 AWG	OS	20 TTSI	AB
A75M11015	10 Cond.	16 AWG	OS	10 UNSH	AB
A75M11016	60 Cond.	16 AWG	OS	60 UNSH	AB
A75M11017	6 Cond.	16 AWG	OS	6 UNSH	AB
A75M11018	4 Cond.	0	OS	4 UNSH	AB
A75M11019	29 Cond.	--	OS	4#2, 9#6, 16#14	AB
A75M11020	40 Cond.	—	OS	5QTSI#10, 20 UNSH#14	AB
A75M11021	52 Cond.	--	OS	4PTSI#7, (11TTSI, 5PTSI, 1SSI#14)	AB
A75M11022	60 Cond.	14 AWG	OS	5PTSI, 50SSI	AB
A75M11023	33 Cond.	--	OS	3#0, 3#4, 13PTSI#14, 1SSI#14	AB
A75M11024	60 Cond.	14 AWG	OS	60 SSI	AB
A75M11025	60 Cond.	14 AWG	OS	30 PTSI	AB
A75M11026	60 Cond.	14 AWG	OS	60 UNSH	AB
A75M11027	6 Cond.	--	OS	4RG214/U, 1RG62A/U, 1#12	AB
A75M14073	60 Cond.	14 AWG	OS	6TTSI, 17PTSI, 8SSI	
A75M14074	7 Cond.	--	OS	7RG180B/U	
A75M14075	60 Cond.	16 AWG	--	60 UNSH	
A75M14076	60 Cond.	14 AWG	OS	5PTSI, 50UNSH	
A75M14077	21 Cond.	8 AWG	OS	21 UNSH	
A75M14078					
A75M14079					
A75M14080					
A75M14081					

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	KENNEDY SPACE CENTER DOCUMENTS (Continued)
A75M14082	
A75M14083	
A75M14084	
A75M14085	
A75M14086	
A75M14087	
A75M14088	
A75M14089	
A75M14090	
A75M14091	
A75M14092	6 Cond. 8 AWG OS 6 UNSH AB
	MARSHALL SPACE FLIGHT CENTER DOCUMENTS
MSFC-STD-105	Synthetic Rubber, Age Control of, Std for
MSFC-SPEC-106	Testing Compatibility of LOX, Spec for
MSFC-SPEC-119	Connectors, Receptacle, Electrical, Spec for
MSFC-SPEC-130	Certification of Welding Machine Operators and Welders, Spec for
MSFC-SPEC-143	Fittings, Flared Tube (Premium Quality) Pressure Connections, Spec for
MSFC-STD-154	Printed Circuit Design & Construction, Std for
MSFC-STD-156	Riveting, Fabrication and Inspection, Std for
MSFC-SPEC-164	Cleanliness of Components for use in Oxygen, Fuel, and Pneumatic Systems, Spec for
MSFC-PROC-195	Cleanliness Level Requirements and Inspection Methods for Determining Cleanliness Level of Gas Bearing Gas Supply and Slash Measuring Systems, Proc for
MSFC-SPEC-202	Compound, Potting and Molding, Elastomeric, Spec for
MSFC-SPEC-222	Resins Systems, Elec and Environmental, Insulation, Epoxy, Spec for
MSFC-PROC-238	Fittings, Female Threads (Prem. Qual.), Preparation and Lubrication, Proc for
MSFC-SPEC-249	Bonding and Grounding, Electrical, Spec for
MSFC-PROC-257	Conformal Coating of Printed Circuit Assys, Proc for
MSFC-PROC-273	Tubing, Heat Reactive, Instl. of, Proc for
MSFC-PROC-274	Terminals, Instl. of, Proc for
MSFC-SPEC-276	Tubing, Heat Reactive, Spec for
MSFC-SPEC-278	Terminals, Bifurcated and Turret, Swage Type;

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	MARSHALL SPACE FLIGHT CENTER DOCUMENTS (Continued)
MSFC-SPEC-278 (Continued)	Terminals, Bifurcated and Turret, Standoff, Insulated Screw Type, Spec for
MSFC-PROC-310	Potting of Electrical Distributors, Proc for
MSFC-SPEC-331	Enclosures, Modular Shielded, RFI, Spec for
MSFC-SPEC-332	Cables, Electrical General Spec for (Slash Sheets not applicable)
MSFC-QPL-332	Qualified Products List for MSFC-SPEC-332
MSFC-SPEC-338	Semiconductor Devices, General Spec for (Slash Sheets/1 through/119 may apply)
MSFC-SPEC-339	Relays, DC, Hermetically Sealed, for Space Vehicles and GSE, General Spec for
MSFC-SPEC-339/1 thru/94	Individual Relay Specs
MSFC-STD-350	Abbreviations for use on Drawings, Std for
NPC 200-2	Quality Program Provisions for Space System Contractors
NPC 200-3	Inspection System Provisions for Supplies of Space Materials, Parts, Components, and Services
NPC 200-4	Quality Requirements for Hand Soldering of Electrical Connections
D10507600	Flared Tube Fittings Concentricity Gage
A10509301	Riveting, Fabrication, and Inspection, Standard for
A10509308	Welding, Carbon, Low Alloy and Stainless Steel, (Manual or Auto) Spec for
A10M01671	Cleanliness Levels, Cleaning, Protection and Inspection Procedures for Parts, Assemblies, Subsystems, and Systems, for Pneumatic use in Support Equipment, Spec for
A50M01161	Aluminum GSE (Except Equipment Racks) Paint Finishing of, Proc for
A50M01162	Aluminum Equipment Racks, GSE, Paint Finishing of, Proc for
A50M01165	Aluminum Electrically Conductive Chromate Coating of, Proc for
	MILITARY STANDARDS AND SPECIFICATIONS
MIL-STD-28	Drawing Titles, Approved Method For Assignment of
MIL-STD-108	Definitions of and Basic Requirements for Enclosures For Electric and Electronic Equipment
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-163	Steel Mill Products Preparation for Shipment and Storage
MIL-STD-171	Finishing of Metal and Wood Surfaces

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	MILITARY STANDARDS AND SPECIFICATIONS (Continued)
MIL-STD-183	Canceled (See FED-STD-183)
MIL-STD-429	Printed Circuit Terms & Definitions
MIL-STD-810	Environmental Test Methods for Aerospace and Ground Equipment
MIL-A-1154	Adhesive, Bonding, Vulcanized Synthetic Rubber to Steel
MIL-A-6091	Alcohol, Ethyl, Specially Denatured, Aircraft
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-A-25994	Aluminum Alloy Angles, Channels I and Z Beams, Extruded or Rolled Structural Shapes
MIL-B-117	Bags, Interior Packaging
MIL-B-5087	Bonding, Electrical (For Aircraft) ASG#
MIL-B-7883	Brazing of Steels, Copper, Copper Alloys, and Nickel Alloys
MIL-B-22205	Bags, Transparent, Flexible, Heat Sealable for Packaging Applications
MIL-B-43014	Boxes, Water Resistant Paper Board, Folding, Set-up and Metal-Stayed
MIL-C-17	Cables, Radio Frequency, Coaxial, Dual Coaxial, Twin Conductor, Twin Lead
MIL-C-104	Crates, Wood, Lumber and Plywood Sheathed, Nailed and Bolted
MIL-C-5015	Connectors, Electric, AN, Type
MIL-C-7769	Cushioning Material, Bound Fiber
MIL-C-12000	Cable, Cord, and Wire, Electric Packages of Connectors. Electrical, Waterproof, Quick Disconnect, Heavy Duty Type
MIL-C-26482	Connectors, Electric, Circular, Miniature, Quick Disconnect (Navy)
MIL-C-26636	Contacts, Crimp Type, For Electrical Connectors
MIL-C-40091	Crimping Tool, Terminal, Hand
MIL-D-3464	Desiccants, Activated, Bagged, Packaging use and Static Dehumidification
MIL-E-463	Ethyl Alcohol (for Ordnance Use)
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Spec.
MIL-E-15090	Enamel, Equipment, Light Gray, Formula No. (11)
MIL-F-21608	Ferrule, Shield Grounding, Insulated, Crimpt Style, Brass (ASG)
MIL-G-613	Grapnels, Marine, Trip Wire, and Crash Truck

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	MILITARY STANDARDS AND SPECIFICATIONS (Continued)
MIL-G-5510	Packing, Preformed, Straight, Thread Tube Fitting Boss
MIL-G-45204	Gold Plating - Electrodeposited
MIL-I-631	Insulation, Electrical, Synthetic - Resin Composition; Nonrigid
MIL-I-3190	Insulation Sleeving, Electrical, Flexible Treated
MIL-I-6181	Interference Control Requirements, Aircraft Equipment
MIL-I-7444	Insulation Sleeving, Electrical, Flexible
MIL-I-8660	Insulating and Sealing Compound, Electrical
MIL-I-10428	Isopropyl Alcohol, Technical
MIL-I-22129	Insulation Tubing, Electrical Polytetrafluorethylene Resin Nonrigid
MIL-P-78	Plastic-Material-Laminated, Thermosetting For Designation Plates
MIL-P-116	Preservation, Methods of
MIL-P-130	Paper, Wrapping, Laminated and Creped
MIL-P-8585	Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity
MIL-P-11414	Primer, Lacquer, Rust-inhibiting
MIL-P-13949	Plastic Sheet, Laminated, Copper Clad
MIL-P-18177	Plastic Sheet, Laminated, Thermosetting, Glass Fiber Base, Epoxy-Resin
MIL-R-26	Resistors, Fixed, Wirewound (Power Type)
MIL-R-93	Resistors, Fixed, Wirewound (Accurate) General Spec for
MIL-R-94	Resistors, Variable, Composition, General Spec for
MIL-R-6855	Rubber, Synthetic, Sheet, Molded, and Extruded for Aircraft Applications
MIL-R-10509	Resistors, Fixed Film, High Stability General Spec for
MIL-R-55182	Resistors, Fixed, Film, Established Reliability, General Spec for
MIL-S-4461	Sealing Machines, Heat, Bench, and Portable (Temperature, Pressure and Time Controlled).
MIL-S-5002	Surface Treatments (Except Priming and Painting) for Metal and Metal Parts in Aircraft
MIL-S-7952	Steel - Sheet and Strip, Uncoated, Carbon 1020 and 1025 (Aircraft Quality)
MIL-S-18729	Steel-Plate, Sheet and Strip, Alloy, 4130 Aircraft Quality
MIL-S-19500	Semiconductor Devices, General Spec for
MIL-T-713	Twine and Tape, Lacing and Typing (for use in Electrical and Electronic Equipment)

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	MILITARY STANDARDS AND SPECIFICATIONS (Continued)
MIL-T-5021	Tests, Aircraft and Missile Welding Operations Qualifications ASG#
MIL-T-7928	Terminals, Lug and Splice, Crimp Style, Copper (ASG)
MIL-T-10727	Tin Plating, Electrode Deposited or Hot-Dipped, For Ferrous and Non-Ferrous Metals
MIL-T-21595	Tape, Pressure-Sensitive Adhesive, Paper, Masking-Non-Staining
MIL-V-173	Varnish, Moisture-and-Fungus-Resistant (For the Treatment of Communications, Electronic, and Associated Electrical Equip)
MIL-W-5086	Wire, Electrical, 600 Volt, Copper, Aircraft
MIL-W-5088	Wiring, Aircraft, Installation of (ASG) Three-Phase For the Production of Aircraft Quality Welds
MIL-W-7973	Welding Machines, Electrical Resistance, Spot, Press Type
MIL-W-8604	Welding of Aluminum Alloys - Process of
MIL-W-8611	Welding, Metal Arc and Gas, Steels, and Corrosion and Heat Resistant Alloys, Process for
MIL-W-16878	Wire, Electrical, Insulated, High Temperature (Navy)
MIL-Y-1140	Yarn, Cord, Sleeving, Cloth, and Type-Glass
	FEDERAL STANDARDS AND SPECIFICATIONS
FED-STD-102	Preservation, Packaging, and Packing Levels
FED-STD-183	Identification Markings for Iron and Steel Proc
FED-STD-595	Colors
BB-N-411	Nitrogen
J-C-98	Cable and Wire, Insulated, Methods of Sampling and Testing
L-P-391	Plastic-Methacrylate, Sheets, Rods and Tubes-Cast
L-P-590	Plastic Compounds, Molding and Extrusion, Polyethylene
O-E-760	Ethyl Alcohol Ethanol, Denatured Alcohol, and Proprietary Solvent
O-T-634	Trichlordethylene, Technical
P-S-661	Solvent-Dry-Cleaning
PPP-T-60	Tape, Pressure Sensitive Adhesive, Water Proof for Packaging and Sealing
PPP-B-601	Boxes, Wood, Cleated, Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock Corner
PPP-B-636	Box Fiber Board

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	FEDERAL STANDARDS AND SPECIFICATIONS (Continued)
PPP-B-640	Boxes, Fiber Board, Corrugated Triple Wall
QQ-A-200/9	Aluminum Alloy Bar, Rod, and Structural and Special Shaped Sections Extruded 6063
QQ-A-250/8	Aluminum Alloy 5052, Plate & Sheet
QQ-A-250/11	Aluminum Alloy 6061, Plate & Sheet
QQ-A-274	Aluminum Alloy Bars, Rods, and Shapes Extruded 6063
QQ-A-282	Aluminum Alloy Bars, Rods, Wire, and Special Shapes, Rolled, Drawn, or Cold Finished 7075
QQ-A-362	Aluminum Alloy Plate and Sheet, Alclad 2024
QQ-B-613	Brass, Leaded and Non-Leaded, Plate Rolled, Bar Sheet and Strip
QQ-P-416	Plating, Cadmium, Electrodeposited
QQ-S-571	Solder, Lead Alloy, Tin Lead Alloy, and Tin Alloy, Flux Cored Ribbon and Wire and Solid Form
QQ-S-633	Steel Bars, Carbon, Cold Finished and Hot Rolled (General Purpose)
QQ-W-343	Wire, Electrical and Non-Electrical, Copper, (Uninsulated)
TT-C-490	Cleaning Methods and Pretreatment of Ferrous Surfaces for Organic Coatings
TT-E-489	Enamel, Alkyd, Gloss, (For exterior and interior surfaces)
TT-E-529	Enamel, Alkyd, Lustreless
TT-I-558	Ink, Marking Stencil, Opaque, for nonporous Surfaces, Metals, Glass, etc.
TT-M-261	Methyl-Ethyl-Ketone for use in Organic Coatings
TT-P-636	Primer Coatings, Synthetic, Wood and Ferrous Metal
TT-P-662	Primer Surfacer, Sanding, Lacquer and Enamel Type
TT-P-666	Primer Coating, Zinc Yellow, for Aluminum and Magnesium Surfaces
TT-X-9-6	Xylene for use in Organic Coatings
UU-T-81	Tags, Shipping and Stock
WW-T-799	Tubing, Copper, Seamless for use with Solder-Joint or Flared to be Fitting
Z-O-358	Oil-Peanut
	MILITARY STANDARDS
MS 20426	Rivet, Solid, Countersunk 100 Degrees, Precision Head Aluminum
MS 20470	Rivet, Solid-Universal Head, Aluminum and Aluminum Alloy

Table 6-1 REFERENCE SPECIFICATIONS (Continued)

DOCUMENT NUMBER	DESCRIPTION
	MILITARY STANDARDS (Continued)
MS 20600	Rivet, Blind, Structural Pull Stem Self Plugging, Protruding Head, Type II, Class I
MS 20601	Rivet, Blind, Self Plugging, 100 deg flush Head, Type II, Class II
MS 20602	Rivet, Blind, Chemically Expanded, Protruding Head, Type I, Class I, Styles A and B
MS 20603	Rivet, Blind, Chemically Expanded, 100 degree flush head, Type I, Class II, Styles A and B
MS 20659	Terminal, Lug, Crimp Style, Copper, Uninsulated, Class I (ASG)
MS 25036	Terminal, Lug, Crimp Style, Copper Insulated, Class I (ASG)
MS 25037	Crimping Tool, Hand, For Copper Insulated Terminal
MS 25042	Cap, Electrical Connector Plug, Dust
MS 25043	Cap, Electrical Connector, Receptacle, Dust
MS 25083	Jumper - Assemblies Bonding and Current Return (ASG)
MS 25274	Cap, Wire End (Class I)
MS 25311	Ferrule, Shield Grounding, one piece, Insulated, Class I, for Coaxial and Shielded Cable
MS 25312	Tool - Crimping, Hand, For Insulated Shield, Ground (ASG)
MS 33584	Tubing End, Standard Dimensions for Flared
	MISCELLANEOUS SPECIFICATIONS
AN 735	Clamp, Loop Type Bonding
AN 742	Clamp, Plain, Support, Loop Type, Aircraft
AND 10387	Drill Sizes and Drilled Hole Tolerances, Twist
NAS 523	Code, Rivet

Table 6-2 DOCUMENTS DISCONTINUED FROM USE BY LAUNCH EQUIPMENT BRANCH, ELECTRICAL SECTION

DISCONTINUED DOCUMENTS	SUPERCEDING DOCUMENTS
ABMA-PD-W-45	MIL-W-8604
ABMA-PD-R-187	MSFC-SPEC-339
ABMA-STD-428	MSFC-STD-154
A10338552	KSC-E-165
A10419905	KSC-STD-169
A10423785	KSC-STD-169
A10M01071	SP-80-D
A75M01260	KSC-STD-132 (In Process)
A75M50222	KSC Dwgs. A75M10180 thru 10204, 11003 thru
A75M50223	11027, 14073 thru 14092, and MSFC-SPEC 332
A75M50497	KSC-E-165
A75M50741	KSC-E-165
A75M51073	KSC-E-165
MIL-STD-12	MSFC-STD-350
MIL-STD-130	KSC-STD-169 and KSC-P-116
MIL-C-13777	MSFC-SPEC 332
MIL-I-7444	MSFC-SPEC-276
MIL-S-8484	A75M09468
QQ-A-318	QQ-A-250/8 (5052)
	QQ-A-250/11 (6061)
QQ-A-327	QQ-A-200/9 Extrusions
MSFC-STD-110	Use only for guideline without use of applicable documents
MSFC-STD-158	MSFC-PROC-256
MSFC-STD-163	Discontinued
MSFC-PROC-186	MSFC-PROC-256
MSFC-PROC-196	MSFC-PROC-256
MSFC-PROC-256	NPC 200-4 and KSC-E-165

Table 6-3 ABBREVIATIONS, CABLE SPECIFICATIONS

ABBREVIATION	DESCRIPTION
C	Conductors
P	Pairs
S	Single
T	Triplets
Q	Quads
(Q)	Quints
SH	Shield
SS	Single conductor shielded
SSI	Single conductor shielded and insulated
PTS	Pairs twisted and shielded
PTSI	Pairs twisted, shielded, and insulated
TTS	Triplets twisted and shielded
TTSI	Triplets twisted, shielded, and insulated
QTS	Quads twisted and shielded
QTSI	Quads twisted, shielded, and insulated
(Q)TS	Quints twisted and shielded
UNSH	Unshielded
OS	Overall shield
OSDB	Overall shield double braid

6-3. ESE EQUIPMENT LOCATIONS.

ESE electrical enclosures on the Mobile Launcher are shown in at least one of the figures 6-2, 6-3, or 6-4. Enclosures for the following subsystems are largely absent:

a. S-IC Engine Servicing Platforms Subsystem

b. Platform Transporter Subsystem

c. S-II and S-IVB Engine Servicing Platform Subsystem

1. 25-TON LOAD BLOCK (PHASE I)
2. HAMMERHEAD CRANE (PHASE I)
3. COUNTDOWN & CONTROL DISTRIBUTOR (PHASE II)
4. OPERATIONAL INTERCOM DISTRIBUTOR (PHASE II)
5. UMBILICAL INSTRUMENT & CONTROL DISTRIBUTOR (PHASE II)
6. UMBILICAL CROSSOVER DISTRIBUTOR
7. "J" BOX #1 (CONTROL CONSOLE #2)
8. RETRACT SLED & ENCLOSURE ASSEMBLY
9. CONTROL CONSOLE #2
10. SERVICE ARM M1 DISTRIBUTOR (PHASE II)
11. OXYGEN BOTTLE RACK
12. ELEVATOR SHAFT
13. UMBILICAL POWER DISTRIBUTOR 28 VDC 400 CPS (PHASE II)
14. UMBILICAL POWER "J" BOX 28 VDC (PHASE II)
15. PNEUMATIC BULKHEAD PLATE #1
16. ELECTRICAL CONTROL DISTRIBUTORS
17. CONTROL CONSOLE #1
18. VALVE PANEL #12
19. VALVE PANEL #12 CONTROL DISTRIBUTOR
20. LH_2 HEAT EXCHANGER
21. SII PNEUMATIC CONSOLE
22. PROPELLANT CONTROL DISTRIBUTOR
23. PROPELLANT CONTROL CONSOLE
24. LOX VALVING COMPLEX
25. LH_2 VALVING COMPLEX
26. LH_2 LINE PURGE CONSOLE
27. AUTOMATIC STAGE SERVICING &

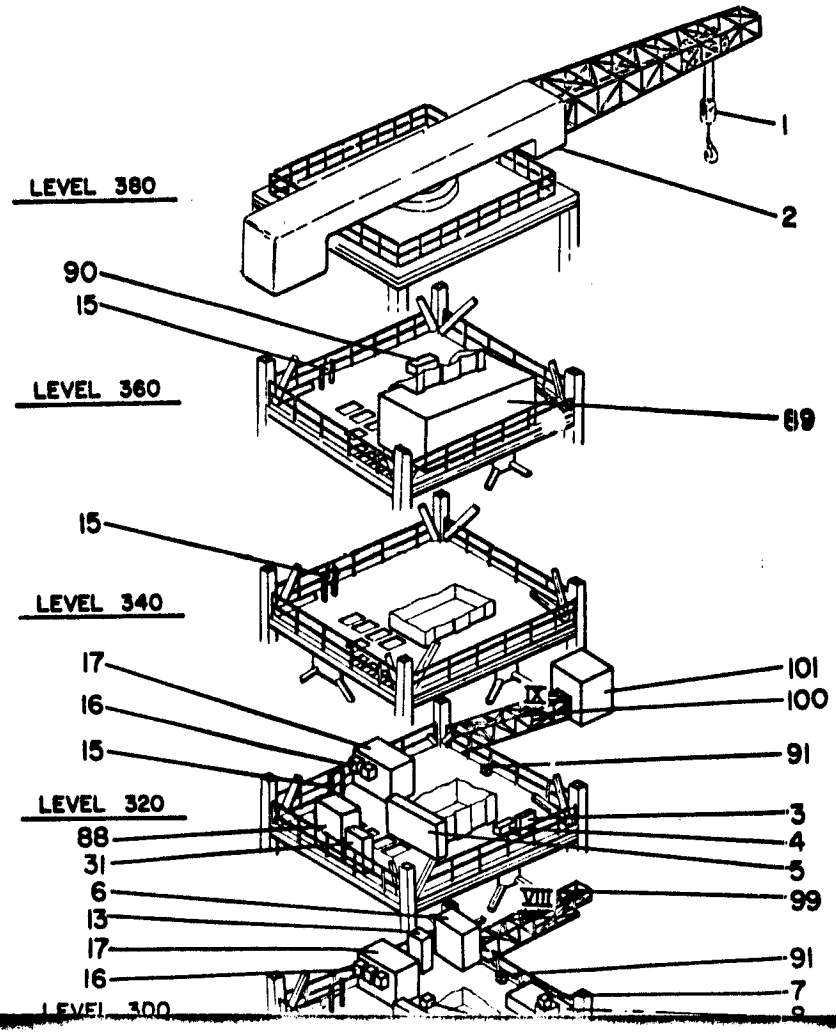


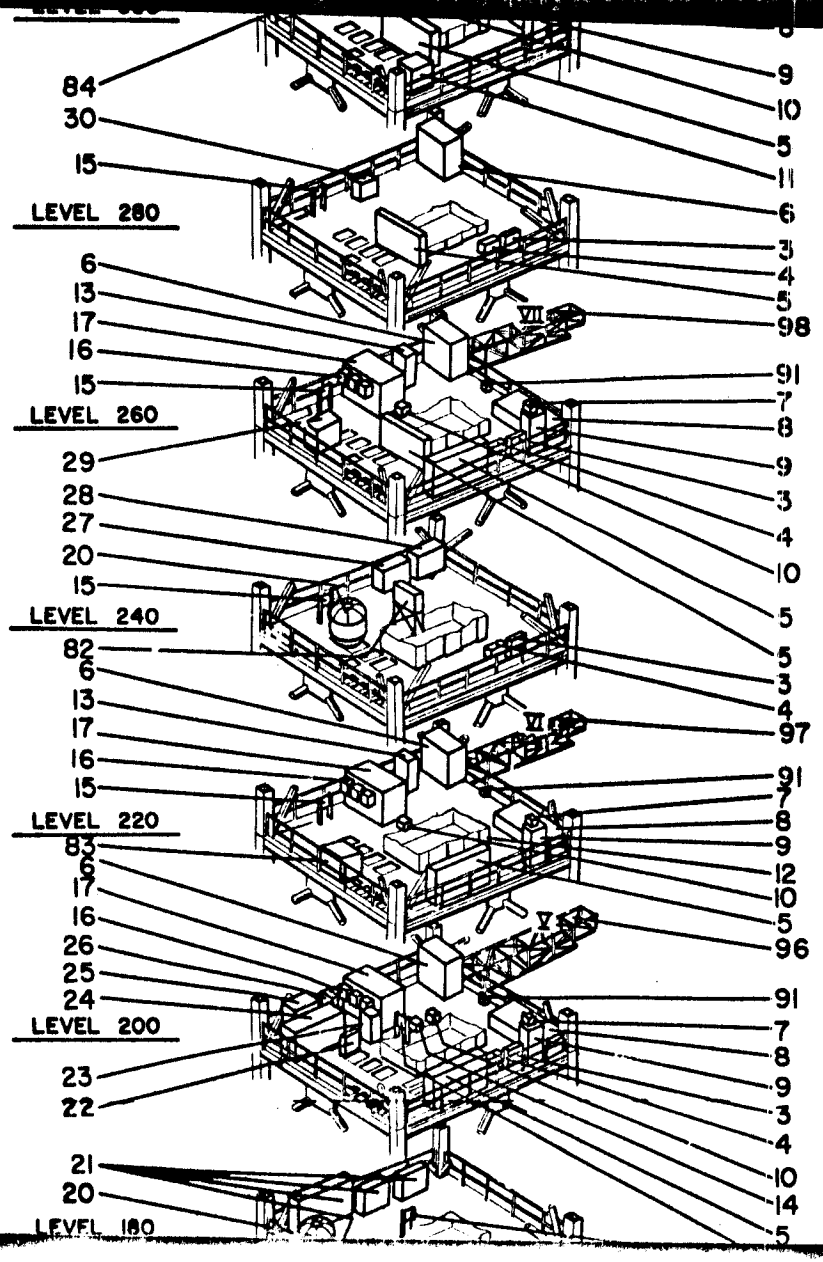
Figure 6-3 Equipment Location, Mobile Launche

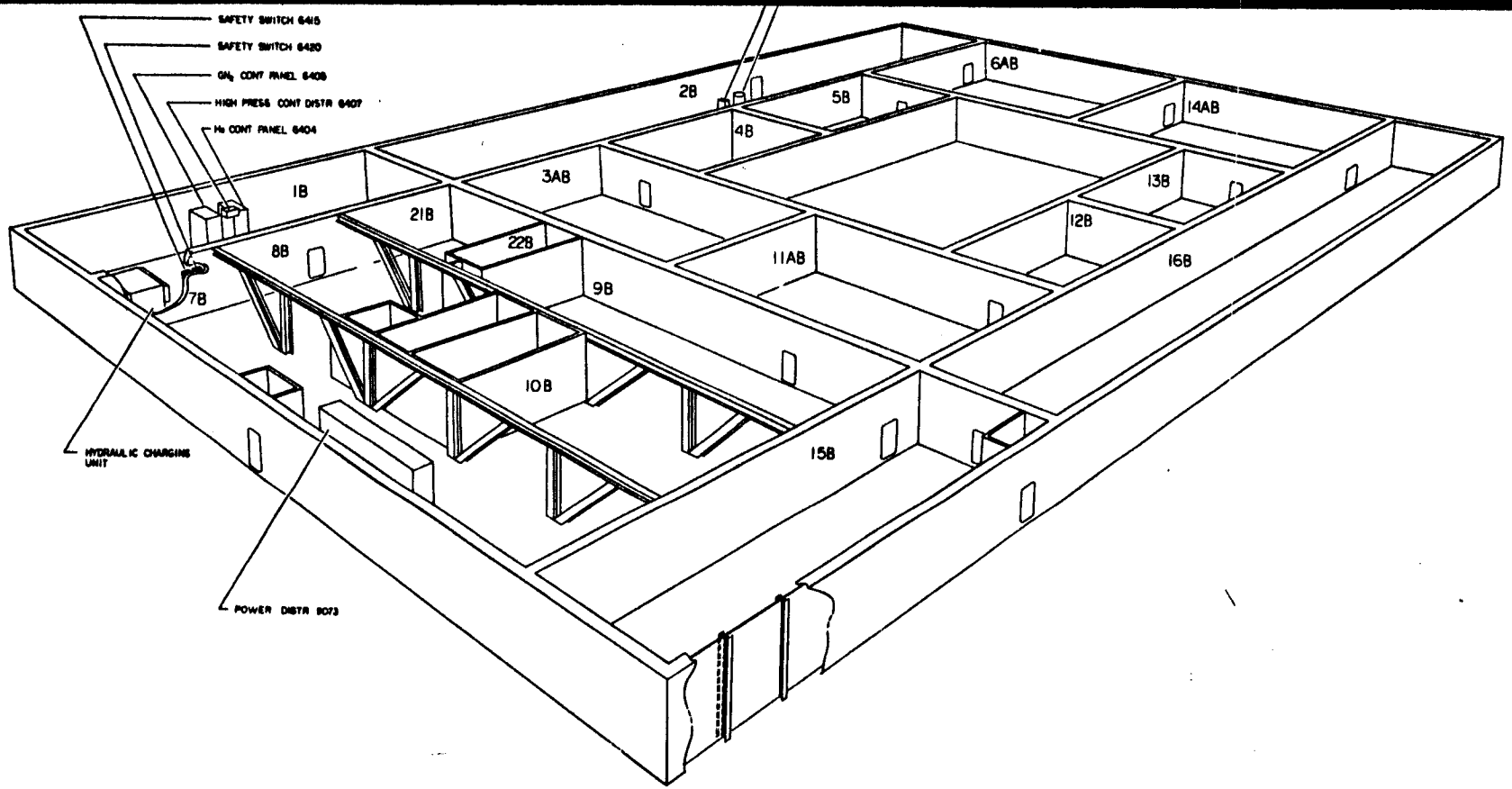
Figure 6-2 ESE Equipment Locations, Launcher

2-69-9

CHECKOUT PNEUMATIC CONSOLE "B"

28. AUTOMATIC STAGE SERVICING CHECKOUT PNEUMATIC CONSOLE "A"
29. WATER METHANOL UNIT
30. INSTRUMENT UNIT PNEUMATIC CONSOLE
31. HYDRAULIC ACCUMULATOR
32. HOLDDOWN ARM *I
33. TAIL SERVICE MAST 1-2
34. TAIL SERVICE MAST 3-2
35. HOLDDOWN ARM *IV
36. TAIL SERVICE MAST 3-4
37. ENGINE SERVICING DISTRIBUTOR
38. HOLDDOWN ARM *III
39. HOLDDOWN ARM *II
40. ENGINE SERVICING PLATFORM RELAY DISTRIBUTOR
41. INSTRUMENTATION & CONTROL DISTRIBUTOR 9092
42. HOLDDOWN ARM CONTROL DISTRIBUTOR
43. SIC PNEUMATIC CONSOLE RACKS
44. INSTRUMENTATION & CONTROL DISTRIBUTOR 9091 (PHASE II)
45. VALVE PANEL *II
46. VALVE PANEL *II CONTROL DISTRIBUTOR
47. SIC PNEUMATIC CHECKOUT RACKS
48. STAGE S[illegible]ICE ARM POWER RACKS
49. MEASURING RACKS
50. HYDRAULIC CHARGING UNIT
51. GN_2 CONTROL PANEL
52. HIGH PRESSURE CONTROL DISTRIBUTOR
53. COMPUTER ELECTRICAL EQUIPMENT RACKS (PHASE IV)
54. He VALVE PANEL
55. INERT PREFILL RESEVOIR SKID
56. INSTRUMENTATION & CONTROL DISTRIBUTOR 9082 (PHASE II)



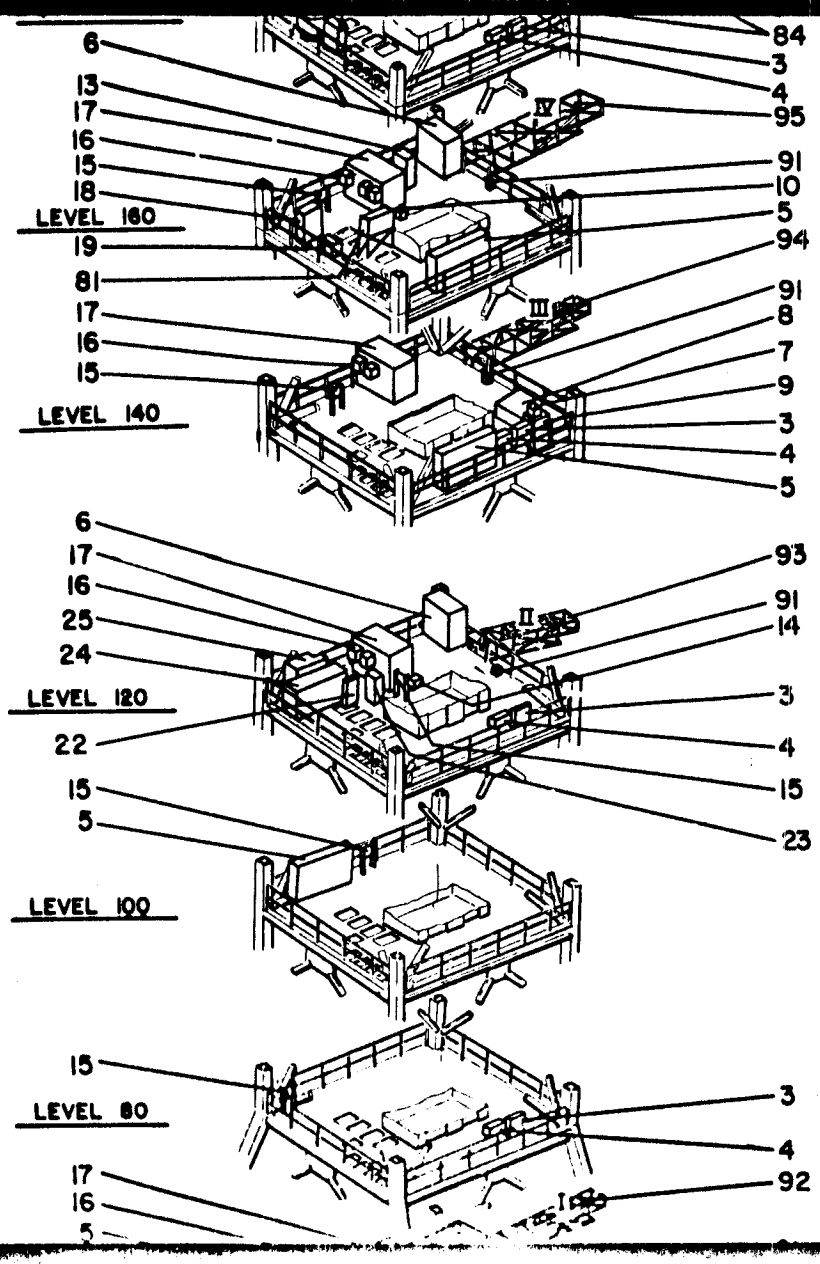


LEVEL "B"

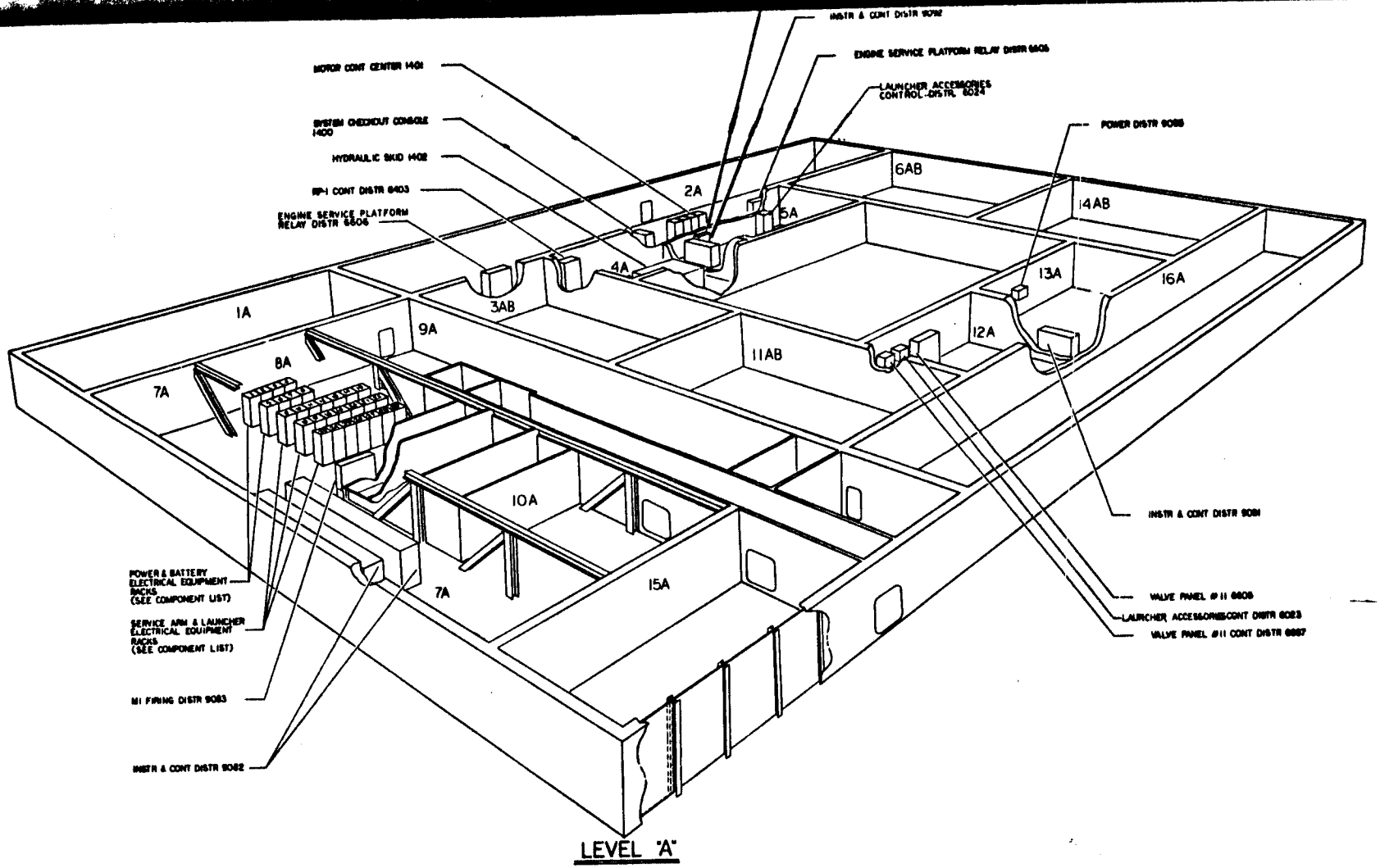
COMPONENT LIST

1. S-II ESE
2. S-II ESE
3. S-II ESE
4. S-II ESE
5. STANDBY BATTERY RACK ☆
   TEST LOAD PANEL
   LOAD CONTROL PANEL
   RECP DISTR TYPE II
6. POWER SUPPLY RACK ☆
   METER PANEL
   POWER SUPPLY
7. POWER DISTR RACK NO.1
   RECP DISTR TYPE I 6413
   POWER MODULES 6431 THRU 6436
8. POWER DISTR RACK NO.2
   RECP DISTR TYPE I A414

57. SERVICE ARM & LAUNCHER ELECTRICAL EQUIPMENT RACKS
58. ENGINE SERVICING PLATFORM WINCH (4 PLACES)
59. ENGINE SERVICING PLATFORM "J" BOX DISTRIBUTOR
60. FUEL VALVE PANEL
61. RP-1 SYSTEM
62. ENGINE GIMBAL HYDRAULIC UNIT
63. INSTRUMENTATION & CONTROL DISTRIBUTOR 9070
64. AIR HANDLING UNIT
65. STAGE E S E RACKS
66. ENGINE GIMBAL HYDRAULIC CHECKOUT CONSOLE
67. ENGINE GIMBAL MOTOR CONTROL CENTER
68. ENGINE GIMBAL HYDRAULIC SKID
69. INSTRUMENTATION UNIT SUBSTATION
70. INDUSTRIAL UNIT SUBSTATION
71. MI TOWER FIRING DISTRIBUTOR 9083
72. SERVICE ARM CONTROL SWITCH
73. GROUND MEASURING & D D A S RACKS
74. CARD PUNCHER
75. CARD READER
76. LINE PRINTER
77. OIS & OTV RACKS
78. PAGING RACK
79. S-IC INERT PREFILL CHECKOUT CONSOLE
80. DDAS & COMMAND RACKS
81. LOX BLANKET PURGE PANEL
82. LH_2 BLANKET PURGE PANEL
83. S-IV B AP SYSTEM PNEUMATIC CONSOLE
84. PNEUMATIC BULKHEAD PLATE #2
85. WATER VALVE CONTROL DISTRIBUTOR 9084
86. [illegible] RACKS

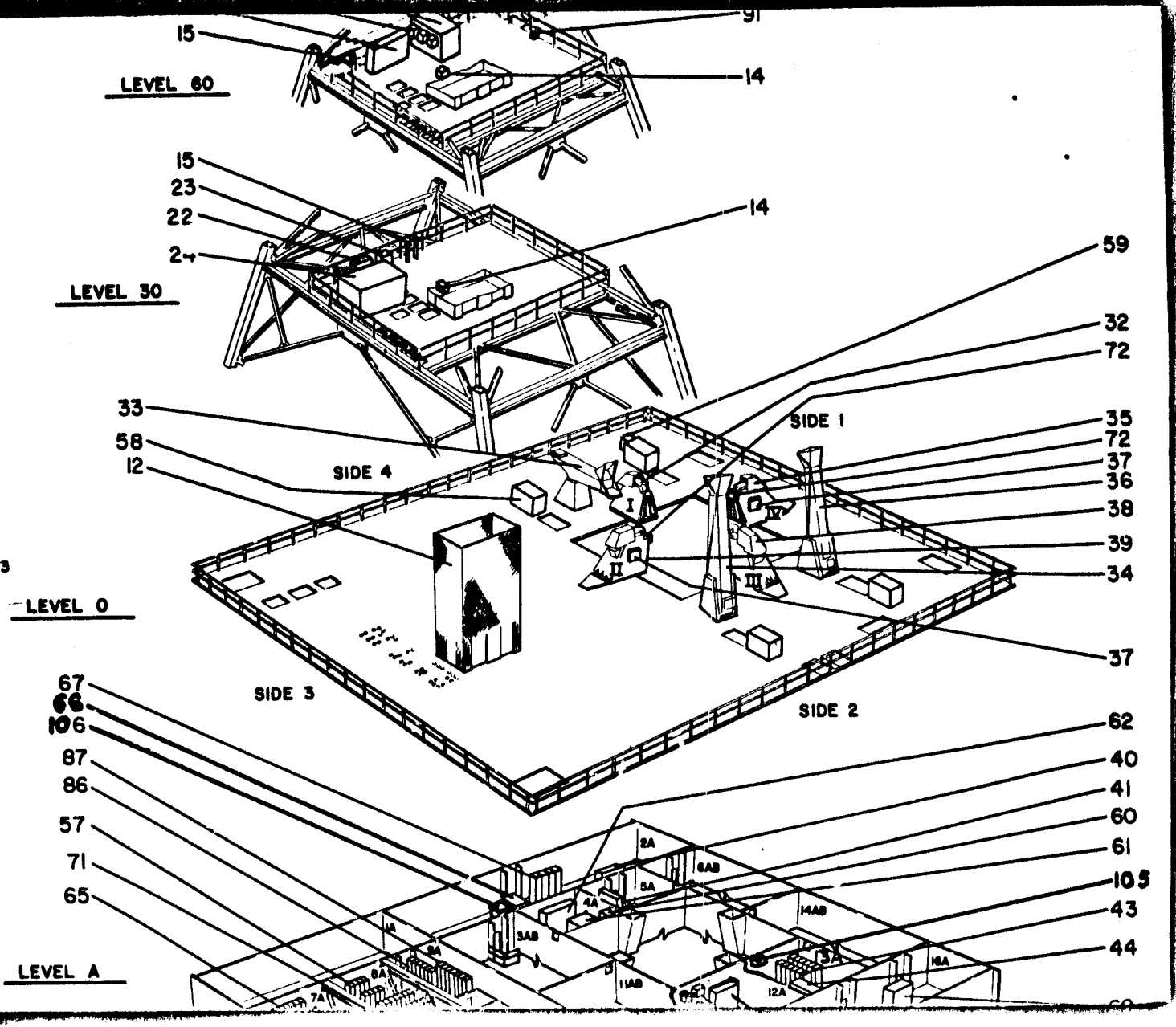


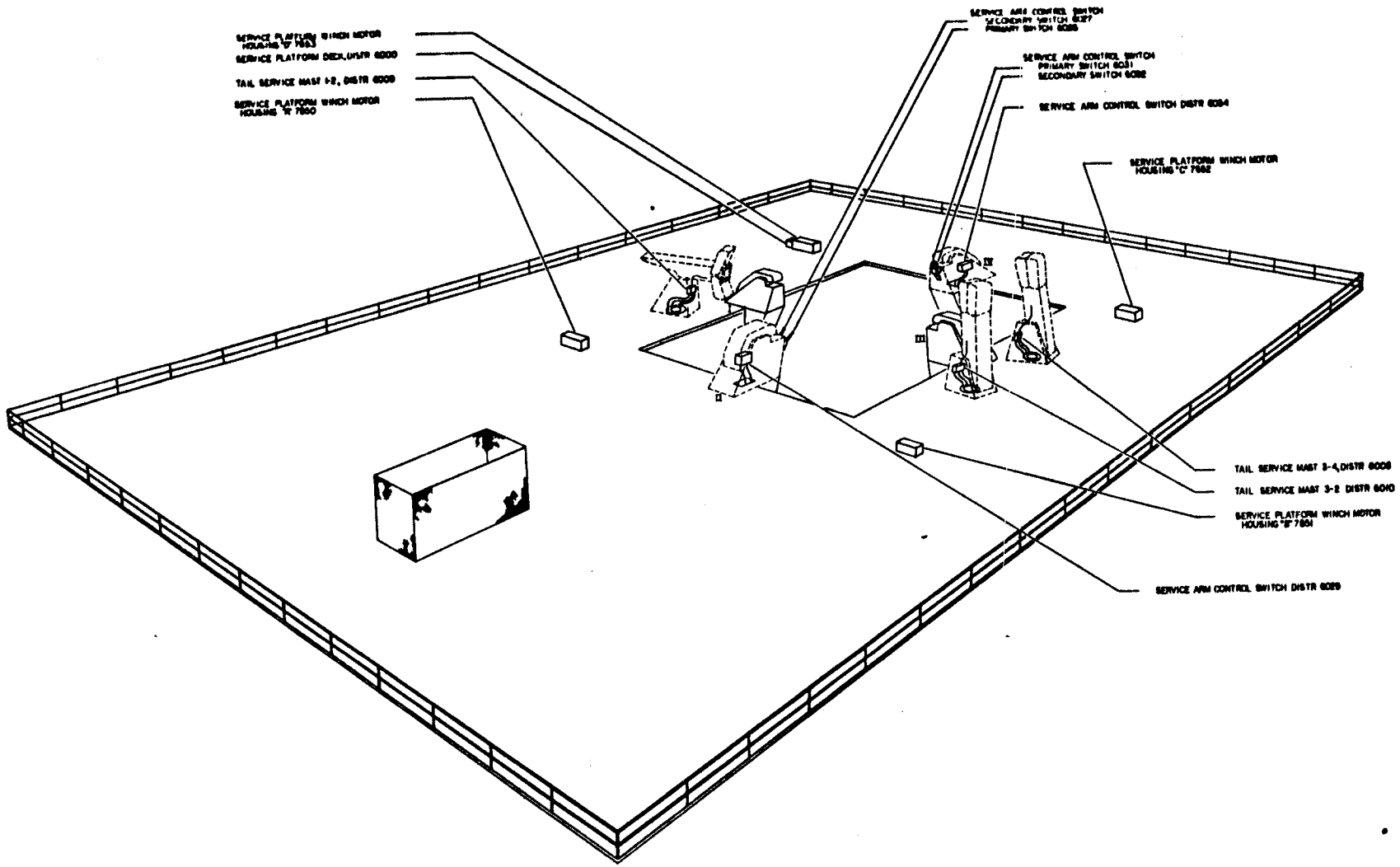
L-1963


INSTR & CONT DISTR 9092
ENGINE SERVICE PLATFORM RELAY DISTR 9606
MOTOR CONT CENTER 1401
LAUNCHER ACCESSORIES CONTROL-DISTR 9024
SYSTEM CHECKOUT CONSOLE 1400
POWER DISTR 9088
HYDRAULIC SKID 1402
RP-1 CONT DISTR 9403
ENGINE SERVICE PLATFORM RELAY DISTR 9606
2A
5A
6AB
14AB
4A
13A
16A
3AB
1A
9A
12A
8A
11AB
7A
10A
INSTR & CONT DISTR 9091
POWER & BATTERY ELECTRICAL EQUIPMENT RACKS (SEE COMPONENT LIST)
7A
15A
VALVE PANEL #11 9606
LAUNCHER ACCESSORIES CONT DISTR 9023
SERVICE ARM & LAUNCHER ELECTRICAL EQUIPMENT RACKS (SEE COMPONENT LIST)
VALVE PANEL #11 CONT DISTR 9607
MI FIRING DISTR 9083
INSTR & CONT DISTR 9082
LEVEL "A"
INSTR PROPELL CHECKOUT CONSOLE 1404

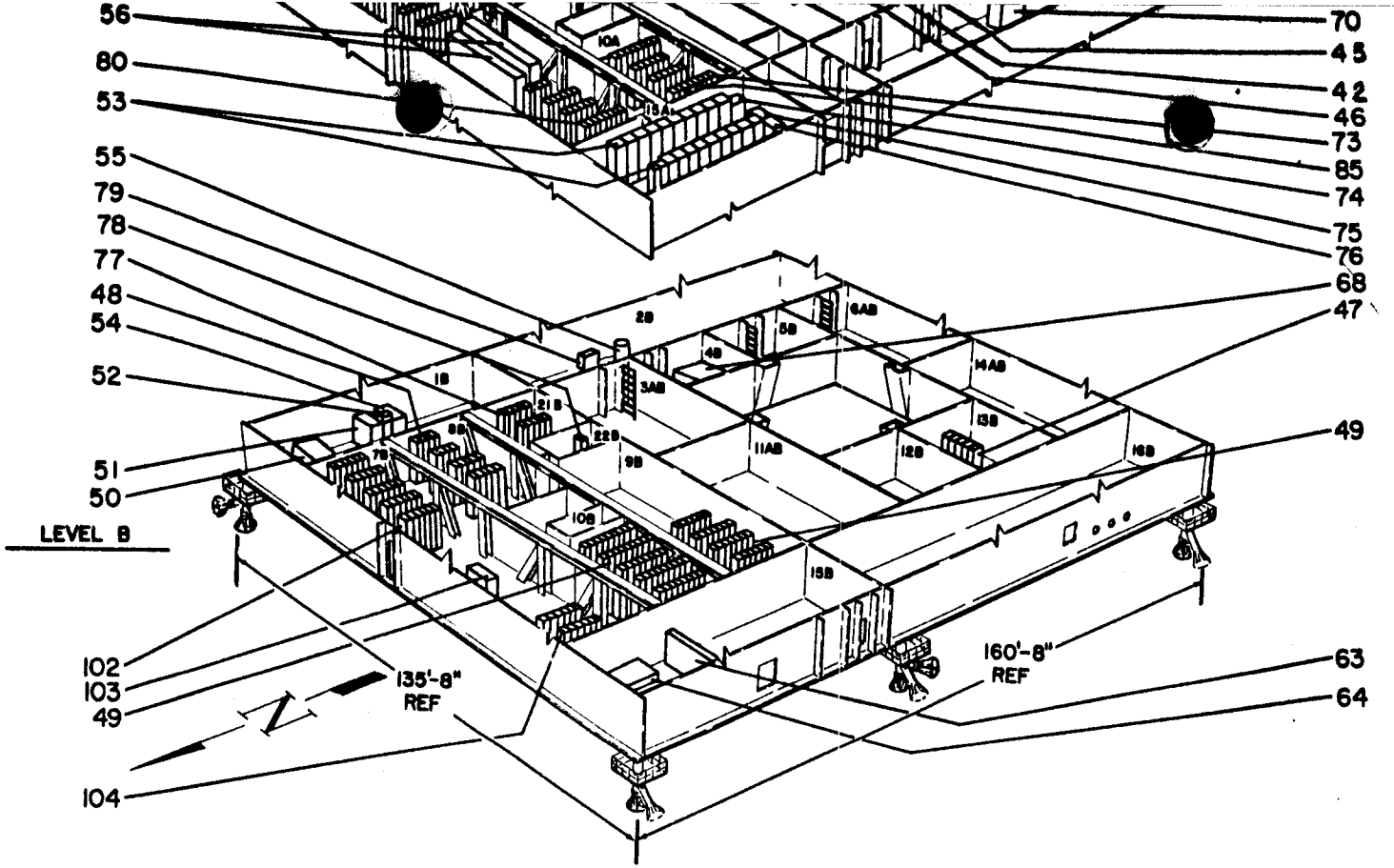
2-163-2

87. TANKING & COMPUTING RACKS
88. AUTOMATIC CHECKOUT EQUIPMENT ROOM (ACE)
89. ELEVATOR MACHINE EQUIPMENT ROOM
90. Q BALL RETRACT SYSTEM
91. H_2O QUENCH VALVE
92. S-IC INTERTANK SERVICE ARM
93. S-IC FORWARD SERVICE ARM
94. S-II AFT SERVICE ARM
95. S-II INTERMEDIATE SERVICE ARM
96. S-II FORWARD SERVICE ARM ASSEMBLY
97. S-IVB AFT SERVICE ARM
98. S-IVB FORWARD SERVICE ARM
99. SERVICE MODULE ARM
100. COMMAND MODULE SERVICE ARM
101. ENVIRONMENTAL CHAMBER
102. STAGE & AUXILIARY POWER RACKS
103. 28 VDC 400 CPS POWER DISTRIBUTOR 9073
104. MSC POWER & ESE RACKS
105. POWER DISTR 9093
106. ENGINE SERVICE PLATFORM RELAY DISTR 6606




SERVICE PLATFORM WINCH MOTOR HOUSING "D" 7683
SERVICE PLATFORM DECK, DISTR 6000
TAIL SERVICE MAST 1-2, DISTR 6009
SERVICE PLATFORM WINCH MOTOR HOUSING "A" 7680
SERVICE ARM CONTROL SWITCH SECONDARY SWITCH 6027 PRIMARY SWITCH 6026
SERVICE ARM CONTROL SWITCH PRIMARY SWITCH 6031 SECONDARY SWITCH 6032
SERVICE ARM CONTROL SWITCH DISTR 6034
SERVICE PLATFORM WINCH MOTOR HOUSING "C" 7682
TAIL SERVICE MAST 3-4, DISTR 6008
TAIL SERVICE MAST 3-2 DISTR 6010
SERVICE PLATFORM WINCH MOTOR HOUSING "B" 7681
SERVICE ARM CONTROL SWITCH DISTR 6029
LEVEL "O"
POWER DISTR 6004

6-1631-1



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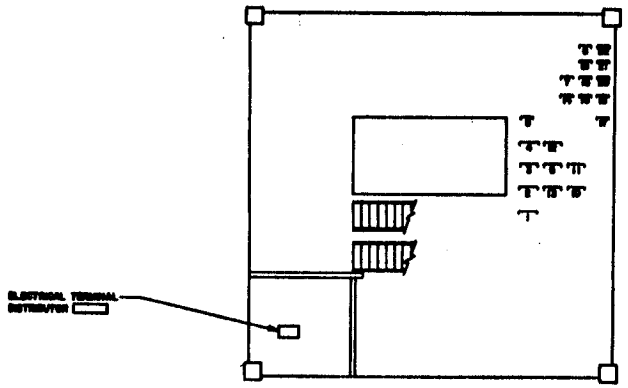
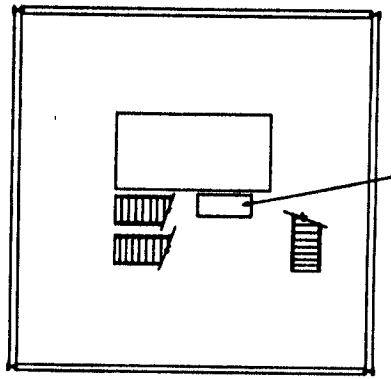
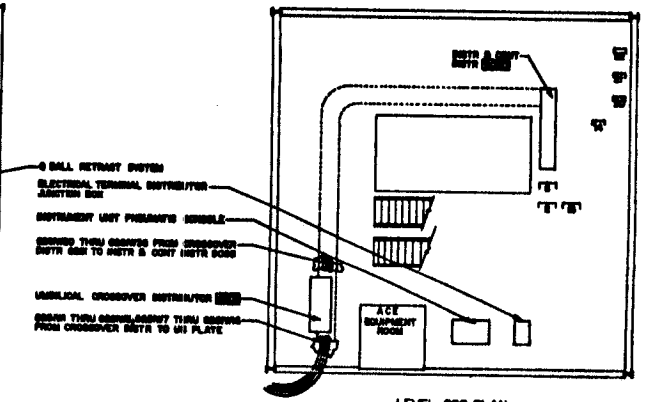
S-12 1.9



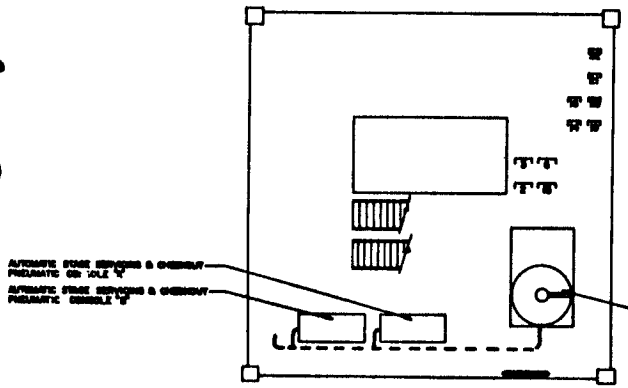
LEVEL 60 PLAN



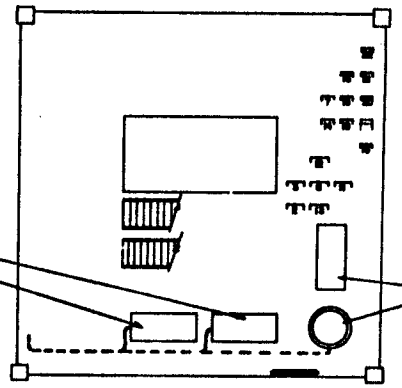
LEVEL 360 PLAN



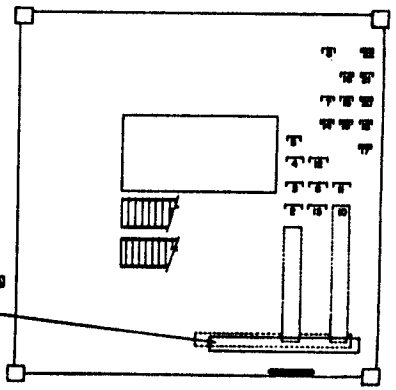
LEVEL 280 PLAN



LEVEL 240 PLAN

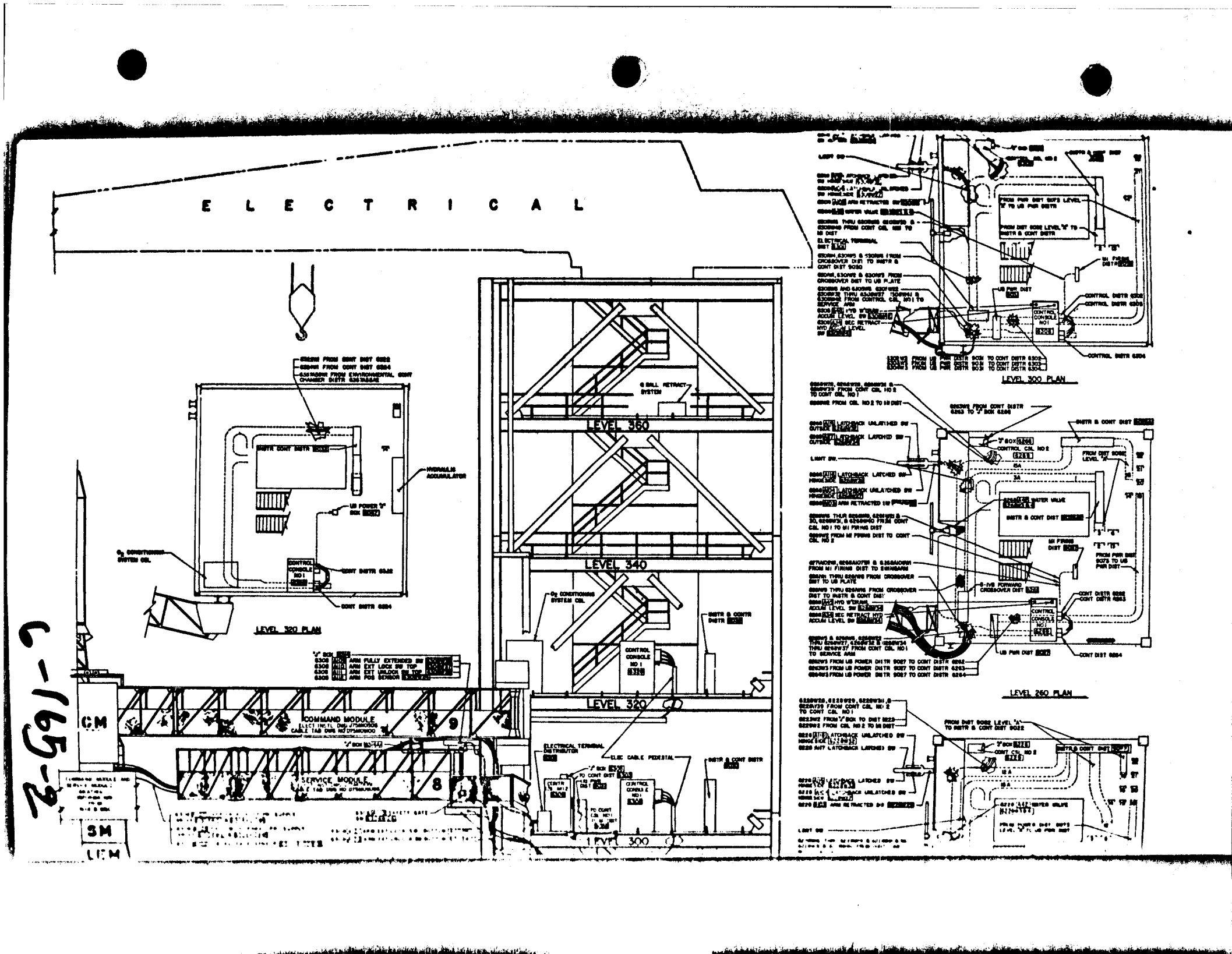


LEVEL 180 PLAN



LEVEL 100 PLAN

1-165-9


E L E C T R I C A L
LEVEL 360
LEVEL 340
LEVEL 320
LEVEL 300
LEVEL 320 PLAN
LEVEL 300 PLAN
LEVEL 260 PLAN
CM
SM
LEM
COMMAND MODULE
SERVICE MODULE
HYDRAULIC ACCUMULATOR
CONTROL CONSOLE NO 1
CONTROL CONSOLE NO 2
ELECTRICAL TERMINAL DISTRIBUTOR
ELEC CABLE PEDESTAL
CONTROL DISTR 6204
CONTROL DISTR 6205
CONT DIST 6884
CONT DISTR 6883
CONT DISTR 6882
CONT DISTR 6881
CONT DISTR 6880
CONT DISTR 6879
CONT DISTR 6878
CONT DISTR 6877
CONT DISTR 6876
CONT DISTR 6875
CONT DISTR 6874
CONT DISTR 6873
CONT DISTR 6872
CONT DISTR 6871
CONT DISTR 6870
CONT DISTR 6869
CONT DISTR 6868
CONT DISTR 6867
CONT DISTR 6866
CONT DISTR 6865
CONT DISTR 6864
CONT DISTR 6863
CONT DISTR 6862
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CONT DISTR 6860
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CONT DISTR 6848
CONT DISTR 6847
CONT DISTR 6846
CONT DISTR 6845
CONT DISTR 6844
CONT DISTR 6843
CONT DISTR 6842
CONT DISTR 6841
CONT DISTR 6840
CONT DISTR 6839
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CONT DISTR 6837
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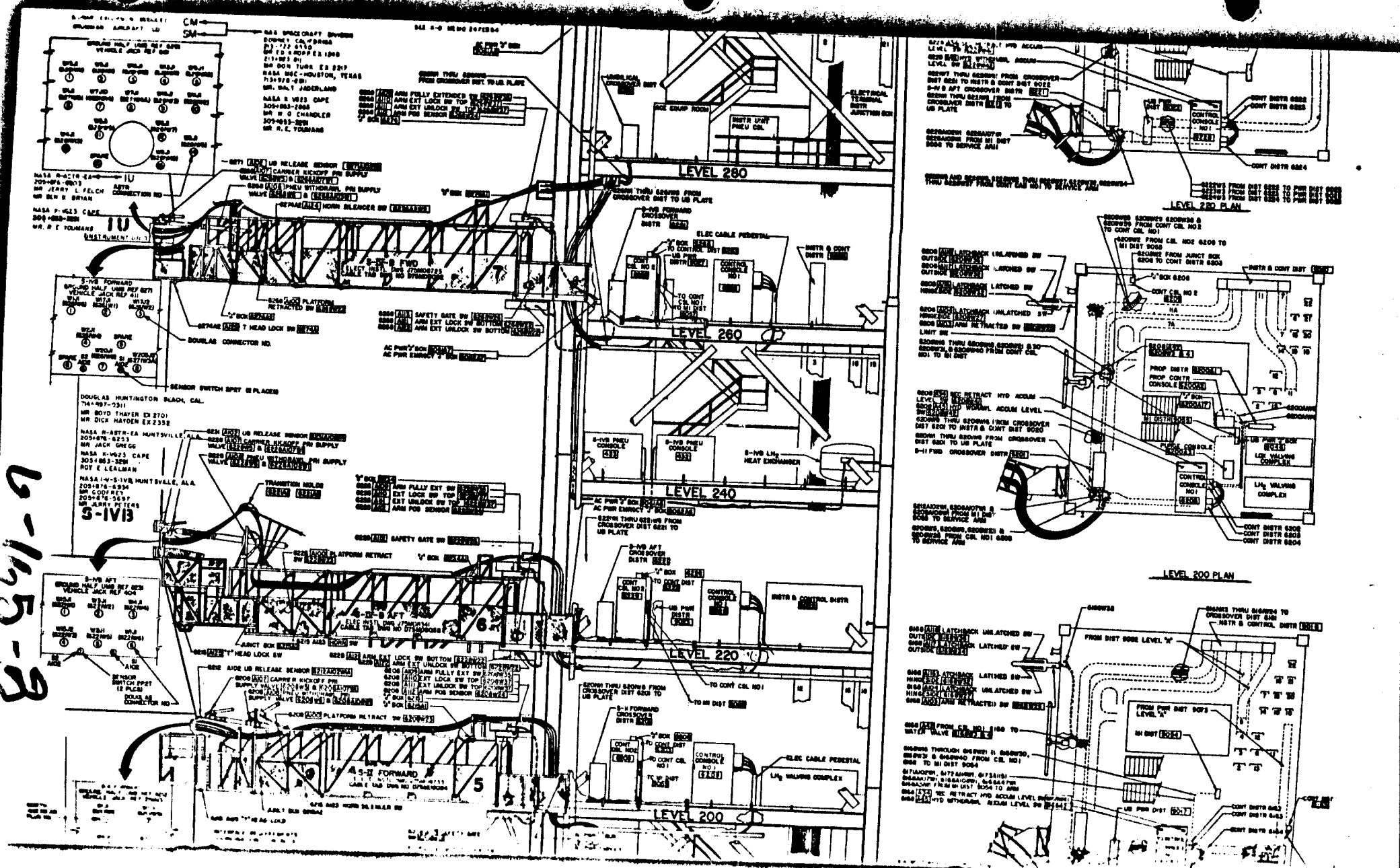
CONT DISTR 6818
CONT DISTR 6817
CONT DISTR 6816
CONT DISTR 6815
CONT DISTR 6814
CONT DISTR 6813
CONT DISTR 6812
CONT DISTR 6811
CONT DISTR 6810
CONT DISTR 6809
CONT DISTR 6808
CONT DISTR 6807
CONT DISTR 6806
CONT DISTR 6805
CONT DISTR 6804
CONT DISTR 6803
CONT DISTR 6802
CONT DISTR 6801
CONT DISTR 6800

C-165-2


LEVEL 280
LEVEL 260
LEVEL 240
LEVEL 220
LEVEL 200
S-IVB
S-IVB FWD
S-IVB AFT
S-II FORWARD
S-II AFT
IU
LEVEL 220 PLAN
LEVEL 200 PLAN

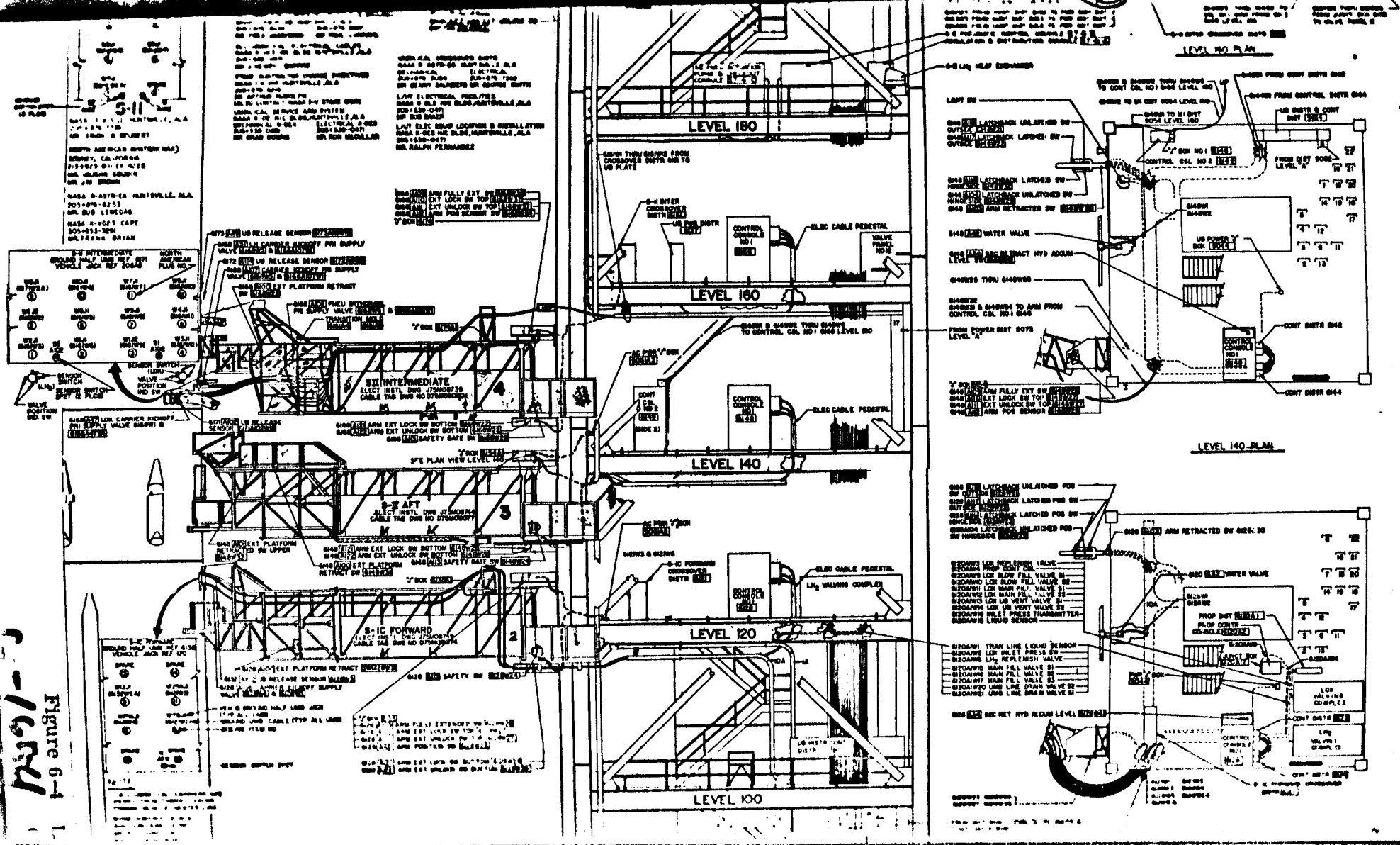
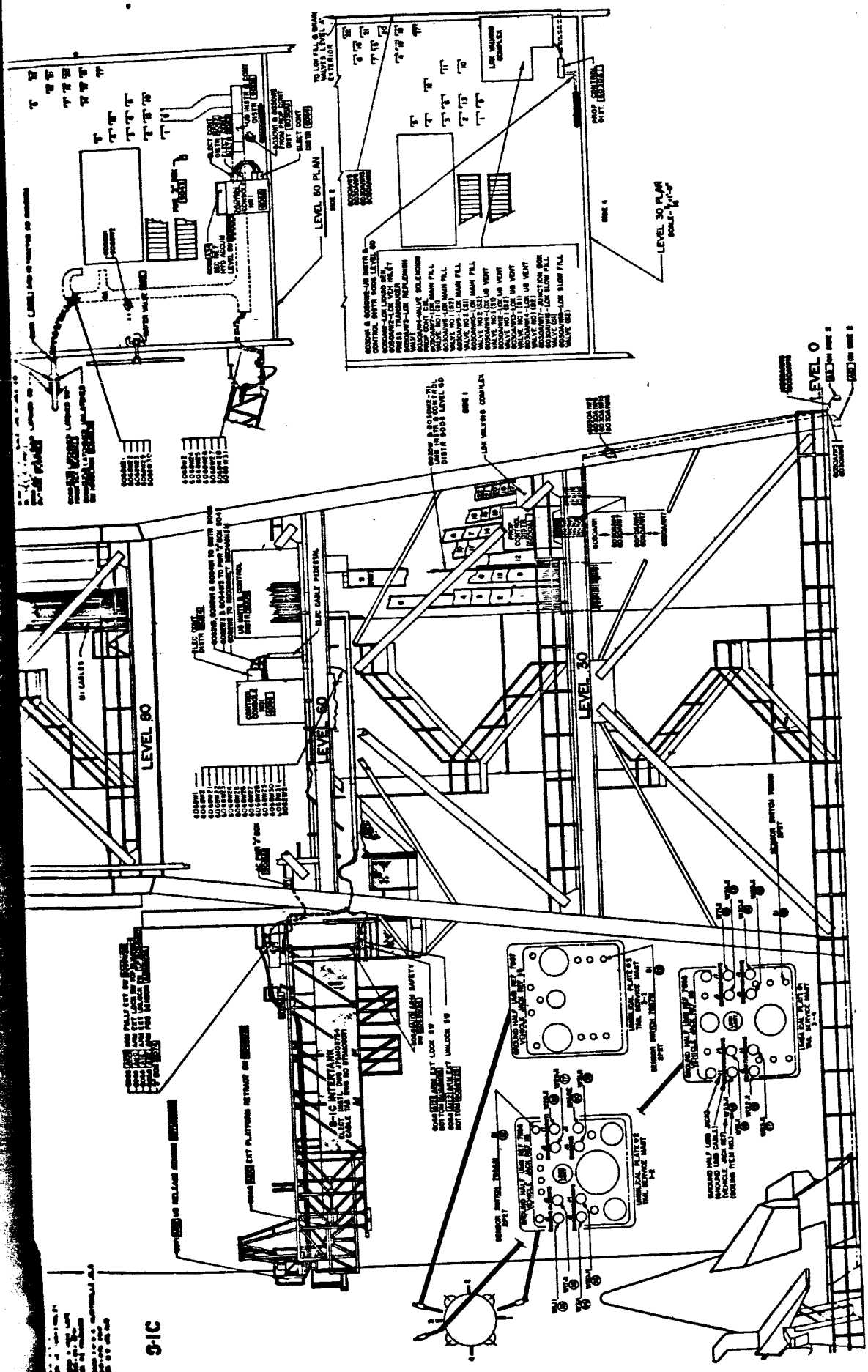

LEVEL 180
LEVEL 160
LEVEL 140
LEVEL 120
LEVEL 100
S-II INTERMEDIATE
S-II AFT
S-IC FORWARD
LEVEL 140 PLAN

Figure 6-4



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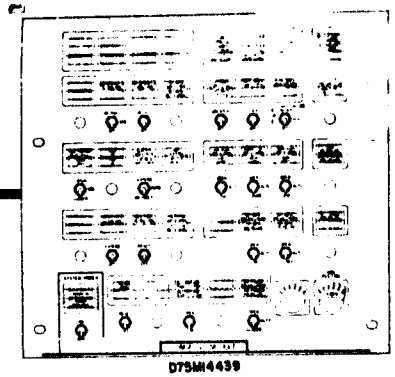
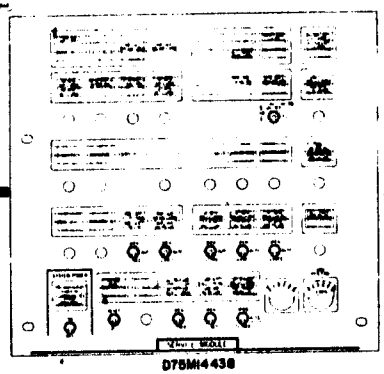
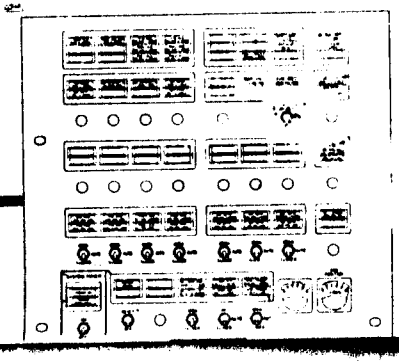
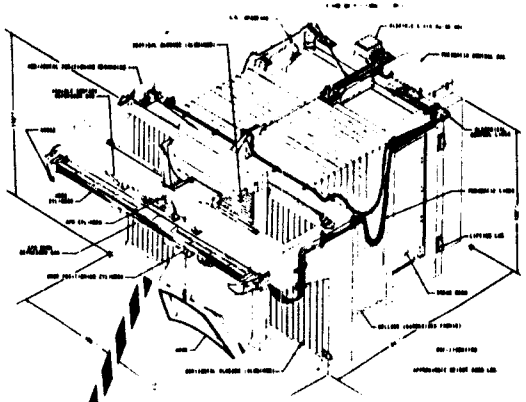
ling Arrangement, Mobile Launcher, LC-39

167-1


D75M14439

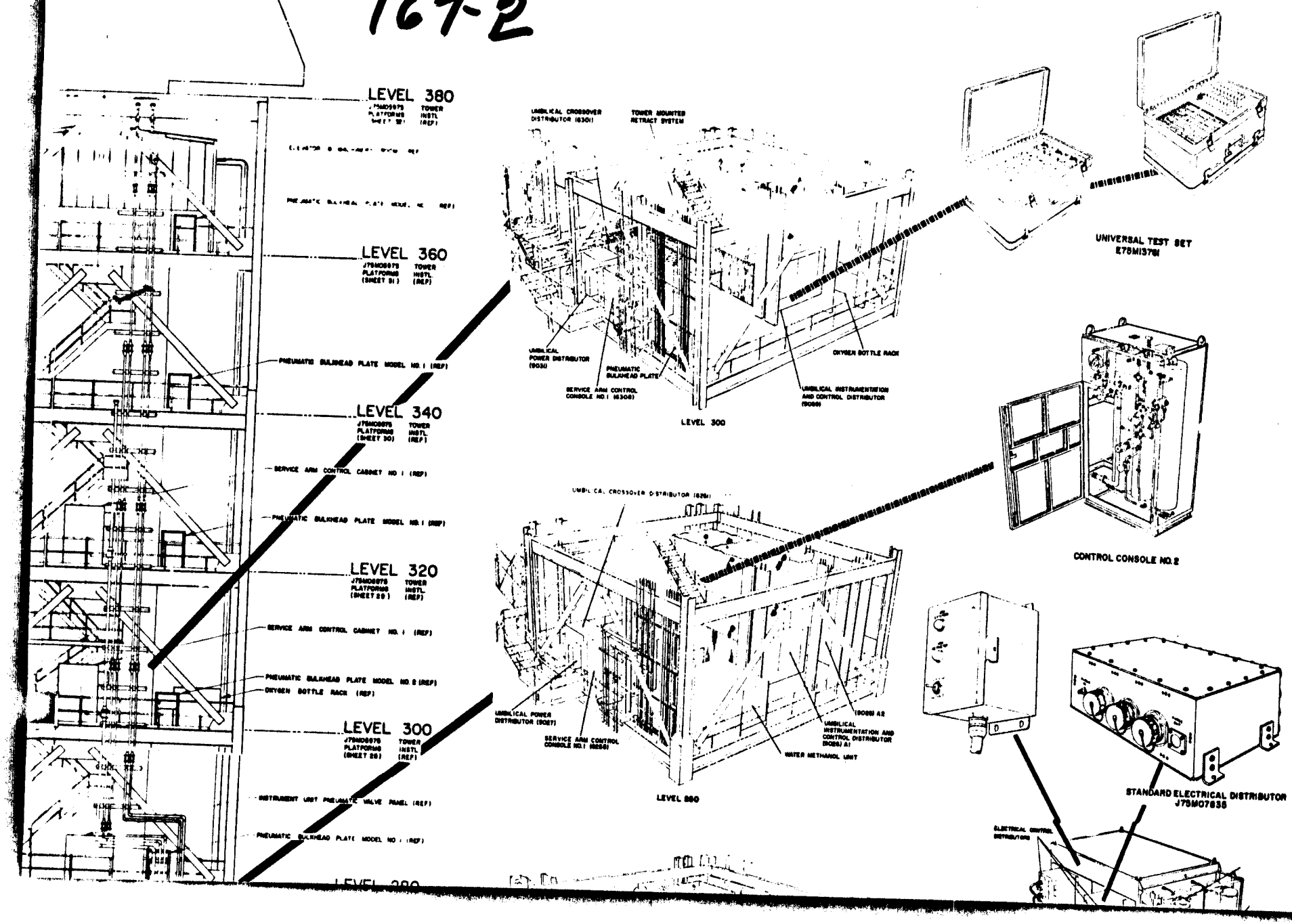

D75M14436

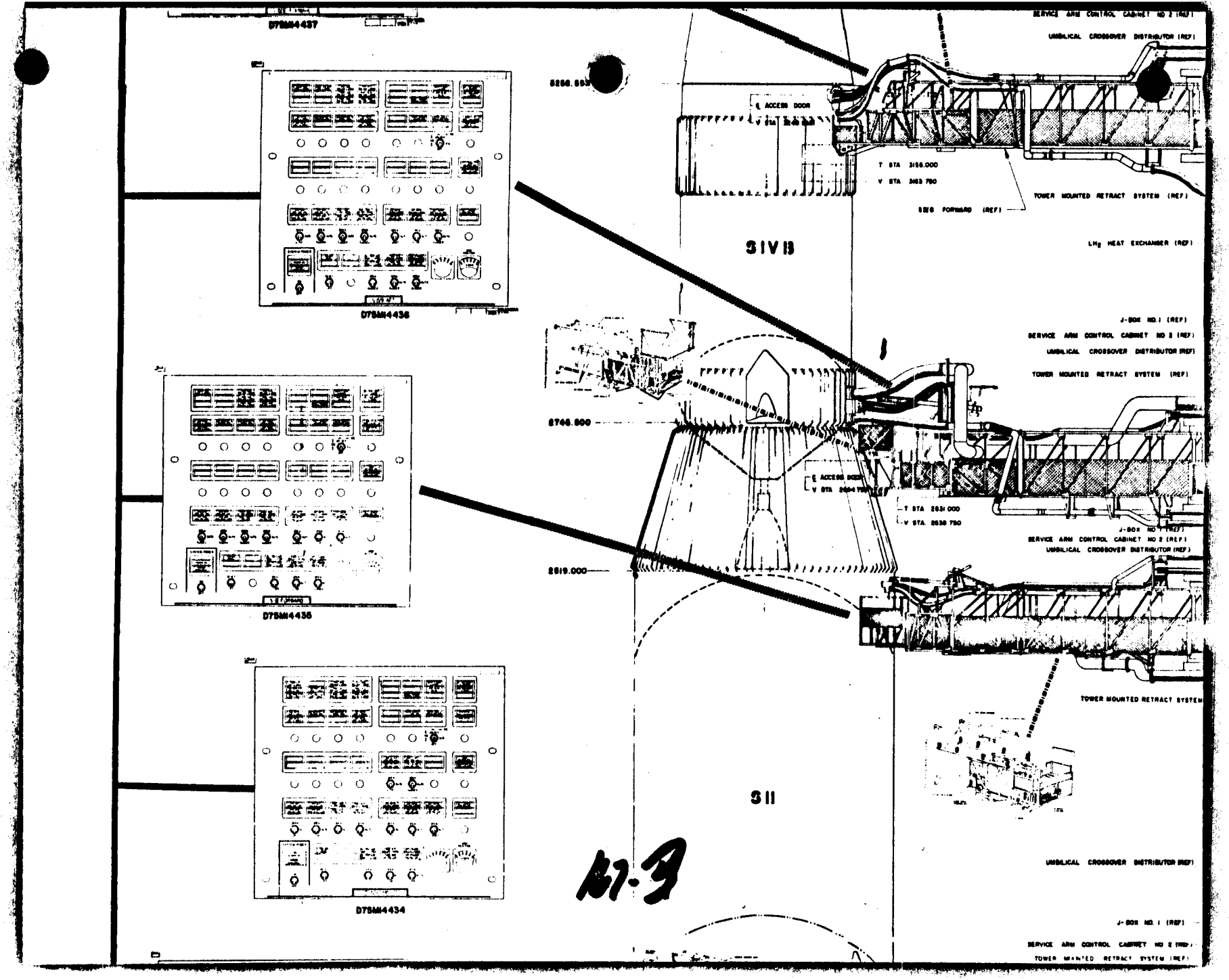


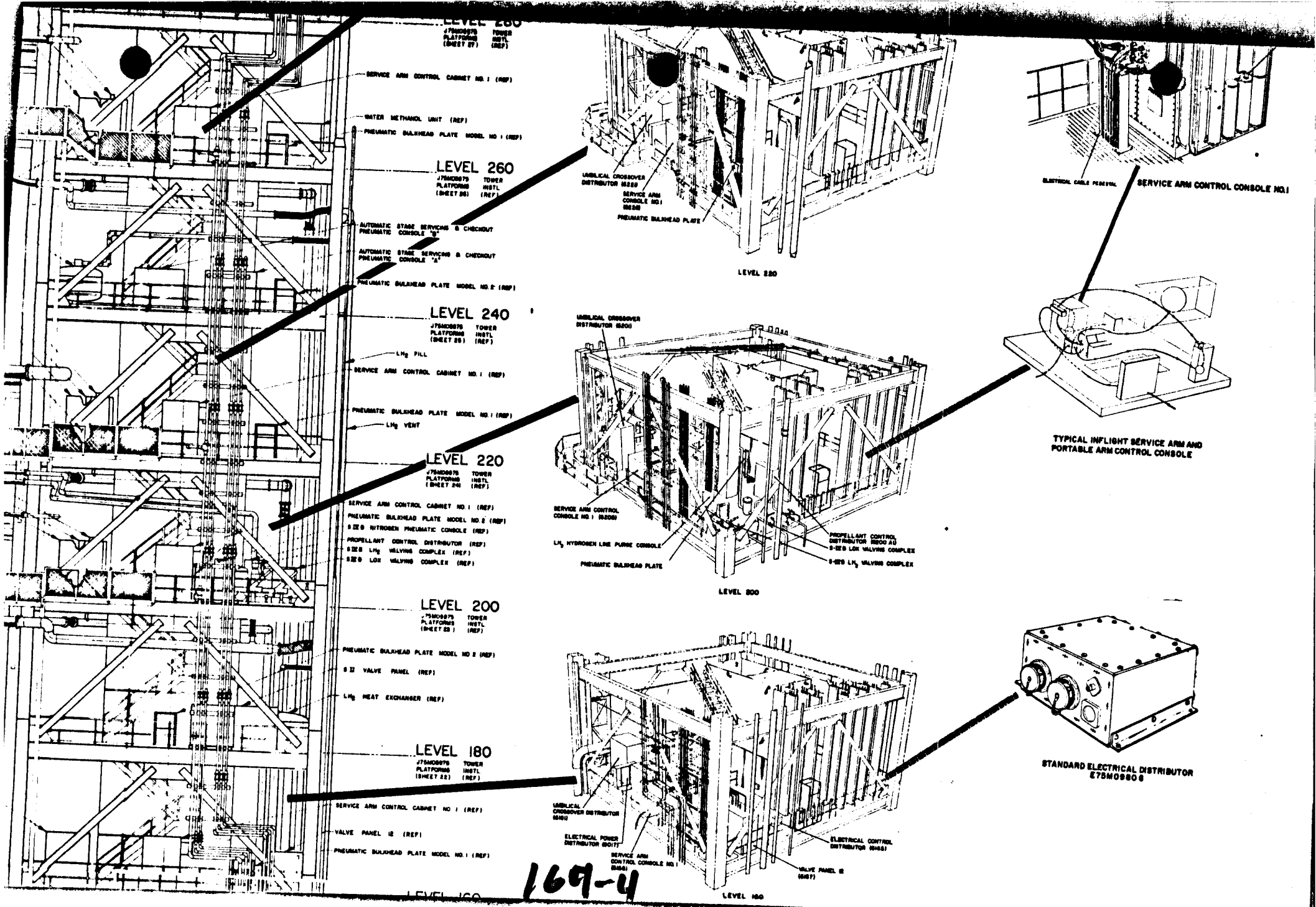

ENVIRONMENTAL CHAMBER
COMMAND MODULE (REF)

3M
LEM
SERVICE MODULE (REF)
J-BOX NO 1 (REF)
UMBILICAL CROSSOVER DISTRIBUTOR (REF)

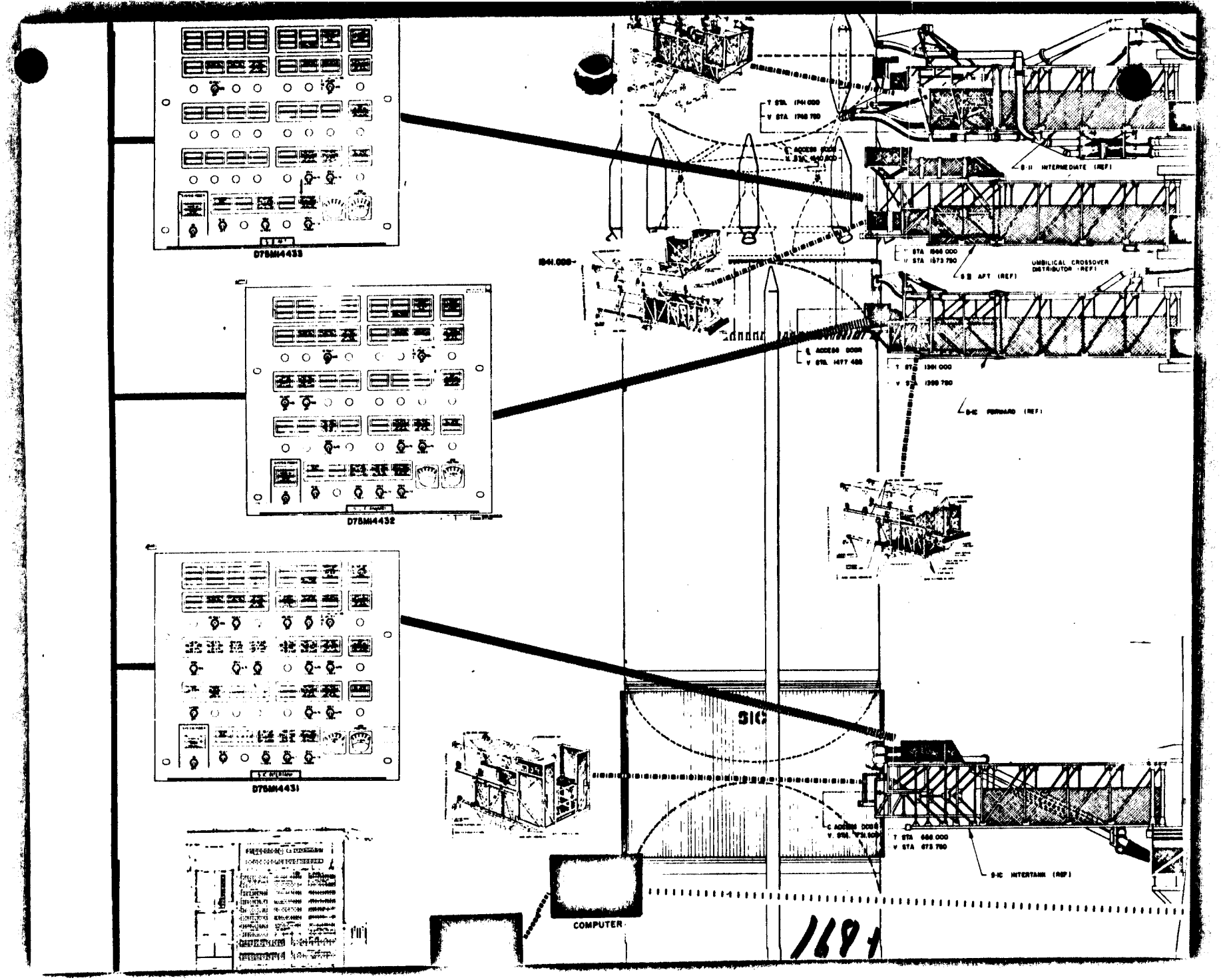
167-2

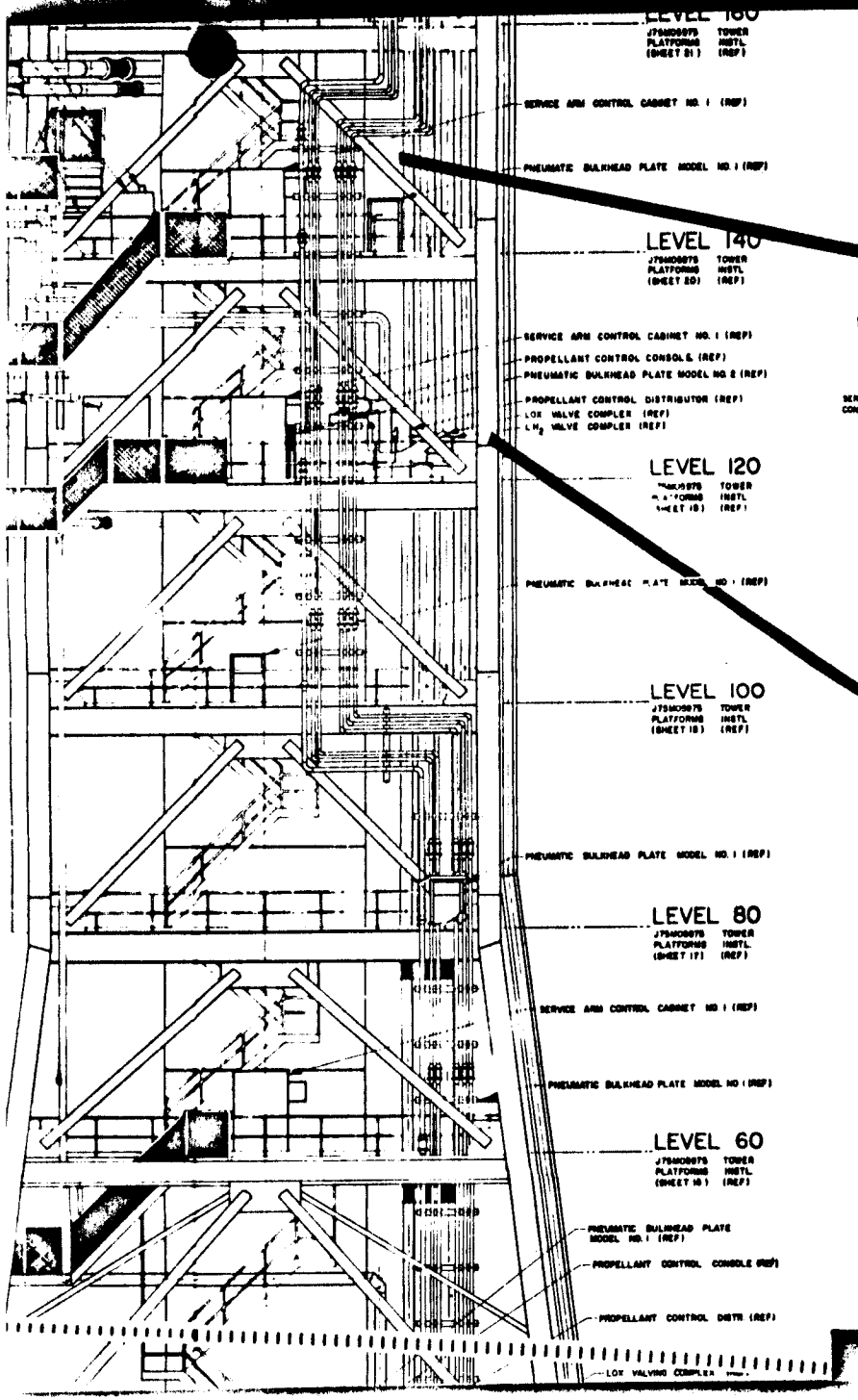

LEVEL 380
LEVEL 360
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LEVEL 340
SERVICE ARM CONTROL CABINET NO. 1 (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LEVEL 320
SERVICE ARM CONTROL CABINET NO. 1 (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 2 (REF)
OXYGEN BOTTLE RACK (REF)
LEVEL 300
INSTRUMENT UNIT PNEUMATIC VALVE PANEL (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LEVEL 280
UMBILICAL CROSSOVER DISTRIBUTOR (6301)
TOWER MOUNTED RETRACT SYSTEM
UMBILICAL POWER DISTRIBUTOR (9031)
PNEUMATIC BULKHEAD PLATE
SERVICE ARM CONTROL CONSOLE NO. 1 (6306)
OXYGEN BOTTLE RACK
UMBILICAL INSTRUMENTATION AND CONTROL DISTRIBUTOR (9089)
LEVEL 300
UMBILICAL CROSSOVER DISTRIBUTOR (6256)
UMBILICAL POWER DISTRIBUTOR (9087)
SERVICE ARM CONTROL CONSOLE NO. 1 (6256)
UMBILICAL INSTRUMENTATION AND CONTROL DISTRIBUTOR (9089) A1
(9089) A2
WATER METHANOL UNIT
LEVEL 280
UNIVERSAL TEST SET E78MI3761
CONTROL CONSOLE NO. 2
STANDARD ELECTRICAL DISTRIBUTOR J78M07835
ELECTRICAL CONTROL DISTRIBUTOR

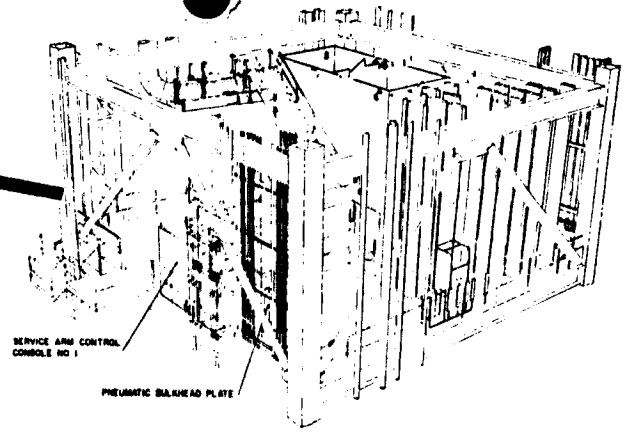

D7SM4437
D7SM4436
D7SM4436
D7SM4434
SERVICE ARM CONTROL CABINET NO 2 (REF)
UMBILICAL CROSSOVER DISTRIBUTOR (REF)
℄ ACCESS DOOR
T STA 3156.000
V STA 3463 750
TOWER MOUNTED RETRACT SYSTEM (REF)
SRS FORWARD (REF)
3IV B
LH2 HEAT EXCHANGER (REF)
J-BOX NO.1 (REF)
SERVICE ARM CONTROL CABINET NO 2 (REF)
UMBILICAL CROSSOVER DISTRIBUTOR (REF)
TOWER MOUNTED RETRACT SYSTEM (REF)
3746.000
℄ ACCESS DOOR
T STA 2831 000
V STA 3030 750
J-BOX NO.1 (REF)
SERVICE ARM CONTROL CABINET NO 2 (REF)
UMBILICAL CROSSOVER DISTRIBUTOR (REF)
3819.000
TOWER MOUNTED RETRACT SYSTEM
3 II
UMBILICAL CROSSOVER DISTRIBUTOR (REF)
J-BOX NO. 1 (REF)
SERVICE ARM CONTROL CABINET NO 2 (REF)
TOWER MOUNTED RETRACT SYSTEM (REF)
67-3


LEVEL 280
J75M08875 TOWER PLATFORMS INSTL (SHEET 27) (REF)
SERVICE ARM CONTROL CABINET NO. 1 (REF)
WATER METHANOL UNIT (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LEVEL 260
J75M08875 TOWER PLATFORMS INSTL (SHEET 26) (REF)
AUTOMATIC STAGE SERVICING & CHECKOUT PNEUMATIC CONSOLE "B"
AUTOMATIC STAGE SERVICING & CHECKOUT PNEUMATIC CONSOLE "A"
PNEUMATIC BULKHEAD PLATE MODEL NO. 2 (REF)
LEVEL 240
J75M08875 TOWER PLATFORMS INSTL (SHEET 25) (REF)
LH2 FILL
SERVICE ARM CONTROL CABINET NO. 1 (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LH2 VENT
LEVEL 220
J75M08875 TOWER PLATFORMS INSTL (SHEET 24) (REF)
SERVICE ARM CONTROL CABINET NO. 1 (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 2 (REF)
S-IC-S NITROGEN PNEUMATIC CONSOLE (REF)
PROPELLANT CONTROL DISTRIBUTOR (REF)
S-IC-S LH2 VALVING COMPLEX (REF)
S-IC-S LOX VALVING COMPLEX (REF)
LEVEL 200
J75M08875 TOWER PLATFORMS INSTL (SHEET 23) (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO 2 (REF)
S-II VALVE PANEL (REF)
LH2 HEAT EXCHANGER (REF)
LEVEL 180
J75M08875 TOWER PLATFORMS INSTL (SHEET 22) (REF)
SERVICE ARM CONTROL CABINET NO. 1 (REF)
VALVE PANEL 12 (REF)
PNEUMATIC BULKHEAD PLATE MODEL NO. 1 (REF)
LEVEL 160
UMBILICAL CROSSOVER DISTRIBUTOR (6220)
SERVICE ARM CONSOLE NO. 1 (6228)
PNEUMATIC BULKHEAD PLATE
LEVEL 220
ELECTRICAL CABLE REMOVAL
SERVICE ARM CONTROL CONSOLE NO. 1
UMBILICAL CROSSOVER DISTRIBUTOR (6201)
SERVICE ARM CONTROL CONSOLE NO. 1 (6208)
LH2 HYDROGEN LINE PURGE CONSOLE
PNEUMATIC BULKHEAD PLATE
PROPELLANT CONTROL DISTRIBUTOR (6200 A)
S-IC-S LOX VALVING COMPLEX
S-IC-S LH2 VALVING COMPLEX
LEVEL 200
TYPICAL INFLIGHT SERVICE ARM AND PORTABLE ARM CONTROL CONSOLE
UMBILICAL CROSSOVER DISTRIBUTOR (6180)
ELECTRICAL POWER DISTRIBUTOR (6017)
SERVICE ARM CONTROL CONSOLE NO. 1 (6456)
ELECTRICAL CONTROL DISTRIBUTOR (6465)
VALVE PANEL 12 (6467)
LEVEL 180
STANDARD ELECTRICAL DISTRIBUTOR E75M09806

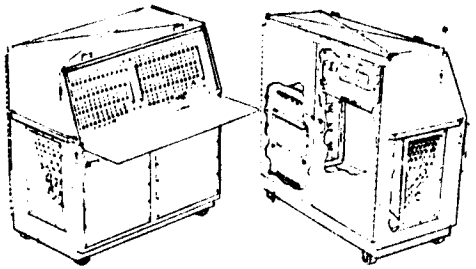
169-4


D75M4433
D75M4432
D75M4431
COMPUTER
S-IC INTERTANK (REF)
S-II INTERMEDIATE (REF)
S-II AFT (REF)
S-IC FORWARD (REF)
UMBILICAL CROSSOVER DISTRIBUTOR (REF)
1691

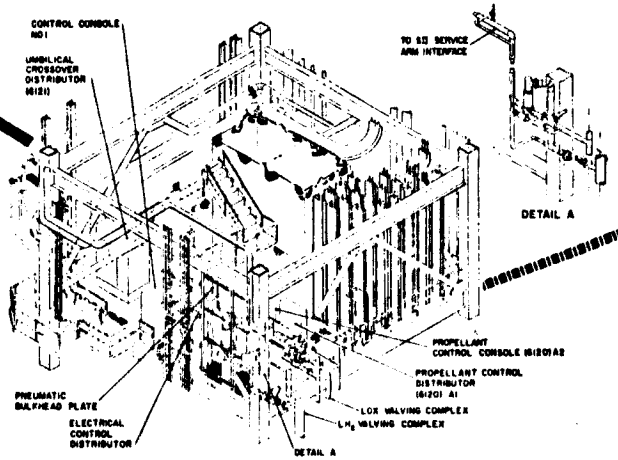




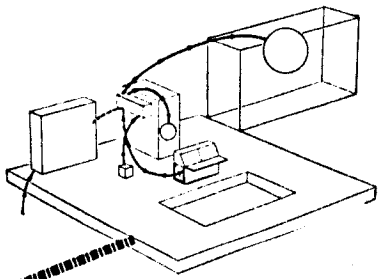
LEVEL 140



PORTABLE ARM CONTROL CONSOLE
J75M07542

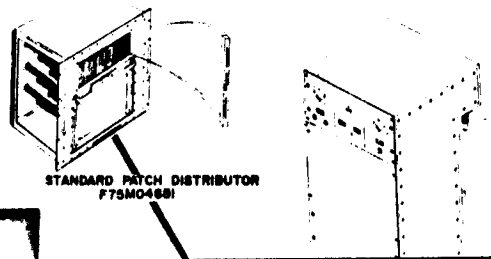


LEVEL 120

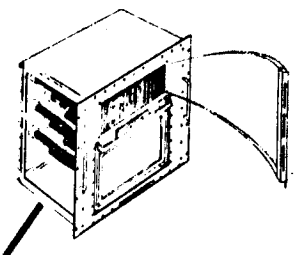


TYPICAL PREFLIGHT SERVICE ARM AND PORTABLE ARM CONTROL CONSOLE

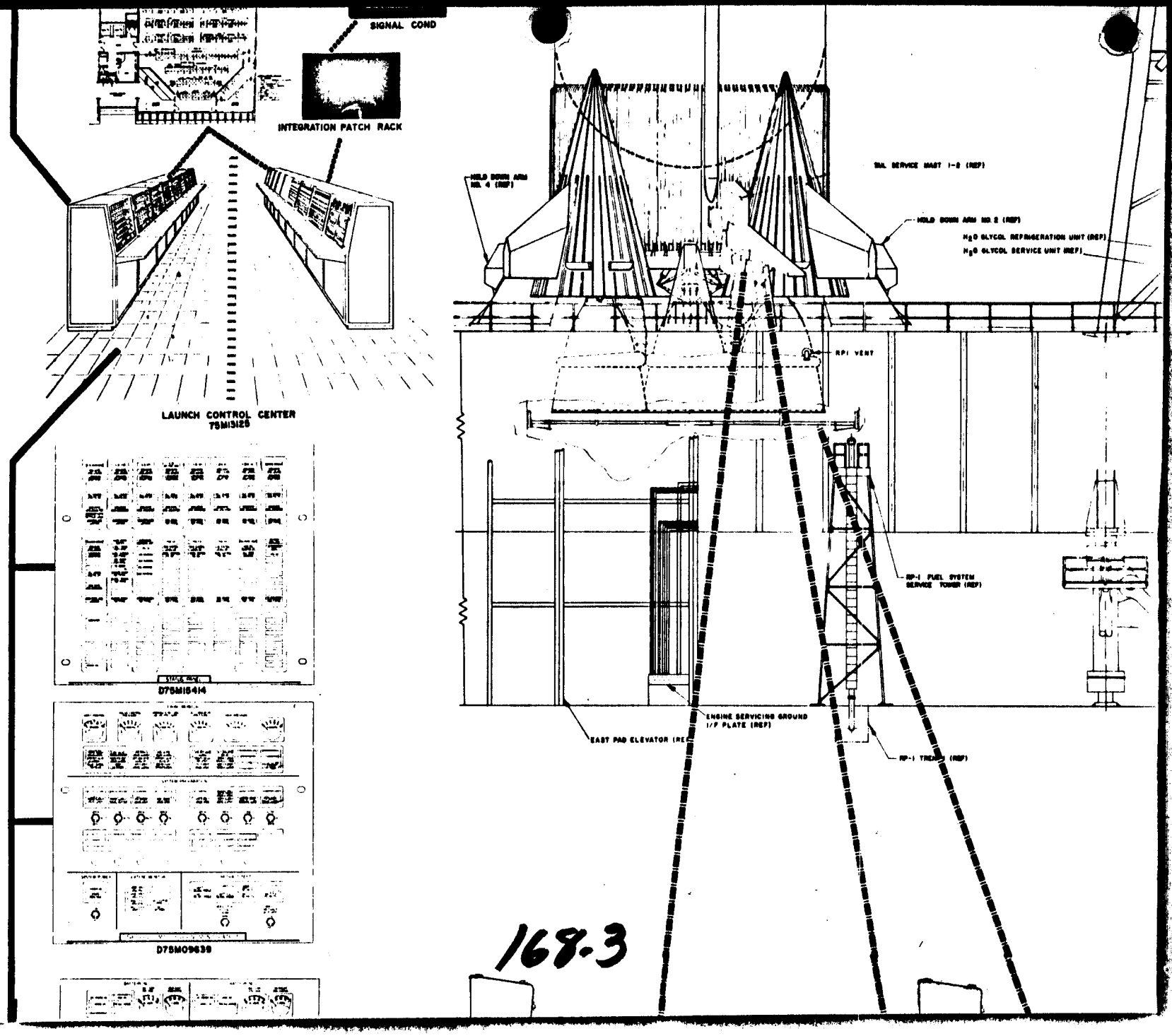
168-2

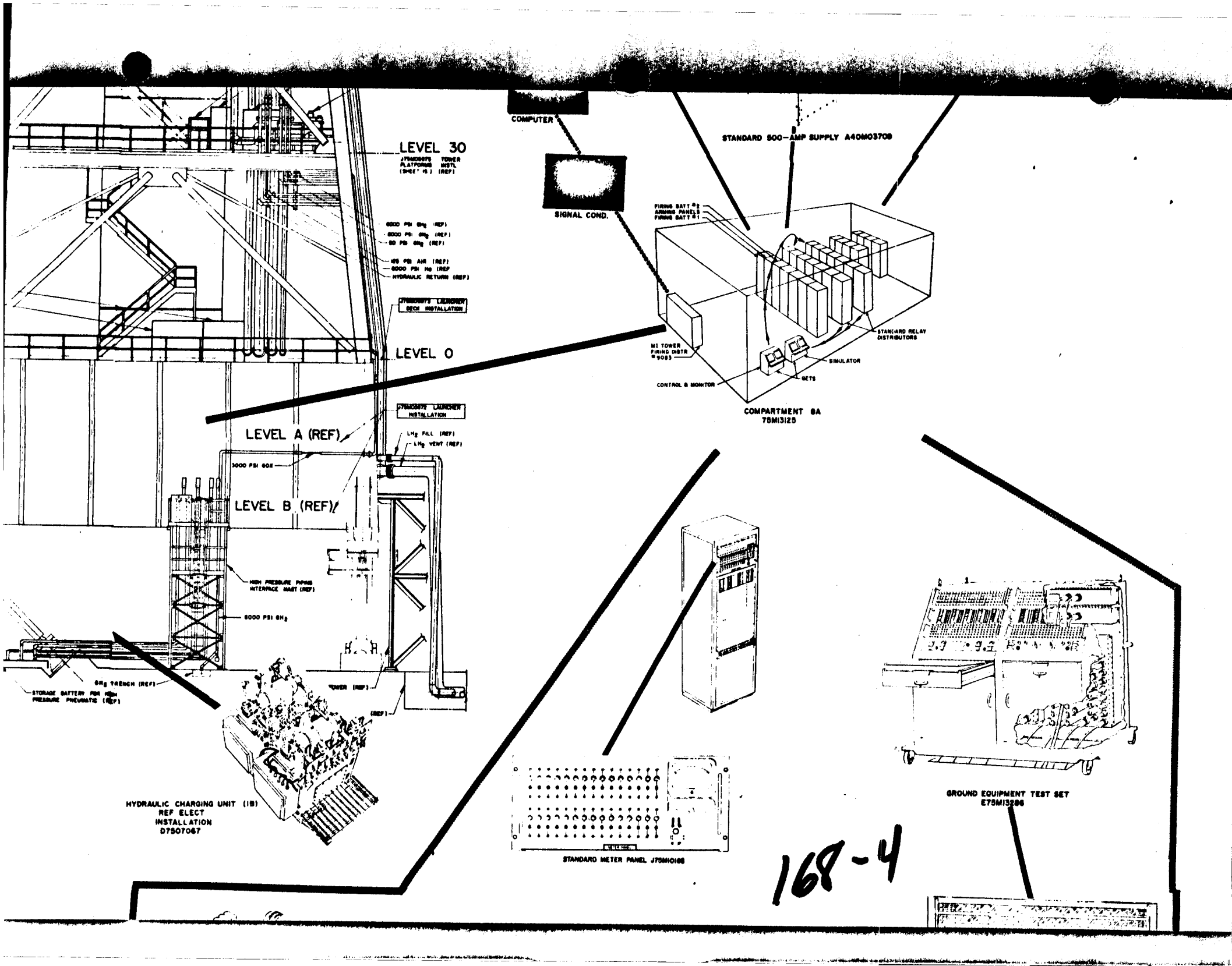


STANDARD PATCH DISTRIBUTOR
F75M04881



STANDARD PATCH DISTRIBUTOR
D75M09313


SIGNAL COND
INTEGRATION PATCH RACK
LAUNCH CONTROL CENTER
75M31125
D75M15414
D75M09639
HOLD DOWN ARM NO. 4 (REF)
TAIL SERVICE MAST 1-8 (REF)
HOLD DOWN ARM NO. 2 (REF)
H2O GLYCOL REFRIGERATION UNIT (REF)
H2O GLYCOL SERVICE UNIT (REF)
RP-1 VENT
RP-1 FUEL SYSTEM SERVICE TOWER (REF)
ENGINE SERVICING GROUND I/F PLATE (REF)
EAST PAD ELEVATOR (RE
RP-1 TREA (REF)
168-3


LEVEL 30
LEVEL 0
LEVEL A (REF)
LEVEL B (REF)
COMPUTER
SIGNAL COND.
STANDARD 500-AMP SUPPLY A40M03709
STANDARD RELAY DISTRIBUTORS
SIMULATOR
SETS
CONTROL & MONITOR
COMPARTMENT 8A
75MI3125
HYDRAULIC CHARGING UNIT (18)
REF ELECT
INSTALLATION
D7507067
STANDARD METER PANEL JT5MI0168
GROUND EQUIPMENT TEST SET
E75MI3286
168-4

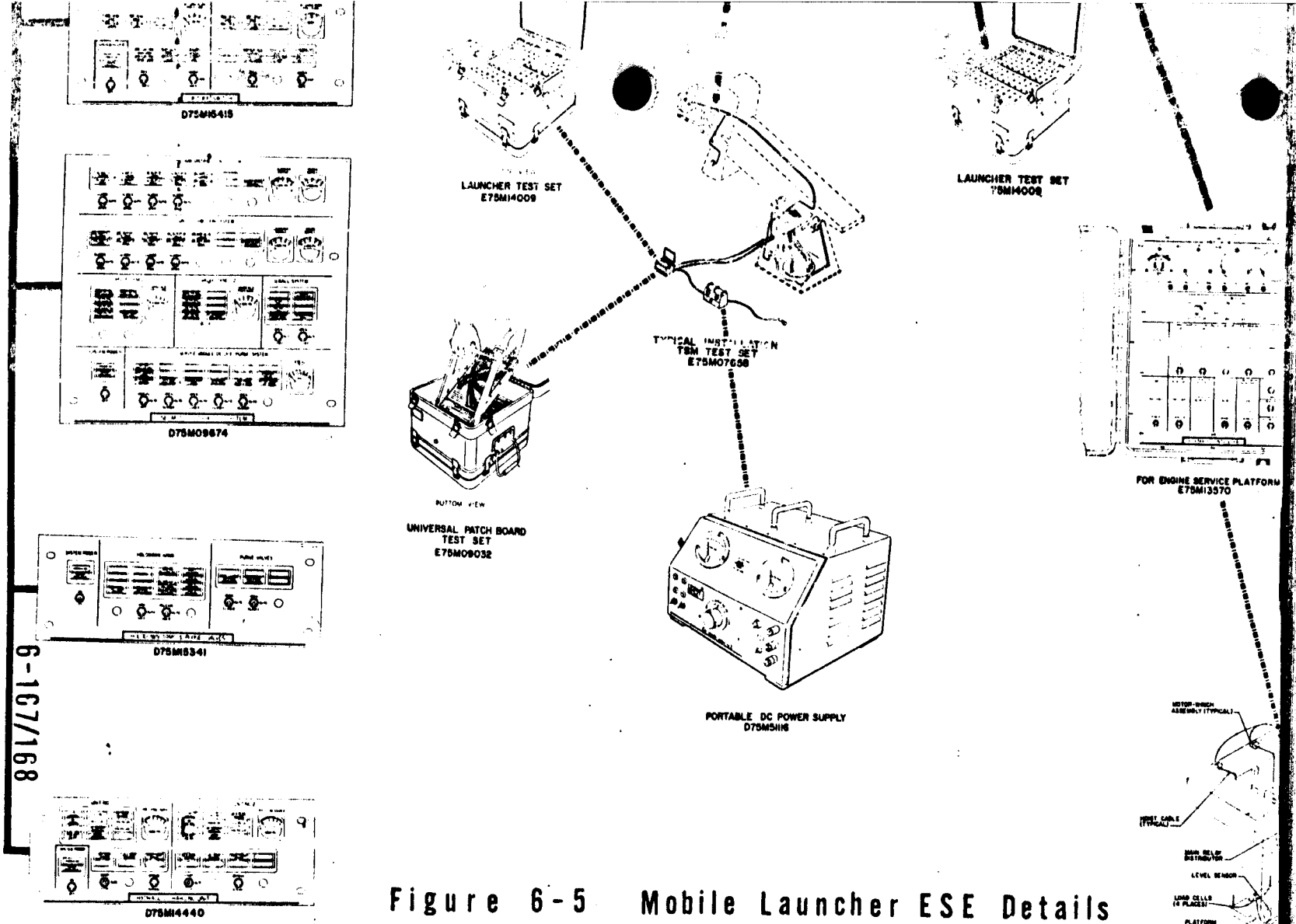


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Figure 6-5 Mobile Launcher ESE Details

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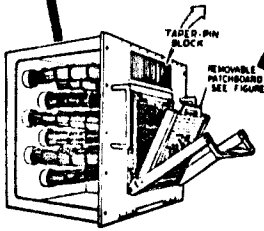
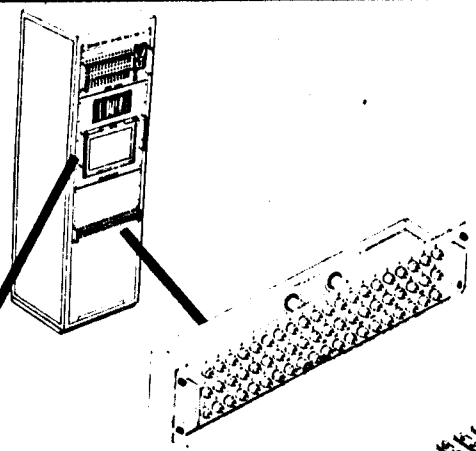
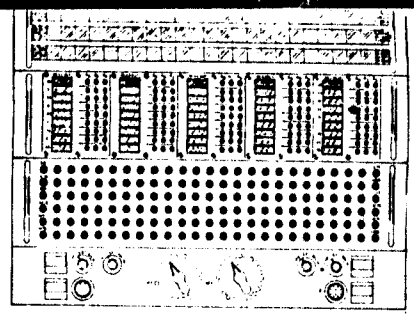
STANDARD RELAY AND DIODE MODULES



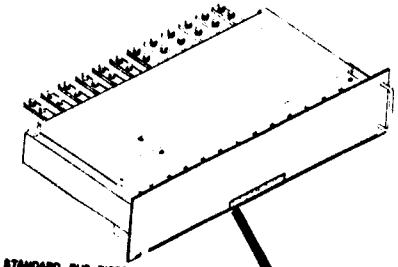
STANDARD PATCH DISTRIBUTOR D75M09313



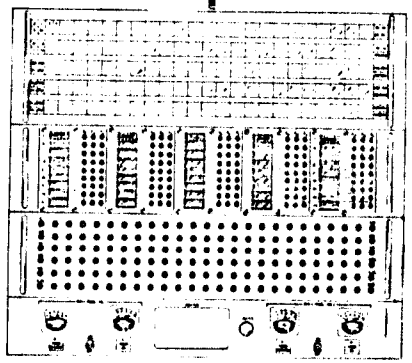
STANDARD FUSE PANEL J75M10163



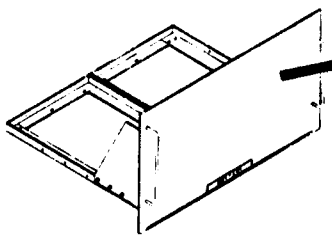
FRONT PANEL SETS



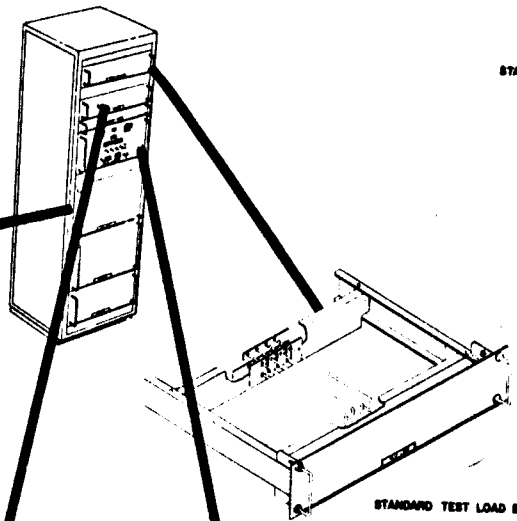
STANDARD BUS DISTRIBUTOR E75M12327



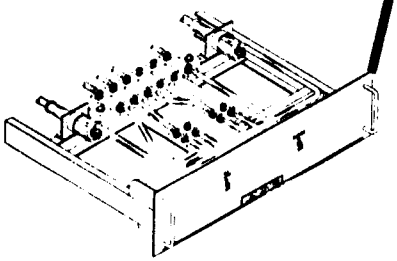
FRONT PANEL SETS



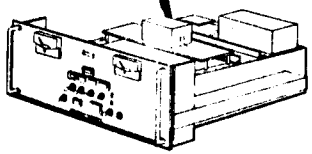
STANDARD BATTERY PANEL J40M03605



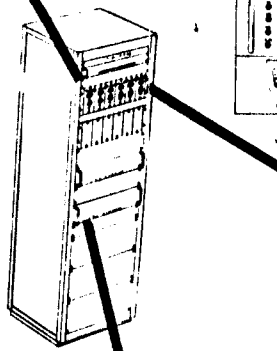
STANDARD TEST LOAD E40M03671

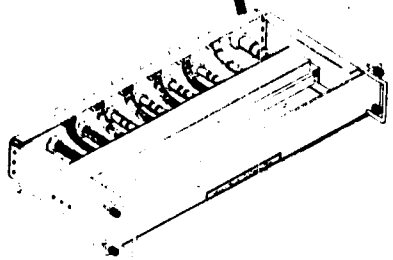


STANDARD LOAD CONTROL PANEL E40M03535

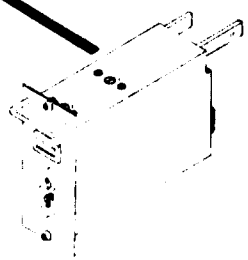


STANDARD BATTERY CHARGER

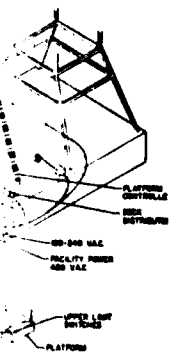




RECEPTACLE DISTRIBUTOR E75M12316



STANDARD POWER MODULE, TYPE HA J75M12316



168-6

6-4. ESE CABLE INTERCONNECT DIAGRAMS.

Cable interconnect diagrams for Electrical Support Equipment are on pages 6-170 through 6-215 following. These diagrams were recently revised and are scheduled for further revision before the next issue of this document.

Also included here are four pages of Cable Interconnect and Electrical Schematic Criteria (6-216 through 6-219).

INDEX

SHEET NO.	REV STATUS	TITLE
1		TITLE SHEET
2		INDEX AND CHANGE SHEET
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4		COMPONENT TABULATION---9008 – 9094
5		CABLE INDEX----------1162 – 6008
6		CABLE INDEX----------6008 – 6028
7		CABLE INDEX----------6028 – 6128
8		CABLE INDEX----------6128 – 6161
9		CABLE INDEX----------6162 – 6188
10		CABLE INDEX----------6171 – 6208
11		CABLE INDEX----------6209 – 6224
12		CABLE INDEX----------6226 – 6263
13		CABLE INDEX----------6264 – 6291
14		CABLE INDEX----------6301 – 6322
15		CABLE INDEX----------6322 – 6413
16		CABLE INDEX----------6414 – 6606
17		CABLE INDEX----------6606 – 6623
18		CABLE INDEX----------6633 – 6709
19		CABLE INDEX----------6713 – 7656
20		CABLE INDEX----------7850 – 7961
21		CABLE INTERCONNECT---LUT BASE
22		CABLE INTERCONNECT---LUT BASE
23		CABLE INTERCONNECT---LUT BASE
24		CABLE INTERCONNECT---LUT BASE
25		CABLE INTERCONNECT---LAUNCHER NETWORKS
26		CABLE INTERCONNECT---LAUNCHER NETWORKS
27		CABLE INTERCONNECT---LAUNCHER NETWORKS
28		CABLE INTERCONNECT---S-IC INTERTANK
29		CABLE INTERCONNECT---S-IC FORWARD
30		CABLE INTERCONNECT---S-II AFT
31		CABLE INTERCONNECT---S-II INTERMEDIATE
32		CABLE INTERCONNECT---S-II INTERMEDIATE
33		CABLE INTERCONNECT---S-II INTERMEDIATE
34		CABLE INTERCONNECT---S-II FORWARD
35		CABLE INTERCONNECT---S-II FORWARD
36		CABLE INTERCONNECT---S-IVB AFT
37		CABLE INTERCONNECT---S-IVB AFT
38		CABLE INTERCONNECT---S-IVB FORWARD
39		CABLE INTERCONNECT---S-IVB FORWARD
40		CABLE INTERCONNECT---S-IVB FORWARD
41		CABLE INTERCONNECT---SERVICE MODULE
42		CABLE INTERCONNECT---SERVICE MODULE
43		CABLE INTERCONNECT---COMMAND MODULE
44		CABLE INTERCONNECT---COMMAND MODULE
45		CABLE INTERCONNECT---HYDRAULIC CHARGING UNIT
46		CABLE INTERCONNECT---LUT
47		CABLE INTERCONNECT---LCC

REFERENCE DRAWINGS

CONTROL DRAWINGS

D75M07[illegible] S-IVB SERVICE ARMS INTERCONNECT (REV C)
D75M07[illegible] LAUNCHER NETWORKS INTERCONNECT (75M66)
D75M[illegible] ELECTRICAL SYSTEMS SCHEMATICS
D75M[illegible] MT BASE INTERCONNECT
D75M[illegible] POWER LEVEL INTERCONNECT
SHEETS 40 & 41 PLS GE/ASTR AGREEMENT 9/9/66

INFORMATION DRAWINGS (CABLE ASSEMBLIES)

D75M07809 S-IVB FWD SERVICE ARM LEM MODIFICATION
D75M08111A S-IC INTERTANK TWR LVL A530C EQUIP 60' LVL
D75M08112BS S-IC FORWARD TWR LVL A530C EQUIP 120' LVL
D75M08113 S-II AFT 140' LVL
D75M08114B S-II INTERMEDIATE 160' LVL
D75M08113A S-II FORWARD 200' LVL
D75M08116A S-IVB AFT 220' LVL
D75M08117C S-IVB FORWARD 260'/280' LVL
D75M08118B SERVICE MODULE 300 LVL
D75M08119A COMMAND MODULE TWR LVL A530C EQUIP 320 LVL
D75M08538A BATTERY ARMING RACK
D75M08662
D75M08665
D75M08471D PORTABLE CONTROL CONSOLE
D75M08707A S-IVB AFT SERVICE ARM MODIFICATION
D75M09057A S-II INTERMEDIATE SERVICE ARM MODIFICATION
D75M09065B OFF-LUT NETWORKS
D75M09064 VALVE PANEL 11
D75M09065 VALVE PANEL 12
D75M09067A 'O' LEVEL NETWORKS (LUT)
D75M09070D LAUNCHER NETWORKS (LUT)
D75M09071D S-IC INTERTANK SERVICE ARM
D75M09071C S-IC INTERTANK TOWER INTERCONNECT
D75M09073A S-IC INTERTANK CONTROL CONSOLE NO. 1
D75M09074E S-IC FWD SERVICE ARM
D75M09075C S-IC FWD TWR INTERCONNECT
D75M09076A S-IC FWD CONTR CONSOLE NO 1
D75M09077B S-II AFT SERVICE ARM
D75M09078C S-II AFT TWR INTERCONNECT
D75M09079A S-II AFT CONTR CONSOLE NO.1
D75M09080E S-II INTERMEDIATE SERVICE ARM
D75M09081D S-II INTERMEDIATE TOWER INTERCONNECT
D75M09082B S-II INTERMEDIATE CONTR CONSOLE NO.1
D75M09083B S-II INTERMEDIATE CONTR CONSOLE NO.2
D75M09084E S-II FWD SERVICE ARM
D75M09085D S-II FWD TOWER INTERCONNECT
D75M09086A S-II FWD CONTR CONSOLE NO.1
D75M09087 S-II FWD CONTR CONSOLE NO.2
D75M09088E S-IVB AFT SERVICE ARM
D75M09089D S-IVB AFT TOWER INTERCONNECT
D75M09090A S-IVB AFT CONTR CONSOLE NO.1
D75M09091 S-IVB AFT CONTR CONSOLE NO.2
D75M09092E S-IVB FWD SERVICE ARM
D75M09093D S-IVB FWD TOWER INTERCONNECT
D75M09094A S-IVB FWD CONTR CONSOLE NO.1
D75M09095 S-IVB FWD CONTR CONSOLE NO.2
D75M09096D SERVICE MODULE SERVICE ARM
D75M09097D SERVICE MODULE TOWER INTERCONNECT
D75M09098A SERVICE MODULE CONTR CONSOL NO.1
D75M09099 SERVICE MODULE CONTR CONSOL NO.2
D75M09100D COMMAND MODULE ACCESS ARM
D75M09101B COMMAND MODULE TOWER INTERCONNECT
D75M09102 COMMAND MODULE CONTR CONSOLE NO.1
D75M09189D TEST SETS (UNIVERSAL)
D75M09187 LUT POWER DISTRIBUTION RACK NO.1 } SERVICE ARM
D75M09188 LUT POWER DISTRIBUTION RACK NO.2 } POWER DISTRIBUTORS
D75M09189
D75M09784 SERVICE ARM CONTROL RACK NO.7 (6618)
D75M09785 SERVICE ARM CONTROL RACK NO.8 (6615)
D75M09786 SERVICE ARM CONTROL RACK NO.3 (6616)
D75M09787 SERVICE ARM CONTROL RACK NO.4 (6615) } SERVICE ARM
D75M09788 SERVICE ARM CONTROL RACK NO.5 (6616) } RELAY / PATCH
D75M09789 SERVICE ARM CONTROL RACK NO.6 (6617) } DISTRIBUTORS
D75M09800 SERVICE ARM CONTROL RACK NO.6 (6619)
D75M09960D SERVICE ARM CONTROL RACK NO.9 (6620)
D75M09980D
D75M10604A H_2 DISTRIBUTION PANEL
D75M10805A GN_2 DISTRIBUTION PANEL
D75M10606B LAUNCHER ACCESSORIES RELAY RACK NO.1 (6620)
D75M10607A LAUNCHER ACCESSORIES RELAY RACK NO.2 (6621)
D75M10608 F-1 ENGINE SERVICE PLATFORM VAB
D75M10618C SERVICE ARM CONTROL SWITCH (162)
D75M11290A
D75M13568 JUNC BOX HARNESS CONTR CONSOLE NO. 2
D75M13604C TAIL SERVICE MAST S-4
D75M13604D TAIL SERVICE MAST 1-2
D75M13608B TAIL SERVICE MAST S-1
D75M13100B LAUNCHER POWER DISTRIBUTION RACK
D75M13665 F-1 ENGINE SERVICE PLATFORM (LC-39)
D75M11860AB VAB NETWORKS
D75M14067A LUT INTEGRATION RACK NO.1 (6612)
D75M [illegible] SERVICE ARM CONTR RACK NO.1 (6621) (SERVICE ARM RELAY / PATCH DISTRIBUTOR)
D75M [illegible] APOLLO GOX MODULE ASSEMBLY
D75M [illegible] 'O' BALL SUBSYSTEM 300' LEVEL
D75M14088B F-1 ENGINE SERVICE PLATFORM (TRANSPORTER)
D75M15761 OXYGEN CONDITIONING SYSTEM (LC-39)
D75M [illegible] LAUNCHER NETWORKS (LCC)
D75M [illegible] LCC INTEGRATION RACK NO.2 (5568)
D75M15530A LCC INTEGRATION RACK NO.1 (5567)
D75M [illegible] HYDRAULIC CHARGING UNIT
D75M [illegible] LUT INTEGRATION RACK NO.2 (6613)

NOTES:

1. UNLESS OTHERWISE NOTED ALL CABLES AND EQUIPMENT ARE EDV-152 EQUIPMENT.
2. LAST DISCONNECT GROUND JUMPER CABLES FURNISHED AND INSTALLED BY STAGE CONTRACTOR AND SHOWN FOR REFERENCE ONLY.
3. TOWER LIGHTNING GROUND JACK SUPPLIED TO ACCOMMODATE FUTURE SERVICE ARM REQUIREMENTS.
4. CABLES SHOWN DOTTED USED FOR TEST ONLY.
5. THE DASH NUMBER AFTER THE CABLE SUBASSEMBLY NUMBER INDICATES CABLE LENGTH IN FEET.
6. COMPONENT DESIGN RESPONSIBILITIES:
   - ▲ MSFC/R-ASTR
   - ⚠ EDV-152
   - ⚠ MSFC/R-P&VE
   - ▲ MSC
7. MSFC/KSC INTERFACE CONTROLLED BY 65ICD9200.
8. MSC/KSC INTERFACE CONTROLLED BY 65ICD7050.
9. ||||||||| DENOTES P & VE CABLES.
10. ●●● DENOTES ALL EDV-152 CABLES.
11. ⊕ DENOTES COMPONENTS LOCATED IN HINGE AREA.
12. ✦✦✦ DENOTES ASTRIONICS CABLE.

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CABLE INTERCONNECT EDV LAUNCH EQUIPMENT, LC-39

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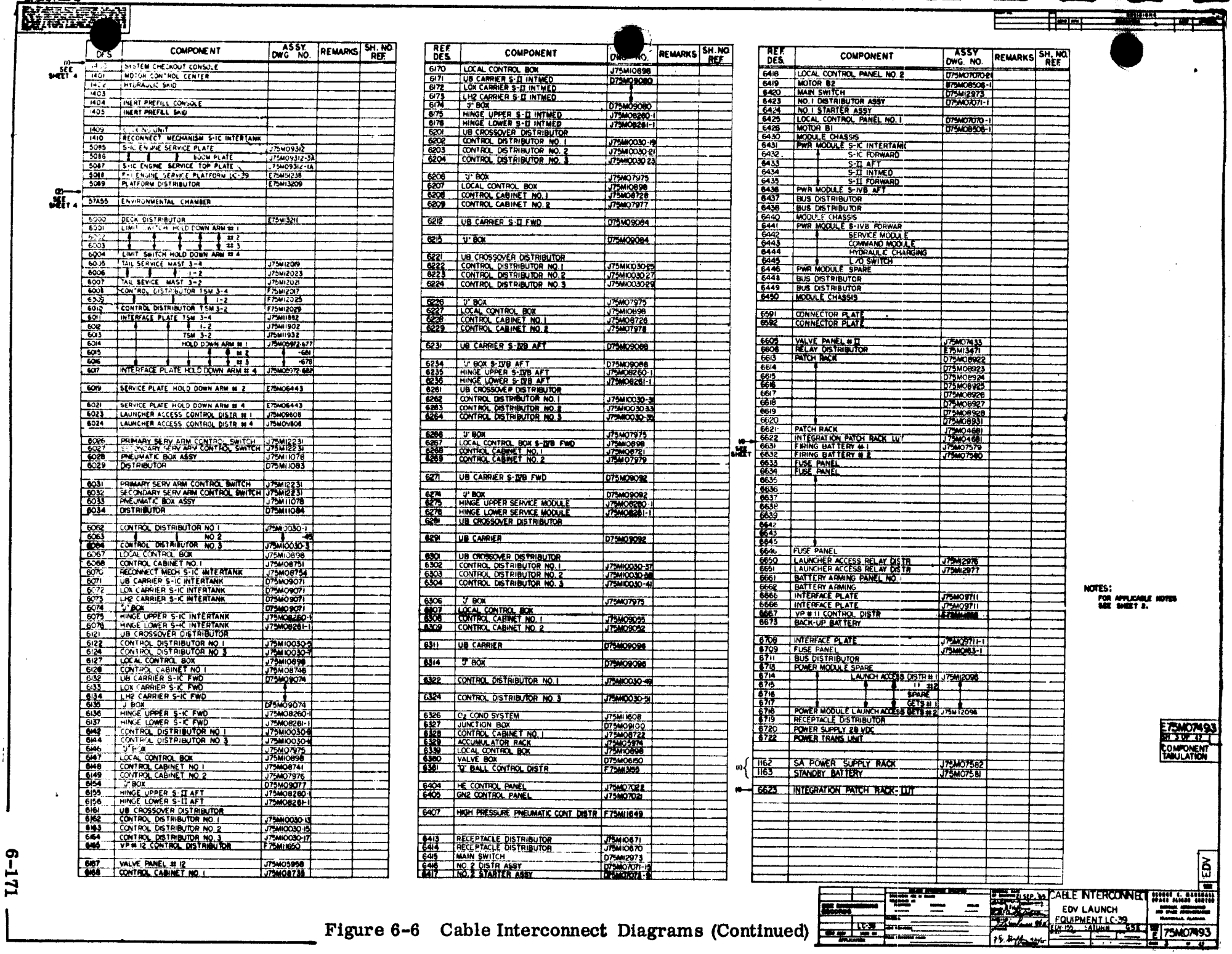
Figure 6-6 Cable Interconnect Diagrams



CPS	COMPONENT	ASSY DWG NO.	REMARKS	SH. NO REF
1400	SYSTEM CHECKOUT CONSOLE			
1401	MOTOR CONTROL CENTER			
1402	HYDRAULIC SKID			
1403				
1404	INERT PREFILL CONSOLE			
1405	INERT PREFILL SKID			
1409	LOCKOUT UNIT			
1410	RECONNECT MECHANISM S-IC INTERTANK			
5085	S-IC ENGINE SERVICE PLATE	J75M09312		
5086	" " " BOOM PLATE	J75M09312-3A		
5087	S-IC ENGINE SERVICE TOP PLATE	J75M09312-1A		
5088	S-I ENGINE SERVICE PLATFORM LC-39	E75M9238		
5089	PLATFORM DISTRIBUTOR	E75M13209		
57A55	ENVIRONMENTAL CHAMBER			
6000	DECK DISTRIBUTOR	E75M13211		
6001	LIMIT SWITCH HOLD DOWN ARM ## 1			
6002	" " " " " ## 2			
6003	" " " " " ## 3			
6004	LIMIT SWITCH HOLD DOWN ARM ## 4			
6005	TAIL SERVICE MAST 3-4	J75M12019		
6006	" " " 1-2	J75M12023		
6007	TAIL SEVICE MAST 3-2	J75M12021		
6008	CONTRO. DISTRIBUTOR TSM 3-4	F75M12017		
6009	" " " 1-2	F75M12025		
6010	CONTROL DISTRIBUTOR TSM 3-2	F75M12029		
6011	INTERFACE PLATE TSM 3-4	J75M11882		
6012	" " " 1-2	J75M11902		
6013	" " TSM 3-2	J75M11932		
6014	" " HOLD DOWN ARM ## 1	J75M09972-677		
6015	" " " " ## 2	-681		
6016	" " " " ## 3	-678		
6017	INTERFACE PLATE HOLD DOWN ARM ## 4	J75M09972-682		
6019	SERVICE PLATE HOLD DOWN ARM ## 2	E75M06443		
6021	SERVICE PLATE HOLD DOWN ARM ## 4	E75M06443		
6023	LAUNCHER ACCESS CONTROL DISTR ## 1	J75M09808		
6024	LAUNCHER ACCESS CONTROL DISTR ## 4	J75M09808		
6026	PRIMARY SERV ARM CONTROL SWITCH	J75M12231		
6027	SECONDARY SERV ARM CONTROL SWITCH	J75M12231		
6028	PNEUMATIC BOX ASSY	J75M11078		
6029	DISTRIBUTOR	D75M11083		
6031	PRIMARY SERV ARM CONTROL SWITCH	J75M12231		
6032	SECONDARY SERV ARM CONTROL SWITCH	J75M12231		
6033	PNEUMATIC BOX ASSY	J75M11078		
6034	DISTRIBUTOR	D75M11084		
6062	CONTROL DISTRIBUTOR NO 1	J75M10030-1		
6063	" " " NO 2	-9		
6064	CONTROL DISTRIBUTOR NO 3	J75M10030-5		
6067	LOCAL CONTROL BOX	J75M10898		
6068	CONTROL CABINET NO 1	J75M08751		
6070	RECONNECT MECH S-IC INTERTANK	J75M08754		
6071	UB CARRIER S-IC INTERTANK	D75M09071		
6072	LOX CARRIER S-IC INTERTANK	D75M09071		
6073	LH2 CARRIER S-IC INTERTANK	D75M09071		
6074	"J" BOX	D75M09071		
6075	HINGE UPPER S-IC INTERTANK	J75M08260-1		
6076	HINGE LOWER S-IC INTERTANK	J75M08261-1		
6121	UB CROSSOVER DISTRIBUTOR			
6122	CONTROL DISTRIBUTOR NO 1	J75M10030-3		
6124	CONTROL DISTRIBUTOR NO 3	J75M10030-7		
6127	LOCAL CONTROL BOX	J75M10898		
6128	CONTROL CABINET NO 1	J75M08748		
6132	UB CARRIER S-IC FWD	D75M09074		
6133	LOX CARRIER S-IC FWD			
6134	LH2 CARRIER S-IC FWD			
6135	J BOX	D75M09074		
6136	HINGE UPPER S-IC FWD	J75M08260-1		
6137	HINGE LOWER S-IC FWD	J75M08261-1		
6142	CONTROL DISTRIBUTOR NO 1	J75M10030-8		
6144	CONTROL DISTRIBUTOR NO 3	J75M10030-4		
6146	"J" BOX	J75M07975		
6147	LOCAL CONTROL BOX	J75M10898		
6148	CONTROL CABINET NO 1	J75M08741		
6149	CONTROL CABINET NO 2	J75M07976		
6154	"J" BOX	D75M09077		
6155	HINGE UPPER S-II AFT	J75M08260-1		
6156	HINGE LOWER S-II AFT	J75M08261-1		
6161	UB CROSSOVER DISTRIBUTOR			
6162	CONTROL DISTRIBUTOR NO. 1	J75M10030-15		
6163	CONTROL DISTRIBUTOR NO. 2	J75M10030-15		
6164	CONTROL DISTRIBUTOR NO. 3	J75M10030-17		
6165	VP ## 12 CONTROL DISTRIBUTOR	F75M11650		
6167	VALVE PANEL ## 12	J75M03998		
6168	CONTROL CABINET NO 1	J75M08738		

REF DES	COMPONENT	DWG NO.	REMARKS	SH. NO REF
6170	LOCAL CONTROL BOX	J75M10898		
6171	UB CARRIER S-II INTMED	D75M09080		
6172	LOX CARRIER S-II INTMED			
6173	LH2 CARRIER S-II INTMED			
6174	"J" BOX	D75M09080		
6175	HINGE UPPER S-II INTMED	J75M06290-1		
6176	HINGE LOWER S-II INTMED	J75M06281-1		
6201	UB CROSSOVER DISTRIBUTOR			
6202	CONTROL DISTRIBUTOR NO. 1	J75M10030-19		
6203	CONTROL DISTRIBUTOR NO. 2	J75M10030-21		
6204	CONTROL DISTRIBUTOR NO. 3	J75M10030-23		
6206	"J" BOX	J75M07975		
6207	LOCAL CONTROL BOX	J75M10898		
6208	CONTROL CABINET NO. 1	J75M08728		
6209	CONTROL CABINET NO. 2	J75M07977		
6212	UB CARRIER S-II FWD	D75M09084		
6215	"J" BOX	D75M09084		
6221	UB CROSSOVER DISTRIBUTOR			
6222	CONTROL DISTRIBUTOR NO. 1	J75M10030-25		
6223	CONTROL DISTRIBUTOR NO. 2	J75M10030-27		
6224	CONTROL DISTRIBUTOR NO. 3	J75M10030-29		
6226	"J" BOX	J75M07975		
6227	LOCAL CONTROL BOX	J75M10898		
6228	CONTROL CABINET NO. 1	J75M08726		
6229	CONTROL CABINET NO. 2	J75M07978		
6231	UB CARRIER S-IVB AFT	D75M09088		
6234	"J" BOX S-IVB AFT	D75M09086		
6235	HINGE UPPER S-IVB AFT	J75M08260-1		
6236	HINGE LOWER S-IVB AFT	J75M08261-1		
6261	UB CROSSOVER DISTRIBUTOR			
6262	CONTROL DISTRIBUTOR NO. 1	J75M10030-31		
6263	CONTROL DISTRIBUTOR NO. 2	J75M10030-33		
6264	CONTROL DISTRIBUTOR NO. 3	J75M10030-35		
6266	"J" BOX	J75M07975		
6267	LOCAL CONTROL BOX S-IVB FWD	J75M10899		
6268	CONTROL CABINET NO. 1	J75M08721		
6269	CONTROL CABINET NO. 2	J75M07979		
6271	UB CARRIER S-IVB FWD	D75M09092		
6274	"J" BOX	D75M09092		
6275	HINGE UPPER SERVICE MODULE	J75M08260-1		
6276	HINGE LOWER SERVICE MODULE	J75M08261-1		
6291	UB CROSSOVER DISTRIBUTOR			
6291	UB CARRIER	D75M09092		
6301	UB CROSSOVER DISTRIBUTOR			
6302	CONTROL DISTRIBUTOR NO. 1	J75M10030-37		
6303	CONTROL DISTRIBUTOR NO. 2	J75M10030-39		
6304	CONTROL DISTRIBUTOR NO. 3	J75M10030-41		
6306	"J" BOX	J75M07975		
6307	LOCAL CONTROL BOX			
6308	CONTROL CABINET NO. 1	J75M08725		
6309	CONTROL CABINET NO. 2	J75M09052		
6311	UB CARRIER	D75M09096		
6314	"J" BOX	D75M09096		
6322	CONTROL DISTRIBUTOR NO. 1	J75M10030-49		
6324	CONTROL DISTRIBUTOR NO. 3	J75M10030-51		
6326	O_2 COND SYSTEM	J75M11608		
6327	JUNCTION BOX	D75M09100		
6328	CONTROL CABINET NO. 1	J75M08722		
6329	ACCUMULATOR RACK	J75M05974		
6339	LOCAL CONTROL BOX	J75M10898		
6360	VALVE BOX	D75M06150		
6361	"Q" BALL CONTROL DISTR	F75M13259		
6404	HE CONTROL PANEL	J75M07028		
6405	GN2 CONTROL PANEL	J75M07029		
6407	HIGH PRESSURE PNEUMATIC CONT DISTR	F75M11649		
6413	RECEPTACLE DISTRIBUTOR	J75M10671		
6414	RECEPTACLE DISTRIBUTOR	J75M10670		
6415	MAIN SWITCH	D75M12973		
6416	NO 2 DISTR ASSY	D75M07071-15		
6417	NO 2 STARTER ASSY	D75M07071-9		

REF DES	COMPONENT	ASSY DWG NO.	REMARKS	SH. NO REF
6418	LOCAL CONTROL PANEL NO 2	D75M07070-2		
6419	MOTOR B2	B75M08508-1		
6420	MAIN SWITCH	D75M12973		
6423	NO. 1 DISTRIBUTOR ASSY	D75M07071-1		
6424	NO. 1 STARTER ASSY			
6425	LOCAL CONTROL PANEL NO. 1	D75M07070-1		
6426	MOTOR B1	D75M08508-1		
6430	MODULE CHASSIS			
6431	PWR MODULE S-IC INTERTANK			
6432	" " S-IC FORWARD			
6433	" " S-II AFT			
6434	" " S-II INTMED			
6435	" " S-II FORWARD			
6436	PWR MODULE S-IVB AFT			
6437	BUS DISTRIBUTOR			
6438	BUS DISTRIBUTOR			
6440	MODULE CHASSIS			
6441	PWR MODULE S-IVB FORWAR			
6442	" " SERVICE MODULE			
6443	" " COMMAND MODULE			
6444	" " HYDRAULIC CHARGING			
6445	" " LO2 SWITCH			
6446	PWR MODULE SPARE			
6448	BUS DISTRIBUTOR			
6449	BUS DISTRIBUTOR			
6450	MODULE CHASSIS			
6591	CONNECTOR PLATE			
6592	CONNECTOR PLATE			
6605	VALVE PANEL # II	J75M07433		
6606	RELAY DISTRIBUTOR	E75M13471		
6613	PATCH RACK	D75M08922		
6614	" "	D75M08923		
6615	" "	D75M08924		
6616	" "	D75M08925		
6617	" "	D75M08926		
6618	" "	D75M08927		
6619	" "	D75M08928		
6620	" "	D75M08931		
6621	PATCH RACK	J75M04681		
6622	INTEGRATION PATCH RACK LVT	J75M04681		
6631	FIRING BATTERY ## 1	J75M07579		
6632	FIRING BATTERY ## 2	J75M07580		
6633	FUSE PANEL			
6634	FUSE PANEL			
6635	" "			
6636	" "			
6637	" "			
6638	" "			
6639	" "			
6642	" "			
6643	" "			
6645	" "			
6646	FUSE PANEL			
6650	LAUNCHER ACCESS RELAY DISTR	J75M12976		
6651	LAUNCHER ACCESS RELAY DISTR	J75M12977		
6661	BATTERY ARMING PANEL NO. 1			
6662	BATTERY ARMING			
6666	INTERFACE PLATE	J75M09711		
6666	INTERFACE PLATE	J75M09711		
6667	VP # 11 CONTROL DISTR	[illegible]		
6673	BACK-UP BATTERY			
6708	INTERFACE PLATE	J75M09711-1		
6709	FUSE PANEL	J75M06483-1		
6711	BUS DISTRIBUTOR			
6713	POWER MODULE SPARE			
6714	" " LAUNCH ACCESS DISTR # 1	J75M12098		
6715	" " " " " # 2	"		
6716	" " SPARE			
6717	" " " " GETS # 1	"		
6718	POWER MODULE LAUNCH ACCESS GETS # 2	J75M12098		
6719	RECEPTACLE DISTRIBUTOR			
6720	POWER SUPPLY 28 VDC			
6722	POWER TRANS UNIT			
1162	SA POWER SUPPLY RACK	J75M07562		
1163	STANDBY BATTERY	J75M07581		
6625	INTEGRATION PATCH RACK-LVT			

NOTES:
FOR APPLICABLE NOTES SEE SHEET 2.

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Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DES.	COMPONENTS	ASSY DWG NO.	REMARKS	SH. NO. REF
6965	CONNECTOR PLATE			
6966				
6967				
6968				
6969				
6990				
6991				
6992				
6995	CONNECTOR PLATE			
7200	FITTING SERVICE PLATFORM VAB	J75M51342		
7201	PLATFORM DISTR	E75M13209		
7202	S-IC ENGINE SERVICE TOP PLATE	J75M09312-3A		
7203	S-IC ENGINE SERVICE BOOM PLATE	J76M09312-3A		
7247	FITTING AFT SKIRT CONSOLE	J76M51342		
7250	MOTOR HOUSING "A"	J75M51413		
7851	" "B"	"		
7852	" "C"	"		
7853	MOTOR HOUSING "D"	J75M51413		
7854	AUXILIARY MOTOR "E"	J75M13064		
7855	UB PLATE, TSM3-4	J65B80001		
7856	" -1-2	J65B80002		
7857	UB PLATE, TSM-3-2	J65B80003		
7858	INTERFACE PLATE	J75M05972		
7859				
7860				
7861	INTERFACE PLATE	J75M05972		
7862	LEVEL "D" PLATFORM	J75M51413		
7863	INTERFACE PLATE MOTOR BRAKE "A"			
7865	" AUX MOTOR "B"			
7866	" MOTOR & BRAKE "B"			
7867	" AUX MOTOR "C"			
7868	" MOTOR & BRAKE "C"			
7869	" AUX MOTOR "D"			
7870	INTERFACE PLATE-- MOTOR & BRAKE "D"	J75M51413		
7871				
9005	UB INST & CONTROL TERMINAL DISTR			
9010	UB INST & CONTROL TERMINAL DISTR			
9014	UB INST & CONTROL TERMINAL DISTR			
9016	UB INST & CONTROL TERMINAL DISTR			
9017	UB POWER TERMINAL DISTR			
9020	UB INST & CONTROL TERMINAL DISTR			
9022	UB INST & CONTROL TERMINAL DISTR			
9023	UB POWER TERMINAL DISTR			
9026	UB INST & CONTROL TERMINAL DISTR			
9027	UB POWER TERMINAL DISTR			
9028	UB INST & CONTROL TERMINAL DISTR			
9030	UB INST & CONTROL TERMINAL DISTR			
9031	UB POWER TERMINAL DISTR			
9032	UB INST & CONTROL TERMINAL DISTR			
9043	UB POWER "B" BOX			
9044				
9045				
9046				
9047	UB POWER "J" BOX			
9054	MALFIRING DISTR	J75M08731		
9055		J75M08730		
9056		J75M08724		
9057		J75M08719		
9059	[redacted] DISTR	J75M09058		
9061	SERVICE ARM LIGHTING "J" BOX			
9062	SERVICE ARM EMERGENCY "J" BOX			
9064	480 VAC			
9075	POWER DISTR 28 VDC			
9082	INST & CONTROL DISTR			
9083	TOWER DISTR	J75M09074		
9084	WATER VALVE CONTROL DISTR			
9091	TERMINAL DISTR			
9092				
9093				
9094	TERMINAL DISTR			
1162	SA POWER [redacted] RACK	J75M07582		
1163	STANDBY BATTERY	J75M07581		

REF DES.	COMPONENTS	ASSY DWG NO.	REMARKS	SH. NO. REF
5347	LCC INTEGRATION RACK NO1			
5348	LCC INTEGRATION RACK NO2			
5350	CONNECTOR PLATE			
5351	CONNECTOR PLATE			
5352	CONNECTOR PLATE			
5353				
5408	CONTROL PANEL -- L/O SW			
5409	" STATUS PANEL			
5410	S-IC INTERBAR			
5411	S-IC FWD			
5412	S-II AFT			
5413	S-II INTMED			
5414	S-II FWD			
5415	S-IVB AFT			
5416	S-IVB FWD			
5417	SM			
5418	CM			
5419	HYD CHG. UNIT			
5420	TSM 1-2			
5421	TSM 3-2			
5422	TSM 3-4			
5423	PNEU DISTR			
5424	CONTROL PANEL -- HOLDDOWN ARMS			
6894	CONNECTOR PLATE-LUT			
6895	"			
6896	CONNECTOR PLATE-LUT			
6823	INTEGRATION PATCH RACK LUT			

NOTES:
FOR APPLICABLE NOTES SEE SHEET 1.

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Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
[illegible]WI							21
[illegible]WS							21
1420WI	D75M09070-244	D75MI5164- 78	A75MI0192-				25
1420W2	-244	D75MI1282- 94	MSFC SPEC 332/M				
1420W4	-245	D75MI6066- 48	A75MI1005-				
1420W6	-246	D75MI1065- 56	A75MI1008				
1420W7	-381	D75MI5113- 80	MSFC SPEC 332/M				
1420W8	-382	D75MI6067- 80	332/ 7				26
1420W9	D75M09070-242	D75MI1281- 34	A75MI0180				
1421WI	D75M09070-248	D75MI1284- 101	MSFC SPEC 332/M				25
1421W2	-247	D75MI3994- 101	TYPE W				
1421W3	-248	D75MI1286- 85	MSFC SPEC 332/M				
1421W4	-249	D75MI3994- 85	TYPE W				
1421W5	-250	D75MI1285- 87	3 COND #3 WIRE				
1421W6	-251	D75MI3994- 87	TYPE W				
1421W7	-253	D75MI1286- 80	6C # 3/0				
1421W8	-253	D75MI3994- 80	TYPE W 20#8				
1421W9	-254	D75MI1283- 78	6C #6/0				
1421W10	-255	D75MI3994- 78	TYPE W 20#8				
1421W11	-256	D75MI1286- 84	MSFC SPEC 332/M				
1421W12	D75M08070-257	D75MI3994- 84	TYPE W 7#8				25
1422WI4	D75M09070-258	D75MI6080- 17	A75MI0180-				25
1423WI	D75MI2024- 46	D75MI2012- 25	A75MI0180				25
1424WI	D75M09070-385	D75MI6066- 138	A75MI0192				23-24
1424W2	D75M09070-258	D75MI1283- 9	A75MI1005				24
1429WI	D75M08117- 46	D75MI4697- 60	MSFC SPEC 332/M				40
1429W2	D75M08117- 54	D75MI5113- 110	A75MI0192				40
1431AIWI	D75M09070-343	D75MI5163- 30	MSFC SPEC 332/M				24
1431AIW2	-337	D75MI5162	A75MI0191				
1431AIW3	-338	D75MI5113	A75MI0192				
1431A8WI	-339	D75MI5163	MSFC SPEC 332/M				
1431A8W2	-339	D75MI5168	A75MI0191				
1431A8W3	-340	D75MI5115	A75MI0192				
1431A8W4	D75M09070-341	D75MI5118- 30	A75MI0192				24
1432AIWI	D75M09070-360	D75MI6063- 15	MSFC SPEC 332/M				24
1432AIW2	-358	D75MI5162	A75MI0191				
1432AIW3	-359	D75MI5117	A75MI0193				
1432A2WI	-362	D75MI6063	MSFC SPEC 332/M				
1432A2W2	-361	D75MI5162	A75MI0191				
1432A2W3	-362	D75MI5117	A75MI0193				
1432A3WI	-360	D75MI6063	MSFC SPEC 332/M				
1432A3W2	-364	D75MI5168	A75MI0191				
1432A3W3	-365	D75MI5117	A75MI0193				
1432A4WI	-369	D75MI6063	MSFC SPEC 332/M				
1432A4W2	-367	D75MI5162	A75MI0191				
1432A4W3	D75M09070-368	D75MI5117- 15	A75MI0193				24
1414WI	D75M08117- 70	D75MI5115- 140	A75MI0192				26
1414W2	-71						
1414W3	-72						
1414W4	D75M08117 -73	D75MI5115 -140	A75MI0192				
1415WI	D75M08117 -74	D75MI5115 -145	A75MI0192				
1415W2	D75M08117 -75	D75MI5115 -145	A75MI0192				
1415W3	D75M08117 -76	D75MI5118 -148	A75MI0192				26
1416WI	D75M08117 -77	D75MI5115 -105	A75MI0192				26
1416W2	D75M08117 -78	D75MI5115 -108	A75MI0192				26
1416W3	D75M08117 -79	D75MI5115 -108	A75MI0192				26
1418WI	D75M08117 -52	D75MI5115 -50	A75MI0192				40
1418W2	D75M08117- -53	D75MI5115 -50	A75MI0192				40
1420WI	D75M08114- -67	D75MI5115 -145	A75MI0192				26
1421AIWI	D75M08114 -68	D75MI5115 -110	A75MI0192				26
1421AIW2	-69	D75MI5164 -110					
1421A2WI	-70	D75MI5115 -140					
1421A2W2	-71	D75MI5164 -140					
1421A2W3	-72	D75MI5115 -140					
1421A3WI	-73	D75MI5115 -145					
1421A3W2	-74	D75MI5164					
1421A3W3	-75	D75MI5164					
1421A3W4	-76	D75MI5115 -145					
1421A4WI	D75M08114- -77	D75MI5115 -171	A75MI0192				26
1429WI	D75M08116- -35	D75MI5115 -65	A75MI0192				26
1429W2	-36						
1429W3	-37						
1429W4	D75M08116- -38	D75MI5115 -62	A75MI0192				26
5085WI	D75M09070-122	D75MI3297 -120	A75MI0181				27
5085W2							27
5085WI	D75MC[illegible]063- 2	D75MI07750 28	A75MI0193				27
5085WII	D75MI[illegible]67- 4	D75MI4947 -3	A75MI0193				
5085WIII	D75MI[illegible]63- 3	D75MI07751 -28	A75MI				27

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
5087WI	[illegible]3-1	D75M07759- 7	A75MI0191				27
5088AIWI	D75MI3683-1	D75M07758-58	A75MI0180				
5088AIW2	-2	D75M07759-19					
5088AIW3	-3	D75M07753-31					
5088AIW4	-4	D75M07755-41	A75MI0180				
5088AIW5	-5	D75M07758-24	A75MI0180				
5088A2WI	-6	D75M07753-62	A75MI0180				
5088A2W2	-7	D75M07759-18					
5088A2W3	-8	D75M07753-35					
5088A2W4	-9	D75M07755-38	A75MI0180				
5088A2W5	-10	D75M07758-52	A75MI0180				
5088A3WI	-11	D75M07751-54	A75MI0180				
5088A4WI	D75MI3683-12	D75M07753- 4	A75MI0180				27
57A55WI							44
57A55W2							
57A55W3							
57A55W4							
57A55W5							
57A55W6							
57A55W7							
57A55W8							
57A55W9							
57A55W10							
57A55W11							
57A55W12							
57A55W13							
57A55W14							
57A55W16							
57A55W19							
57A55W20							
57A55AIWI							
57A55AIW2							
57A55AIW3							
57A55AIW4							
57A55AIW5							
57A55AIW6							
57A55AIW7							
57A55AIWI							
57A55AIW2							
57A55AIW3							
57A55AIW4							
57A55AIW5							
57A55AHW6							44
6000WI	D75M09067- 7	D75M7760-	A75MI0190				27
6000W2	D75M09067- 8	D75M7760-	A75MI0190				27
6000W3	D75M09067- 9	D75M7760-	A75MI0190				27
6005WI	D75MI2016- 1	D75M7780	A75MI0193				25
6005W2	-2	D75M7780	A75MI0193				
6005W3	-3	D75MI3518	A75MI0204				
6005W4	-4	D75M7780	A75MI0193				
6005W5	-5	D75M7780	A75MI0193				
6005W6	-6	D75M7771	A75MI0191				
6005W7	-7	D75M7780	A75MI0193				
6005W8	-8	D75MI5181	A75MI0195				
6005W9	-50	D75MI3466					
6005W12	-52	D75MI3466					
6005AIWI	-9	D75M7757	A75MI0180				
6005A2WI	-10	D75M7753					
6005A3WI	-11						
6005A4WI	-12						
6005A5WI	-13	D75M7753					
6005A6WI	-14	D75M7755					
6005A7WI	-15	D75M7756					
6005A8WI	-16	D75M7755					
6005A9WI	-21	D75M7756					
6005A10WI	-22	D75M7755					
6005A11WI	-23	D75M7753					
6005A12WI	-24	D75M7755					
6005A13WI	-25	D75M7755					
6005A14WI	-30	D75M7762					
6005A14W2	-31	D75M7753					
6005A15WI	-32	D75M7754					
6005A15W2	-33	D75M7753					
6005A16WI	-34	D75M7755					
6005A17WI	-35	D75M7755					
6005A18WI	-37	D75M7755					
6005A19WI	-38	D75M7753					
6005A20WI	-39	D75M7755					
6005A21WI	-40	D75M7754					
6005A21W2	-41	D75M7753					
6005A22WI	-42	D75M7751					
6005A22W2	-44	D75M7751					
6005S1WI	-15	D75M7753					
6005S2WI	-17	D75M7752					
6005S3WI	-19	D75M7757					
6005S4WI	-20	D75M7757					
6005S6WI	-26	D75M7756					
6005S8WI	D75MI[illegible]16- 31	D75M7751A	A75MI0180				25

BULK CABLE INDEX

A75MI4078- IC = 500M/055H
A75MI4089- IC = 500M/05, AB, 55I
A75MI0203-3C = 8/UNSH
A75MI0200-4C = 0/05, 4UNSH
A75MI0118- 4C = 0/05, AB, 4UNSH
A75MI0198- 4C -/3 = 8, 1 = 16
A75MI0199- 5C = 10/UNSH
A75MI0180- 6C = 16/05, 6UNSH
A75MI1017- 6C = 16/05, AB, 6UNSH
A75MI0187- 6C = 8/05, 6UNSH
A75MI4084- 6C = 8/05, AB, 6UNSH
A75MI4087- 6C -/05, AB, 4RG214/U, 1RG62A/U, 1=12
A75MI0204- 6C -/05, 4RG214/U, 1RG62A/U, 1=18
A75MI0189- 7C = 8/05, 7UNSH
A75MI4074- 7C -/05, RG180B/U
A75MI0198- 10C = 16/05, 10UNSH
A75MI1015- 10C = 16/05, AB, 10UNSH
A75MI4077- 21C = 8/05, 21UNSH
A75MI1007- 25C -/05, 4 = 2, 3 = 8, 18 = 16
A75MI4019- 29C -/05, AB, 4 = 2, 3 = 8, 18 = 16
A75MI0202- 32C = 20/UNSH
A75MI1006- 33C -/05, 3 = 0.3 = 4, 13PTSI = 14, 19SI = 14
A75MI1023- 33C -/05, AB, 3 = 0.3 = 4, 13PTSI = 14, 19SI = 14
A75MI1008- 40C = 14/05, 20PTSI
A75MI1003- 40C -/05, 5QTSI = 10, 20UNSH = 14
A75MI1020- 40C -/05, AB, 5QTSI = 10, 20UNSH = 14
A75MI4079- 45C = 14/05, 15TTSI
A75MI1004- 48C -05, AB, 4SSI = 4, 11TTSI = 14, 8PTSI = 14, 8SI = 14
A75MI1021- 48C -05, AB, 4SSI = 4, 11TTSI = 14, 5PTSI = 14, 8SI = 14
A75MI0190- 60C = 8/05, UNSH
A75MI4075- 60C = 16/ UNSH
A75MI0181- 60C = 16/05, 60 UNSH
A75MI0192- 60C = 16/05, 60 SSI
A75MI4076- 60C = 14/05, 5PTSI, 50UNSH
A75MI1005- 60C = 14/05, 5PTSI, 50 SSI
A75MI0193- 60C = 14/05, 30PTSI
A75MI0187- 60C = 14/05, 2TTSI, 3PTSI, 48 UNSH
A75MI0188- 60C = 14/05, 3TTSI, 3PTSI, 39 SSI
A75MI4093- 60C = 14/05, 6TTSI, 17PTSI, 8 SSI
A75MI0194- 60C = 14/05, 20PTSI
A75MI0195- 60C = 14/05, 15QTSI
A75MI1026- 60C = 14/05, AB, 60UNSH
A75MI1024- 60C = 14/05, AB, 60 SSI
A75MI1010- 60C = 14/05, AB, 5PTSI, 50UNSH
A75MI1022- 60C = 14/05, AB, 5PTSI, 50SSI
A75MI1025- 60C = 14/05, AB, 30PTSI
A75MI1011- 60C = 14/05, AB, 2TTSI, 3PTSI, 48 UNSH
A75MI1009- 60C = 14/05, AB, 4TTSI, 12PTSI, 24 SSI
A75MI1012- 60C = 14/05, AB, 6TTSI, 17PTSI, 8SSI
A75MI1014- 60C = 14/05, AB, 20TTSI
A75MI1013- 60C = 14/05, AB, 30 QTSI
A75MI0201- 61C = 20/UNSH

UNSH - UNSHIELDED
OS - OVERALL SHIELD
AB - ABLATIVE SHEATH
SSI - SINGLE, SHIELDED, INSULATED
PTSI - PAIRS, TWISTED, SHIELDED, INSULATED
TTSI - TRIPLE, TWISTED, SHIELDED, INSULATED
QTSI - QUADRUPLE, TWISTED, SHIELDED, INSULATED

NOTES:
FOR APPLICABLE NOTES SEE SHEET 2.

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CABLE INTERCONNECT
EDV LAUNCH EQUIPMENT, LC39
75M07493

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
[illegible]	[illegible] -25	[illegible]					24
[illegible]	-34	07796-					
[illegible]	-34	07758-					
[illegible]	-42	07774-					
[illegible]	-48	19465-					
[illegible]	D75M12026-44	D75M19465-					29
6006W1	D75M12034-1	D75M07770-					25
6006W2	-2	07771-					
6006W3	-3	07771-					
6006W4	-4	07771-					
6006W5	-5	07771-					
6006W6	-6	07780-					
6006W7	-7	07771-					
6006W8	-53	16297-					
6006W18	-52	19466-					
6006A1W1	-8	07757-					
6006A2W1	-9	07753-					
6006A3W1	-10	07755-					
6006A4W1	-11	07753-					
6006A5W1	-12	07753-					
6006A6W1	-13	07765-					
6006A7W1	-15	07756-					
6006A8W1	-17	07755-					
6006A9W1	-20	07756-					
6006A10W1	-21	07755-					
6006A11W1	-22	07755-					
6006A12W1	-23	07755-					
6006A13W1	-24	07755-					
6006A14W1	-29	07762-					
6006A14W2	-30	07753-					
6006A15W1	-31	07754-					
6006A15W2	-32	07753-					
6006A16W1	-34	07755-					
6006A17W1	-35	07755-					
6006A18W1	-36	07755-					
6006A19W1	-37	07755-					
6006A20W1	-38	07756-					
6006A21W1	-39	07754-					
6006A21W2	-40	07755-					
6006A22W1	-44	07751-					
6006A22W2	-45	07751					
6006S1W1	-14	07755-					
6006S2W1	-16	07753-					
6006S3W1	-18	07757-					
6006S4W1	-19	07757-					
6006S5W1	-25	07756-					
6006S6W1	-26	07756-					
6006S7W1	-27	07756-					
6006S8W1	-28	07756-					
6006S9W1	-33	07753-					
6006S10W1	-41	07755-					
6006S11W1	-42	19465-					
6006S18W1	D75M12024-43	D75M19465-					29
6007W8	D75M12028-41	D75M19446-					24
6007A1W1	-1	07757-					
6007A2W1	-2	07753-					
6007A3W1	-3	07753-					
6007A4W1	-4	07753-					
6007A5W1	-5	07753-					
6007A6W1	-6	07755-					
6007A7W1	-8	07756-					
6007A8W1	-10	07755-					
6007A9W1	-13	07756-					
6007A10W1	-14	07755-					
6007A11W1	-15	07753-					
6007A12W1	-16	07755-					
6007A13W1	-17	07755-					
6007A14W1	-22	07762-					
6007A14W2	-23	07758-					
6007A15W1	-24	07764-					
6007A15W2	-25	07755-					
6007A16W1	-27	07755-					
6007A17W1	-28	07755-					
6007A20W1	-29	07755-					
6007A21W1	-30	07754-					
6007A21W2	-31	07755-					
6007A22W1	-35	07751-					
6007A22W2	-36	07751-					
6007S1W1	-7	07755-					
6007S2W1	-9	07755-					
6007S3W1	-11	07757-					
6007S4W1	-12	07757-					
6007S5W1	-18	07756-					
6007S6W1	-19	07756-					
6007S7W1	-20	07756-					
6007S8W1	-21	07756-					
6007S9W1	-26	07753-					
6007S10W1	-32	07756-					
6007S11W1	-33	19465-					
6007S12W1	D75M12026-34	D75M19465-					24
6008W1	D75M12026-41	D75M07779-					25
6008W2	D75M12026-46	D75M07779-					28

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
6008W41	D75M12026-49	D75M07756-					23
6009W1	[illegible]-47	D75M07788-					28
6009W2	-48	07788-					
6009W3	-50	19466-					
6009W41	D75M12024-49	D75M07756-					28
6010W1	D75M12028-37	D75M07759-					26
6010W2	D75M12028-38	D75M07759-					26
6010W41	D75M12028-39	D75M07756-					26
6011W1	D75M09010-1	D75M14948-					25
6011W2	-2	14948-					
6011W3	-3	11259-					
6011W4	-4	14948-					
6011W5	-5	14948-					
6011W6	-6	13803-					
6011W7	-7	14948-					
6011W8	-8	15161-					
6011W9	-9	13802-					
6011W10	-10	07199-					
6011W11	-11	07199-					
6011W12	D75M09010-298	D75M15172-					27
6012W1	D75M09010-14	D75M07782-					25
6012W2	-15	13803-					
6012W3	-16	-					
6012W4	-17	-					
6012W5	-18	13803-					
6012W6	-19	14949-					
6012W7	-20	13803-					
6012W8	-21	14948-35	A75M10193	10-323640-81S	10-323640-81S		
6012W9	-22	13802-					
6012W10	-23	07799-					
6012W11	-24	07799-					
6012W13	D75M09010-299	D75M15172-					28
6013W1	D75M09010-25	D75M07759-					26
6013W2	D75M09010-26	D75M07759-					26
6013W3	D75M09010-300	D75M15172-					26
6014W2	D75M09010-386	D75M07759-					26
6014W3	D75M09010-387	D75M07759-					26
6014W4	D75M09010-93	D75M07751-					27
6015W2	D75M09010-230	D75M07782-					21
6015W4	-125	07799-					27
6015W5	-273	13993-					24
6015W6	-274	07782-					21
6015W7	D75M09010-92	D75M07791-					27
6016W2	D75M09010-386	D75M07759-					26
6016W3	D75M09010-387	D75M07759-					26
6016W4	D75M09010-94	D75M07751-					27
6017W2	D75M09010-234	D75M07782-					21
6017W4	-121	07799-					27
6017W5	-275	13993-					24
6017W6	-276	07782-					21
6017W7	D75M09010-95	D75M07791-					27
6019W1	D75M09067-2	D75M07759-					27
6019W11	D75M09067-4	D75M14949-					
6021W1	D75M09067-1	D75M07759-					27
6021W11	D75M09067-3	D75M14949-					
6023W1	D75M09010-100	D75M07759-					27
6023W11	-101	07754-					
6023W12	-97	07751-					
6023W13	-98	07751-					
6023W14	-109	07754-					
6023W15	-110	07753-					
6023W17	-111	15193-					
6023W18	D75M09010-108	D75M07757-					27
6024W1	D75M09010-102	D75M07759-					27
6024W11	-96	07751-					
6024W12	-103	07754-					
6024W13	-104	07753-					
6024W14	-99	07751-					
6024W15	-105	07754-					
6024W16	-106	07757-					
6024W18	D75M09010-181	D75M07751-					27
6026W1	D75M10612-6	D75M07791-					21
6026W2	D75M10612-7	D75M07752-					21
6027W1	D75M10612-8	D75M07791-					21
6027W2	D75M10612-9	D75M07752-					21
6028A1W1	D75M10612-1	D75M07787-					21
6028A2W1	-4	D75M07787-					
6028A3W1	-5	D75M07787-					
6028MT1W1	D75M10612-3	D75M07788-2 [illegible]	[illegible]	[illegible]-3P	MS3106[illegible]		21

NOTES:
FOR APPLICABLE NOTES SEE SH 2.

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CABLE INDEX

CABLE INTERCONNECT
[illegible] LAUNCH
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Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
[illegible]	D75M10612-3	D75M07739		[illegible]	MS3106A16S-5S		21
6028W1	-10	D75M07785	A75M10133	MS3106A14S-5S			
6028W2	-11	D75M07753		MS3106R10SL-3P	MS3106R10SL-3S		
6028W3	-12	D75M07783		MS3106R16S-1P	MS3106R14S-5S		
6028W4	-13	D75M07755		MS3106R16S-1P	MS3106R14S-5S		
6028W5	D75M10612-14	D75M07785	A75M10180	MS3106R16S-1P	MS3106R14S-5S		
6029W1	D75M10612-19	D75M07759	A75M10191	10-323640-81P	10-323640-81S		
6031W1	D75M10612-6	D75M07791	A75M10200	10-323640-75P	MS3106R16S-5S		
6031W2	D75M10612-7	D75M07752	A75M10180	MS3106R16S-1P	MS3106R14S-5S		
6032W1	D75M10612-8	D75M07791	A75M10200	10-323640-75P	MS3106R16S-5S		
6032W2	D75M10612-9	D75M07752	A75M10180	MS3106R16S-1P	MS3106R14S-5S		
6033AW1	D75M10612-1	D75M07787		-1BFR14S-5P	MS3106R14S-5S		
6033A2W1	-4	D75M07787		-1BFR14S-5P	MS3106R14S-5S		
6033A3W1	-5	D75M07787		-1BFR14S-5P	MS3106R14S-5S		
6033MTW1	-2	D75M07788		-1BR10SL-3P	MS3106R10SL-3S		
6033J3W1	-3	D75M07788		-1BFR10SL-3P	MS3106R10SL-3S		
6035W1	-10	D75M07755	A75M10180	MS3106R16S-1P	MS3106R14S-5S		
6035W2	-11	D75M07753		MS3106R16S-1P	MS3106R10SL-3S		
6035W3	-12	D75M07753		MS3106R16S-1P	MS3106R10SL-3S		
6035W4	-13	D75M07755		MS3106R16S-1P	MS3106R14S-5S		
6035W5	D75M10612-14	D75M07755	A75M10180	MS3106R16S-1P	MS3106R14S-5S		
6034W1	D75M10612-15	D75M07759	A75M10191	10-323640-81P	10-323640-81S		21
6062W1	D75M08111-1	D75M13967	A75M10191				28
6062W3	D75M08111-5	D75M07782	A75M10200				
6062W10	D75M09073-43	D75M07756	A75M10180				
6062W12	-1	D75M07751					
6062W13	-2	D75M07751					
6062W14	-3	D75M07751					
6062W17	-4	D75M07753					
6062W18	-5	D75M07754					
6062W19	-6	D75M07751					
6062W21	-7	D75M07751					
6062W23	-8	D75M07751					
6062W24	-9	D75M07751					
6062W26	-10	D75M07756					
6062W27	-11	D75M07754					
6062W28	-12	D75M07753					
6062W29	-13	D75M07761					
6062W32	-14	D75M07751					
6062W33	-15	D75M07751					
6062W34	-16	D75M07751					
6062W35	-40	D75M07755					
6062W37	-17	D75M07756					
6062W38	-18	D75M07753					
6062W39	-19	D75M07764					
6062W43	-20	D75M07751					
6062W44	-21	D75M07751					
6062W45	-41	D75M07756					
6062W46	-22	D75M07753					
6062W46	-23	D75M07755					
6062W47	-23	D75M07756					
6062W48	-24	D75M07753					
6062W49	D75M09073-25	D75M07754	A75M10180				28
6063W1	D75M08111-2	D75M13967	A75M10191				21
6063W2	D75M09071-4	D75M11291	A75M10134				21
6063W3	D75M08111-7	D75M07782	A75M10200				21
6064W1	D75M08111-4	D75M13967	A75M10191				28
6064W3	D75M08111-6	D75M07782	A75M10200				
6064W10	D75M09073-42	D75M07755	A75M10180				
6064W11	D75M09073-26	D75M07753					
6064W13	D75M09073-27	D75M07751					
6064W14	D75M09073-28	D75M07751					28
6064W15	D75M09073-29	D75M07751					
6064W16	D75M09073-30	D75M07751					
6064W20	D75M09073-31	D75M07753					28
6064W21	D75M09073-32	D75M07754					
6064W30	D75M09073-33	D75M07754					
6064W31	D75M09073-34	D75M07753					
6064W39	D75M09073-35	D75M07755					
6064W40	D75M09073-36	D75M07756					
6064W41	D75M09073-37	D75M07754					
6064W43	D75M09073-38	D75M07755	A75M10180				
6068W1	D75M09072-10	D75M07753	A75M10180				
6068W2	D75M09072-11	D75M07753	A75M10180				
6068W21	D75M09072-1	D75M07756	A75M10180				
6068W22	D75M09072-2	D75M07756	A75M10180				
6068W23	D75M09072-3	D75M07756	A75M10180				
6068W24	D75M09071-1	D75M11296	A75M11017				
6068W25	D75M09072-6	D75M07751	A75M10180				
6068W26	D75M09072-8	D75M07751	A75M10180				
6068W27	D75M09072-7	D75M07751	A75M10180				
6068W28	D75M09072-9	D75M07756	A75M10180				
6068W29	D75M09072-4	D75M07756	A75M10180				
6068W30	D75M09072-5	D75M07756	A75M10180				
6068W31	D75M09071-2	D75M11296	A75M11017				28

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
6068W 41	[illegible]073-29	D75M07753	A75M10180				28
6071W1B	[illegible]9071-5	D75M15087					
6075W1	D75M09960-10	D75M09960					
6075W2	D75M07793-1	D75M07793	A75M10180				
6076W1	D75M09960-1	D75M09960					28
6119W1	D75M09076-8	D75M15666					29
6121W3	D75M09074-2	D75M07799	A75M11026				
6121W5	D75M09074-10	D75M11298	A75M11018				
6121W4	D75M09074-11	D75M11298	A75M11018				
6121W20	D75M08112-1	D75M13967	A75M10191				
6121W21	D75M08112-2	D75M13967	A75M10191				
6121W22	D75M08112-3	D75M13962	A75M10192				
6121W23	D75M08112-4	D75M13962	A75M10192				
6121W24	D75M08112-5	D75M13962-60	A75M10192				29
6121W25							
6121W26	D75M08112-13	D75M13968	A75M10193				29
6121W27	D75M08112-14	D75M07782	A75M10200				
6121W28	D75M08112-15	D75M07782	A75M10200				
6121W29	D75M08112-16	D75M07782	A75M10200				
6122W1	D75M08112-9	D75M13967	A75M10191				
6122W2	D75M08112-12	D75M07782	A75M10200				
6122W10	D75M09076-49	D75M07756	A75M10180				
6122W12	D75M09076-1	D75M07751					
6122W13	D75M09076-2	D75M07751					
6122W14	D75M09076-3	D75M07751					
6122W15	D75M09076-4	D75M07755					
6122W16	D75M09076-5	D75M07756					
6122W17	D75M09076-6	D75M07753					
6122W18	D75M09076-7	D75M07754					
6122W19	D75M09076-8	D75M07751					
6122W22	D75M09076-9	D75M07751					
6122W23	D75M09076-10	D75M07751					
6122W24	D75M09076-11	D75M07751					
6122W25	D75M09076-12	D75M07755					
6122W26	D75M09076-13	D75M07756					
6122W27	D75M09076-14	D75M07754					
6122W28	D75M09076-15	D75M07753					
6122W29	D75M09076-16	D75M07761					
6122W32	D75M09076-17	D75M07751					
6122W33	D75M09076-18	D75M07751					
6122W34	D75M09076-19	D75M07751					
6122W36	D75M09076-20	D75M07756					
6122W37	D75M09076-21	D75M07756					
6122W38	D75M09076-22	D75M07753					
6122W39	D75M09076-23	D75M07764					
6122W43	D75M09076-24	D75M07751					
6122W44	D75M09076-25	D75M07751					
6122W45	D75M09076-26	D75M07755					
6122W47	D75M09076-27	D75M07756					
6122W48	D75M09076-28	D75M07753					
6122W49	D75M09076-29	D75M07754	A75M10180				
6124W1	D75M08112-10	D75M13967	A75M10191				
6124W3	D75M08112-13	D75M07782	A75M10200				
6124W10	D75M09076-31	D75M07755	A75M10180				
6124W11	D75M09076-32	D75M07753					
6124W12	D75M09076-33	D75M07755					
6124W13	D75M09076-34	D75M07751					
6124W14	D75M09076-35	D75M07751					
6124W15	D75M09076-36	D75M07751					
6124W16	D75M09076-37	D75M07751					
6124W17	D75M09076-38	D75M07751					
6124W20	D75M09076-39	D75M07753					
6124W21	D75M09076-40	D75M07754					
6124W22	D75M09076-48	D75M07755					
6124W30	D75M09076-42	D75M07754					
6124W31	D75M09076-43	D75M07753					
6124W32	D75M09076-44	D75M07753					
6124W33	D75M09076-45	D75M07755					
6124W40	D75M09076-46	D75M07756					
6124W41	D75M09076-47	D75M07754					
6124W45	D75M09076-41	D75M07755	A75M10180				
6128W1	D75M09075-10	D75M07753	A75M10180				
6128W2	D75M09075-11	D75M07753	A75M10180				
6128W3	D75M09074-3	D75M11296	A75M11017				
6128W4	D75M09074-5	D75M11304	A75M11017				
6128W5	D75M09074-6	D75M11303	A75M11017				
6128W21	D75M09075-1	D75M07754	A75M10180				
6128W22	D75M09075-2	D75M07756	A75M10180				
6128W23	D75M09075-3	D75M07756	A75M10180				
6128W24	D75M09074-7	D75M11296	A75M11017				
6128W25	D75M09075-6	D75M07751	A75M10180				
6128W26	D75M09075-8	D75M07751	A75M10180				
6128W27	D75M09075-7	D75M07751	A75M10180				
6128W28	D75M09075-9	D75M07756	A75M10180				
6128W29	D75M09075-4	D75M07756	A75M10180				
6128W30	D75M09075-5	D75M07756	A75M10180				
6128W31	D75M09074-4	D75M11296	A75M11017				29

NOTES:
FOR APPLICABLE NOTES SEE SH 2.

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CABLE INDEX

CABLE INTERCONNECT
LDV LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PE CONNECTOR	FURNISHED BY	SH NO. REF
							29
6196W1	D75M39960-11	D75M09960					
6196W2	D75M37793-2	D75M07793	A75M10180				
6197W1	D75M09960-2	D75M09960					29
6142W1	D75M08115-1	D75M13967	A75M10191				30
6142W3	8115-3	D75M07782	A75M10200				
6142W10	9079-35	7756	A75M10180				
6142W12	-1	7751					
6142W13	-2	7751					
6142W14	-3	7751					
6142W17	-4	7753					
6142W18	-5	7756					
6142W19	-6	7751					
6142W22	-7	7751					
6142W23	-8	7751					
6142W24	-9	7751					
6142W26	-10	7756					
6142W27	-11	7754					
6142W28	-12	7753					
6142W29	-13	7761					
6142W32	-14	7751					
6142W33	-15	7751					
6142W36	-16	7751					
6142W37	-17	7756					
6142W38	-18	7753					
6142W39	-19	7764					
6142W42	-20	7751					
6142W43	-21	7751					
6142W44	-22	7751					
6142W46	-23	7753					
6142W47	-24	7756					
6142W48	-25	7753					
6168W49	D75M09079-26	D75M07754	A75M10180				
6144W1	D75M08115-2	D75M13967	A75M10191				
6144W3	8115-4	D75M07782	A75M10200				
6144W11	9079-27	7753	A75M10180				
6144W13	-28	7751					
6144W14	-29	7751					
6144W20	-30	7752					
6144W21	-31	7754					
6144W30	-32	7754					
6144W31	-33	7753					
6144W33	-34	7755					
6144W40	-35	7756					
6144W41	-36	7754					
6144W43	D75M09079-37	D75M07753	A75M10180				30
6146W1	D75M09081-5	D75M07758	A75M10191				33
6146W2	9081-1	7756	A75M10180				
6146W3	-2	7754					
6146W4	-3	7753					
6146W5	-4	7755					
6146W6	-5	7754					
6146W7	9083-6	7764	A75M10180				31
6148W1	9078-10	7753	A75M10180				30
6148W2	-11	7753					
6148W21	-1	7756					
6148W22	-2	7756					
6148W23	9078-3	D75M07756	A75M10180				
6148W24	9077-1	D75M11896	A75M11017				
6148W25	9078-6	D75M07751	A75M10180				
6148W26	-8	7751					
6148W27	-7	7751					
6148W28	-9	7756					
6148W29	-4	7756					
6148W30	9078-5	D75M07756	A75M10180				
6148W31	9077-2	D75M11896	A75M11017				
6148W32	9077-3	D75M11896	A75M11017				
6148W41	D75M09079-38	D75M07756	A75M10180				30

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PE CONNECTOR	FURNISHED BY	SH NO. REF
6149W8	D75M08116-10	D75M07781	A75M10180				33
6149W9	9083-1						31
6149W	-2						
6149W	-3						
6149W6	9081-8	7751					
6149A1TW1	9083-8	7754					
6149A1TW2	-9	7764					
6149A1BW1	-10	7754					
6149A1BW2	-11	7764					31
6149A2BW1	D75M09083-7	D75M07754	A75M10180				
6155W1	D75M09960-15	D75M09960					30
6155W2	D75M07793-3	D75M07793	A75M10180				30
6156W1	D75M09960-1	D75M09960					30
6160W1	D75M09080-14	D75M13609	A75M11017				
6161W2	D75M09080-2	D75M07795	A75M11025				28
6161W5	-5	D75M07795	A75M11025				
6161W6	-6	D75M07796	A75M11022				
6161W8	9080-8	D75M11279	A75M11024				
6161W9	9037-1	D75M15086	A75M11023				
6161W10	9080-4	D75M07797	A75M11023				
6161W7	9080-7	D75M07796	A75M11022				
6161W8	9080-6	D75M07797	A75M11023				
6161W6	9037-2	D75M15086	A75M11025				
6161W9	9080-9	D75M07797	A75M11023				
6161W10	-10	D75M07798	A75M11020				
6161W11	-11	D75M07795	&75M11026				
6161W12	9080-12	D75M11279	A75M11024				
6161W20	8114-18	13967	A75M10191				
6161W21	-1						
6161W22	-2						
6161W23	-3						
6161W24	-4						
6161W27	-7	13967	A75M10191				
6161W26	-6	13968	A75M10195				
6161W28	-8						
6161W29	-9						
6161W30	-10	13968	A75M10195				
6161W35	-15	13968	A75M10195				
6161W36	-16	13968	A75M10193				
6161W40	-40	13967	A75M10191				
6161W41	-41	13968	A75M10198				
6161W42	-46	13967	A75M10191				
6161W43	-47						
6161W44	-48						
6161W45	-49						
6161W46	-50						
6161W47	-51						
6161W48	-52	13967	A75M10191				
6161W49	-53	4103	A75M11000				
6161W50	-54	13968	A75M10198				
6161W51	-55						
6161W52	-56						
6161W53	-57	13968	A75M10198				
6161W54	-58	D75M15332					
6161W55	-59	D75M07762	A75M10200				
6161W56	-61	D75M15332					
6161W57	-61						
6161W58	-62						
6161W59	-63						
6161W60	-64						
6161W61	-65						
6161W62	8114-66	15332					
6161A3W2	9037-3	5084	A75M11018				
6161A3W3	-4	5083	A75M14089				
6161A3W4	-5						
6161A3W5	-6						
6161A3W6	-7						
6161A4W1		5083	A75M14089				
6161A5W2	-8	5084	A75M11018				
6161A5W3	-9	5083	A75M14089				
6161A5W4	-10						
6161A5W5	-11						
6161A5W6	-12						
6161A6W1	D75M09037	D75M15083	A75M14089				32

NOTES:
FOR APPLICABLE NOTES SEE SH 2.

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EDV

CABLE INTERCONNECT
EDV LAUNCH EQUIPMENT, LC-39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PB CONNECTOR	FURNISHED BY	SH NO REF
[illegible]	D75M30B114-16	D75M11967	A75M1D191				31
6162 W 5	B114-15	D75MO7782	0200				
6162 W 10	9082-98	7756	0180				
6162 W 12	-1	7751					
6162 W 13	-2	7751					
6162 W 14	-3	7756					
6162 W 15	-4	7753					
6162 W 16	-5	7751					
6162 W 17	-6	7756					
6162 W 18	-7	7756					
6162 W 19	-8	7761					
6162 W 22	-9	7751					
6162 W 23	-10	7751					
6162 W 24	-11	7753					
6162 W 25	-12	7753					
6162 W 26	-13	7751					
6162 W 27	-14	7753					
6162 W 28	-15	7764					
6162 W 29	-16	7764					
6162 W 34	-17	7751					
6162 W 35	-18						
6162 W 36	-19						
6162 W 37	-20						
6162 W 38	-21						
6162 W 39	-22						
6162 W 44	-23						
6162 W 45	-24						
6162 W 46	-25						
6162 W 47	-26						
6162 W 48	-27						
6162 W 49	D75MO9082-28	D75MO 7751	A75M10180				31
6163 W 1	D75MOB114-20	D75M1 3967	A75M10191				33
6163 W 9	B114-16	D75MO7782	0200				
6163 W 10	9082-31	7756	0180				
6163 W 11	-32	7756					
6163 W 12	-33	7753					
6163 W 13	-34	7756					
6163 W 14	-35	7756					
6163 W 17	-82	7751					
6163 W 18	-80	7751					
6163 W 19	-98	7751					
6163 W 20	-36	7756					
6163 W 21	-37	7756					
6163 W 23	-38	7755					
6163 W 23	-39	7755					
6163 W 24	-60	7762					
6163 W 28	-79	7751					
6163 W 29	-37	7751					
6163 W 30	-61	7756					
6163 W 31	-62	7756					
6163 W 32	-63	7755					
6163 W 33	-64	7755					
6163 W 34	-65	7756					
6163 W 40	-66	7756					
6163 W 41	-67	7756					
6163 W 42	-68	7755					
6163 W 43	-69	7755					
6163 W 44	D75MO9082-50	D75MO 7762	A75M10180				33
6164 W 1	D75MOB114-23	D75M1 3967	A75M10191				31
6164 W 3	B114-18	D75MO 7782	0200				
6164 W 10	9082-51	7756	0180				
6164 W 11	-52	7756					
6164 W 12	-53	7756					
6164 W 13	-54	7753					
6164 W 14	-55	7755					
6164 W 15	-56	7755					
6164 W 17	-58	7751					
6164 W 18	-59	7751					
6164 W 19	-60	7751					
6164 W 20	-61	7756					
6164 W 21	-62	7756					
6164 W 22	-63	7755					
6164 W 23	-64	7756					
6164 W 24	-65	7756					
6164 W 25	-66	7755					
6164 W 26	-67	7753					
6164 W 27	-68	7751					
6164 W 28	-69	7751					
6164 W 29	-70	7751					
6164 W 30	-71	7756					
6164 W 31	-72	7756					
6164 W 32	-73	7755					
6164 W 33	-74	7755					
6164 W 34	-75	7753					
6164 W 35	-76	7753					
6164 W 36	-77	7756					
6164 W 40	-81	7756					
6164 W 42	-83	7756					
6164 W 43	-84	7753					
6164 W [illegible]	-85	7756					
6164 W [illegible]	-86	7756					
6164 W [illegible]	D75MF9082-87	D75MO7755	A75M10180				31

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PB CONNECTOR	FURNISHED BY	SH NO REF
6165W45	D75MO9082-98	D75M09755	A75M10180				1
6165 W 1	D75MOB114-93	D75M11967	A75M10191				31
6165 W 11	-58	D75MO7751	0180				
6165 W 12	-59						
6165 W 13	-60						
6165 W 14	-61						
6165 W 15	D75MOB114-92	D75MO 7751	A75M10180				31
6167A 1W1	D75MO9063-3	D75MO 7756	A75M10180				31
6167MT1W1	-1	7757					
6167S1W1	-2	7753					
6167S2W1	-3	7753					
6167S3W1	D75MO9063-4	D75MO7757	A75M10180				31
6168W1	D75MO9080-13	D75M11303	A75M11017				31
6168W2	9080-14	D75M11303	1017				
6168W3	9081-11	D75MO7753	0180				
6168W4	9081-10	D75MO7783	0180				
6168W5	9080-13	D75M11303	1017				8
6168W6	-16						31
6168W7	-89						33
6168W8	-90						
6168W9	-91						
6168W10	-92						
6168W11	9080-33	D75M11303	1017				33
6168W16	B114-24	D75MO7751	0180				31
6168W17	-25						
6168W18	-26						
6168W19	-27						
6168W20	-28						31
6168W21	B114-21						33
6168W22	9081-8	D75MO 7751	0180				31
6168W23	9080-17	D75M11296	1017				
6168W24	9081-9	D75MO7751	0180				
6168W25	9081-16	D75MO7756	0180				
6168W26	9080-18	D75M11296	1017				
6168W27	9081-15	D75MO7756	0180				8
6168W30	B114-17	7751					31
6168W31	B114-22	7751					33
6168W32	9081-14	7756					31
6168W35	-20						8
6168W34	-13						
6168W35	-9						
6168W36	-12	7756					
6168W37	9081-7	7751					
6168W40	B114-18	7751					
6168W41	9082-29	7755					
6168W42	-30	7764					
6168A23W1	-89	7754					
6168A28W1	9082-90	7754	0180				
6168A47W1	9080-19	D75M11304	1017				
6168A51W1	9080-20	D75M11304	1017				
6168A72W1	9082-91	D75MO7754	0180				8
6168A84W1	-92	7754					31
6168A85W1	-93	7762					33
6168A86W1	-94	7762					33
6168A87W1	-95	7754					31
6168A88W1	-96	7754					
6168A89W1	9082-97	D75MO 7754	0180				
6168A107W1	9080-23	D75M11304	1017				8
6168A108W1	D75MO9080-24	D75M11304	A75M11017				31

NOTES:
FOR APPLICABLE NOTES SEE SH 6.

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FDV

CABLE INTERCONNECT
FDV LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	TERMINATED BY	SH NO. REF
[illegible]	[illegible]	[illegible]	[illegible]				32
[illegible]	[illegible]	D75M07732	A75MI1037				33
[illegible]	[illegible]	D75MI4029	A75MI0206				
[illegible]	D75M09080-21	D75MI1299	A75MI1017				34
[illegible]	D75M09080-22	D75MI3979	A75MI4092				
[illegible]	D75M09057-13	D75MI1299	A75MI1017				
6171A1C45W1A	D75M09057-14	D75MI3979	A75MI4092				
6172A1145W1A	D75M09080-25	D75MI5166	A75MI1017				
6172A1145W1B	D75M09080-26	D75MI3979	A75MI4092				
6172A1145W2A	D75M09057-15	D75MI1299	A75MI1017				
6172A1145W2B	D75M09057-16	D75MI3979	A75MI4092				
6173A1155W1A	D75M09080-27	D75MI5166	A75MI1017				
6173A1155W1B	D75M09080-28	D75MI3979	A75MI4092				
6173A1155W2A							
6173A1155W2B							
6175W1	D75M09960-13	D75M09960					
6175W2	D75M07792-6	D75M07792	A75MI0180				
6176W1	D75M09960-4	D75M09960					31
6201W1	D75M09084-1	D75MI1271	A75MI1021				34
6201W2	D75M09084-2	D75M07795	A75MI1025				
6201W3	D75M09084-3	D75M07796	A75MI1022				
6201W4							
6201W5	D75M09084-5	D75M07766	A75MI1024				
6201W6	D75M09084-6	D75M07766	A75MI1026				
6201W7	D75M09084-7	D75MI1268	A75MI1009				
6201W20	D75M08115-1	D75MI3967	A75MI0191				
6201W21	D75M08115-2	D75MI3967	A75MI0191				
6201W22	D75M08115-3	D75MI3967	A75MI0191				
6201W23	D75M08115-6	D75MI3967	A75MI0191				
6201W24	D75M08115-5	D75MI3962	A75MI0192				
6201W25	D75M08115-6	D75MI3962	A75MI0192				
6201W26	D75M08115-7	D75MI3962	A75MI0192				
6201W29	D75M08115-25	D75MI5336	A75MI4079				
6201W30	D75M08115-26	D75MI1272	A75MI0194				
6201W31	D75M08115-27	D75MI4103	A75MI1008				
6201W32	D75M08115-28	D75MI5332					
6201W33	D75M08115-29	D75MI5332					
6201W34	D75M08115-30	D75MI5332					34
6202W1	D75M08115-9	D75MI3967	A75MI0191				34
6202W3	D75M08115-19	D75M07782	A75MI0200				
6202W10	D75M09086-91	D75M07756	A75MI0180				
6202W12	D75M09086-1	D75M07751					
6202W13	-2	D75M07751					
6202W14	-3	D75M07754					
6202W15	-4	D75M07753					
6202W16	-5	D75M07751					
6202W17	-6	D75M07754					
6202W18	-7	D75M07754					
6202W19	-8	D75M07761					
6202W22	-9	D75M07751					
6202W23	-10	D75M07751					
6202W24	-11	D75M07753					
6202W25	-12	D75M07753					
6202W26	-13	D75M07751					
6202W27	-14	D75M07753					
6202W28	-15	D75M07764					
6202W29	-16	D75M07764					
6202W34	-17	D75M07751					
6202W35	-18						
6202W36	-19						
6202W37	-20						
6202W38	-21						
6202W39	-22						
6202W44	-23						
6202W45	-24						
6202W46	-25						
6202W47	-26						
6202W48	-27						
6202W49	D75M09086-28	D75M07751	A75MI0180				34

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	TERMINATED BY	SH NO. REF
6203W1	D75M08115-10	D75MI3967	A75MI0191				35
6203W2	D75M09085-17	D75M07759	A75MI0191				
6203W3	D75M08115-20	D75M07782	A75MI0200				
6203W10	D75M09086-31	D75M07756	A75MI0180				
6203W13	-32	D75M07759					
6203W15	-33	D75M07756					
6203W16	-34	D75M07756					
6203W20	-35	D75M07756					
6203W22	-36	D75M07755					
6203W24	-37	D75M07763					
6203W30	-38	D75M07756					
6203W31	-39	D75M07756					
6203W32	-40	D75M07759					
6203W34	-41	D75M07756					
6203W40	-42	D75M07756					
6203W41	-43	D75M07756					
6203W42	-44	D75M07755					
6203W43	-45	D75M07755					
6203W44	D75M09086-46	D75M07762	A75MI0180				35
6204W1	D75M08115-11	D75MI3967	A75MI0191				34
6204W3	D75M08115-21	D75M07782	A75MI0200				
6204W10	D75M09086-47	D75M07756	A75MI0180				
6204W11	-48	D75M07756					
6204W12	-49	D75M07754					
6204W13	-50	D75M07753					
6204W14	-51	D75M07753					
6204W15	-52	D75M07759					
6204W19	-53	D75M07751					
6204W20	-54	D75M07754					
6204W21	-55	D75M07754					
6204W22	-56	D75M07759					
6204W23	-57	D75M07754					
6204W24	-58	D75M07754					
6204W25	-59	D75M07759					
6204W27	-60	D75M07751					
6204W28	-61	D75M07751					
6204W29	-62	D75M07751					
6204W30	-63	D75M07756					
6204W31	-64	D75M07754					
6204W32	-65	D75M07753					
6204W33	-66	D75M07755					
6204W34	-67	D75M07753					
6204W35	-68	D75M07753					
6204W40	-69	D75M07754					
6204W42	-70	D75M07754					
6204W43	-71	D75M07753					
6204W44	-72	D75M07754					
6204W45	D75M09086-73	D75M07764	A75MI0180				34
6206W2	D75M09087-1	D75M07756	A75MI0180				35
6206W8	-2	D75M07754					
6206W4	-3	D75M07753					
6206W5	-4	D75M07755					
6206W6	-5	D75M07754					
6206W7	D75M09087-6	D75M07764	A75MI0180				35
6208W3	D75M09085-11	D75M07753	A75MI0180				34
6208W4	D75M09085-10	D75M07753	A75MI0180				
6208W5	D75M09084-9	D75MI1303	A75MI1017				
6208W6	D75M09084-10	D75MI1303	A75MI1017				
6208W16	D75M08115-12	D75M07751	A75MI0180				
6208W17	D75M08115-13	D75M07751	A75MI0180				
6208W18	D75M08115-14	D75M07751	A75MI0180				
6208W21	D75M08115-15	D75M07751	A75MI0180				
6208W22	D75M09085-8	D75M07751	A75MI0180				
6208W23	D75M09084-11	D75MI1296	A75MI1017				
6208W24	D75M09085-6	D75M07751	A75MI0180				
6208W25	D75M09085-5	D75M07756	A75MI0180				
6208W26	D75M09084-12	D75MI1296	A75MI1017				
6208W27	D75M09085-4	D75M07756	A75MI0180				
6208W28	D75M09085-13	D75M07751					
6208W29	D75M09085-14	D75M07751					
6208W30	D75M08115-16	D75M07781					
6208W31	D75M08115-17	D75M07751					
6208W32	D75M09085-3	D75M07756					
6208W33	D75M09085-12	D75M07756					
6208W34	D75M09085-2	D75M07756					
6208W35	D75M09085-9	D75M07756					
6208W36	D75M09085-1	D75M07756					
6208W37	D75M09085-7	D75M07751					
6208W38	D75M09085-15	D75M07751					
6208W39	D75M09085-16	D75M07751					
6208W40	D75M08115-18	D75MI0180					
6208W41	D75M09086-29	D75M07753					
6208W42	D75M09086-30	D75M07764					
6208A72W2	D75M09086-74	D75M07754					
6208A84W2	D75M09086-75	D75M07754					
6208A85W2	D75M09086-76	D75M07762					
6208A86W2	D75M09086-77	D75M07762					
6208A87W2	D75M09086-78	D75M07754					
6208A88W2	D75M09086-79	D75M07754					
6208A89TW1	D75M09086-80	D75M07756	A75MI0180				
6208A107W1	D75M09084-15	D75MI1304	A75MI1017				
6208A108W1	D75M09084-16	D75MI1304	A75MI1017				34

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CABLE INTERCONNECT DIV LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
6209W2	D75M40081-22	D75M40781-					33
6209W3	09081-A	07754-					34
6209W4	-9	07764-					
6209W5	-10	07754-					
6209W6	-11	07764-					34
6209A22W1	D75M09081-7	D75M40794-					35
6212W1A	-	-					
6212W1B	D75M09084-21	D75M15182-					34
6212W2A	09084-4	07772-					
6212W2B	08116-24	14928-					
6212A102SW1A	09084-22	11298-					
6212A102S1W1B	-23	13979-					
6212A102S2W1A	-13	11298-					
6212A102S2W1B	D75M09084-14	D75M13979-					34
6215A2W1	D75M09084-17	D75M11296-					35
6215A2W1	-24	-					
6215A2W2	-18	-					35
6215A2W3	D75M09084-19	D75M11296-					35
6216W1	D75M09960-16	D75M09960-					34
6216W2	D75M07793-5	D75M07793-					34
6217W1	D75M09960-5	D75M09960-					34
6218W1	D75M09084-20	D75M11294-					34
6220W1	D75M09088-23	D75M15466-					36
6221W1	D75M08101-1	D75M15086-					36
6221W1	09088-1	07765-					
6221W2	09088-2	07799-					
6221W3	08101-2	15086-					
6221W3	09088-3	07765-					
6221W4	-4	07769-					
6221W5	-5	07769-					
6221W6	09088-6	07799-					
6221W20	08116-1	13967-					
6221W21	-2	-					
6221W22	-3	-					
6221W23	-4	-					
6221W24	-5	-					
6221W25	-6	-					
6221W26	-22	-					
6221W27	-23	13941-					
6221W28	-24	13942-					
6221W29	-25	14103-					
6221W31	-27	13942-					
6221W32	-28	13942-					
6221W33	-29	14103-					
6221W34	-30	15382-					
6221W35	-31	-					
6221W36	-32	-					
6221W37	-33	-					
6221W38	08116-34	15382-					
6221A3W2	08101-3	15085-					
6221A3W3	-4	15085-					
6221A3W4	-5	15085-					
6221A3W5	-6	15084-					
6221A3W6	-7	15084-					
6221A4W1	-	-					
6221A5W2	-9	15085-					
6221A5W3	-10	-					
6221A5W4	-11	-					
6221A5W5	D75M08108-8	D75M15085-					
6221A6W1	-	-					36

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
6222W1	08116-7	D75M13967-					36
6222W9	08116-14	07782-					
6222W10	09090-39	07796-					
6222W12	-1	07795-					
6222W13	-2	07795-					
6222W14	-3	07794-					
6222W15	-4	07793-					
6222W16	-5	07794-					
6222W17	-6	07794-					
6222W18	-7	07794-					
6222W19	-8	07761-					
6222W22	-9	07795-					
6222W23	-10	07795-					
6222W24	-11	07793-					
6222W25	-12	07793-					
6222W26	-13	07794-					
6222W27	-14	07793-					
6222W28	-15	07764-					
6222W29	-16	07764-					
6222W34	-17	07751-					
6222W35	-18	-					
6222W36	-19	-					
6222W37	-20	-					
6222W38	-21	-					
6222W39	-22	-					
6222W44	-23	-					
6222W45	-24	-					
6222W46	-25	-					
6222W47	-26	-					
6222W48	-27	-					
6222W49	D75M09090-28	D75M07751-					36
6223W1	D75M08116-8	D75M13967-					37
6223W2	09089-17	07759-					
6223W3	08116-15	07782-					
6223W10	09090-31	07756-					
6223W12	-32	07755-					
6223W13	-33	07756-					
6223W14	-34	07756-					
6223W17	-37	07751-					
6223W18	-38	07751-					
6223W19	-39	07751-					
6223W20	-35	07756-					
6223W22	-36	07755-					
6223W24	-37	07768-					
6223W28	-38	07751-					
6223W29	-85	07751-					
6223W30	-40	07756-					
6223W31	-39	07756-					
6223W32	-40	07758-					
6223W34	-41	07756-					
6223W40	-42	07756-					
6223W41	-43	07756-					
6223W42	-44	07755-					
6223W43	-45	07793-					
6223W44	D75M09090-46	D75M07768-					37
6224W1	D75M08116-9	D75M13967-					36
6224W3	08116-16	07782-					
6224W10	09090-47	07756-					
6224W11	-48	07756-					
6224W12	-49	07754-					
6224W13	-50	07755-					
6224W14	-51	07759-					
6224W15	-81	07755-					
6224W19	-53	07751-					
6224W20	-54	07754-					
6224W21	-55	07754-					
6224W22	-56	07795-					
6224W23	-57	07754-					
6224W24	-58	07754-					
6224W25	-82	07759-					
6224W27	-60	07751-					
6224W28	-61	07751-					
6224W29	-62	07751-					
6224W30	-63	07756-					
6224W31	-83	07756-					
6224W32	-82	07753-					
6224W33	-65	07793-					
6224W34	-66	07793-					
6224W35	-67	07758-					
6224W40	-68	07754-					
6224W41	-69	07758-					
6224W42	-83	07754-					
6224W43	-70	07759-					
6224W44	-71	07754-					
6224W45	D75M09090-72	D75M07794-					36

NOTES:
FOR APPLICABLE NOTES SEE SH 2.

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CABLE INTERCONNECT LAUNCH EQUIPMENT, LC39

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Figure 6-6 Cable Interconnect Diagrams (Continued)

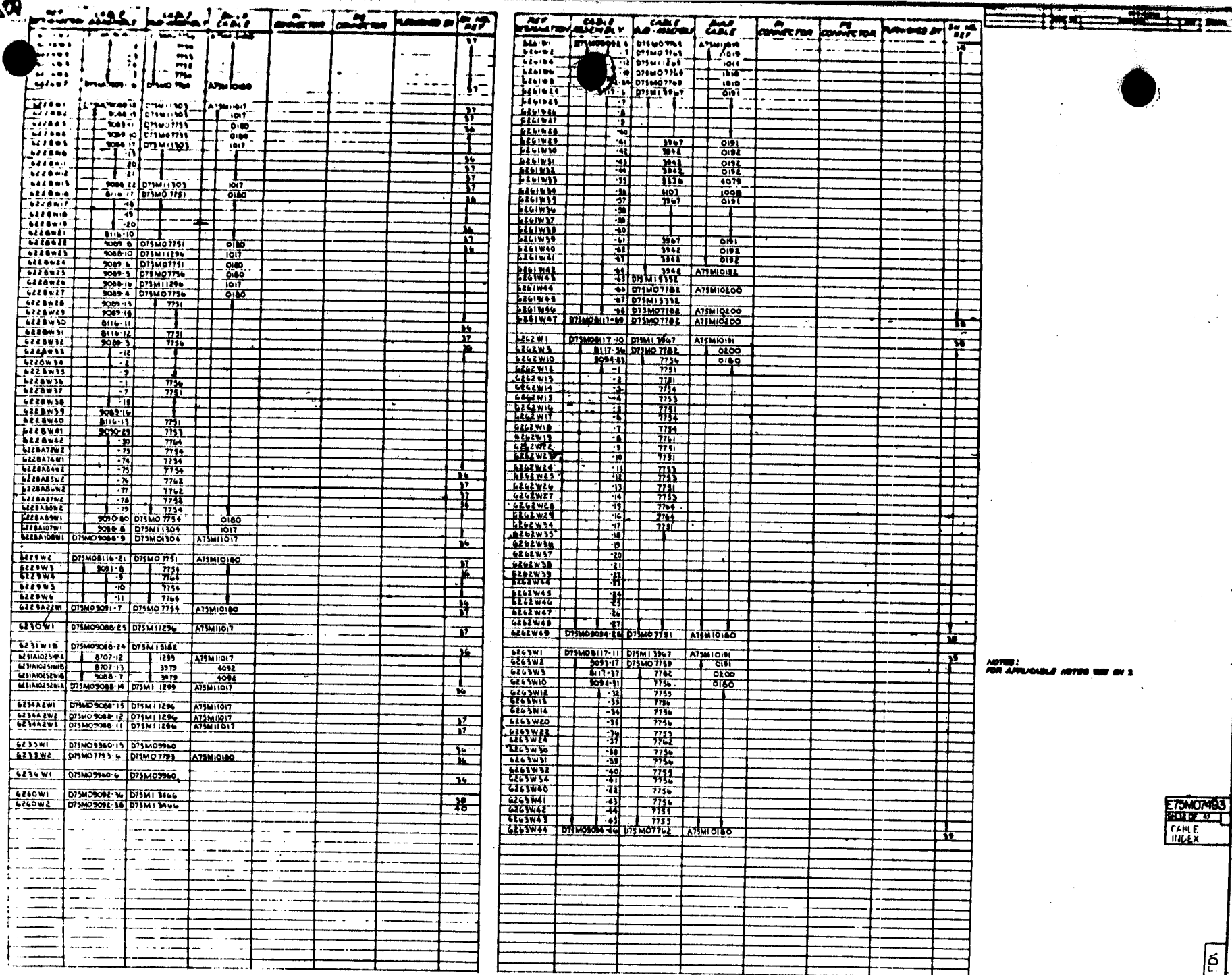

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PE CONNECTOR	FURNISHED BY	SH NO. REF
6264W1	[illegible]	U75M13967	A75MI0191				38
6264W1	U75M07782-38	U75M07782	A75MI0200				38
6264W10	U75M09094-47	D75M07756	A75MI0180				38
6264W11	-48	D75M07756					38
6264W12	-49	D75M07754					38
6264W13	-50	D75M07753					38
6264W14	-51	D75M07753					38
6264W15	-52	D75M07755					38
6264W19	-53	D75M07751					38
6264W20	-54	D75M07756					38
6264W21	-55	D75M07754					38
6264W22	-56	D75M07755					38
6264W23	-57	D75M07754					38
6264W24	-58	D75M07754					38
6264W25	-59	D75M07755					38
6264W27	-60	D75M07751					38
6264W28	-61	D75M07751					38
6264W29	-62	D75M07751					38
6264W30	-63	D75M07756					38
6264W31	-64	D75M07756					38
6264W32	-65	D75M07753					38
6264W33	-66	D75M07755					38
6264W34	-67	D75M07753					38
6264W35	-68	D75M07753					38
6264W40	-69	D75M07754					38
6264W41	-70	D75M07753					38
6264W42	-71	D75M07754					38
6264W43	-72	D75M07753					38
6264W44	-73	D75M07754					38
6264W45	D75M09094-74	D75M07754	A75MI0180				38
6265W1	D75M08117-90	D75M13967	A75MI0190				39
6265W3	D75M08117-89	D75M07782	A75MI0200				39
6266W2	D75M09095-1	D75M07756	A75MI0180				39
6266W3	-2	D75M07754					39
6266W4	-3	D75M07753					39
6266W5	-4	D75M07755					39
6266W6	-5	D75M07764					39
6266W7	D75M09095-6	D75M07764	A75MI0180				39
6268W3	D75M09093-11	D75M07753	A75MI0180				38
6268W4	D75M09093-10	D75M07753	A75MI0180				38
6268W5	D75M09092-25	D75MI1303	A75MI1017				38
6268W6	D75M09092-26	D75MI1303	A75MI1017				38
6268W7	D75M08117-91	D75M07751	A75MI0180				38
6268W8	D75M08117-92	D75M07751	A75MI0180				38
6268W9	D75M03809-1	D75MI1303	A75MI1017				38
6268W16	D75M08117-12	D75M07751	A75MI0180				38
6268W17	D75M08117-13	D75M07751	A75MI0180				38
6268W18	D75M08117-14	D75M07751	A75MI0180				38
6268W19	D75M08117-15	D75M07751	A75MI0180				38
6268W21	D75M08117-16	D75M07751	A75MI0180				38
6268W22	D75M09093-8	D75M07751	A75MI0180				38
6268W23	D75M09092-27	D75MI1296	A75MI1017				38
6268W24	D75M09093-6	D75M07751	A75MI0180				38
6268W25	D75M09093-5	D75M07756	A75MI0180				38
6268W26	D75M09092-28	D75MI1296	A75MI1017				38
6268W27	D75M09093-4	D75M07756	A75MI0180				38
6268W28	D75M09093-13	D75M07751					38
6268W29	D75M09093-14	D75M07751					38
6268W30	D75M08117-17	D75M07751					38
6268W31	D75M08117-18	D75M07751					38
6268W32	D75M09093-3	D75M07756					38
6268W33	-12	D75M07756					38
6268W34	-2	D75M07756					38
6268W35	-9	D75M07756					38
6268W36	-1	D75M07756					38
6268W37	-7	D75M07751					38
6268W38	-15	D75M07751					38
6268W39	D75M09093-16	D75M07751					38
6268W40	D75M08117-19	D75M07751					38
6268W41	D75M09094-29	D75M07753					38
6268W42	-30	D75M07764					38
6268A72W2	-75	D75M07754					38
6268A74W1	-76	D75M07754					38
6268A84W2	-77	D75M07754					38
6268A85W2	-78	D75M07762					39
6268A86W2	-79	D75M07762					39
6268A87W2	-80	D75M07754					38
6268A88W2	-81	D75M07754					38
6268A89W2	D75M09094-82	D75M07754	A75MI0180				38
6268A1C7W1	D75M09092-29	D75MI1304	A75MI1017				38
6268A1C8W1	D75M09092-35	D75MI1304	A75MI1017				38
6268A1C9W1	D75M07809-2	D75MI1304	A75MI1017				39

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	PI CONNECTOR	PE CONNECTOR	FURNISHED BY	SH NO. REF
6269W2	[illegible]7-39	D75M07751	A75MI0180				[illegible]
6269W3	[illegible]95-8	D75M07754					[illegible]
6269W4	[illegible]095-9	D75M07764					39
6269W5	D75M09095-10	D75M07754					39
6269W6	D75M09095-11	D75M07764					39
6269A22W1	D75M09095-7	D75M07764	A75MI0180				[illegible]
6270W1	D75M09092-40	D75MI1296	A75MI1017				38
6271W1B	D75M09092-17	D75MI5182					38
6271W3A	D75M09092-8	D75M07772	A75MI1027				
6271W3B	D75M08117-5	D75MI4529	A75MI0204				
6271W4B	D75M08117-26	D75MI4529	A75MI0204				
6271A1025IW1A	D75M09092-41	D75MI1299	A75MI1017				38
6271A1025IW1B	D75M09092-42	D75MI3979	A75MI4092				38
6271A1025IW2A	D75M09092-33	D75MI1299	A75MI1017				38
6271A1025IW2B	D75M09092-34	D75MI3979	A75MI4092				38
6274A2W1	D75M09092-30	D75MI1296	A75MI1017				
6274A2W2	D75M09092-31	D75MI1296	A75MI1017				35
6274A2W3	D75M09092-32	D75MI1296	A75MI1017				35
6275W1	D75M09960-16	D75M09960					38
6275W3	D75M07793-7	D75M07793	A75MI0180				38
6276W1	D75M09960-7	D75M09960					38
6280W1	D75M08117-80	D75MI4103	A75MI1008				40
6280W2	D75M08117-81	D75MI4103	A75MI1008				40
6280W3	-82	D75MI4103	A75MI1008				40
6280W4	-83	D75MI4103	A75MI1008				40
6280W5	-84	D75MI4103	A75MI1008				40
6280W6	-85	D75MI3942	A75MI0192				40
6280W7	-86	D75MI3942	A75MI0192				40
6280W8	-87	D75MI3942	A75MI0192				40
6280W9	D75M08117-88	D75MI3942	A75MI0192				40
6281W1	D75M09092-1	D75MI1275	A75MI1014				40
6281W2	-2	D75MI1273	A75MI1025				40
6281W3	-3	D75M07794	A75MI1024				40
6281W5	-5	D75M07799	A75MI1026				40
6281W7	-18	D75M07799	A75MI1026				40
6281W8	-23	D75MI1275	A75MI1014				40
6281W9	-9	D75MI1273	A75MI1025				40
6281W11	-11	D75MI1274	A75MI1012				40
6281W12	-22	D75MI1276	A75MI1013				40
6281W13	-13	D75M07799	A75MI1026				40
6281W14	-14	D75M07799	A75MI1026				40
6281W15	-20	D75M07794	A75MI1024				40
6281W16	D75M09092-21	D75MI1273	A75MI1025				40
6281W20	D75M08117-20	D75MI1272	A75MI0194				40
6281W21	-21	D75MI4001	A75MI0195				40
6281W22	-22	D75MI3968	A75MI0193				40
6281W23	-23	D75MI3968	A75MI0193				40
6281W24	-24	D75MI3968	A75MI0193				40
6281W25	-25	D75MI3968	A75MI0193				40
6281W27	-27	D75MI3967	A75MI0191				40
6281W28	-28	D75MI3967	A75MI0191				40
6281W29	-29	D75MI3967	A75MI0191				40
6281W30	-30	D75MI3942	A75MI0192				40
6281W31	-31	D75MI3942	A75MI0192				40
6281W32	-32	D75MI3942	A75MI0192				40
6281W33	-13	D75MI3942	A75MI0192				40
6281W34	-34	D75MI3942	A75MI0192				40
6281W35	-35	D75MI3942	A75MI0192				40
6281W36	-45	D75MI3942	A75MI0192				40
6281W37	-47	D75MI3967	A75MI0191				40
6281W38	-48	D75MI1272	A75MI0194				40
6281W39	-49	D75MI5332					40
6281W40	-50	D75MI5332					40
6281W41	D75M08117-51	D75MI5332					40
6291W1	D75M09092-17	D75MI1298	A75MI1018				40
6291W28	D75M09092-29	D75MI5182					40
6291W34	D75M09092-10	D75M07772	A75MI1027				40

NOTES:
FOR APPLICABLE NOTES SEE SH 2

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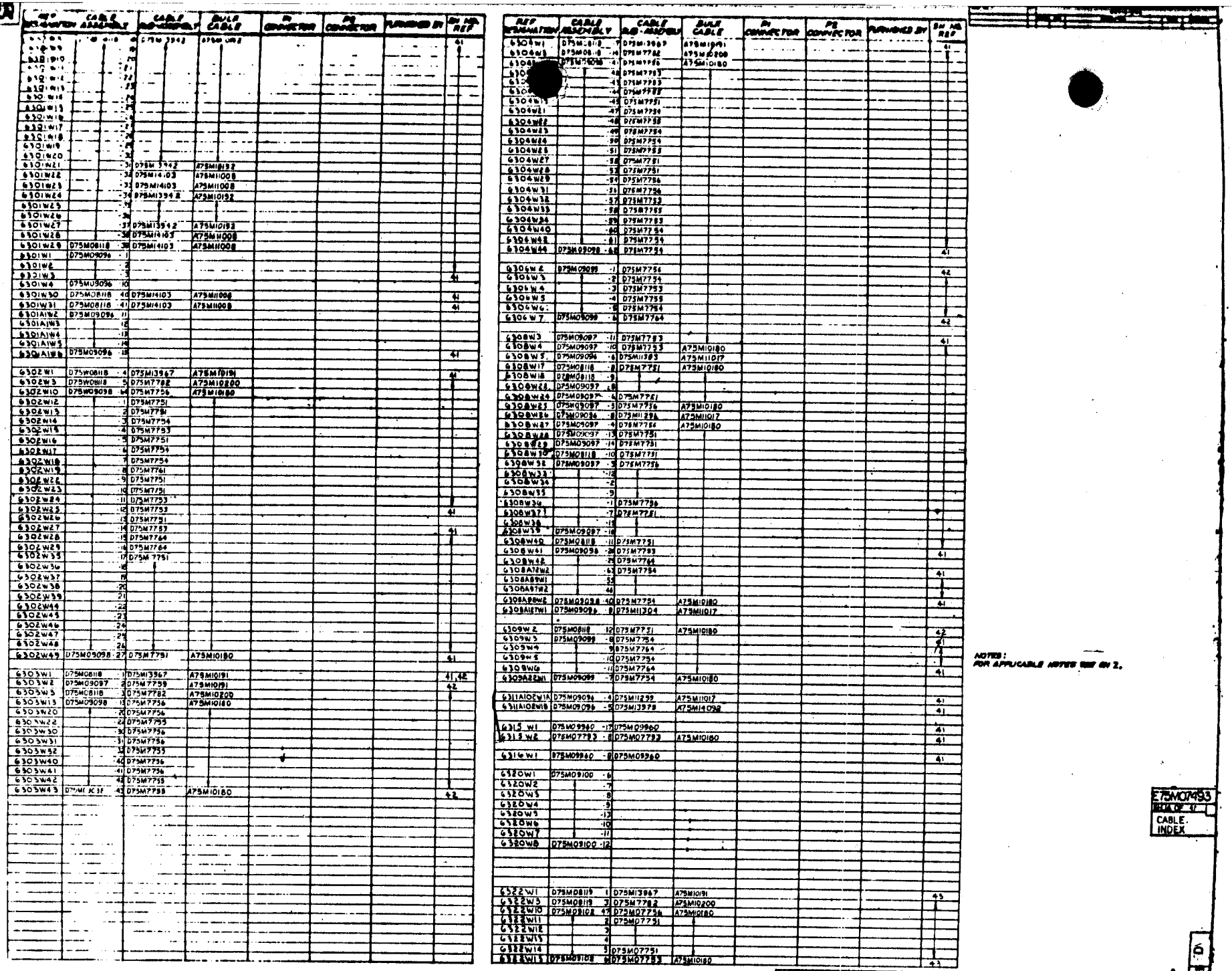
CABLE INTERCONNECT
EDV LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)



REF DESIGNATION	CABLE ASSEMBLY		CABLE ASSEMBLY	BULK CABLE	PL CONNECTOR	PJ CONNECTOR	FURNISHED BY	SH NO REF
6301W1		-1						
6301W2		-2						
6301W3		-3						
6301W4		-4						
6301W5		-5						
6301W6		-6						
6301W7		-7						
6301W8		-8						
6301W9		-9						
6301W10		-10						
6301W11		-11						
6301W12		-12						
6301W13		-13						
6301W14		-14						
6301W15		-15						
6301W16		-16						
6301W17		-17						
6301W18		-18						
6301W19		-19						
6301W20		-20						
6301W21		-21	D75M 3942	A75MI0192				
6301W22		-22	D75MI4103	A75MI1008				
6301W23		-23	D75MI4103	A75MI1008				
6301W24		-24	D75MI3942	A75MI0192				
6301W25		-25						
6301W26		-26						
6301W27		-27	D75MI3942	A75MI0192				
6301W28		-28	D75MI4103	A75MI1008				
6301W29	D75M08118	-29	D75MI4103	A75MI1008				
6301W1	D75M09096	-1						
6301W2		-2						
6301W3		-3						41
6301W4	D75M09096	-10						
6301W30	D75M08118	-40	D75MI4103	A75MI1008				41
6301W31	D75M08118	-41	D75MI4103	A75MI1008				41
6301AW2	D75M09096	-11						
6301AW3		-12						
6301AW4		-13						
6301AW5		-14						
6301AW6	D75M09096	-15						41
6302W1	D75W08118	-4	D75MI3967	A75MI0191				41
6302W3	D75W08118	-5	D75M7782	A75MI0200				
6302W10	D75W09098	-6	D75M7756	A75MI0180				
6302W12		-1	D75M7751					
6302W13		-2	D75M7791					
6302W14		-3	D75M7756					
6302W15		-4	D75M7753					
6302W16		-5	D75M7751					
6302W17		-6	D75M7756					
6302W18		-7	D75M7756					
6302W19		-8	D75M7761					
6302W22		-9	D75M7751					
6302W23		-10	D75M7751					
6302W24		-11	D75M7753					
6302W25		-12	D75M7753					41
6302W26		-13	D75M7751					
6302W27		-14	D75M7753					
6302W28		-15	D75M7764					41
6302W29		-16	D75M7764					
6302W35		-17	D75M 7751					
6302W36		-18						
6302W37		-19						
6302W38		-20						
6302W39		-21						
6302W44		-22						
6302W45		-23						
6302W46		-24						
6302W47		-25						
6302W48		-26						
6302W49	D75M09098	-27	D75M7791	A75MI0180				41
6303W1	D75M08118	-1	D75MI3967	A75MI0191				41,42
6303W2	D75M09097	-2	D75M7759	A75MI0191				42
6303W3	D75M08118	-3	D75M7782	A75MI0200				
6303W13	D75M09098	-13	D75M7756	A75MI0180				
6303W20		-20	D75M7756					
6303W22		-22	D75M7795					
6303W30		-30	D75M7756					
6303W31		-31	D75M7756					
6303W32		-32	D75M7755					
6303W40		-40	D75M7756					
6303W41		-41	D75M7756					
6303W42		-42	D75M7755					
6303W43	D75M[illegible]38	-43	D75M7758	A75MI0180				42

REF DESIGNATION	CABLE ASSEMBLY		CABLE ASSEMBLY	BULK CABLE	PJ CONNECTOR	PJ CONNECTOR	FURNISHED BY	SH NO REF
6304W1	D75M08118	-7	D75MI3967	A75MI0191				41
6304W3	D75M08118	-16	D75M7782	A75MI0200				
6304W6	D75M09098	-6	D75M7756	A75MI0180				
6304W		-42	D75M7783					
6304W		-43	D75M7783					
6304W		-44	D75M7788					
6304W19		-45	D75M7751					
6304W21		-47	D75M7759					
6304W22		-48	D75M7758					
6304W23		-49	D75M7784					
6304W24		-50	D75M7754					
6304W25		-51	D75M7783					
6304W27		-58	D75M7781					
6304W28		-53	D75M7751					
6304W29		-54	D75M7786					
6304W31		-55	D75M7756					
6304W32		-57	D75M7753					
6304W33		-58	D75M7785					
6304W34		-59	D75M7783					
6304W40		-60	D75M7754					
6304W42		-61	D75M7754					
6304W44	D75M09098	-62	D75M7754					41
6304W6	D75M09099	-1	D75M7756					42
6305W3		-2	D75M7754					
6305W4		-3	D75M7753					
6305W5		-4	D75M7755					
6305W6		-5	D75M7764					
6306W7	D75M09099	-6	D75M7764					42
6308W3	D75M09097	-11	D75M7783					
6308W4	D75M09097	-10	D75M7733	A75MI0180				41
6308W5	D75M09096	-6	D75MI1383	A75MI1017				
6308W17	D75M08118	-8	D75M7751	A75MI0180				
6308W18	D75M08118	-9						
6308W26	D75M09097	-68						
6308W24	D75M09097	-4	D75M7761					
6308W31	D75M09097	-3	D75M7756	A75MI0180				
6308W36	D75M09096	-8	D75MI1284	A75MI1017				
6308W27	D75M09097	-4	D75M7756	A75MI0180				
6308W28	D75M09097	-15	D75M7751					
6308W29	D75M09097	-14	D75M7751					
6308W30	D75M08118	-10	D75M7751					
6308W32	D75M09097	-5	D75M7756					
6308W33		-12						
6308W34		-2						
6308W35		-9						
6308W36		-11	D75M7756					
6308W37		-7	D75M7751					
6308W38		-13						
6308W39	D75M09097	-16						
6308W40	D75M08118	-11	D75M7751					
6308W41	D75M09098	-20	D75M7793					41
6308W42		-21	D75M7764					
6308A78W2		-63	D75M7754					41
6308A89W1		-55						
6308A97W2		-44						
6308A98W2	D75M09038	-10	D75M7754	A75MI0180				41
6308A107W1	D75M09096	-8	D75MI1304	A75MI1017				
6309W2	D75M08118	-12	D75M7751	A75MI0180				42
6309W3	D75M09099	-6	D75M7754					41
6309W4		-9	D75M7764					
6309W5		-10	D75M7754					
6309W6		-11	D75M7764					41
6309A82W1	D75M09099	-7	D75M7754	A75MI0180				
6311A10ZW1A	D75M09096	-4	D75MI1299	A75MI1017				41
6311A10ZW1B	D75M09096	-5	D75MI3978	A75MI4098				41
6315 W1	D75M09960	-17	D75M09960					41
6315 W2	D76M07793	-8	D75M07793	A75MI0180				41
6316W1	D75M09960	-8	D75M09960					41
6320W1	D75M09100	-6						
6320W2		-7						
6320W3		-8						
6320W4		-9						
6320W5		-13						
6320W6		-10						
6320W7		-11						
6320W8	D75M09100	-12						
6322W1	D75M08118	-1	D75MI3967	A75MI0191				43
6322W3	D75M08118	-3	D75M7782	A75MI0200				
6322W10	D75M09098	-13	D75M07756	A75MI0180				
6322W11		-2	D75M07751					
6322W12		-5						
6322W13		-4						
6322W14		-5	D75M07751					
6322W15	D75M09098	-14	D75M07783	A75MI0180				43

NOTES:
FOR APPLICABLE NOTES SEE SH 2.

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CABLE INTERCONNECT
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Figure 6-6 Cable Interconnect Diagrams (Continued)

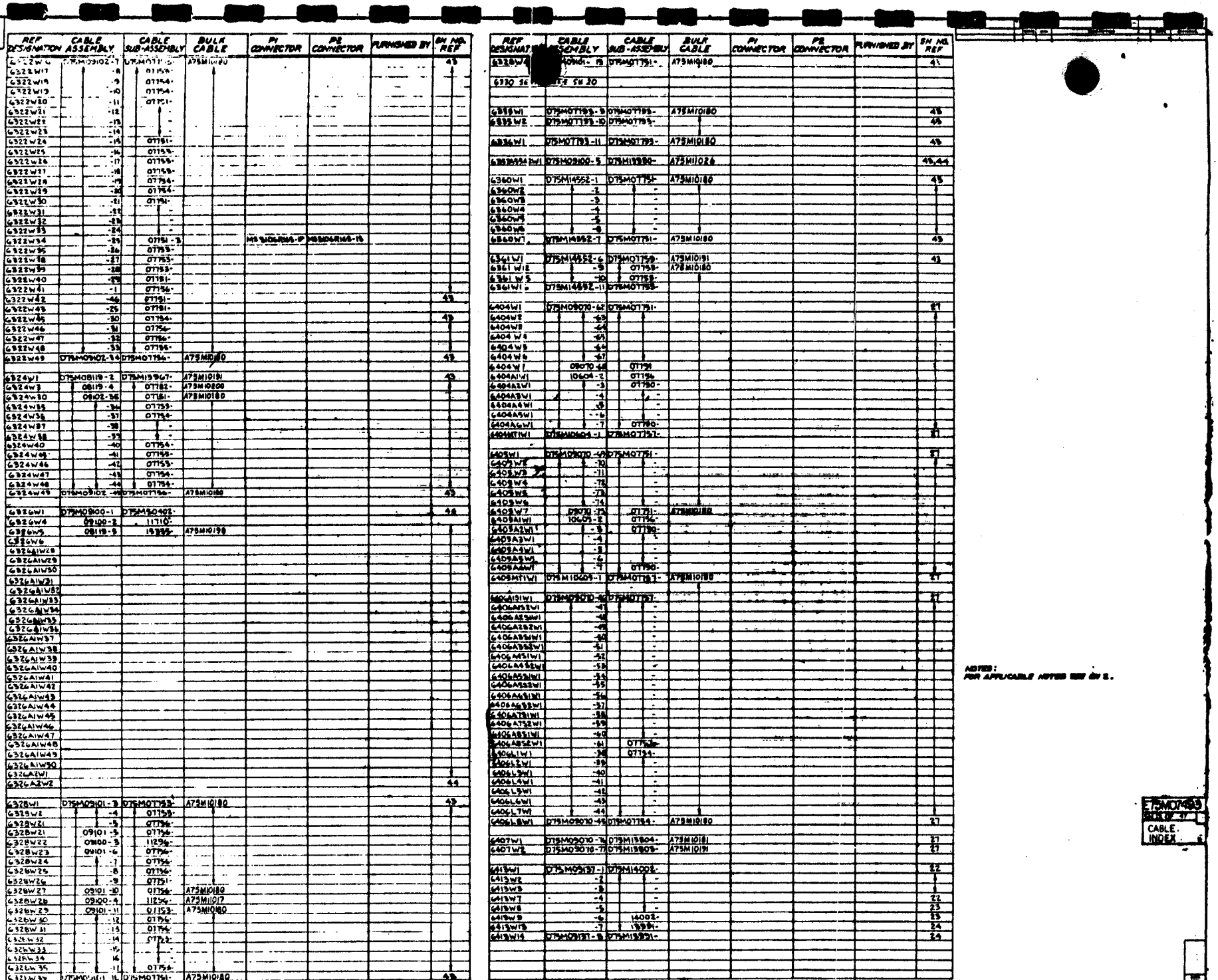
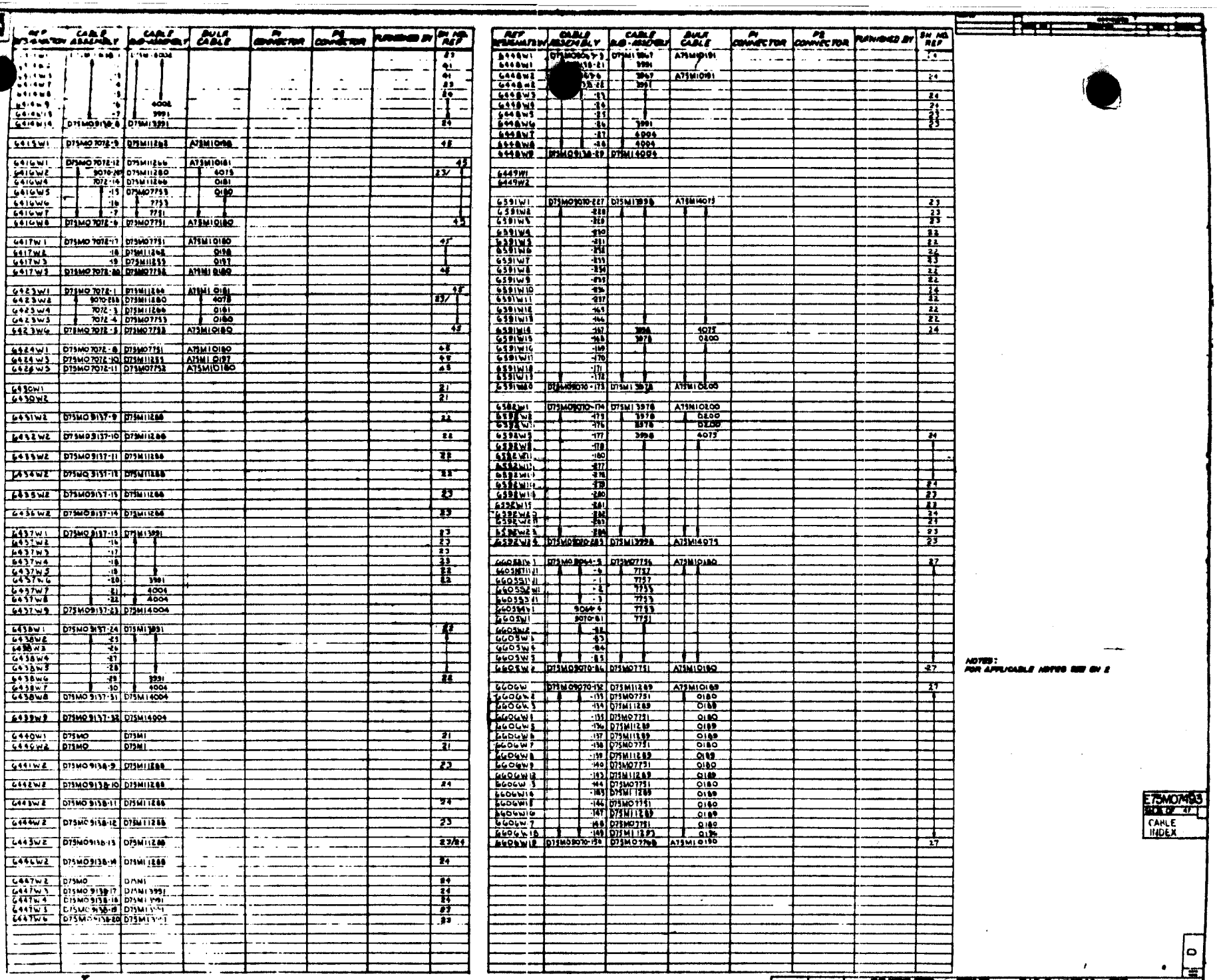


Figure 6-6 Cable Interconnect Diagrams (Continued)



REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
6415W1	D75MO7078-9	D75MI1288	A75MI0188				48
6416W1	D75MO7078-12	D75MI1266	A75MI0181				45
6416W2	9070-89	D75MI1280	4075				23/
6416W4	7072-14	D75MI1266	0181				
6416W5	-15	D75MO7753	0180				
6416W6	-16	7753					
6416W7	-7	7751					
6416W8	D75MO7078-9	D75MO7751	A75MI0180				45
6417W1	D75MO 7078-17	D75MO7751	A75MI0180				47
6417W2	-18	D75MI1248	0198				
6417W3	-19	D75MI1255	0197				
6417W3	D75MO 7078-20	D75MO7756	A75MI 0180				46
6423W1	D75MO 7072-1	D75MI1266	A75MI 0181				45
6423W2	9070-266	D75MI1280	4075				23/
6423W4	7072-3	D75MI1266	0181				
6423W5	7072-4	D75MO7753	0180				
6423W6	D75MO 7072-5	D75MO7758	A75MI0180				45
6424W1	D75MO 7072-6	D75MO7751	A75MI0180				48
6424 W3	D75MO 7072-10	D75MI1255	A75MI 0197				49
6426W5	D75MO 7072-11	D75MO7752	A75MI0180				48
6430W1							21
6430W2							21
6431W2	D75MO 9137-9	D75MI1288					22
6432W2	D75MO 9137-10	D75MI1288					22
6433W2	D75MO 9137-11	D75MI1286					22
6434W2	D75MO 3137-12	D75MI1288					22
6435W2	D75MO9137-13	D75MI1288					23
6436W2	D75MO 9137-14	D75MI1286					23
6437W1	D75MO 9137-15	D75MI3991					23
6437W2	-16						23
6437W3	-17						23
6437W4	-18						23
6437W5	-19						23
6437W6	-20	3991					23
6437W7	-21	4004					
6437W8	-22	4004					
6437W9	D75MO9137-23	D75MI4004					
6438W1	D75MO 9137-24	D75MI3991					23
6438W2	-25						
6438W3	-26						
6438W4	-27						
6438W5	-28						
6438W6	-29	3991					22
6438W7	-30	4004					
6438W8	D75MO 9137-31	D75MI4004					
6439W9	D75MO 9137-32	D75MI4004					
6440W1	D75MO	D75MI					21
6440W2	D75MO	D75MI					21
6441W2	D75MO 9138-9	D75MI1288					23
6442W2	D75MO 9138-10	D75MI1288					24
6443W2	D75MO 9138-11	D75MI1286					24
6444W2	D75MO 9138-12	D75MI1286					23
6445W2	D75MO9138-13	D75MI1288					23/24
6446W2	D75MO9138-14	D75MI1288					24
6447W2	D75MO	D7SMI					24
6447W3	D75MO 9138-17	D75MI 3991					24
6447W4	D75MO 9138-18	D75MI 3991					24
6447W5	D75MO 9138-19	D75MI 3991					23
6447W6	D75MO 9138-20	D75MI 3991					23

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
6448W1	D75MO9038-3	D75MI 3967	A75MI0191				24
6448W1	-21	3991					
6448W2	9696	3967	A75MI0191				24
6448W2	-22	3991					
6448W3	-23						24
6448W4	-24						24
6448W5	-25						24
6448W6	-26	3991					23
6448W7	-27	4004					
6448W8	-28	4004					
6448W9	D75MO9138-29	D75MI4004					
6449W1							
6449W2							
6591W1	D75MO9010-227	D75MI3978	A75MI4075				23
6591W2	-228						23
6591W3	-229						23
6591W4	-230						22
6591W5	-231						22
6591W6	-232						22
6591W7	-233						23
6591W8	-234						22
6591W9	-235						22
6591W10	-236						24
6591W11	-237						22
6591W12	-164						22
6591W13	-166						22
6591W14	-167	3996	4075				24
6591W15	-168	3978	0200				
6591W16	-169						
6591W17	-170						
6591W18	-171						
6591W19	-172						
6591W20	D75MO9010-173	D75MI 3978	A75MI0200				
6598W1	D75MO9010-174	D75MI 3978	A75N10200				
6598W2	-175	3978	0200				
6598W3	-176	3978	0200				
6598W4	-177	3998	4075				24
6598W8	-178						
6598W11	-180						
6598W12	-177						
6598W13	-178						
6598W14	-179						24
6598W15	-280						23
6598W16	-281						23
6598W17	-282						24
6598W18	-283						24
6598W19	-284						23
6598W20	D75MO9010-285	D75MI3998	A75MI4075				23
6603W1	D75MO 8964-5	D75MO7756	A75MI0180				27
6603W11	-6	7757					
6603W11	-7	7757					
6603W1	-8	7755					
6603W1	-9	7753					
6603W1	9064-6	7753					
6603W1	9070-81	7751					
6603W2	-82						
6603W3	-83						
6603W4	-84						
6603W5	-85						
6603W6	D75MO9070-86	D75MO7751	A75MI0180				27
6606W	D75MO9070-132	D75MI1289	A75MI0189				27
6606W2	-133	D75MO7751	0180				
6606W3	-134	D75MI1289	0189				
6606W4	-135	D75MO7751	0180				
6606W5	-136	D75MI1289	0189				
6606W6	-137	D75MI1289	0189				
6606W7	-138	D75MO7751	0180				
6606W8	-139	D75MI1289	0189				
6606W9	-140	D75MO7751	0180				
6606W10	-143	D75MI1289	0189				
6606W11	-144	D75MO7751	0180				
6606W12	-145	D75MI1289	0189				
6606W13	-146	D75MO7751	0180				
6606W14	-147	D75MI1289	0189				
6606W15	-148	D75MO7751	0180				
6606W16	-149	D75MI1289	0189				
6606W17	D75MO9070-150	D75MO7758	A75MI0180				27

NOTES:
FOR APPLICABLE NOTES SEE SH 2

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CABLE INTERCONNECT
D LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
[illegible]	[illegible]	[illegible]					22
6613W7	-7						
6613W11	-8						
6613W12	-4						
6613W13	-5						
6613W18	-6						
6613W21	-7						
6613W32	-8						
6613W33	-9						
6613W41	-10						
6613W42	D75M09795-11	D75MI3992					22
6614W4	D75M09796-1	D75MI3992					23
6614W5	-2						
6614W6	-3						
6614W7	-4						
6614W11	-5						
6614W12	-6						
6614W35	-7						
6614W41	-8						
6614W42	D75M09796-9	D75MI3992					22
6615W4	D75M09797-1	D75MI3992					23
6615W5	-2						
6615W6	-3						
6615W11	-4						
6615W35	-5						
6615W41	-6						
6615W42	D75M09797-7	D75MI3992					23
6616W4	D75M09798-1	D75MI3992					23
6616W5	-2						
6616W6	-3						
6616W11	-4						
6616W35	-5						
6616W41	-6						
6616W42	D75M09798-7	D75MI3992					23
6617W4	D75M09799-1	D75MI3992					23
6617W5	-2						
6617W6	-3						
6617W7	-4						
6617W11	-5						
6617W19	-6						
6617W20	-7						
6617W27	-8						
6617W28	-9						
6617W35	-10						
6617W40	-11						
6617W41	-12						
6617W42	D75M09799-13	D75MI3992					23
6618W4	D75M09794-1	D75MI3992					24
6618W5	-2						
6618W6	-3						
6618W11	-4						
6618W35	-5						
6618W41	-6	D75MI3992					
6618W42	D75M09794-7	D75MI3991					24
6619W12	D75M09800-1	D75MI3992					24
6619W13	-2						
6619W19	-3						
6619W20	-4						
6619W21	-5						
6619W41	-6						
6619W42	D75M09800-7	D75MI3992					24
6620W4	D75M09801-1	D75MI3992					24
6620W5	-2						
6620W6	-3						
6620W11	-4						
6620W12	-5						
6620W14	-6						
6620W20	-7						
6620W27	-8						
6620W28	-9						
6620W32	-10						
6620W33	-11						
6620W34	-12						
6620W35	-13						
6620W41	-14						
6620W42	D75M09801-15	D75MI3992					24
6621W4	D75MI4068-1	D75MI3992					22
6621W5	-2						
6621W6	-3						
6621W7	-4						
6621W11	-5						
6621W41	-6						
6621W42	D75MI4068-7	D75MI3992					22

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
6622W1							44
6622W7							
6622W8							
6622W9							
6622W10	D75MI4067-45	D75MI5495-8					
6622W16	-25	D75MI3992					
6622W17	-1						
6622W18	-2						44
6622W19	-3						
6622W20	-4	D75MI3992					
6622W21							44
6622W22	-26	D75MI5495					
6622W23	-27						
6622W24	-28						
6622W25	-29						
6622W26	-30						44
6622W27	-31						
6622W28	-32						
6622W29	-33						
6622W30	-34	D75MI5495					
6622W31	-5	D75MI3992					
6622W32	-6						
6622W33	-7						
6622W34	-8						
6622W35	-9						
6622W36	-10						44
6622W37	-11						
6622W38	-12						
6622W39	-13						44
6622W40	-14	D75MI3992					
6622W41	-35	D75MI5496					
6622W42	-36						
6622W43	-37						44
6622W44	-38						
6622W45	-39						44
6622W46	-40						
6622W47	-41						44
6622W48	-42						
6622W49	-43						
6622W50	-44	D75MI5495					
6622W51	-15	D75MI3992					
6622W52	-16						
6622W53	-17						44
6622W54	-18						
6622W55	-19						
6622W56	-20						
6622W57	-21						
6622W58	-22						
6622W59	-23						
6622W60	D75MI4067-24	D75MI3992					
6623W3							
6623W7							
6623W9							
6623W12							44
6623W21							
6623W23							
6623W24							
6623W26							
6623W27							
6623W28							
6623W29							
6623W30							
6623W32							
6623W33							
6623W34							44
6623W37							
6623W38							44
6623W39							
6623W40							
6623W41							44
6623W42							
6623W43							44
6623W44							
6623W45							
6623W47							
6623W48							
6623W50							44
6623W51							
6623W52							44
6623W53							44
6623W54							
6623W55							
6623W56							
6623W57							44
6623W58							44

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CABLE INTERCONNECT
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Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	SUB-ASSEMBLY	BULK CABLE	IN CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
6640W1	D75M09010-924	D75M07759-					22
6640W2	09010-924	07759-					22
6640W2	09799-15	19991-					22/23
6640W3	09010-924	07759-	A75M10191				
6640W4	-924	-					
6640W5	-923	-					
6640W6	-922	-					
6640W7	-921	-					
6640W8	-920	07759-	A75M10191				
6640W9	-931	19942-	A75M10192				
6640W10	-934	07799-	A75M10191				
6640W11	-933	19942-	A75M10192				
6640W12	-932	19942-	A75M10192				
6640W13	-929	07759-	A75M10191				
6640W14	-928	07759-	A75M10191				
6640W15	-927	19942-	A75M10191				
6640W16	-936	-	A75M10192				
6640W25	-939	-					
6640W26	-938	-					
6640W27	-937	-					
6640W28	-938	19942-	A75M10192				
6640W29	-930	13968-	A75M10193				
6640W30	-927	13968-	A75M10193				
6640W31	-928	19968-	A75M10193				25
6640W42	-977	19803-	A75M10191				26
6640W43	-976	19803-	A75M10191				26
6640W101	-947	07782-	A75M10200				25
6640W102	-945	-					
6640W103	-946	-					
6640W104	-951	-					
6640W105	-950	-					
6640W106	-954	-					
6640W107	-948	-					
6640W108	-955	-					
6640W109	D75M09070-952	D75M07782-	A75M10200				25
6641W1	D75M09070-941	D75M07759-	A75M10191				25
6641W2	09070-941	07759-	A75M10191				
6641W2	09794-8	13991-					25
6641W3	09070-942	07759-	A75M10191				
6641W4	-941	-					
6641W5	-940	-					
6641W6	-909	07759-	A75M10191				
6641W7	-908	13942-	A75M10192				
6641W8	-907	13942-	A75M10192				
6641W9	-906	13942-	A75M10192				
6641W10	-903	13968-	A75M10193				
6641W11	-902	13968-	A75M10193				
6641W12	-904	13998-	A75M14075				
6641W13	-908	07759-	A75M10191				
6641W14	-907	07759-					25
6641W33	-915	13803-					26
6641W34	-916	19803-	A75M10191				26
6641W101	-980	07782-	A75M10200				25
6641W102	-979	07782-	A75M10200				25
6641W103	D75M09070-978	D75M07782-	A75M10200				25
6642W3	D75M09800-8	D75M13991-					24
6643W2	D75M09801-16	D75M13991-					24
6650W5	D75M10606-5	D75M13998-					26
6650W6	-6	-					
6650W7	-8	-					
6650W12	-9	-					
6650W13	-7	-					
6650W14	-4	-					
6650W20	-13	-					
6650W21	-3	-					
6650W22	-12	-					
6650W32	-11	-					
6650W40	-1	-					
6650W41	-2	-					
6650W42	D75M10606-10	D75M13998-					26
6651W5	D75M10607-12	D75M13998-					26
6651W6	-1	-					26
6651W7	-13	-					26
6651W14	D75M10603-14	D75M13998-					27

REF DESIGNATION	CABLE ASSEMBLY	SUB-ASSEMBLY	BULK CABLE	IN CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO REF
6651W15	D75M10607-4	D75M13998-					
6651W19	-10	-					26
6651W20	-16	-					27
6651W21	-5	-					26
6651W25	-15	-					
6651W26	-19	-					
6651W27	-20	-					26
6651W28	-17	-					27
6651W32	-6	-					
6651W33	-7	-					
6651W34	-11	-					
6651W35	-12	-					
6651W38	-8	-					27
6651W40	-2	-					26
6651W41	-9	-					26
6651W42	D75M10607-6	D75M13998-					26
6661W1	D75M08386-1	D75M13991-					21
6661W2	D75M08386-2	D75M14003-	A75M10200				21
6661W3	D75M08386-3	D75M13981-					21
6662W1	D75M08386-4	D75M13991-					21
6662W2	D75M08386-5	D75M14003-	A75M10200				21
6662W3	D75M08386-6	D75M13981-					21
6665W1	D75M09010-95	D75M13998-	A75M14075				26
6665W2	-293	13998-					
6665W3	-79	11280-					146
6665W4	-78	11280-					146
6665W5	-112	11280-					146
6665W6	-36	13998-					
6665W8	-28	11280-					
6665W10	-12	11280-					
6665W11	-113	11280-					146
6665W13	-86	13998-					
6665W14	-29	11280-					
6665W15	-13	11280-					
6665W16	-37	13998-					26
6665W17	D75M09070-294	D75M13998-					
6666W1	D75M09070-93	D75M13998-					
6666W2	-125	11280-					26
6666W3	-124	-					27
6666W3	-80	-					26/46
6666W4	-114	-					146
6666W5	-115	11280-					146
6666W6	-32	13998-					26
6666W7	-123	11280-	A75M14075				27
6666W9	-89	-	A75M10191	P101P8A-WP-1	P101P8A-WP-1		27
6666W9	-88	-	A75M14075				27
6666W10	-30	-					26
6666W11	-116	-					26/46
6666W13	-120	-					27
6666W14	-89	-					27
6666W15	-91	-					26
6666W16	-101	11280-					27
6666W18	-27	13998-					26
6666W20	D75M09070-89	D75M13998-	A75M14075				26
6667W1	D75M09070-87	D75M07759-	A75M10191				27
6668W2	D75M09070-98	D75M11280-	A75M14075				
6708W1	D75M13100-4	D75M08666-					26
6708W2	-6	-					
6708W3	-9	-					
6708W4	-10	-					
6708W5	-4	-					
6708W6	-12	-					
6708W7	-13	-					
6708W8	-14	-					
6708W9	-23	-					
6708W10	-16	08666-					26
6708W11	-15	14528-1	MICRO-DOT MS3470L4S-10-32S32-17P		PTO6P-24-61P		
6708W16	-17	08666-					26
6708W14	D75M13100-18	D75M08666-					26
6709W1W1	D75M13100-19	D75M08666-					26
6709W1W1	-16	-					
6709W2W1	-22	-					
6709W3W1	-21	-					
6709W4W1	-24	-					
6709W5W1	-20	-					
6709W6W1	-31	-					
6709W8W1	D75M13100-33	D75M08666-					26

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Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
6714W1	D75MI2100-2	D75M50452					26
6714W2	D75MI2100-7	D75MI1288					26
6715W1	D75MI2100-3	D75M50452					26
6715W2	D75MI2100-8	D75MI1288					26
6716W1	D75MI2100-20	D75M50452					26
6716W2	D75MI2100-24	D75MI1288					26
6717W1	D75MI2100-25	D75M50452					26
6717W2	D75MI2100-27	D75MI1288					26
6718W1	D75MI2100-26	D75M50452					26
6718W2	D75MI2100-28	D75MI1288					26
6883W1	D75M09070-181	D75MI1280	A75MI4075				22,46
6883W2	-183						22,46
6883W3	-183						22
6883W4	-184						22
6883W5	-185						22
6883W6	-186						22
6883W7	D75M09070-398	D75MI1280	A75MI4075				22,46
6884W1	D75M09070-187	D75MI1280	A75MI4075				22
6884W2	-188						22
6884W3	-189						22
6884W4	-190						22
6884W5	-191						22,46
6884W6	-191						22,46
6884W7	D75M09070-192	D75MI1280	A75MI4075				22,46
6885W1	D75M09070-193	D75MI1280	A75MI4075				23
6885W2	-194						23
6885W3	-195						23
6885W4	-196						22,46
6885W5	D75M09070-196	D75MI1280	A75MI4075				22,46
6886W1	D75M09070-197	D75MI1280	A75MI4075				23
6886W2	-198						23
6886W3	-199						23
6886W4	-199						23,46
6886W5	D75M09070-200	D75MI1280	A75MI4075				23,46
6887W1	D75M09070-201	D75MI1280	A75MI4075				23
6887W2	-202						23
6887W3	-203						23
6887W4							23
6887W5	-204						23,46
6887W6	-204						23,46
6887W9	D75M09070-204	D75MI1280	A75MI4075				23,46
6888W1	D75M09070-204	D75MI1280	A75MI4075				24
6888W2	-207						24
6888W3	-208						24
6888W4	-207						24,46
6888W6	D75M09070-209	D75MI1280	A75MI4075				24,46
6889W1	D75M09070-210	D75MI1280	A75MI4075				24
6889W2	-211						24
6889W3	-212						24
6889W4	-398						46
6889W5	D75M09070-213	D75MI1280	A75MI4075				46
6890W3	D75M09070-214	D75MI1998	A75MI4075				21
6890W5							24
6890W6							24
6890W7	-215	1280					24
6890W8	-216	1280					24
6890W12	D75M09070-216	D75MI1998	A75MI4075				21
6891W1	D75M09070-289	D75MI1280	A75MI4075				22
6891W2	-290						22
6891W3	-291						46
6891W6	-291						46
6891W7	D75M09070-292	D75MI1280	A75MI4075				22
6892W1	D75M09070-271	D75MI1999	A75MI0200				21
6892W2	-272						21
6892W3							
6892W4	D75M09070-	D75MI1999	A75MI0200				
6895W3	D75M09070-286	D75MI1280	A75MI4075				46

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	P1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH NO. REF
7200AW1	D75MI0400-1	D75MD7755	A75MI0180				
7200AW2	-2	7755					
7200AW3	-3	7755					
7200AW4	-4	7755	0180				
7200AW8	-8	7768	0190				
7200A2W1	-6	7753	0190				
7200A2W2	-7	7755					
7200A2W3	-8	7755					
7200A2W4	-9	7755	0180				
7200A2W5	-10	7768	0190				
7200A3W1	-11	7751	0180				
7200AAW1	D75MI0400-12	D75MO7755	A75MI0180				
7202W1	D75MI3806-1	D75MO7759	A75MI0191				2
7203W1	D75MI3806-2	D75MO7759	A75MI0191				27
7203W11	D75MI3806-5	D75MI4947	A75MI0191				
7203K8W1	D75MI3806-3	D75MO7761	A75MI0198				27
7204W1	D75MI3806-4	D75MO7761	A75MI0180				
7601W1	D75M09109-4	D75MO7774	A75MI0201				
7601W2	D75M09109-5	7774	0201				
7601W3	D75M09109-6	7773	0203				
7601W3	D75MI2016-51						
7601W3	D75MI3884-51						
7601W3	D75MI3888-40	D75MO7773	A75MI0203				
7602W1	D75M09109-7	D75MO7774	A75MI0201				21
7602W3	D75M09109-8	D75MO7773	A75MI0203				
7603AIW1	D75M08671-6	D75MO8667					
7603AIW2	-8						
7603AIW3	-9						
7603AIW4	-10	8667					
7603AIW5		8666					
7603AIW6	-8						
7603AIW7	-18						
7603AIW8	8671-4	8666					
7603AIW10	8667-1	8669					
7603AIW11	8666-1	8668					
7603AIW12	8671-6	8669					
7603AIW13	-9						
7603AIW14	-10						
7603AIW15	-15						
7603AIW16	-16						
7603AIW17	-10	8668					
7603AIW20	-17	8667					
7603AIW21	-11						
7603AIW22	-7						
7603AIW27	-17	8667					
7603A2W7	-28	8664					
7603A2W8	-23						
7603A2W9	-24						
7603A2W10	-21						
7603A2W11	-28	8664					
7603A2W12	-20	8668					
7603A3W1	-19	8669					
7603A6W28	-31	8134					
7603A6W33	-27	8968					
7603A6W34	-26						
7603A6W35	-29						
7603A6W36	-30	8968					
7603A6W39	-32	7759	A75MI0191				
7603A6W40	-33						
7603A6W41	-34						
7603A6W42	-35						
7603A6W43	-36						
7603A6W45	D75M08671-37	D75MO7759	A75MI0191				
7606W1	D75M09108-9	D75MO7774	A75MI0201				
7608W1	D75M09109-10	D75MO7774	A75MI0201				
7608W2	D75M09109-11	D75MO7774	A75MI0201				

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CABLE INTERCONNECT D LAUNCH EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	J1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH. NO. REF
7830A1W2	D75M11290-1	D75M11290		MS3106R14S-2S			
7830B1W1	D75M09067-12	D75M11289	A10189	MS3106R24-10P	MS3106R24-10S		
7831A1W2	D75M11290-2	D75M11290		MS3106R14S-2S			27
7831B1W1	D75M09067-13	D75M11289	A10189	MS3106R24-10P	MS3106R24-10S		27
7832A1W2	D75M11290-3	D75M11290		MS3106R14S-2S			27
7832B1W1	D75M09067-14	D75M11289	A10189	MS3106R24-10P	MS3106R24-10S		27
7833A1W2	D75M11290-4	D75M11290		MS3106R14S-2S			27
7833B1W1	D75M09067-15	D75M11289	A10189	MS3106R24-10P	MS3106R24-10S		27
7834W1	D75M09067-17	D75M11289	A10189	MS3106R24-10P	MS3106R24-10S		27
7834W2	D75M11290-5	D75M11290		MS3106R14S-2S			27
7859W4	D75M09070-127	D75M07739	A10191	10-32 3440-81P	10-32 3440-81S		27
7861W4	D75M09070-126	D75M07739	A10191	10-32 3440-81P	10-32 3440-81S		27
7862W1	D75M09070-132	D75M13984	A10188	MS3106R24-23S			27
7862W2	D75M09067-18	D75M11262	A10188	MS3106R24-23P	MS3106R24-23S		27
7869W3	D75M09067-16	D75M11293	A10196	MS3106R18-1P	MS3106R18-1S		
7950W1	D75M14892-1	D75M07731	A10180	MS3106R16S-1P	MS3106R16S-1S		
7950W2	D75M14892-3	D75M07731	A10180	MS3106R16S-1P	MS3106R16S-1S		
7950W3	D75M14892-3	D75M07731	A10180	MS3106R16S-1P	MS3106R16S-1S		
7953W1	D75M14892-2	D75M07731	A10180				
7953W2	D75M14892-4	D75M07731	A10180				
7956W1	D75M14892-6	D75M07731	A10180				
7957W1	D75M14892-7	D75M07731	A10180				
7958W1	D75M09063-9	D75M13967	A10191				
7958W2	D75M09063-10	D75M13967	A10191				
7959W1	D75M09063-11	D75M13967	A10191				
7959W2	D75M09063-12	D75M13967	A10191				
7960W1	D75M09063-13	D75M14947	A10191				
7960W2	D75M09063-14	D75M14947	A10191				
7961W1	D75M09063-15	D75M14947	A10191				
7961W2	D75M09063-16	D75M14947	A10191				
424W							
424W							
424W							
424W							
6330W2							43
6330W3							
633CW4							
633CW5							
633CW6							
633CW7							
633CA1W1							
633CA2W1							
633CA4W1							
633CA5W1							
633CA6W1							
633CA7W1							43

REF DESIGNATION	CABLE ASSEMBLY	CABLE SUB-ASSEMBLY	BULK CABLE	J1 CONNECTOR	P2 CONNECTOR	FURNISHED BY	SH. NO. REF

NOTES:
FOR APPLICABLE NOTES SEE SH 2

ZSM09063
CABLE INDEX

CABLE INTERCONNECT
D LAUNCH
EQUIPMENT, LC39

Figure 6-6 Cable Interconnect Diagrams (Continued)

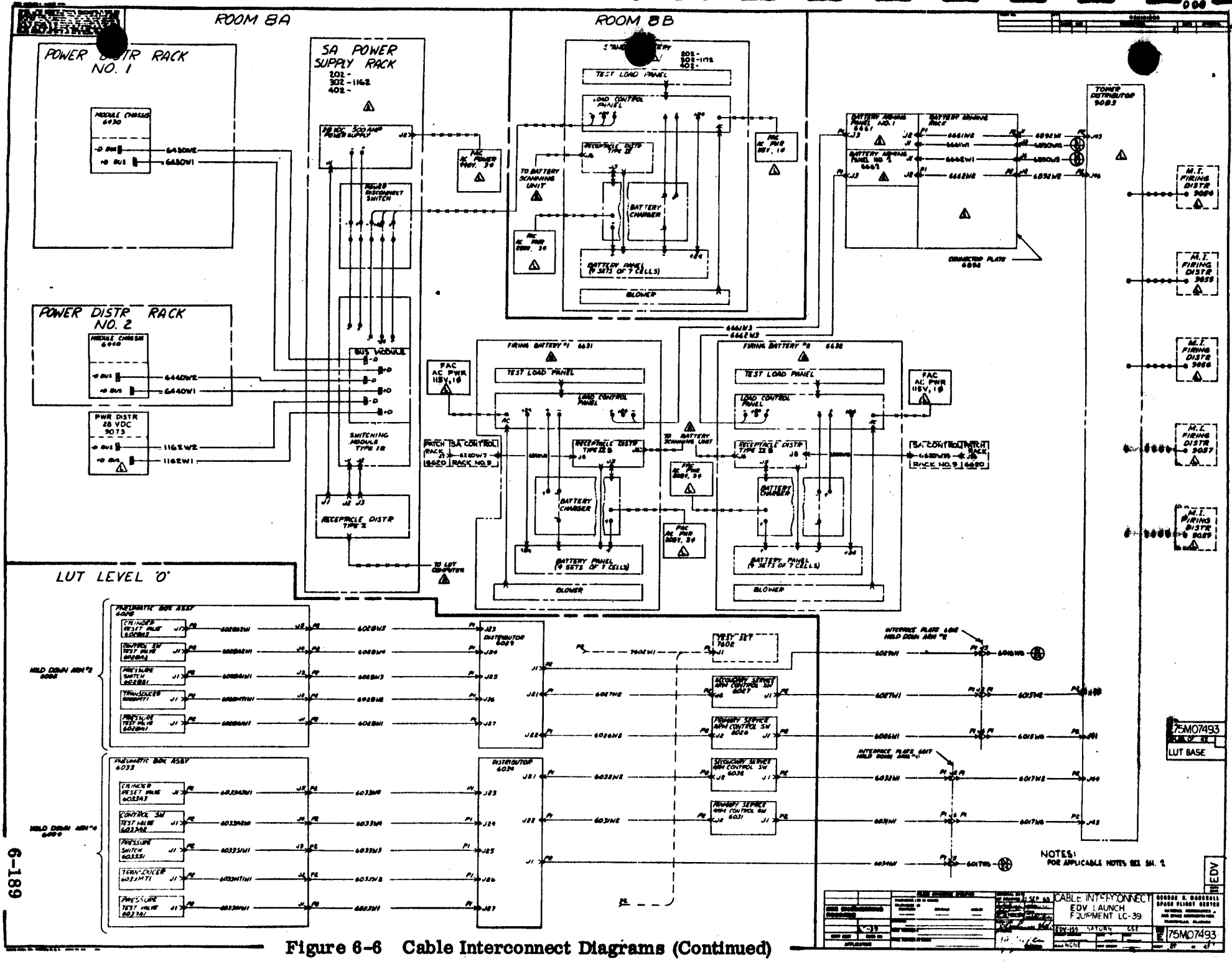

Figure 6-6 Cable Interconnect Diagrams (Continued)

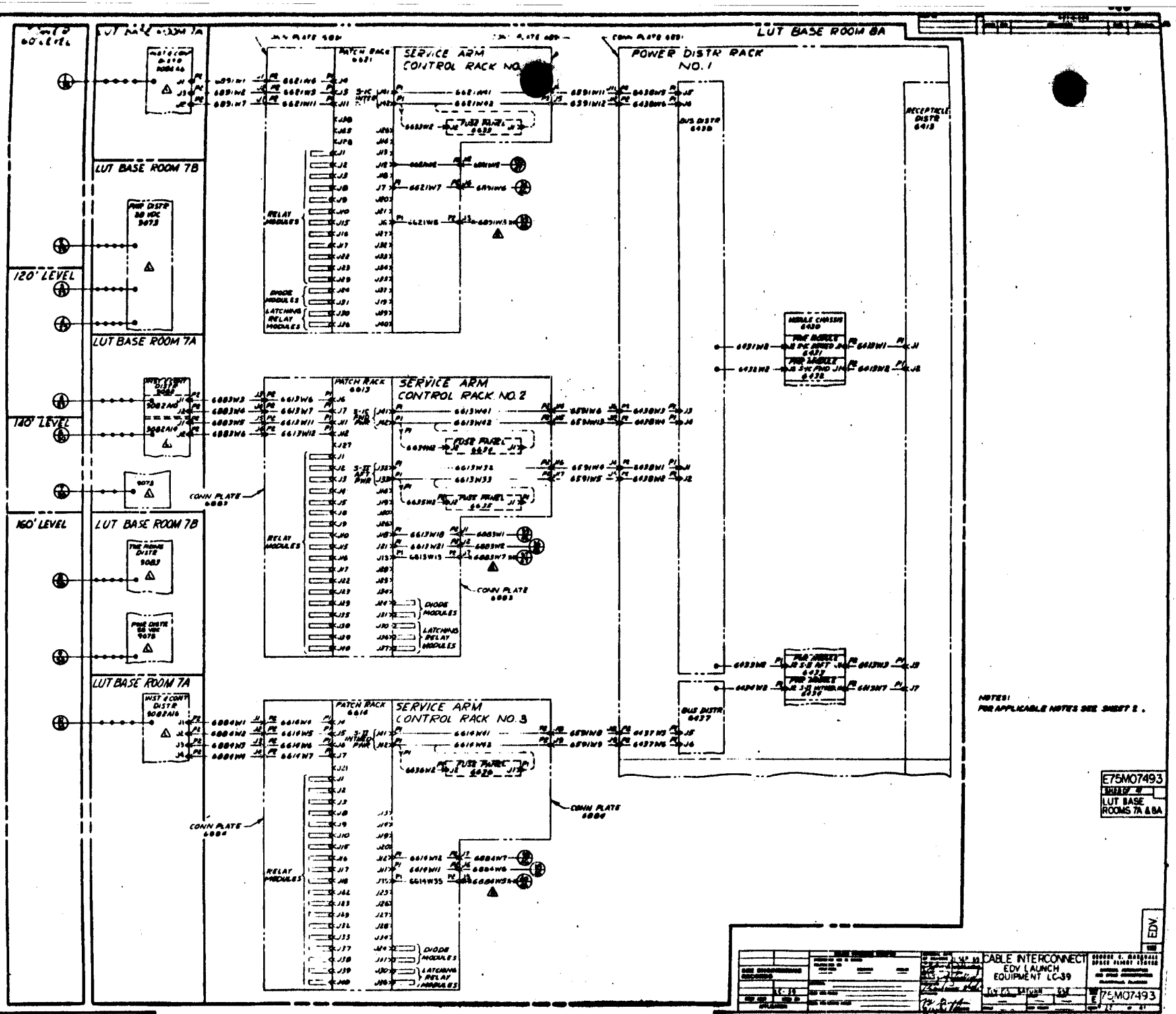

Figure 6-6 Cable Interconnect Diagrams (Continued)

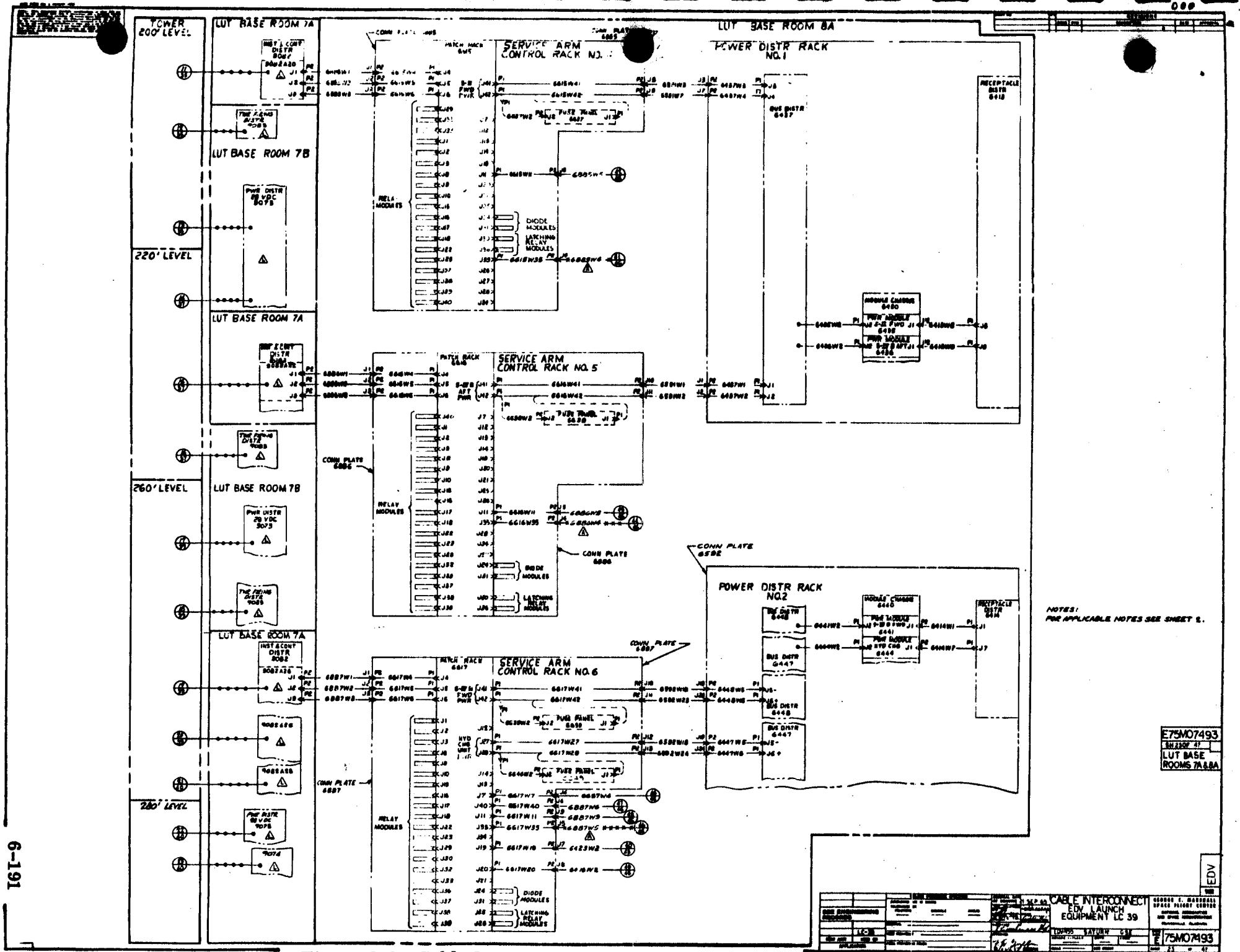

Figure 6-6 Cable Interconnect Diagrams (Continued)

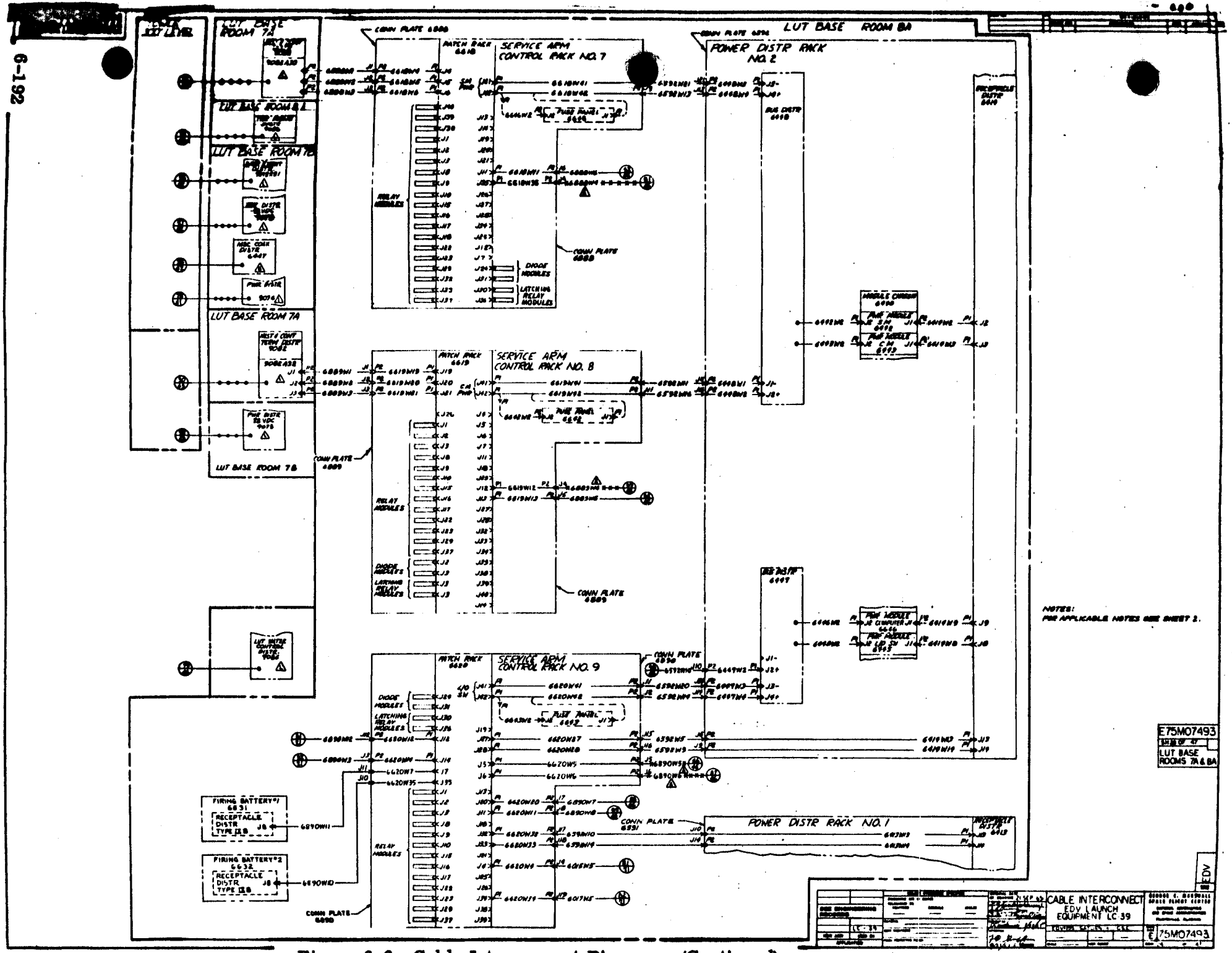

Figure 6-6 Cable Interconnect Diagrams (Continued)

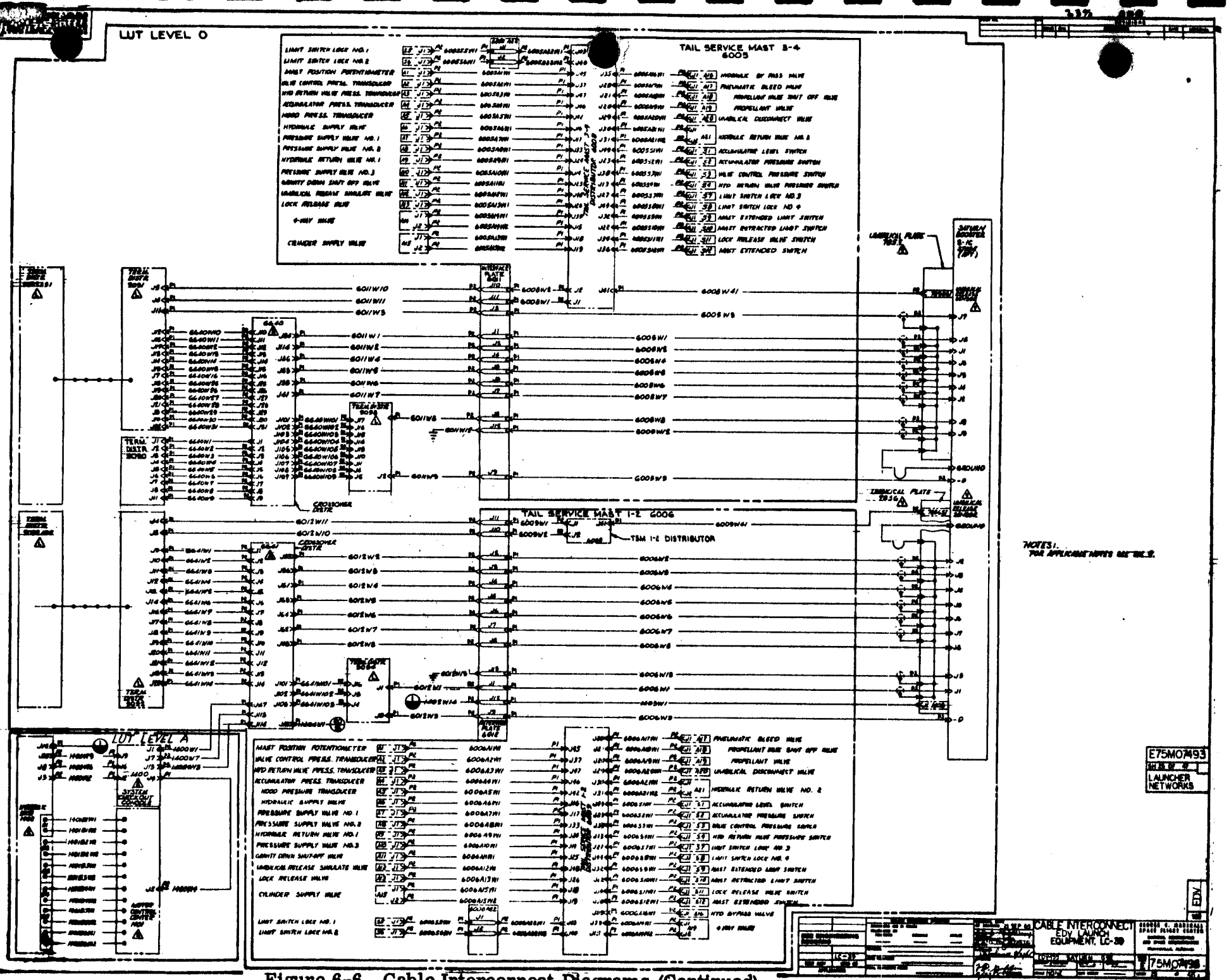

Figure 6-6 Cable Interconnect Diagrams (Continued)

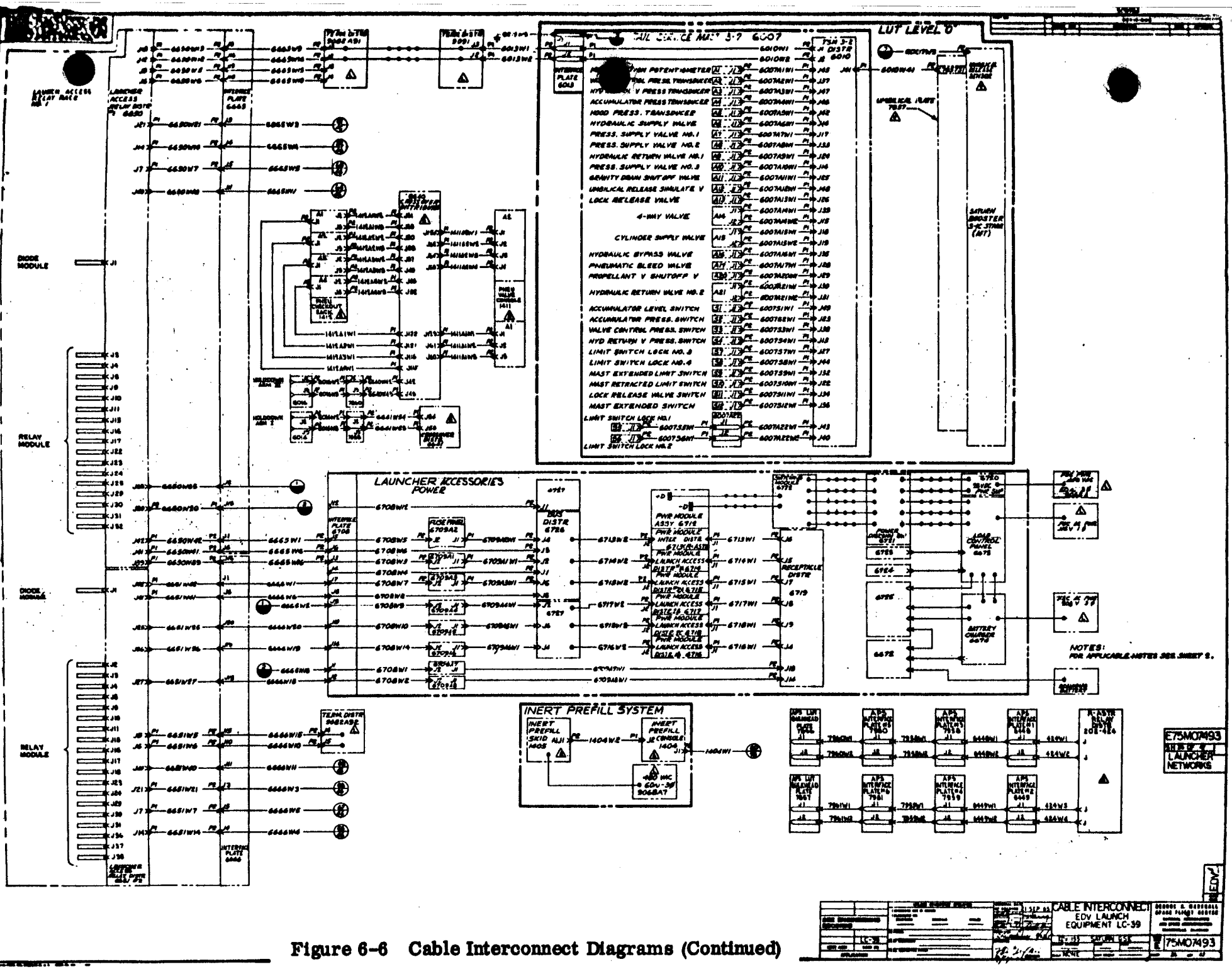

Figure 6-6 Cable Interconnect Diagrams (Continued)

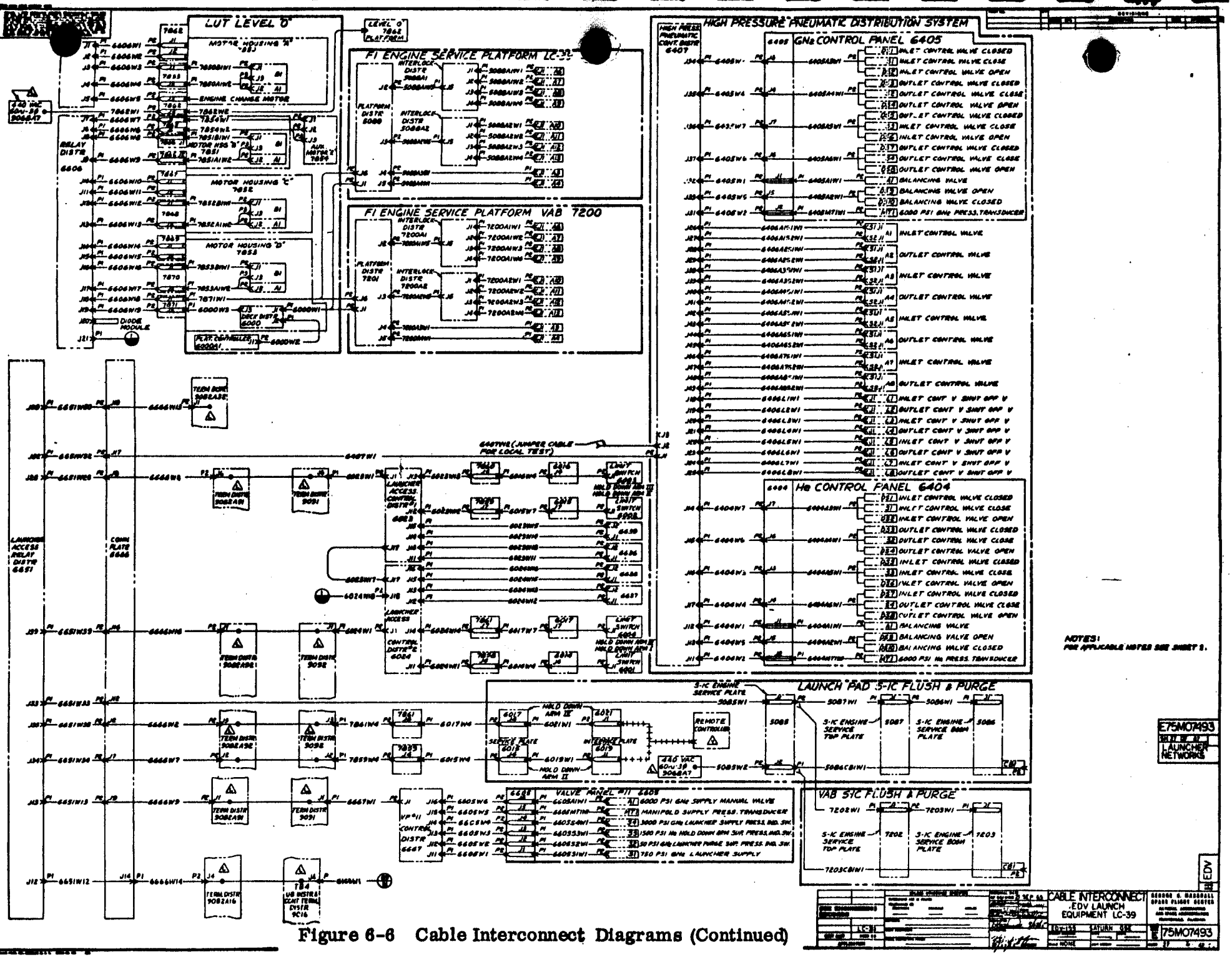

Figure 6-6 Cable Interconnect Diagrams (Continued)

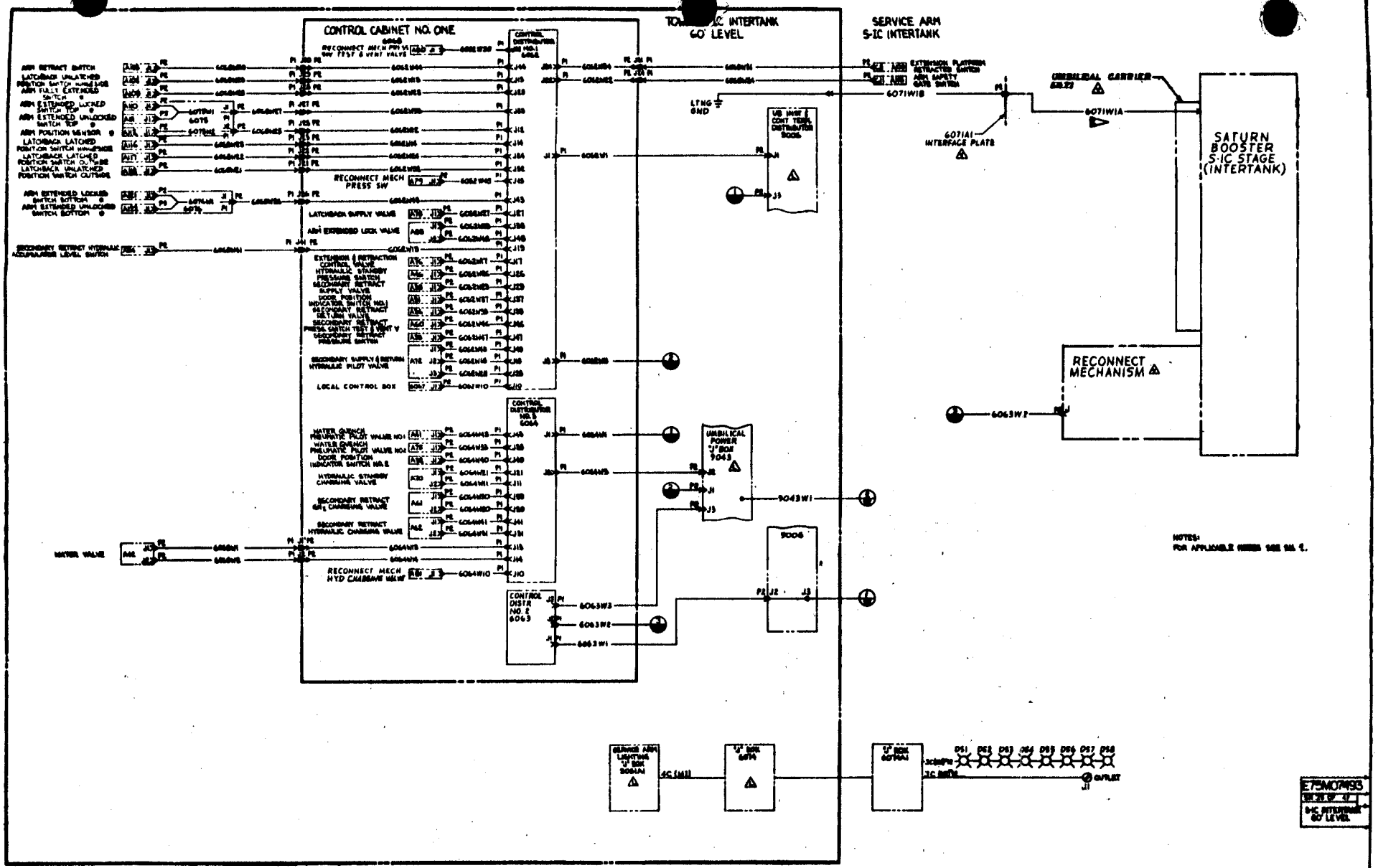

Figure 6-6 Cable Interconnect Diagrams (Continued)

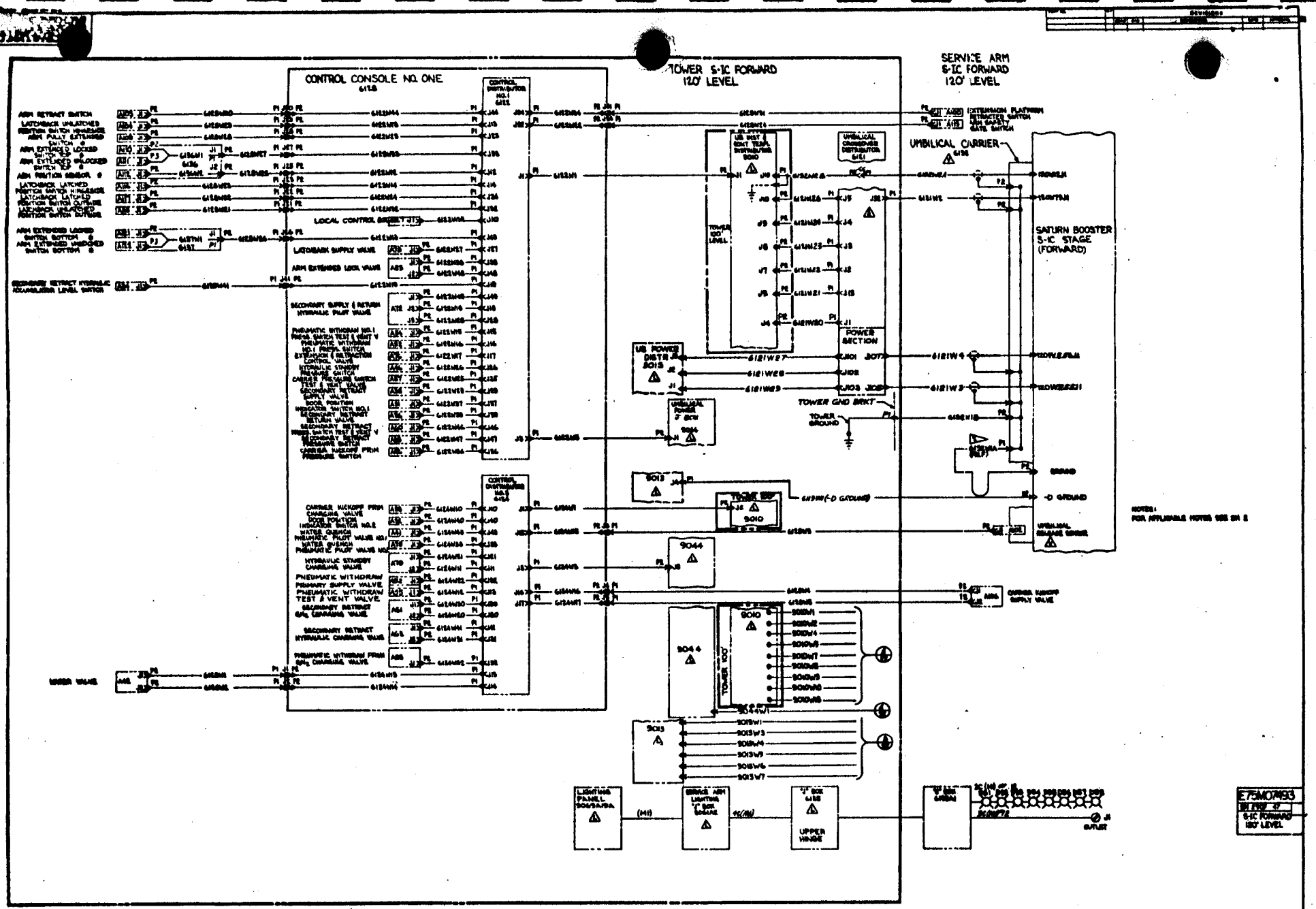

Figure 6-6 Cable Interconnect Diagrams (Continued)

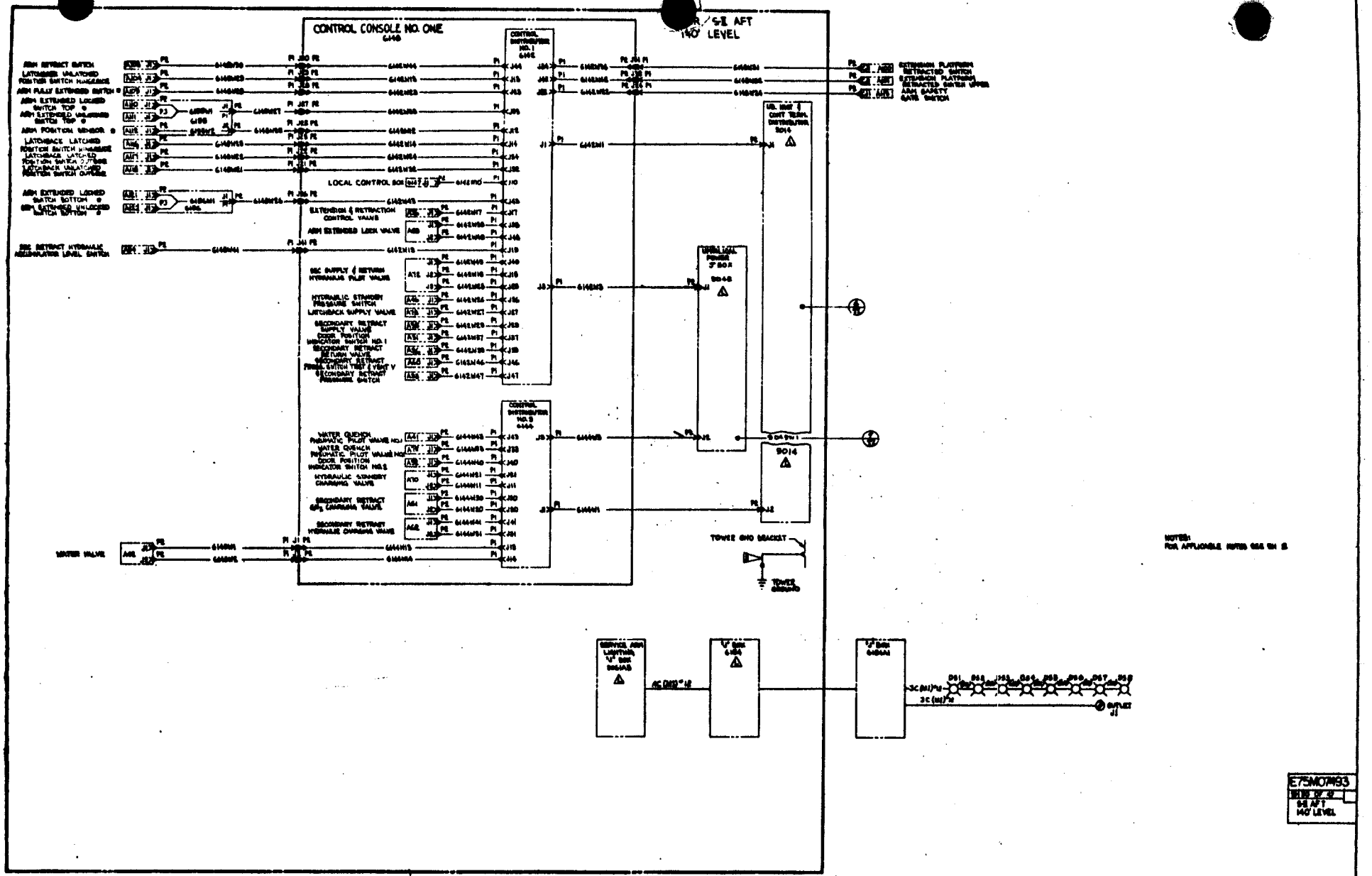

Figure 6-6 Cable Interconnect Diagrams (Continued)

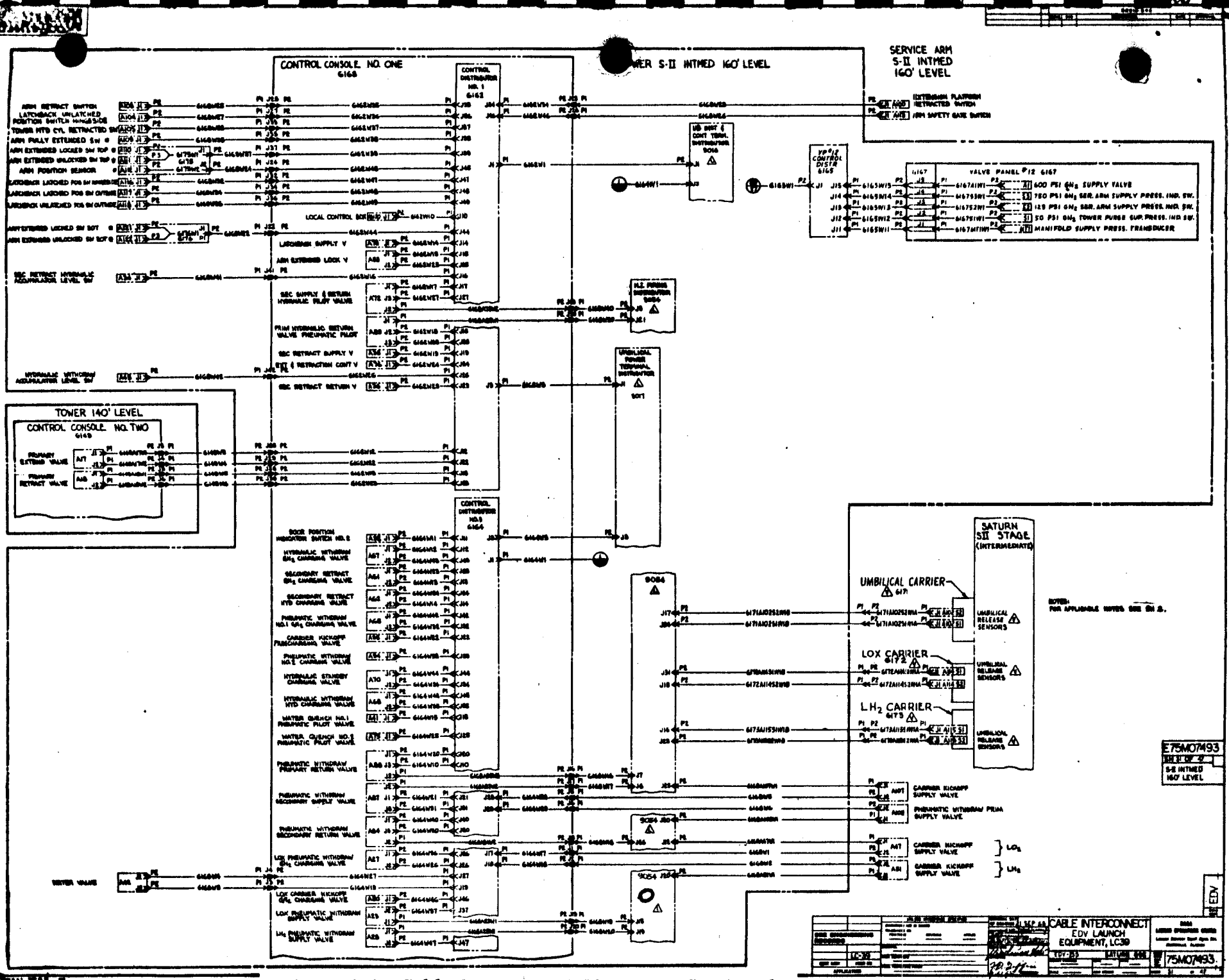

Figure 6-6 Cable Interconnect Diagrams (Continued)

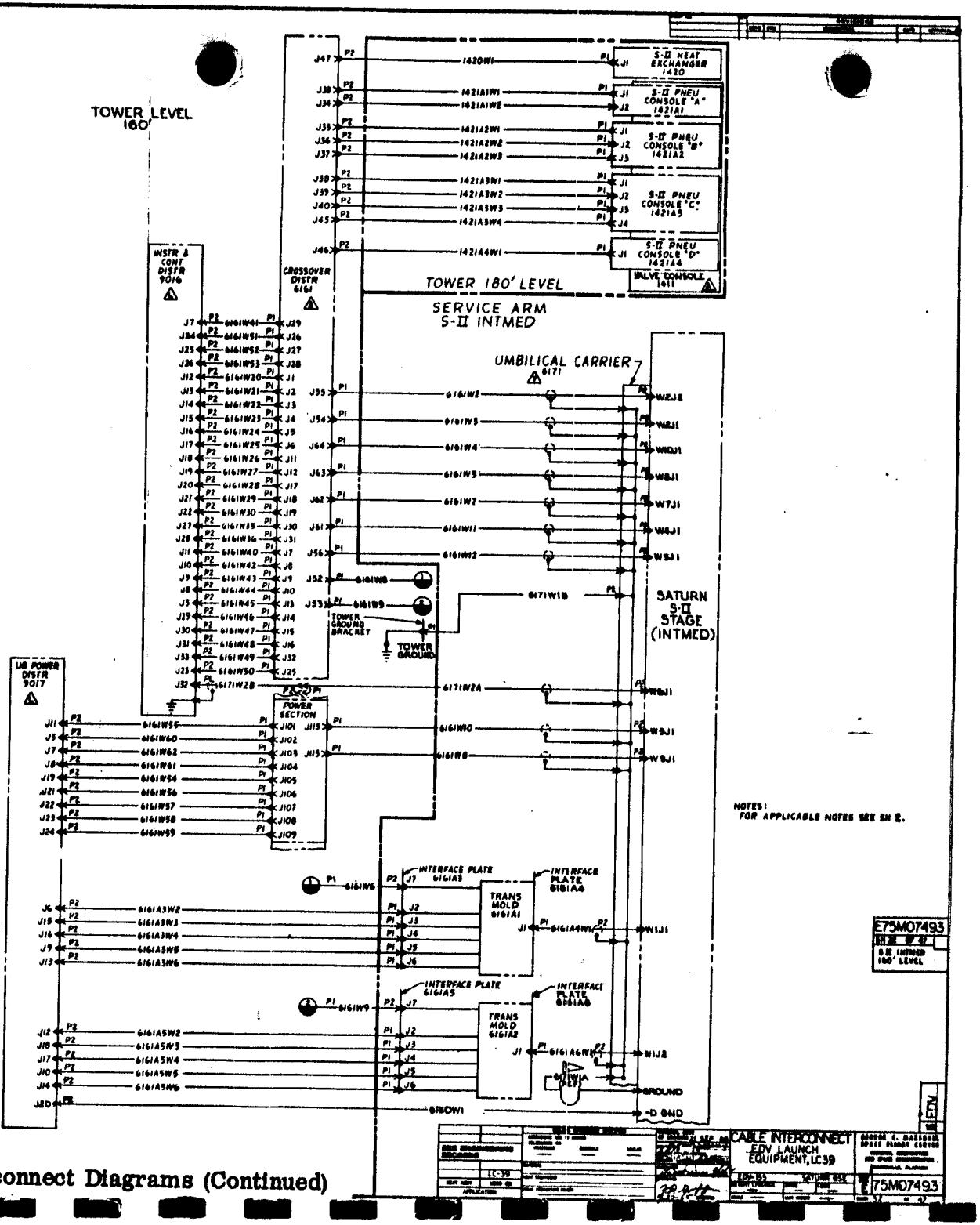

Figure 6-6 Cable Interconnect Diagrams (Continued)

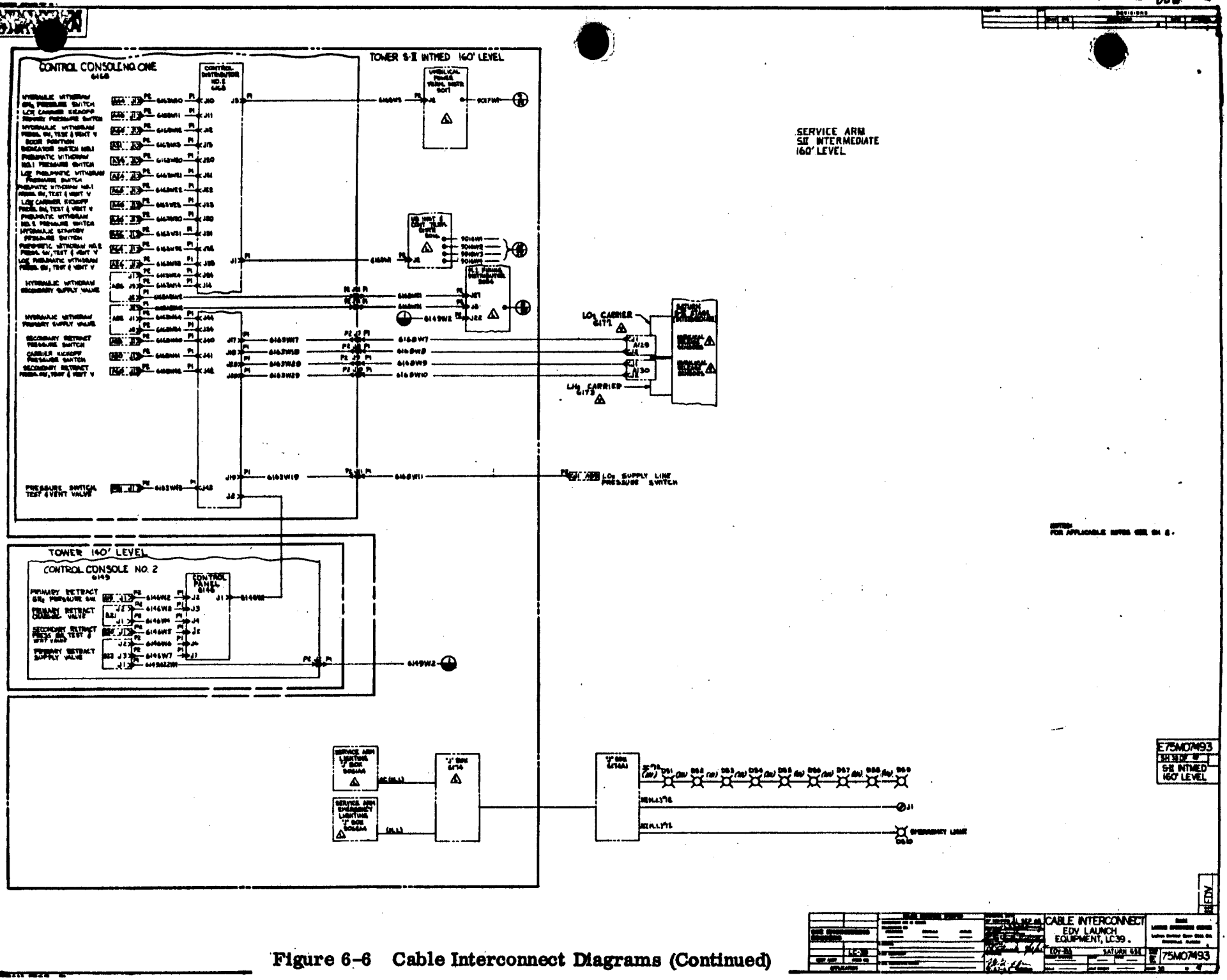

Figure 6-6 Cable Interconnect Diagrams (Continued)

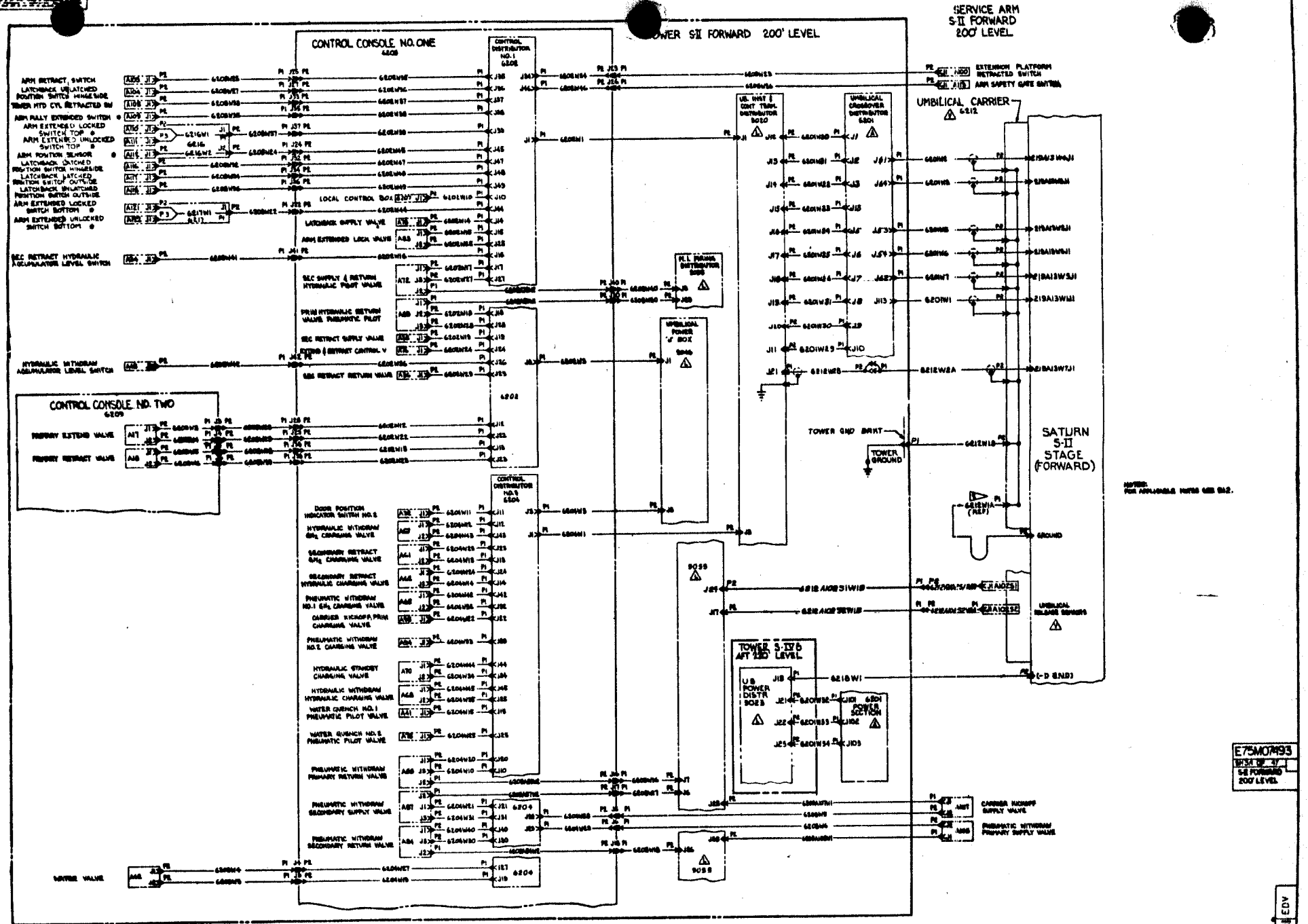

Figure 6-6 Cable Interconnect Diagrams (Continued)

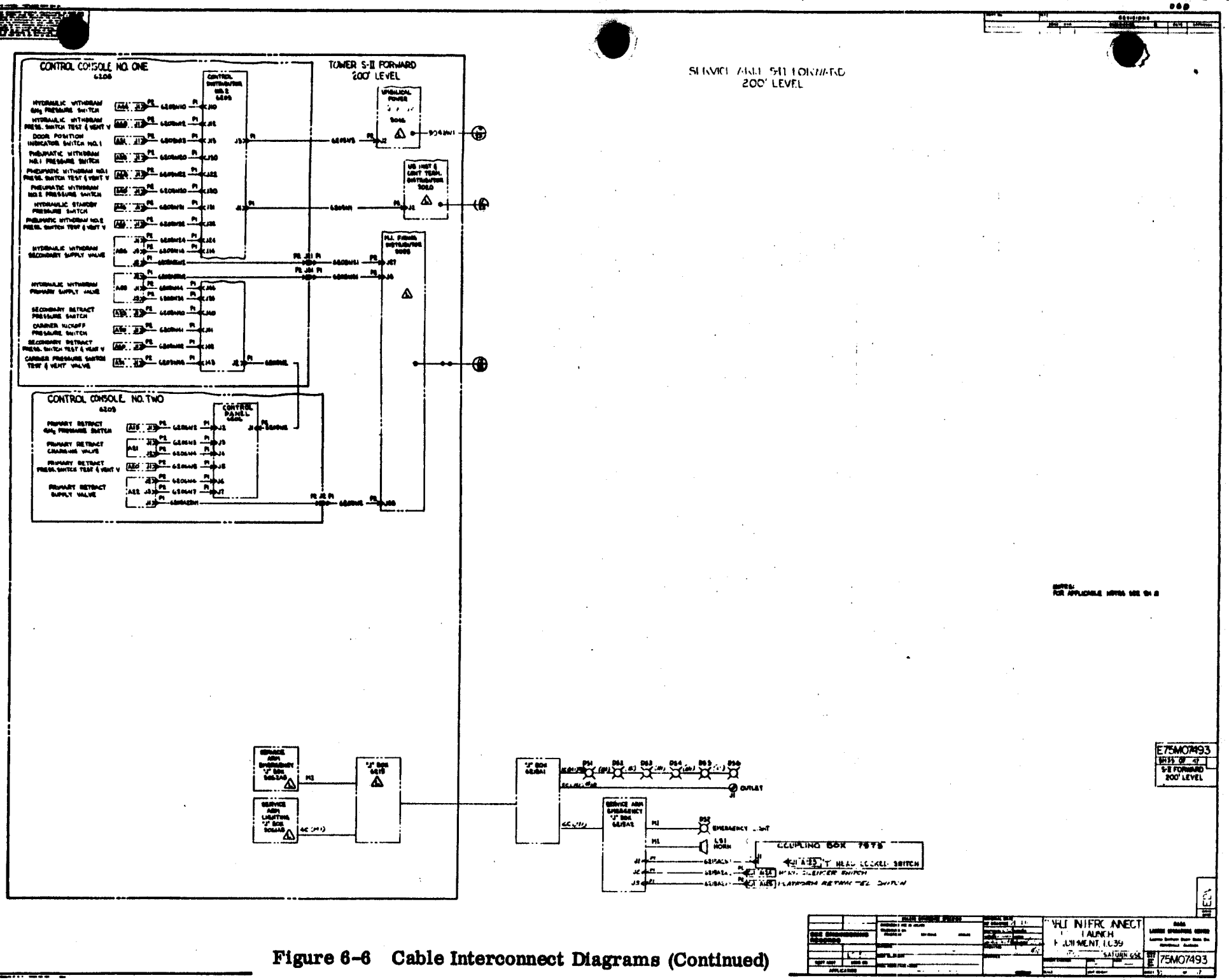

Figure 6-6 Cable Interconnect Diagrams (Continued)

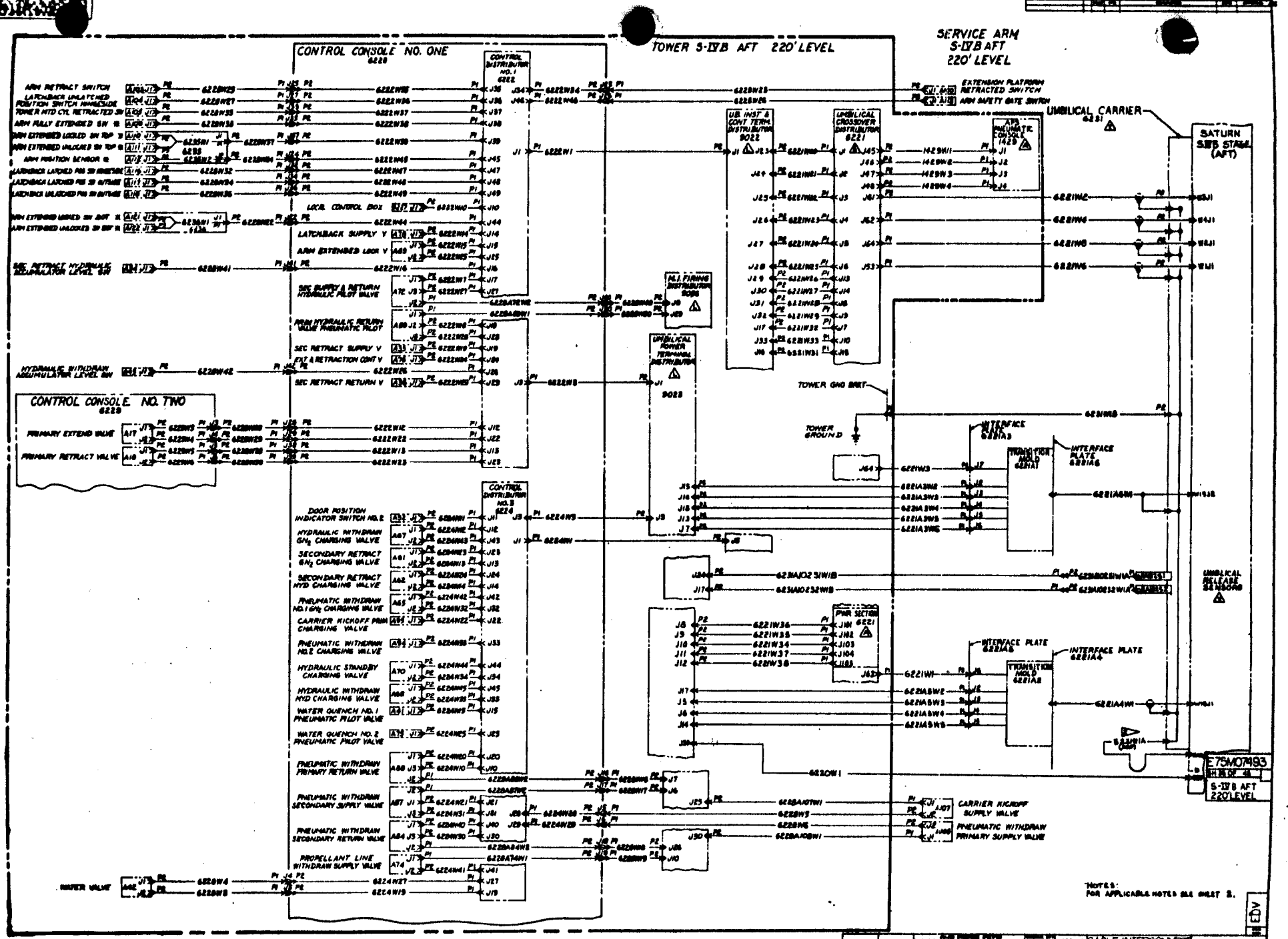

Figure 6-6 Cable Interconnect Diagrams (Continued)

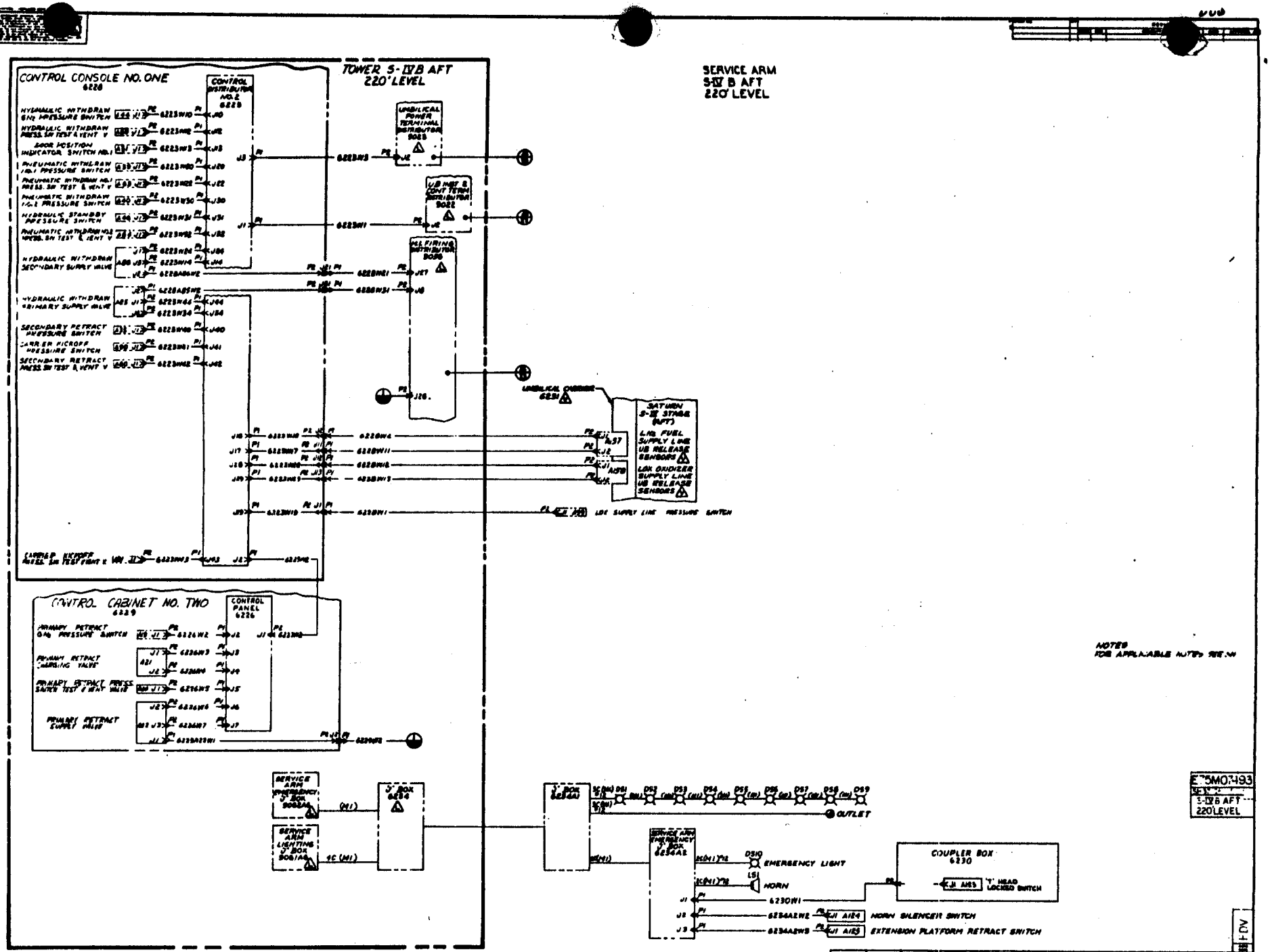

Figure 6-6 Cable Interconnect Diagrams (Continued)

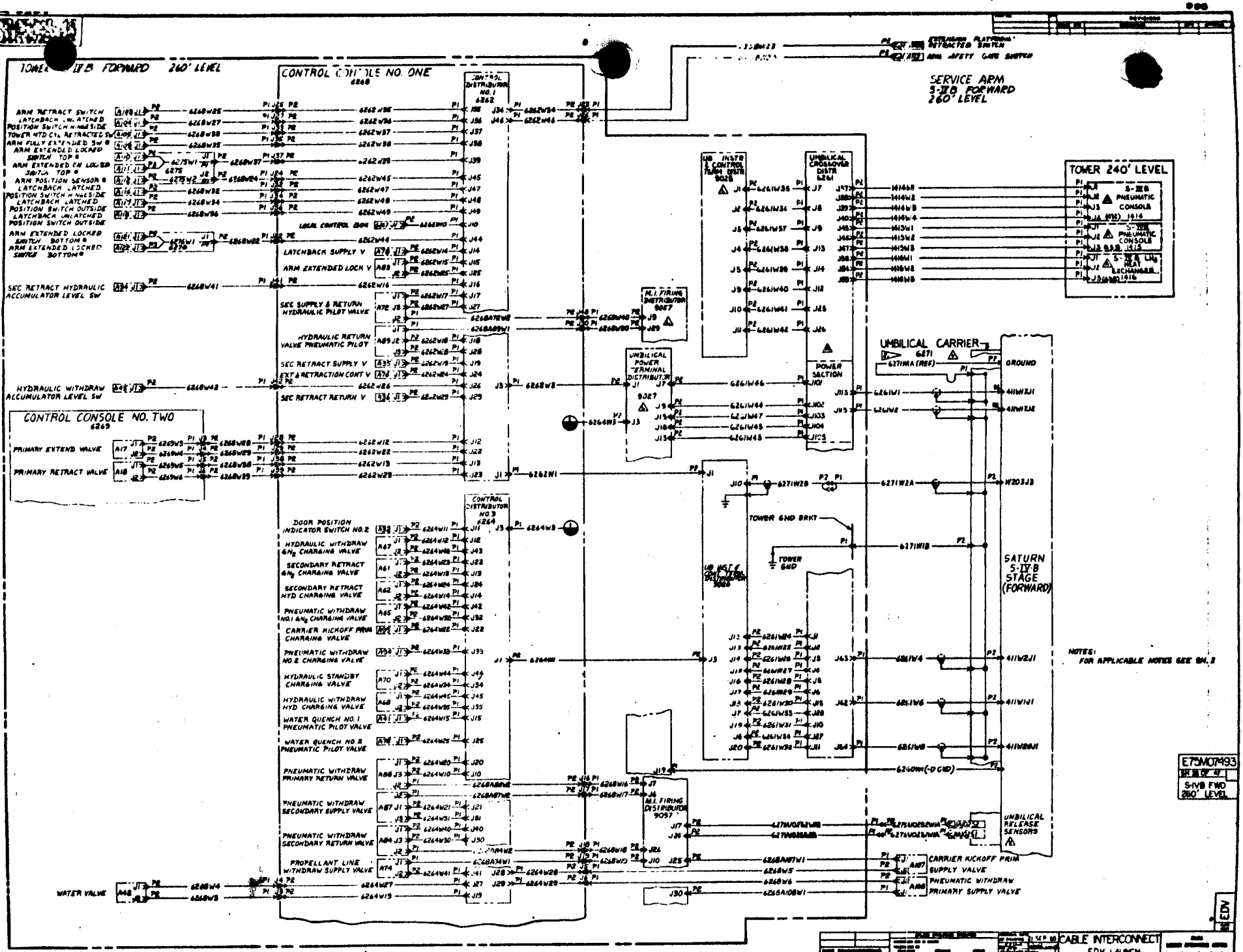

Figure 6-6 Cable Interconnect Diagrams (Continued)

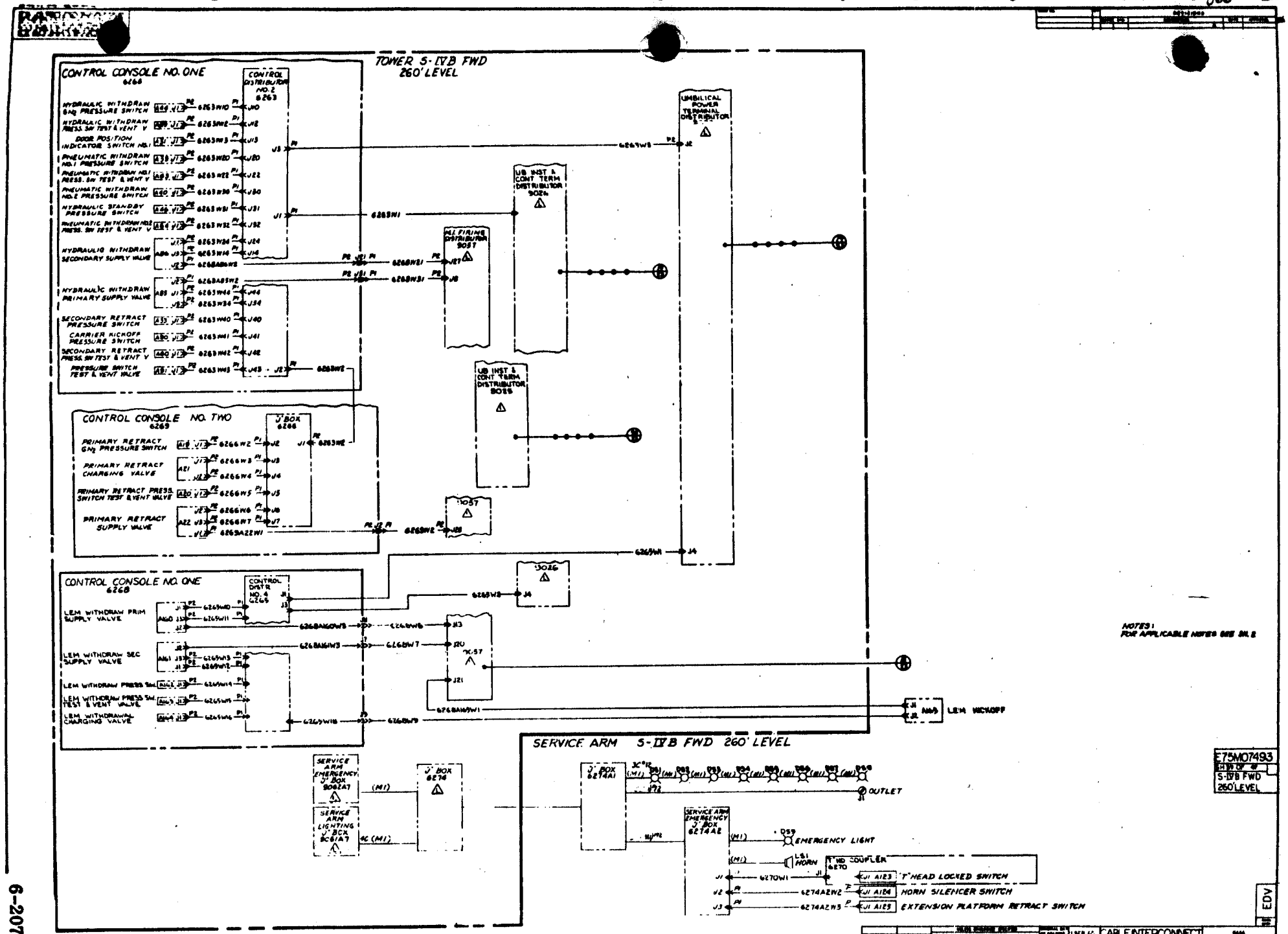

Figure 6-6 Cable Interconnect Diagrams (Continued)

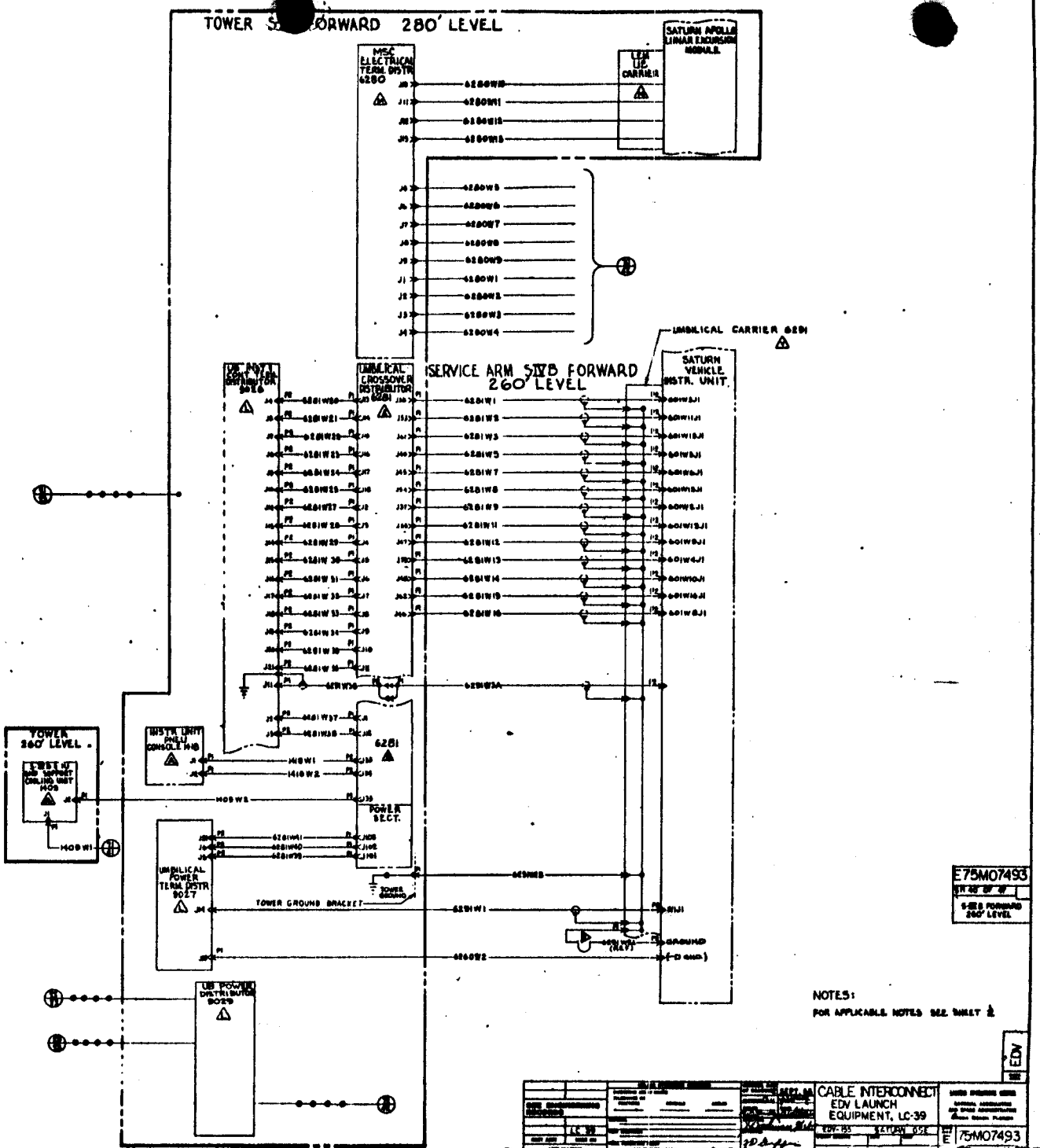

Figure 6-6 Cable Interconnect Diagrams (Continued)

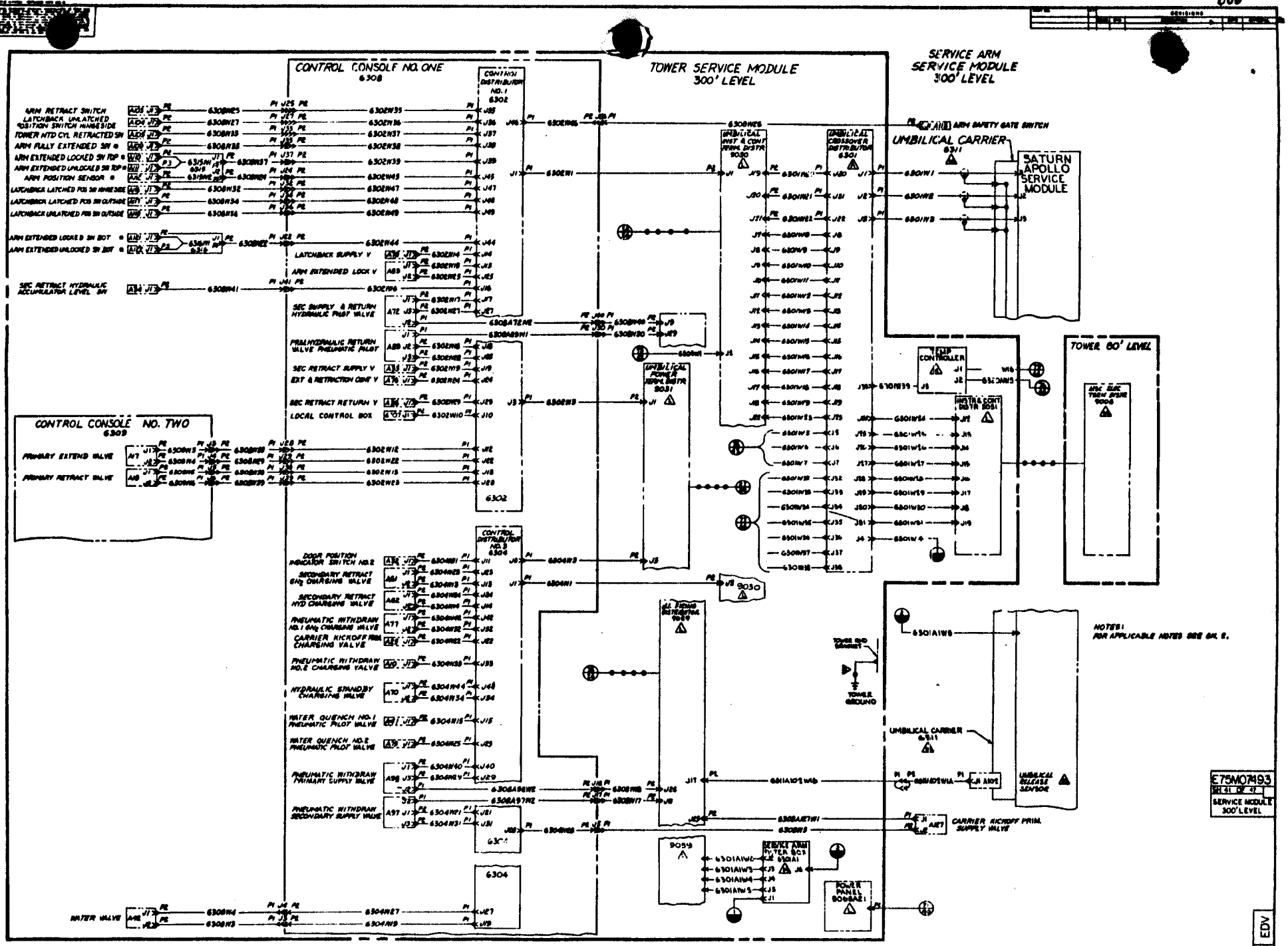

Figure 6-6 Cable Interconnect Diagrams (Continued)

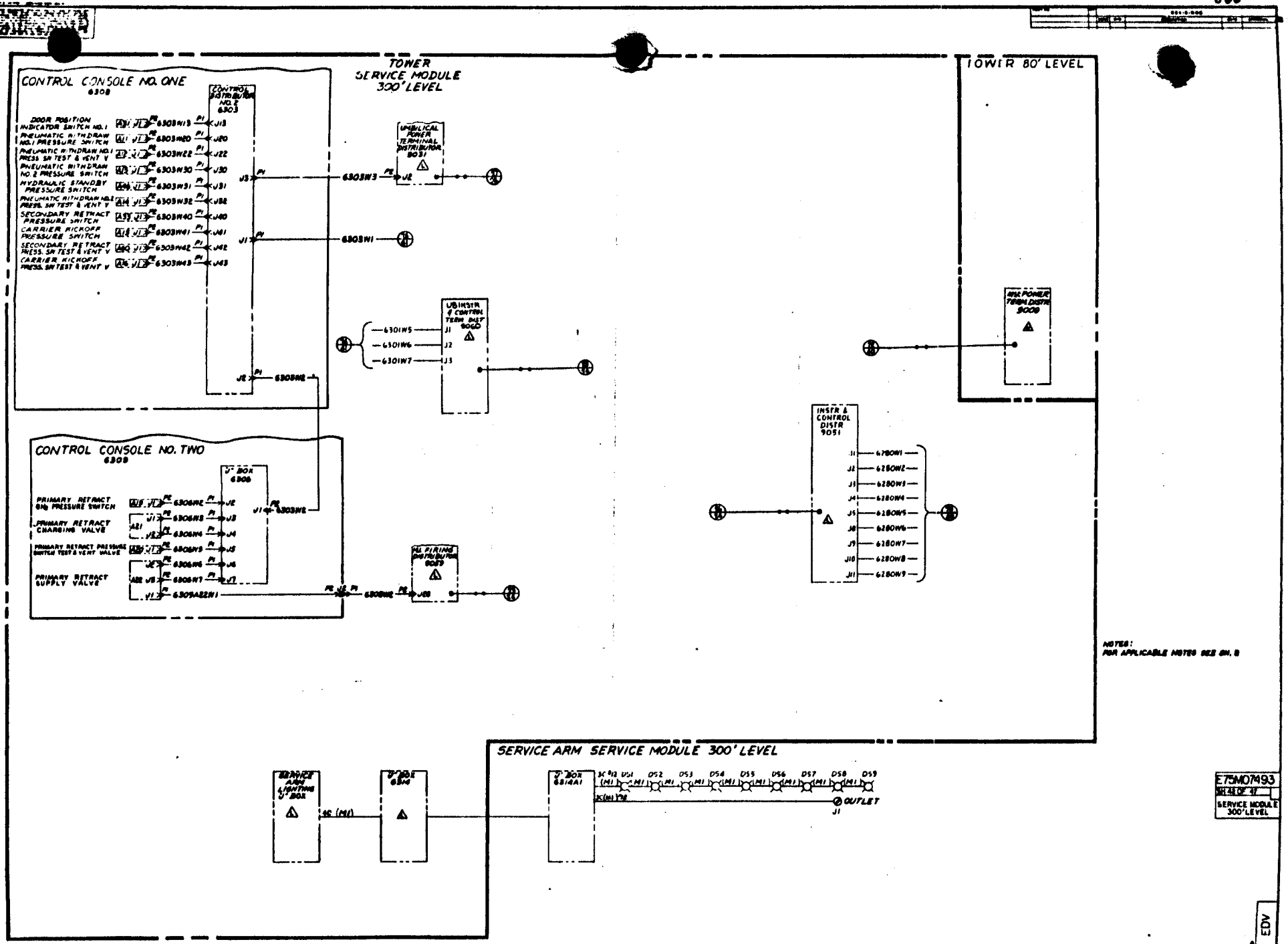

Figure 6-6 Cable Interconnect Diagrams (Continued)

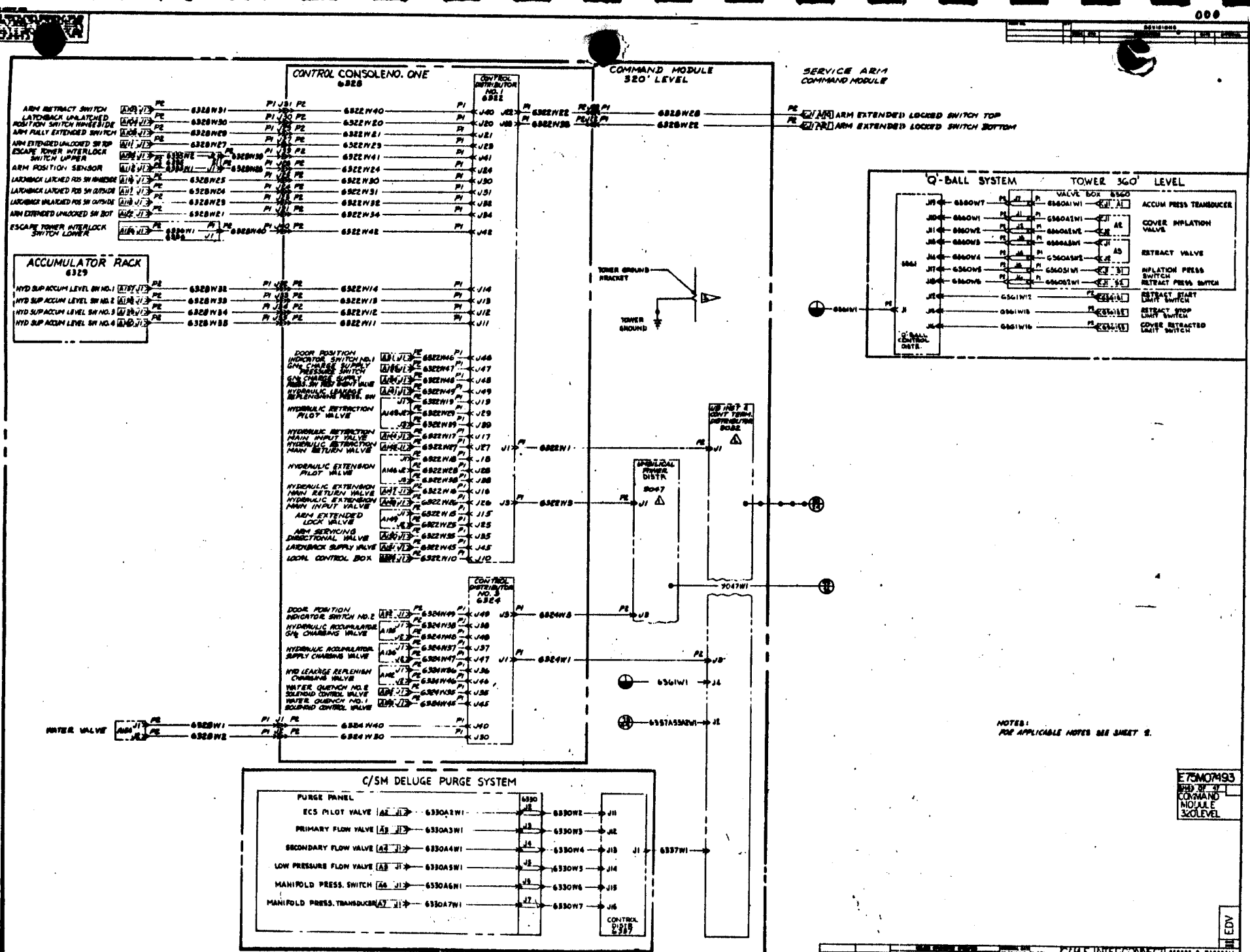

Figure 6-6 Cable Interconnect Diagrams (Continued)

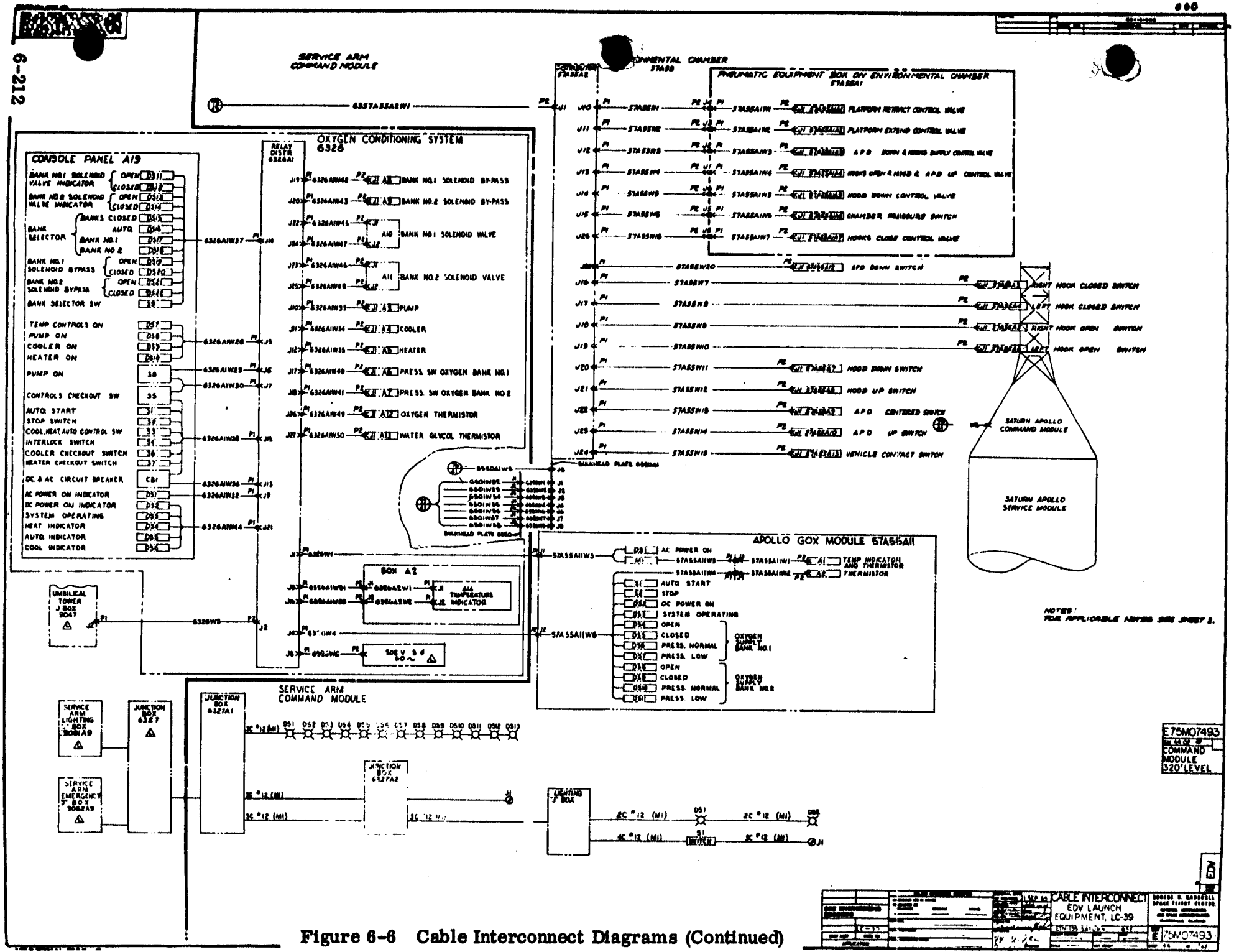

Figure 6-6 Cable Interconnect Diagrams (Continued)

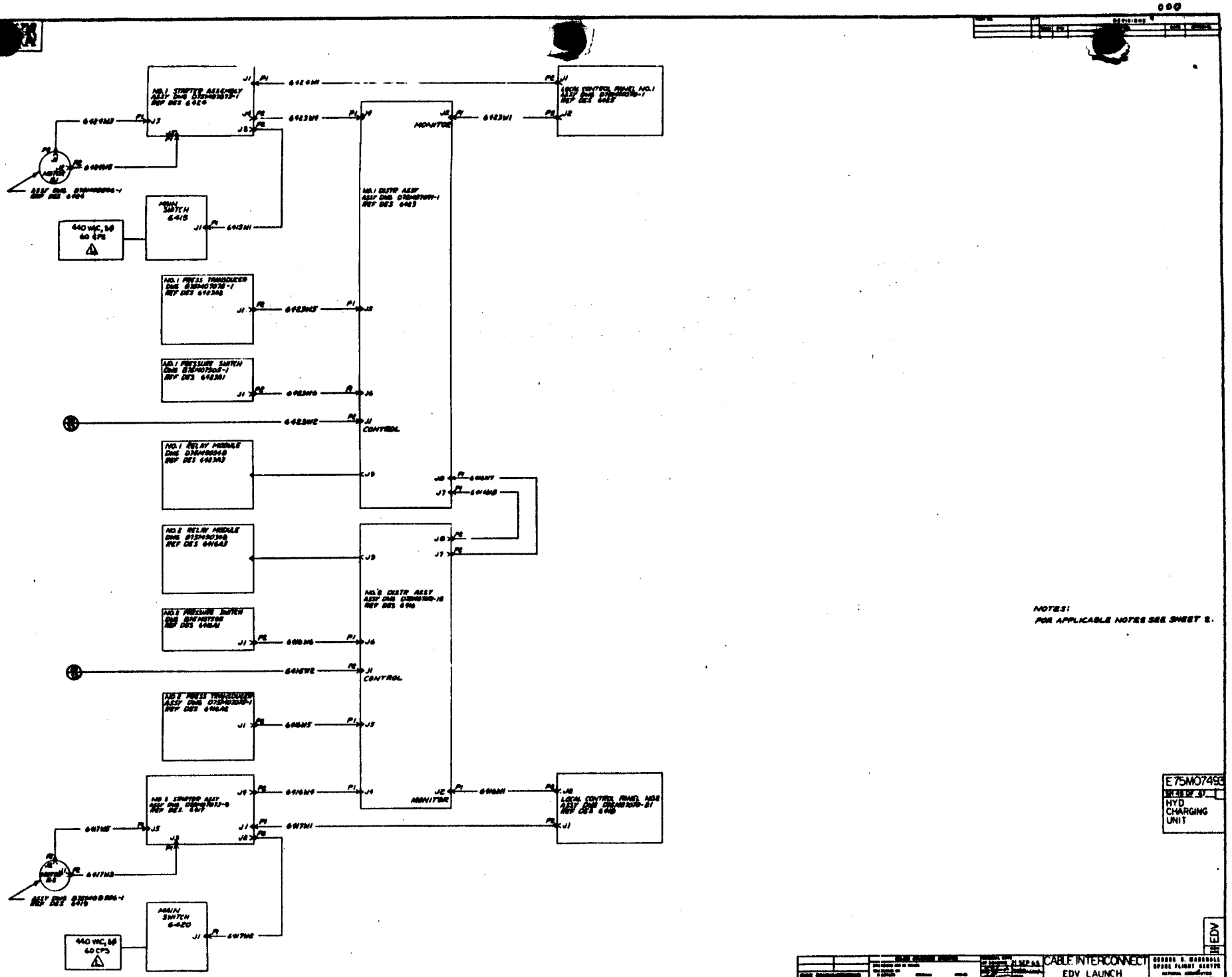

Figure 6-6 Cable Interconnect Diagrams (Continued)

LUT Cable Interconnect

Information

to be

Supplied

LCC Cable Interconnect

Information

to be

Supplied

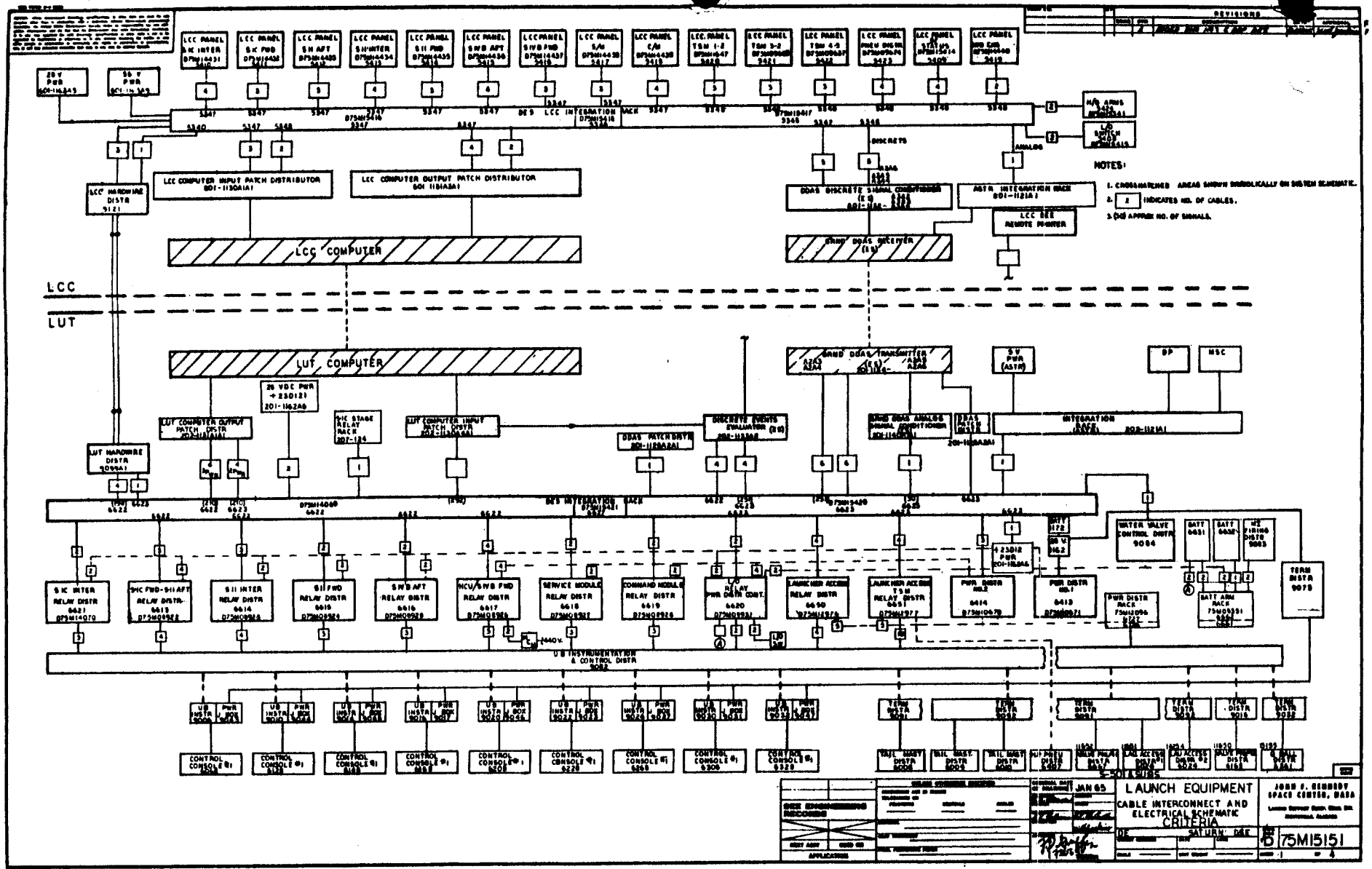

Figure 6-6 Cable Interconnect Diagrams (Continued)

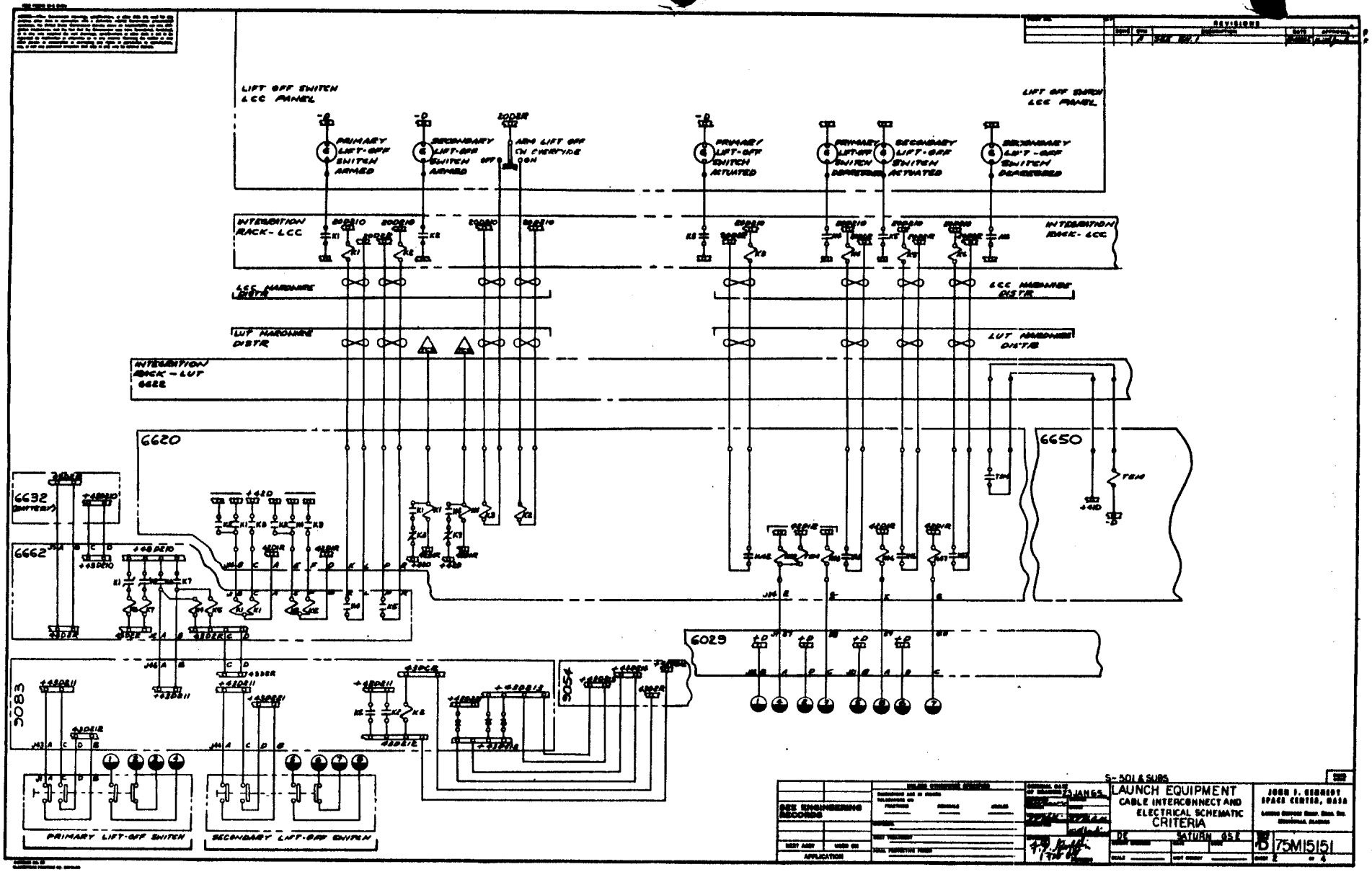

Figure 6-6 Cable Interconnect Diagrams (Continued)

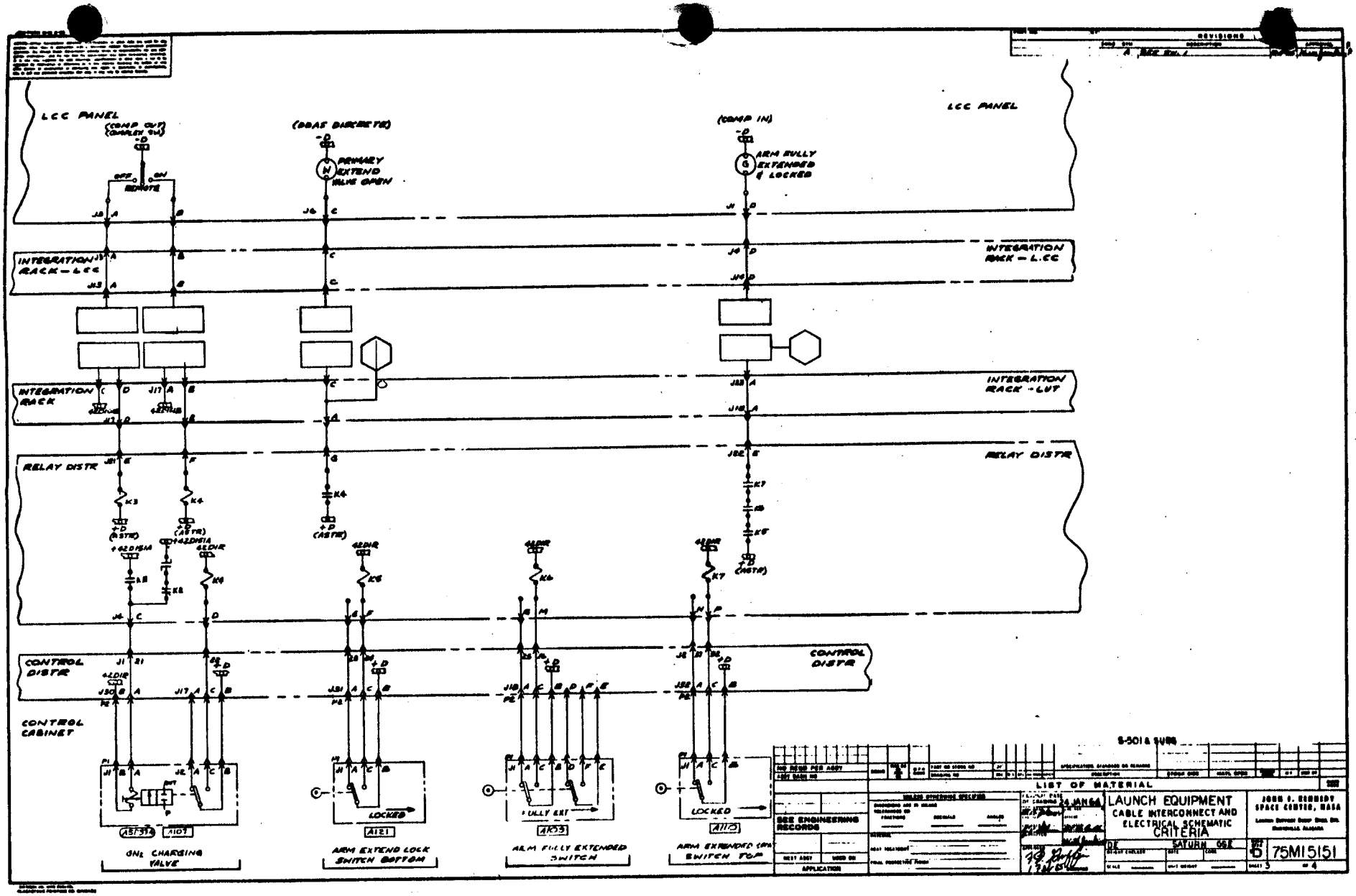

Figure 6-6 Cable Interconnect Diagrams (Continued)

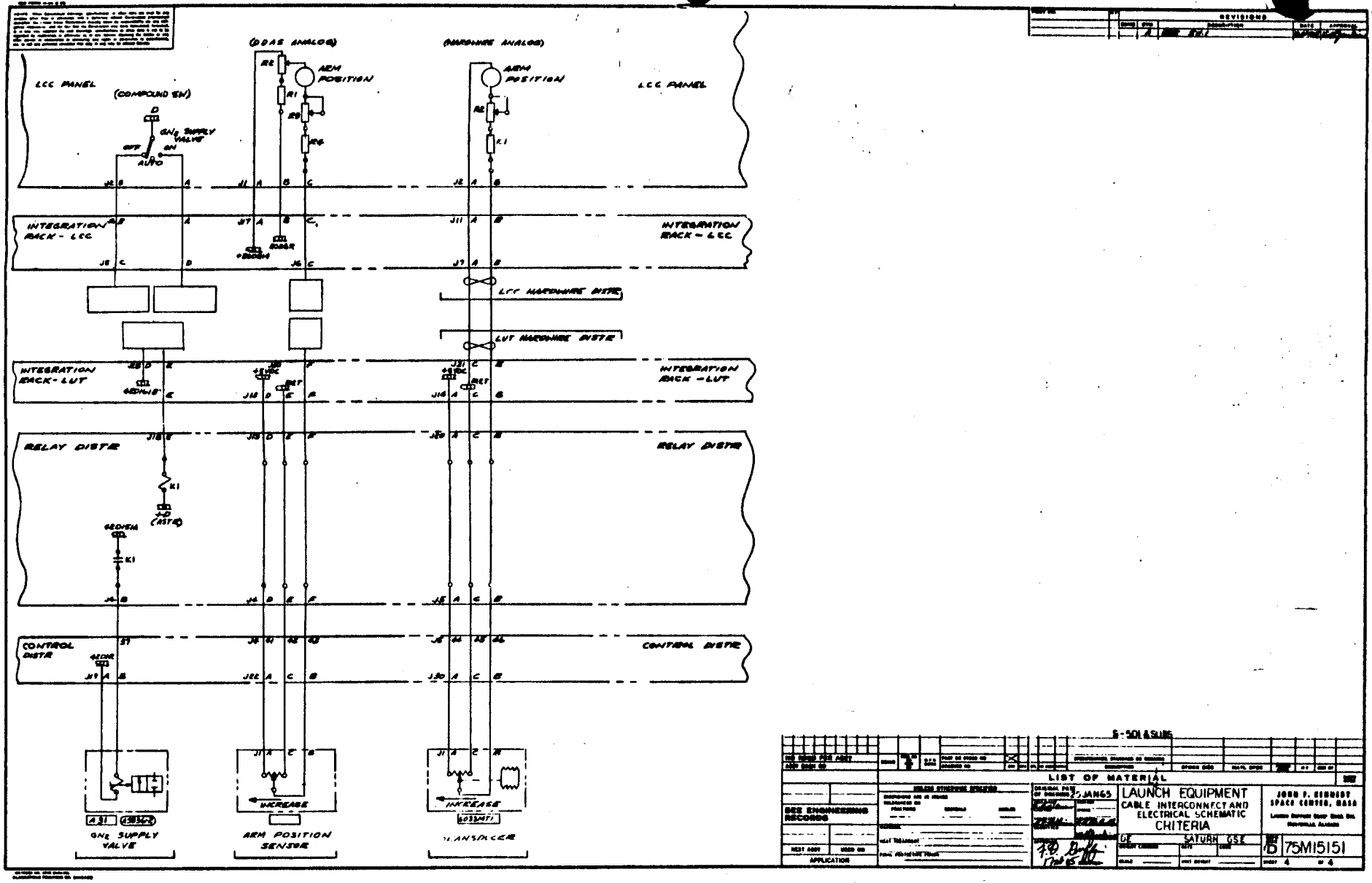

Figure 6-6 Cable Interconnect Diagrams (Continued)

5. REFERENCE DESIGNATION NUMBERS VS. ASSY DRAWING NUMBERS.

The electrical reference designation numbers in Table 6-4 are assigned to ESE assemblies or to assemblies carrying ESE cable. The drawing given for each assembly should call out other drawings showing any assembly or installation information required.

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
5085	S-IC Engine Servicing Plate	J75M09312
5086	S-IC Engine Servicing Boom Plate	J75M09312-3A
5087	S-IC Engine Servicing Top Plate	J75M09312-1A
5088	S-IC Engine Servicing Platform (Pad)	*E75M51238
5089	F-1 Engine Skirt Instl. Distr.	E75M13209
5347	LCC Integration Rack Assy #1	D75M15416
5348	LCC Integration Rack Assy #2	D75M15417
5349	LCC Cable Assy Installation	D75M15419
6000	Deck Distributor, F-1 Engine Servicing Platform	E75M13211
6000A1	Platform Controller, F-1 Engine Servicing Platform	D75M13570
6005	Tail Service Mast 3-4	*J75M12019
6006	Tail Service Mast 1-2	*J75M12023
6007	Tail Service Mast 3-2	*J75M12027
6008	Control Distributor, TSM 3-4	F75M12017
6009	Control Distributor, TSM 1-2	F75M12025
6010	Control Distributor, TSM 3-2	F75M12029
6011	Interface Plate, TSM 3-4	J75M11882
6012	Interface Plate, TSM 1-2	J75M11902
6013	Interface Plate, TSM 3-2	J75M11932
6014	Interface Plate, Holddown Arm #1	J75M05972-677
6015	Interface Plate, Holddown Arm #2	J75M05972-681
6016	Interface Plate, Holddown Arm #3	J75M05972-678
6017	Interface Plate, Holddown Arm #4	J75M05972-682
6019	Service Plate, Holddown Arm #2	E75M06443
6021	Service Plate, Holddown Arm #4	E75M06443
6023	Launcher Accessories Control Distributor #1	F75M14254

* Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6024	Launcher Accessories Control Distributor #2	F75M11651
6026	Primary Liftoff Switch, Holddown Arm #2	J75M12231
6027	Secondary Liftoff Switch, Holddown Arm #2	J75M12231
6028	Liftoff Switch Pneumatic Assy, Holddown Arm #2	*J75M11078
6029	Liftoff Switch Distr. Assy, Holddown Arm #2	D75M11083
6031	Primary Liftoff Switch, Holddown Arm #4	J75M12231
6032	Secondary Liftoff Switch, Holddown Arm #4	J75M12231
6033	Liftoff Switch Pneumatic Assy, Holddown Arm #4	*J75M11078
6034	Liftoff Switch Distributor Assy, Holddown Arm #4	D75M11084
6062	Control Distr. #1	Assy. J75M10030 Wiring A75M10558
6063	Control Distr. #2	Assy. J75M10030 Wiring A75M10557
6064	Control Distr. #3	Assy. J75M10030-3 Wiring A75M10561
6067	Local Control Unit, S-IC Int.	Assy. J75M10898 Instl. J75M07578-1
6068	Control Console No. 1, S-IC Intertank	*J75M08751
6070	Reconnect Mech. S-IC Intertank	J75M08754
6071	Umb. Carrier, S-IC Intertank	Cable Assy. D75M09071
6072	LOX Carrier, S-IC Intertank	Cable Assy. D75M09071
6073	LH_2 Carrier, S-IC Intertank	Cable Assy. D75M09071
6074	Service Arm Power "J" Box	Cable Assy. D75M09071
	*Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6075	Hinge Upper, S-IC Int.	J75M08260-1
6076	Hinge Lower, S-IC Int.	J75M08261-1
6122	Control Distr. #1	Assy. J75M10030-5 Wiring A75M10559
6124	Control Distr. #3	Assy. J75M10030-7 Wiring A75M10562
6127	Local Control Unit, S-IC FWD	Assy. J75M10898 *J75M07578-3
6128	Control Console No. 1	*J75M08746
6132	Umb. Carrier, S-IC Fwd	Cable Assy. D75M09074
6133	LOX Carrier, S-IC Fwd	Cable Assy. D75M09074
6134	LH_2 Carrier, S-IC Fwd	Cable Assy. D75M09074
6135	Service Arm, Power "J" Box	Cable Assy. D75M09074
6136	Hinge Upper, S-IC Fwd	J75M08260-1
6137	Hinge Lower, S-IC Fwd	J75M08261-1
6142	Control Distr. #1	Assy. J75M10030-9 Wiring A75M10560
6144	Control Distr. #3	Assy. J75M10030-11 Wiring A75M10563
6146	Console No. 2 "J" Box	Assy J75M07975 Harness D75M11336
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6147	Local Control Unit, S-II Aft	Assy. J75M10898 *J75M07578-5
6148	Control Console No. 1	*J75M08741
6149	Control Console No. 2	*J75M07976
6151	Umb. Carrier, S-II Aft	Cable Assy. D75M09077
6152	LOX Carrier, S-II Aft	Cable Assy. D75M09077
6153	LH_2 Carrier, S-II Aft	Cable Assy. D75M09077
6154	Service Arm Power "J" Box	Cable Assy. D75M09077
6155	Hinge Upper, S-II Aft	J75M08260-1
6156	Hinge Lower, S-II Aft	J75M08261-1
6162	Control Distr. #1	Assy. J75M10030-13 Wiring A75M10546
6163	Control Distr. #2	Assy. J75M10030-15 Wiring A75M10550
6164	Control Distr. #3	Assy. J75M10030-17 Wiring A75M10554
6165	Valve Panel No. 12 Control Distr.	Assy. F75M11650 Wiring A75M11644
6167	Valve Panel #12	J75M05958
6168	Control Console #1	J75M08735
6170	Local Control Unit, S-II Int.	Assy. J75M10898 *J75M07578-7

* Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6171	Umb. Carrier, S-II Int.	Cable Assy. D75M09080
6172	LOX Carrier, S-II Int.	Cable Assy. D75M09080
6173	LH_2 Carrier, S-II Int.	Cable Assy. D75M09080
6174	Service Arm Power "J" Box	Cable Assy D75M09080
6175	Hinge Upper, S-II Int.	J75M08260-1
6176	Hinge Lower, S-II Int.	J75M08261-1
6202	Control Distr. #1	Assy. J75M10030-19 Wiring A75M10547
6203	Control Distr. #2	Assy. J75M10030-21 Wiring A75M10551
6204	Control Distr. #3	Assy. J75M10030-23 Wiring A75M10555
6206	Console No. 2 "J" Box	Assy. J75M07975 Harness D75M11366
6207	Local Control Unit, S-II Fwd	Assy. J75M10898 *J75M07578-9
6208	Control Console #1	*J75M08728
6209	Control Console #2	*J75M07977
6212	Umb. Carrier, S-II Fwd	Cable Assy. D75M09084
6213	LOX Carrier, S-II Fwd	Cable Assy. D75M09084
6214	LH_2 Carrier, S-II Fwd	Cable Assy. D75M09084

* Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6215	Service Arm Power "J" Box	Cable Assy. D75M09084
6216	Hinge Upper, S-II Fwd	J75M08260-1
6217	Hinge Lower, S-II Fwd	J75M08261-1
6222	Control Distr. #1	Assy. J75M10030-25 Wiring A75M09346
6223	Control Distr. #2	Assy. J75M10030-27 Wiring A75M09347
6224	Control Distr. #3	Assy. J75M10030-29 Wiring A75M09348
6226	Console #2 "J" Box	Assy J75M07975 Harness D75M11366
6227	Local Control Unit, S-IVB Aft	Assy. J75M10898 *J75M07578-11
6228	Control Console #1	*J75M08726
6229	Control Console #1	J75M07978
6231	Umb. Carrier, S-IVB Aft	Cable Assy. D75M09088
6232	LOX Carrier, S-IVB Aft	Cable Assy. D75M09088
6233	LH_2 Carrier, S-IVB Aft	Cable Assy. D75M09088
6234	Service Arm Power "J" Box	Cable Assy. D75M09088
6235	Hinge Upper, S-IVB Aft	J75M08260-1
6236	Hinge Lower, S-IVB Aft	J75M08261-1
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6262	Control Distr. #1	Assy. J75M10030-31 Wiring A75M10548
6263	Control Distr. #2	Assy. J75M10030-33 Wiring A75M10552
6264	Control Distr. #3	Assy. J75M10030-35 Wiring A75M10556
6266	Console #2 "J" Box	Assy. J75M07975 Harness D75M11366
6267	Local Control Unit, S-IVB Fwd	Assy. J75M10898 *J75M07578-13
6268	Control Console #1	*J75M08721
6269	Control Console #2	*J75M07979
6271	Umb. Carrier, S-IVB Fwd	Cable Assy. D75M09092
6272	LOX Carrier, S-IVB Fwd	Cable Assy. D75M09092
6273	LH_2 Carrier, S-IVB Fwd	Cable Assy. D75M09092
6274	Service Arm Power "J" Box	Cable Assy. D75M09092
6275	Hinge Upper, S/M	J75M08260-1
6276	Hinge Lower, S/M	J75M08261-1
6291	Umb. Plate, Inst. Unit S-IVB Fwd	Cable Assy. D75M09092

* Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6302	Control Distr. #1	Assy. J75M10030-37 Wiring A75M10549
6303	Control Distr. #2	Assy. J75M10030-39 Wiring A75M10553
6304	Control Distr. #3	Assy. J75M10030-41 Wiring A75M10557
6306	Console #2 "J" Box	*J75M07975
6307	Local Control Unit, S/M	Assy. J75M10898 *J75M07578-15
6308	Control Console #1	*J75M09055
6309	Control Console #2	*J75M09052
6311	Umb. Carrier, S/M	Cable Assy. D75M09096
6312	LOX Carrier, S/M	Cable Assy. D75M09096
6313	LH_2 Carrier, S/M	Cable Assy. D75M09096
6314	Service Arm Power "J" Box	Cable Assy. D75M09096
6315	Hinge Upper, C/M	J75M12139-1
6316	Hinge Lower, C/M	J75M12139-3
6322	Control Distr. #1	Assy. J75M10030-49 Wiring A75M12674
6324	Control Distr. #3	Assy. J75M10030-51 Wiring A75M12675
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6325	Local Cont. Unit, C/M	Assy. J75M10898 *J75M07578-17
6326	Oxygen Conditioning Console	J75M11608
6327	Service Arm Lighting "J" Box	Cable Assy. D75M09100
6328	Control Console #1	*J75M08722
6329	Accumulator Bottles	J75M05974
6357	Environmental Chamber	*J75M07104
6360	Q-Ball Control Panel	D75M06150
6361	Q-Ball Cover Control Distr.	F75M13155
6401	Flush & Purge Boom	delete
6402	Flush & Purge Distr.	delete
6404	He Distribution Panel	J75M07022
6405	GN_2 Distribution Panel	J75M07021
6406	High Press Pneu. Distr. System	delete
6407	High Pressure Pneumatics Control Distr.	J75M11649
6413	Power Distr. S/A	J75M10671
6414	Power Distr. S/A	J75M10670
6415	Safety Sw.	D75M12973
6416	Distr. Assy Hyd Unit #2	D75M07071
6417	Starter Assy Hyd Unit #2	D75M07073
6418	Control Pnl Hyd Unit #2	D75M07070
6419	Motor Assy Hyd Unit #2	B75M08506
6420	Safety Sw. Hyd Unit #2	D75M12973
6421	Pwr Supply Launcher Acc.	delete
6422	Cable Installation Rack	J75M12096
6423	Distr. Assy Hyd Unit #1	D75M07071
6424	Starter Assy Hyd Unit #1	D75M07073
6425	Cont. Pnl. Assy Hyd Unit #1	D75M07070
6426	Motor Assy Hyd Unit #1	B75M08506
6427	Fuse Panel	delete
6428	Fuse Panel	delete
6429	Interface Plate, Launcher Pwr Distr	delete

*Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6430	Pwr Module, Launcher Pwr Distr. 2	delete
6431	Pwr Module Launcher Pwr Distr. 1	delete
6432	Pwr Module, Spare	delete
6433	Power Transfer Module Chassis	delete
6434	Pwr Transfer Unit Batt. Rack	delete
6604	Deluge Purge Panel	delete
6605	Valve Panel #11	J75M07433
6606	Engine Service Platform Relay Distr.	E75M13471
6611	Launch Aux. Relay Patch Distr.	
6612	Flush & Purge Power Supply	
6613	Service Arm Control Rack #2	D75M08922
6614	Service Arm Control Rack #3	D75M08923
6615	Service Arm Control Rack #4	D75M08924
6616	Service Arm Control Rack #5	D75M08925
6617	Service Arm Control Rack #6	D75M08926
6618	Service Arm Control Rack #7	D75M08927
6619	Service Arm Control Rack #9	D75M08928
6620	Service Arm Control Rack #8	D75M08931
6621	Relay Distr. (Spare)	F75M04681
6622	LUT Integration Rack #1	D75M14069
6623	LUT Integration Rack #2	D75M15420
6629	Meter Panel, Integration Rack	J75M10165
6636	Purge Valve #1	B75M14551-1
6637	Purge Valve #2	B75M14551-1
6638	Purge Valve #3	B75M14551-1
6639	Purge Valve #4	B75M14551-1
6640	Crossover Distr. S-IC, Room 13-A	delete
6641	Crossover Distr. S-IC, Room 5-A	delete
6650	Launcher Access. Relay Rack #1	J75M12976
6651	Launcher Access. Relay Rack #2	J75M12977
6652	Hydraulic Charging Unit Electric Distr. #2	D75M07071
6653	Hydraulic Charging Unit Starter Panel #2	D75M07073
6654	Hydraulic Charging Unit Control Panel #2	D75M07070
6655	Hydraulic Charging Unit Pump Motor #2	Cable Assy. D75M07072
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6656	Connector Plate, Relay Rack	Assy. J75M09711
6657	Connector Plate, Relay Rack	Assy. J75M09711
6658	Connector Plate, Relay Rack	Assy. J75M09711
6659	Connector Plate, Relay Rack	Assy. J75M09711
6660	Connector Plate, Relay Rack	Assy. J75M09711
6661	Connector Plate, Relay Rack	Assy. J75M09711
6662	Connector Plate, Relay Rack	Assy. J75M09711
6663	T. S. Mast Relay Distr. Int. Plate	Assy. J75M09711
6664	Launcher Access Distr. Int. Plate	Assy. J75M09711
6665	Valve Panel #11 Control Distr.	F75M11652
6666	Interface Plate, Launcher Power Rack	Assy. J75M09711-1
6700	Fuse Panel Assy	*J75M12096 Assy. J75M10163-1
6710	Power Module Frame Assy	*J75M12096
6711	Power Module R/ASTP Integration	D75M12301 Assy.
6712	Power Module, Launcher Accessories Distr. #1	*J75M12096 Assy.
6713	Power Module, Launcher Accessories Distr. #2	*J75M12096 Assy.
6716	Power Module Spare	*J75M12096 Assy. *J75M12096

* Electrical Installation Drawing

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
6717	Power Module GETS #1	Assy. *J75M12096
6718	Power Module GETS #2	Assy. *J75M12096
6726	Bus Distributor	*J75M12096
6727	Bus Distributor	*J75M12096
7200	F1 Engine Change Platform (VAB)	*J75M51342
7201	F1 ESP Platform Distr.	E75M13209
7202	S-IC Engine Service Top Plate (VAB)	J75M09312-5A
7203	S-IC Engine Service Boom Plate (VAB)	J75M09312-3A
7204	Distribution Box, S-II Engine Servicing Platform	B75M14680
7205	"J" Box Winch #1	B75M14683
7206	"J" Box Winch #2	B75M14683
7207	"J" Box Winch #3	B75M14683
7208	"J" Box Winch #4	B75M14683
7601	Tail Mast Test Set	E75M07658
7602	Launcher Accessories Test Set No. 2	J75M11087
7603	Portable Arm Control Console	J75M07542
7604	Portable Control Unit Distr.	delete
7605	Portable Control Unit Power Supply	
7606	Tower Test Set	E75M14137
7607	Portable Power Supply (Pneumatic)	
7650	Launcher Acc. Test Set No. 1	E75M14009
7656	GETS	E75M13286
7657	GETS Simulator	E75M13286
7658	Launcher Test Set	
7850	Platform Motor & Brake Assy #1	*J75M51413
7851	Platform Motor & Brake Assy #2	*J75M51413
7852	Platform Motor & Brake Assy #3	*J75M51413
7853	Platform Motor & Brake Assy #4	*J75M51413
7854	Platform Motor & Brake Assy #5	*J75M13064
7855	Umbilical Plate, TSM 3-4	J65B80001
7856	Umbilical Plate, TSM 1-2	J65B80002
7857	Umbilical Plate, TSM 3-2	J65B80003
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
7858	Haunch Plate, Holddown Arm #1	J75M05972
7859	Haunch Plate, Holddown Arm #2	J75M05972
7860	Haunch Plate, Holddown Arm #3	J75M05972
7861	Haunch Plate, Holddown Arm #4	J75M05972
7862	LUT Level Interface Plate Aux Motor "A"	*J75M51413
7863	LUT Level Interface Plate Motor Brake "A"	*J75M51413
7865	LUT Level Interface Plate Aux Motor "B"	*J75M51413
7866	LUT Level Interface Plate Motor & Brake "B"	*J75M51413
7867	LUT Level Interface Plate Aux Motor "C"	*J75M51413
7868	LUT Level Interface Plate Motor & Brake "C"	*J75M51413
7869	LUT Level Interface Plate Aux Motor "D"	*J75M51413
7870	LUT Level Interface Plate Motor & Brake "D"	*J75M51413
7872	LUT Level "0" Platform Elect. System	*J75M51639
7950	Distributor Box #1, Platform Transporter Control North	B75M14679-1
7951	Distributor Box #2, Platform Transporter Control North	B75M14679-2
7952	Portable Controller, Platform Transporter Control	B75M14682
7953	Distributor Box #1, Platform Transporter Control South	B75M14679-3
7954	Distributor Box #2, Platform Transporter Control South	B75M14679-4
7955	Portable Controller, Platform Transporter Control South	B75M14682
7956	Motor/Winch Bulkhead, Platform Transporter Control #1	J75M14891
7957	Motor/Winch Bulkhead, Platform Transporter Control #2	J75M14891
9001	LUT - Pad Interface, Power	F75M12270
9002	LUT - Crawler Interface, PWR	F75M05121
9006	UB. Instr. & Control Term Distr	F75M05121
9008	UB. Instr & Control Term Distr-80' (MSC)	F75M12270
9009	UB. Power Term Distr-80' (MSC)	F75M12270
9010	UB. Instr. & Control Term Distr-100'	F75M05121
	*Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
9013	UB. Power Term Distr-120' (S-IC FWD)	F75M05121
9014	UB. Instr & Control Term Distr - 140'	F75M05121
9016	UB. Instr & Control Term Distr - 160'	F75M05121
9017	UB. Power Term Distr - 160'	F75M05121
9020	UB. Instr & Control Term Distr-200'	F75M05121
9022	UB. Instr & Control Term Distr-220'	F75M05121
9023	UB. Power Term Distr-220'	F75M05121
9025	UB. Instr & Control Term Distr-260'	F75M05121
9026	UB. Instr & Control Term Distr-260'	F75M05121
9027	UB. Power Term Distr-260'	F75M05121
9028	UB. Instr & Control Term Distr-280'	F75M05121
9029	UB. Power Term Distr-280'	F75M05121
9030	UB. Instr & Control Term Distr-300'	F75M05121
9031	UB. Power Term Distr-300'	F75M05121
9032	UB. Instr & Control Term Distr-320'	F75M05121
9033	Prop. Loading A.C. PWR "J" Box-30'	F75M05121
9034	Prop. Loading A.C. PWR "J" Box-120'	F75M05121
9035	Prop. Loading A.C. PWR "J" Box-200'	F75M05121
9038	Crane	F75M05120
9042	UB. Power "J" Box 30' Tower Level	F75M05121
9043	UB. Power "J" Box 60' Tower Level	F75M05121
9044	UB. Power "J" Box 120' Tower Level	F75M05121
9045	UB. Power "J" Box 140' Tower Level	F75M05121
9046	UB. Power "J" Box 200' Tower Level	F75M05121
9047	UB. Power "J" Box 320' Tower Level	F75M05121
9048	OTV Cables, Phase III	F75M12270
9049	Measuring Acquisition Term Distrs.	F75M05121
9050	Measuring Coax Term. Distrs.	F75M05121
9051	UB. Instr & Control Distr-300' (MSC)	F75M12270
9052	Service Arm MI Term Distr-120' Level	F75M05121
9054	Service Arm MI Term Distr-160' Level	F75M05121
9055	Service Arm MI Term Distr-200' Level	F75M05121
9056	Service Arm MI Term Distr-220' Level	F75M05121
9057	Service Arm MI Term Distr-260' Level	F75M05121
	* Electrical Installation Drawing	

Table 6-4 REFERENCE DESIGNATION NUMBERS VERSUS ASSY DRAWING NUMBERS (Continued)

Reference Designation Number	Assembly	Assembly Drawing or Installation Drawing
9059	Service Arm MI Term Distr-300' Level	F75M05121
9060	Coax Distr - MSC. 300' Level	F75M12270
9061	Service Arm Lighting Junction Boxes	F75M05121
9062	Service Arm Emergency PWR. "J" Boxes	
9063	"J" Box, S-IC FWD Foamflex (120')	F75M12270
9064	"J" Box, S-II FWD Foamflex (200')	F75M12270
9065	"J" Box, S-IVB FWD Foamflex (260')	F75M12270
9068	Power Panel ("A" Suffixes)	F75M05121
9069	Lighting Panel ("A" Suffixes)	F75M05121
9070	Term. Rm. Instr & Control Distr.	F75M05121
9072	Rm. 1-A Instr & Control Distr.	
9073	Rm. 7-B Power Term Distr.	F75M05121
9074	MSC PWR Distr Rm. 1-A	F75M12270
9075	Anem & Film Camera Distr 9-B	F75M12270
9076	Coax Cable, Meas, 10B Rack 42	
9077	Pair Cables, Meas, 10B Rack 43	
9078	S-IC Eng. Ign. Term. Distr, Rm. 7-B	
9081	Rm. 8-A Instr & Control Distr.	
9082	Rm. 7-A Instr & Control Distr.	F75M05121
9083	Firing Distributor	F75M05121
9084	ML Water Control Cabinet	F75M05121
9085	Prop Loading AC PWR "J" Box, Rm. 7-A	
9086	Inst Gnd Plates, MSC, Rm. 1-A	
9087	Computer Interface, Rm. 10-A	
9088	Computer Interface, Rm. 7-A	
9089	Computer Interface, Rm. 7-A	
9090	No. 1 Tail Service Mast Instr & Control	
9091	No.1 Tail Service Mast Instr & Control, Rm. 13-B Term Distr Rm. 13-A	
9092	No.2 Tail Service Mast Instr & Control Term Distr Rm. 5-A	
9093	S-IC AFT PWR. Distr No. 1 Rm. 13-A	
9094	S-IC AFT PWR. Distr No. 2 Rm. 5-A	
9095	Prop Loading AC PWR "J" Box, Rm. 4-A	
9099	PTCR-LUT Instr & Control Interface	
	* Electrical Installation Drawing	

5000-5049	ENVIRONMENTAL CONTROL SYSTEM
5050	LH_2 STORAGE AREA
5051	LOX STORAGE AREA
5052	RP-1 STORAGE AREA
5053-5054	(FUTURE)
5055-5079	PNEUMATICS SYSTEM (CCF)
5080-5099	PAD & PERIMETER AREA
5100-5299	PTCR (1st & 2nd FLOOR)
5300-5999	LCC (FIRING ROOMS 1 THRU 4)
6900-6999	(FUTURE)
7000-7199	ARMING TOWER
7200-7499	VAB
7500-7549	MOBILE LAUNCHER ERECT. & REFURB.
7550-7599	CRAWLER - TRANSPORTER
7600-7799	PORTABLE TEST EQUIPMENT
7800-7814	PNEUMATICS STORAGE BATTERY (VAB)
7815-7829	PNEUMATICS STORAGE BATTERY (PAD)
7830-8999	(FUTURE)
9000-9099	MOBILE LAUNCHER TERM. DISTR.
9100-9299	LCC TERMINAL DISTRIBUTORS
9300-9499	VAB TERMINAL DISTRIBUTORS
9500-9699	PTCR TERMINAL DISTRIBUTORS
9700-9799	ARMING TOWER TERM. DISTR.
9800-9899	OTHER LAUNCH AREA TERM. DISTR.
9900-9999	(FUTURE)

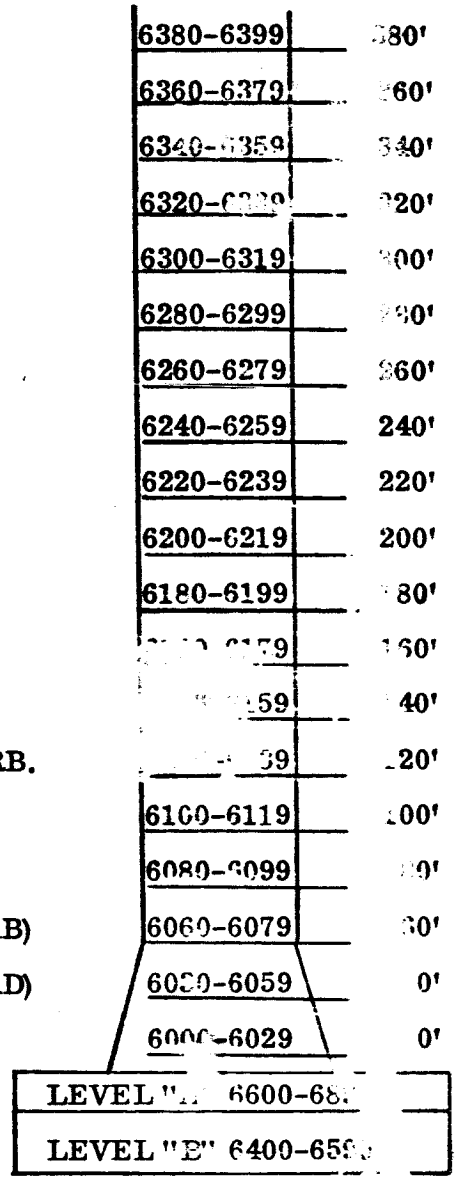

Figure 6-7 Reference Designation Assignment Areas, LC-39

APPENDIX A

GLOSSARY

C/M	Command Module, Apollo spacecraft
DDAS	Digital Data Acquisition System
ESE	Electrical Support Equipment (ESE) which is responsibility of Launch Equipment Branch
DLTR	Digital Link Transmission Repeater
Firing Batteries	See Service Arms Firing Circuits, par. 3-25
GETS	Ground Equipment Test Set
GN_2	Gaseous Nitrogen
GOX	Gaseous Oxygen
GSE	Ground Support Equipment
He	Helium
H. P. Gas	High Pressure Gas
Inflight Arms	Service Arms which retract during launch
KSC	Kennedy Space Center
LCC	Launch Control Center
LC-39	Launch Complex 39
LEM	Lunar Excursion Module
LES	Launch Escape System
LH_2	Liquid Hydrogen
LOX	Liquid Oxygen
MI Distributor	Terminating Mineral Insulated Cable
MI Cable	Mineral Insulated Cable
MSFC	Marshall Space Flight Center
MUTS	Miniaturized Universal Test Set

Preflight Arms	Service Arms which retract prior to launch
Q-Ball	A device on the vehicle nose for measuring temperature or aerodynamic pressure
R. F. I.	Radio Frequency Interference
SCR	Silicon Control Rectifier
S-IC	Saturn V first stage
S-II	Saturn V second stage
S-IVB	Saturn V third stage
SM	Service Module, Apollo spacecraft
TCS	Terminal Countdown Sequencer
TSM	Tail Service Mast
UB	Umbilical
VAB	Vehicle Assembly Building