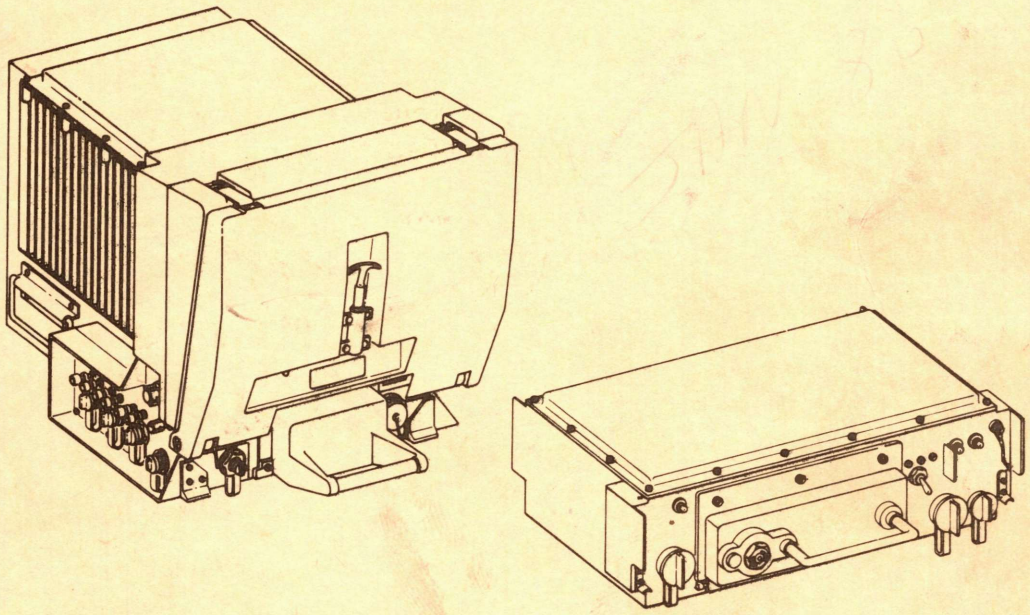
TM 11-7440-283-12-1

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL



EQUIPMENT DESCRIPTIONS Page 1-7

OPERATING INSTRUCTIONS Page 2-0

DESCRIPTION OF CONTROLS Page 2-1

PMCS Page 2-29

MAINTENANCE Page 3-0

TROUBLESHOOTING Page 3-9

COMPUTER GROUP, GUN DIRECTION OL-200/GYK-29(V) (NSN 7025-01-134-2331)

(PART OF COMPUTER SYSTEM, GUN DIRECTION AN/GYK-29(V))

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1982



5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4. SEND FOR HELP AS SOON AS POSSIBLE

5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1984

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL COMPUTER GROUP, GUN DIRECTION OL-200/GYK-29(V) (NSN 7025-01-134-2331) (PART OF COMPUTER SYSTEM, GUN DIRECTION AN/GYK-29(V))

TM 11-7440-283-12-1, 24 September 1982, is changed as follows:

1. New or changed material is indicated by a vertical bar in the margin of the page. Revised figures are indicated by a vertical bar next to changed text or by a miniature pointing hand.

2. Remove and insert pages as indicated below.

Remove Pages	Insert Pages
1-1 through 1-24	1-1 through 1-24
1-25 and 2-0	1-25 and 2-0
2-7 through 2-12	2-7 through 2-12
2-15 through 2-30	2-15 through 2-30
2-33 and 3-0	2-33 and 3-0
3-1/(3-2 blank)	3-1/(3-2 blank)
3-5 through 3-10	3-5 through 3-10 and 3-10.1/(3-10.2 blank)
3-11 through 3-16	3-11 through 3-16
3-19 through 3-22	3-19 through 3-22
3-25 through 3-30	3-25 through 3-30
3-41 through 3-44	3-41 through 3-44, 3-44.1 and 3-44.2
3-45 and 3-46	3-45 and 3-46
3-49 through 3-52	3-49 through 3-52
3-55 through 3-58	3-55 through 3-58
3-65/(3-66 blank)	3-65/(3-66 blank)
A-1/(A-2 blank)	A-1 and A-2
B-3 through B-7/(B-8 blank)	B-3 through B-8
C-3 through C-8	C-3 through C-8
D-3/(D-4 blank)	D-3/(D-4 blank)
Index-3 and Index-4	Index-3 and Index-4

3. File this sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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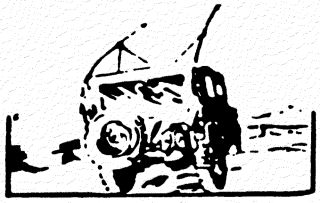
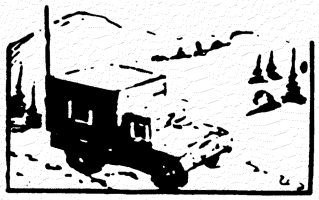
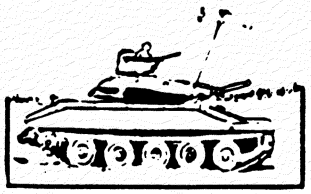
WARNING

SERIOUS INJURY OR EVEN DEATH CAN HAPPEN IF THE FOLLOWING ARE NOT CAREFULLY OBSERVED WHEN INSTALLING AND USING THE ANTENNAS USED WITH YOUR RADIO SETS.

BEFORE ANY MISSION FIND OUT

1. ARE THERE ANY POWERLINES IN YOUR AREA OF OPERATION ?
2. HOW HIGH ARE THESE POWERLINES ?
3. HOW TALL ARE THE POLES OR TOWERS CARRYING POWERLINES ?

MOBILE OPERATION WITH WHIP ANTENNAS

DO NOT STOP YOUR VEHICLE UNDER POWERLINES.

- IF POSSIBLE, TRY TO MAINTAIN MOBILE COMMUNICATIONS WITH YOUR ANTENNA(S) TIED DOWN.
- MAKE SURE AN ANTENNA TIP CAP IS SECURELY TAPED ON THE END OF EACH WHIP ANTENNA.
- DO NOT LEAN AGAINST OR TOUCH A WHIP ANTENNA WHILE THE TRANSMITTER IS ON.
- DURING CROSS-COUNTRY OPERATION, DO NOT ALLOW ANYONE TO STICK AN ARM, LEG OR WEAPON OVER THE SIDES OF THE VEHICLE. IF YOUR ANTENNA ACCIDENTALLY TOUCHES A POWERLINE AND A LEG, ARM OR WEAPON CONTACTS A DAMP BUSH OR THE GROUND, A SERIOUS OR FATAL ACCIDENT CAN HAPPEN.
- IF YOU ARE NOT SURE THAT AN ANTENNA ON YOUR VEHICLE WILL CLEAR A POWERLINE, STOP BEFORE YOU GET CLOSE TO THE POWERLINE AND EITHER CAREFULLY TIE DOWN THE ANTENNA OR REMOVE ANTENNA SECTIONS TO MAKE SURE THAT YOU CAN SAFELY DRIVE UNDER THE POWERLINE.

WARNING

Dangerous rf voltages exist around antennas and antenna terminals during transmission. Protect yourself by knowing the safety procedures in TB SIG 291.

*DO NOT allow the antennas to touch powerlines. Tie them down before moving.

*DO NOT smoke or use flame when in contact with fuel or the fuel system.

CAUTION

Handle modules by ends of boards. Do not touch component side, printed circuit side, or connector pins. Stray voltage may induce failures.

CAUTION

The BCU weighs 106 pounds and requires two persons to lift it.

TECHNICAL MANUAL

No. 11-7440-283-12-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 24 September 1982

OPERATOR'S AN ORGANIZATIONAL MAINTENANCE MANUAL COMPUTER GROUP, GUN DIRECTION OL-200/GYK-29(V) (NSN 7025-01-134-2331) (PART OF COMPUTER SYSTEM, GUN DIRECTION AN/GYK-29(V))

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703.

In either case, a reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

THIS MANUAL TELLS ABOUT THE TYPICAL ARRANGEMENTS OF COMPUTER GROUP, GUN DIRECTION, OL-200/GYK-29(V).

ALL THE PROCEDURES IN THIS MANUAL MUST BE EXAMINED BEFORE YOU BEGIN ANY TASK.

THIS MANUAL IS ORGANIZED INTO CHAPTERS, SECTIONS, PARAGRAPHS, AND ILLUSTRATIONS WHICH ARE NUMBERED TO HELP YOU FIND INFORMATION ABOUT YOUR EQUIPMENT QUICKLY AND EASILY.

THE FIRST PAGE OF EACH CHAPTER CONTAINS A DETAILED TABLE OF CONTENTS FOR THE CHAPTER. THIS WILL ALSO HELP YOU FIND INFORMATION QUICKLY.

CHAPTER 1
INTRODUCTION

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SECTION I. GENERAL INFORMATION

1-1. SCOPE

This manual covers operation, installation, and organizational maintenance for the inventoried configurations of the Battery Computer System (BCS) installed in a Cargo Truck, M561 and an Armored Personnel Carrier, M577A1 or M577A2. The BCS is comprised of a Battery Computer Unit (BCU), a Power Distribution Unit (PDU), and other auxiliary equipment such as radios and COMSEC equipment. Separate from the M561 or M577A1/A2 are the Gun Display Units (GDU's) located at the individual firing pieces.

1-2. INDEX OF PUBLICATIONS

Refer to the latest issue of DA Form 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. REPORTS OF MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/ NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C/DLAR 4500.15.

1-4. HAND RECEIPT (HR) MANUALS

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 11-7440-283-10-1 - HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) you must account for. As an aid to property accountability, additional - HR manuals may be requisitioned from the US Army Adjutant General Publications Center in Baltimore, MD, in accordance with the procedures in Chapter 3, AR 310-2, and DA Form 310-10-2.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your BCU needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command, and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you a reply.

1-6. NOMENCLATURE CROSS REFERENCE LIST

COMMON NAME	NOMENCLATURE
Battery Computer Unit	Computer, Gun Direction, CP-1317/GYK-29(V) (B4009200)
Tape Transport Unit	Tape Transport Unit RD-439/GYK-29(V) (B4009186)
Power Distribution Group, consisting of:	Power Distribution Group, ON-188/GYK-29(V) (B4009280)
Power Distribution Unit	Power Distribution Unit Assembly (B4009290)
Cable Assembly W6	Cable Assembly, W6, BCU-PDU Power (B4009385)
Cable Assembly W19	Cable Assembly, W19, Aux. Power, Generator (B4009395)
Cable Assembly W20	Cable Assembly, W20, Aux. Power, Generator (B4009396)
Ground Stake Kit	Kit, Ground Stake (5975-X07-8007)
Interconnecting Kit, consisting of:	Interconnecting Kit MK-1829/GYK-29(V)
Cable Assembly W7/W10	Cable Assembly, W7/W10 (B4009388)
Cable Assembly W13	Cable Assembly, W13 (B4009391)
Cable Assembly W3	Cable Assembly, W3 (B4009383)
Cable Assembly W11	Cable Assembly, W11 (B4009389)
Cable Assembly W5	Cable Assembly, W5 (B4009384)
Cable Assembly W31	Cable Assembly, W31 (B4009397)
Cable Assembly W32	Cable Assembly, W32 (B4009398-1)

1-6. NOMENCLATURE CROSS REFERENCE LIST - CONTINUED

COMMON NAME	NOMENCLATURE
Cable Assembly W8	Cable Assembly, W8 (B4009386)
Cable Assembly W9	Cable Assembly, W9 (B4009387)
Cable Assembly W12	Cable Assembly, W12 (B4009390)
Cable Assembly W16	Cable Assembly, W16 (B4009392)
Cable Assembly W17	Cable Assembly, W17 (B4009393)
Cable Assembly W18	Cable Assembly, W18 (B4009394)
Headset	Headset, H-161D/U (5965-01-104-0947)
Handset	Handset, H-189/GR (5965-00-069-8886)
Battery Computer Unit Mounting Base, consisting of:	Mounting Base, Computer Gun Direction MT-4938/GYK-29(V) (B4009183)
Electrical Equipment Table	Table, Electrical Equipment, MT-4394/GSG-10 (SC-C-690584)
Adapter Plate Assembly	Assembly, Adapter Plate (B4009722)
Frame Support Assembly	Assembly, Frame Support (B4009720)
KG-31 Tray Mounting Assembly	Mounting Assembly, KG-31 Tray (B4009723)
Angle, Clamping	Angle, Clamping (B4009724)
BCU Tray Mounting Assembly	Mounting Assembly, BCU Tray (B4009721)
M561 Mounting Kit Assembly, consisting of:	Kit Assembly, M561, Mounting, MK-1831/ GYK-29(V) (B4009184)
Sub-Base Mount	Mount, Sub-Base (SC-D-866281)
Radio Mount	Mount, Radio, MT-6188 (B4005075)
Rear Support Assembly	Support Assembly, Rear (B4009818)
Stiffener Assembly	Assembly, Stiffener (B4009819)
Cable Assembly W1	Cable Assembly, W1 (B4009381)
Cable Assembly W2	Cable Assembly, W2 (B4009382)

1-6. NOMENCLATURE CROSS REFERENCE LIST - CONTINUED

COMMON NAME	NOMENCLATURE
M577 Mounting Kit Assembly, consisting of:	Kit Assembly, M577, Mounting, MK-1832/GYK-29(V) (B4009185)
Cable Assembly W1	Cable Assembly, W1 (B4009381)
Cable Assembly W2	Cable Assembly W2 (B4009382)
Table Support Block	Block, Table Support (B4009820)
Power Connector Bracket	Bracket, Power Connector (B4009821)
Antenna Connector Bracket	Bracket, Antenna Connector (B4009822)
Top Plate Assembly	Assembly Plate, Top (B4009337)
Bottom Plate Assembly	Assembly Plate, Bottom (SC-D-866100)

1-7. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-8. PREPARATION FOR STORAGE OR SHIPMENT

To prepare the BCS for administrative storage, perform the procedures described in Maintenance. Upon removal from administrative storage, perform the procedures described in Operation to determine that the equipment is fully operational.

1-9. LIST OF ABBREVIATIONS

BCS	Battery Computer System
BCU	Battery Computer Unit
BIT	Built-In Test
COMSEC	Communications Security
CP	Central Processor Assembly
CP INT	Central Processor Interface Assembly
FDC	Fire Direction Center
FDO	Fire Direction Officer
FIST	Fire Support Team
FSK	Frequency Shift Keying
FSO	Fire Support Officer
GDU	Gun Display Unit
IDC-1	Interface Data Controller 1 Assembly
IDC-2	Interface Data Controller 2 Assembly
LVPS	Low Voltage Power Supply
MEM-1	65 KW Memory Assembly 1
MEM-2	65 KW Memory Assembly 2
MEM-CONT	Memory Control Assembly
PDU	Power Distribution Unit
PLU	Program Load Unit
PLU-EU	Program Load Unit-Tape Electronics Unit
PLU-TU	Program Load Unit-Tape Transport Unit
SYM GEN	Symbol Generator Assembly
TEU	Tape Electronics Unit
TTU	Tape Transport Unit

1-9. LIST OF ABBREVIATIONS - CONTINUED

VFMED	Variable Format Message Entry Device
W1	Cable Assembly W1
W2	Cable Assembly W2
W3	Cable Assembly W3
W5	Cable Assembly W5
W6	Cable Assembly W6
W7/W10	Cable Assembly W7/W10
W8	Cable Assembly W8
W9	Cable Assembly W9
W11	Cable Assembly W11
W12	Cable Assembly W12
W13	Cable Assembly W13
W16	Cable Assembly W16
W17	Cable Assembly W17
W18	Cable Assembly W18
W19	Cable Assembly W19
W20	Cable Assembly W20
W21	Cable Assembly W21
W22	Cable Assembly W22
W23	Cable Assembly W23
W24	Cable Assembly W24
W31	Cable Assembly W31
W32	Cable Assembly W32
W33	Cable Assembly W33
W34	Cable Assembly W34
W35	Cable Assembly W35

SECTION II. EQUIPMENT DESCRIPTIONS

1-10. PURPOSE

The BCS communicates between the FSO, FIST, Battalion TACFIRE, and individual weapons. The BCS receives and stores data, computes fire commands, and sends the firing data to the sections. It also displays the data for the FDO and the operator to review, edit, and approve.

. Data Reception and Storage. The BCU receives data from the FSO, FIST, and Battalion. It also allows inputs from the BCS operator. All data is stored in the BCU memory for computational purposes.

. Computation. The BCU computes fire commands for the firing pieces using data stored in its memory. It does these computations for the type of weapon in the battery.

. Transmission. The BCU sends the results of its calculations to the gun sections. It also sends the messages to the FSO, FIST, and Battalion TACFIRE.

. Display. The BCU keeps the operator and the FDO up-to-date by displaying mission status. It helps the operator to type in data by displaying fill-in-the-blanks type of display.

1-11. CAPABILITIES

. Built-in test function

. Radio communications over three channels

. Wire line communications over three channels

. Auxiliary radio channel reception

. Secure or non-secure communications

. Speed of computations

. Mission status display

. Gun status display

. Memory retention during prime power failure

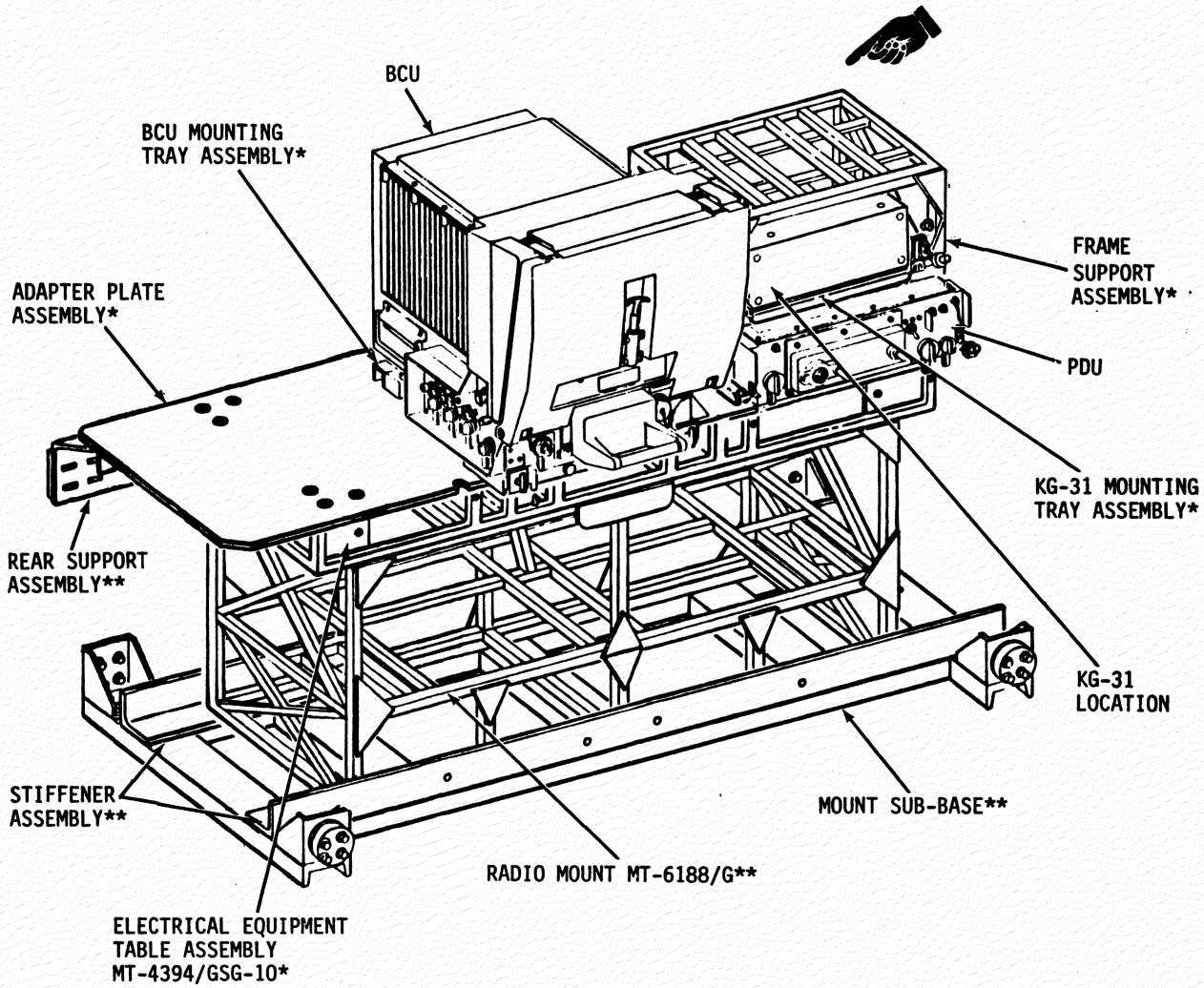
. Message editing

. Data file update

1-12. LOCATION AND DESCRIPTION

1. INVENTORIED CONFIGURATIONS

. M561

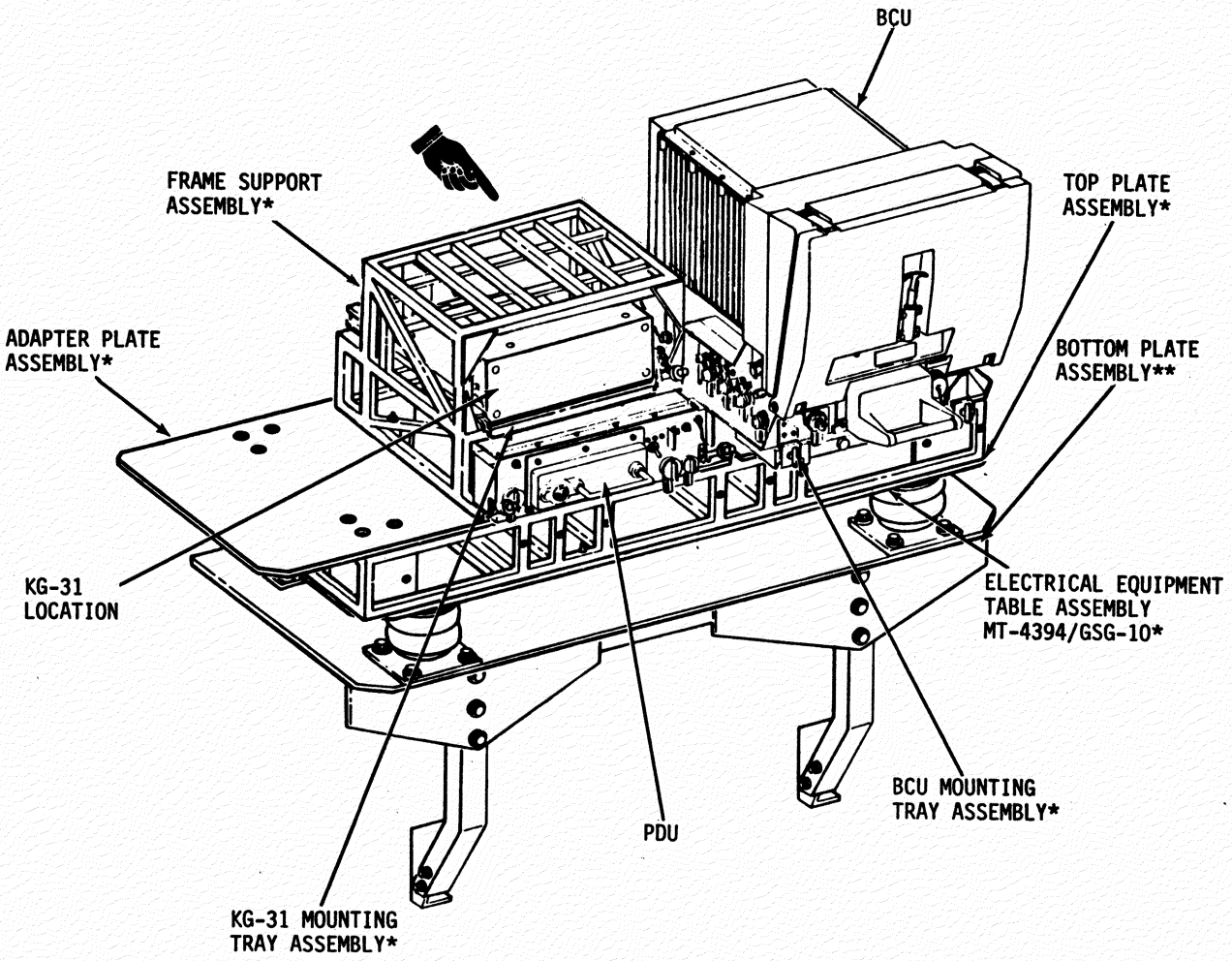


*P/O COMPUTER GUN DIRECTION MOUNTING BASE
**P/O MOUNTING KIT ASSEMBLY, MK-1831

1-12. LOCATION AND DESCRIPTION - CONTINUED

1. INVENTORIED CONFIGURATIONS - CONTINUED

. M577A1/M577A2



*P/O COMPUTER GUN DIRECTION MOUNTING BASE
**P/O MOUNTING KIT ASSEMBLY, MK-1832

1-12. LOCATION AND DESCRIPTION - CONTINUED

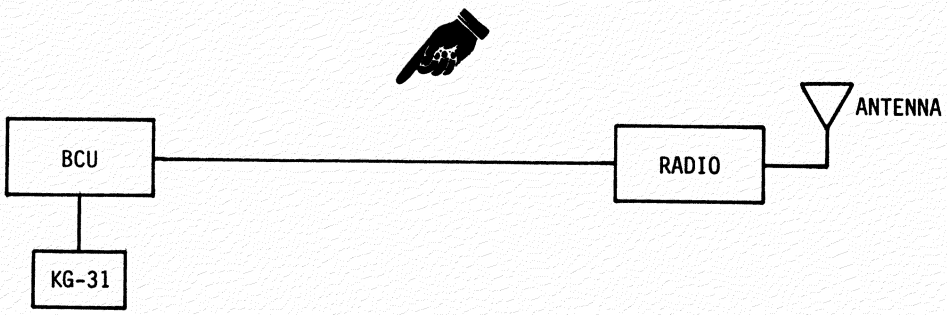
1. INVENTORIED CONFIGURATIONS - CONTINUED

. COMMUNICATIONS CHANNEL

A communications channel may consist of an AN/VRC-46 radio with:

. KG-31 or

. No security device



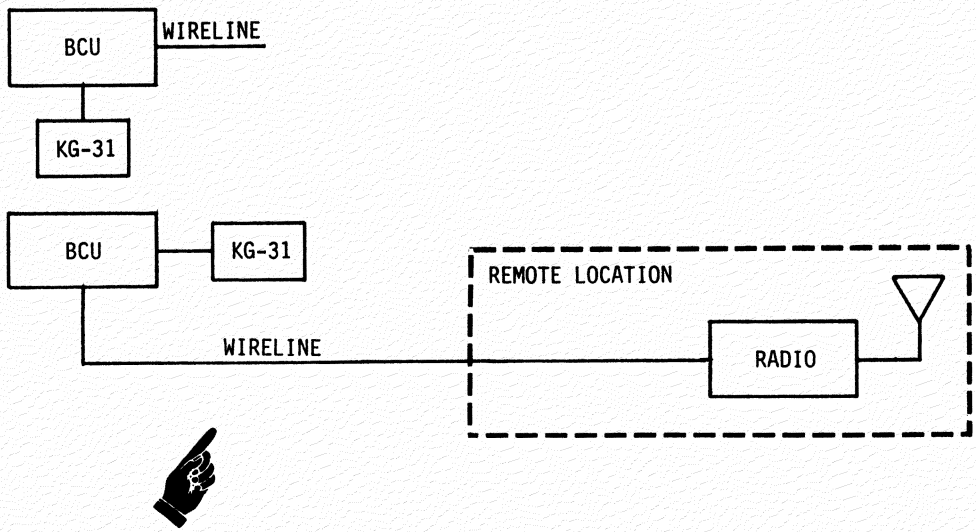
2. OTHER CONFIGURATIONS

Communications channels in other configurations may consist of:

. Wire or remote radio with:

. KG-31 or

. No security device



1-12. LOCATION AND DESCRIPTION - CONTINUED

2. OTHER CONFIGURATIONS - CONTINUED

- AN/GRC-106 with
  - KG-31 or
  - No security device
- AN/GRA-39 (remote unit) with
  - KG-31 or
  - No security device
- AN/PRC-77 manpack with
  - KG-31 or
  - No security device

(An AN/PRC-25 radio may be used in place of the AN/PRC-77)

- AN/GRC-160 (AN/PRC-77 vehicle mounted) with
  - KG-31 or
  - No security device

- AN/GRA-39 (remote unit) with
- KG-31 or
- No security device

3. BCU

- Keyboard
  - Operating keys for entering data and controlling BCU
  - Swings down and locks for operation
  - Swings up and latches
- Display
  - 24 lines of 72 characters each
  - Three separate sections:

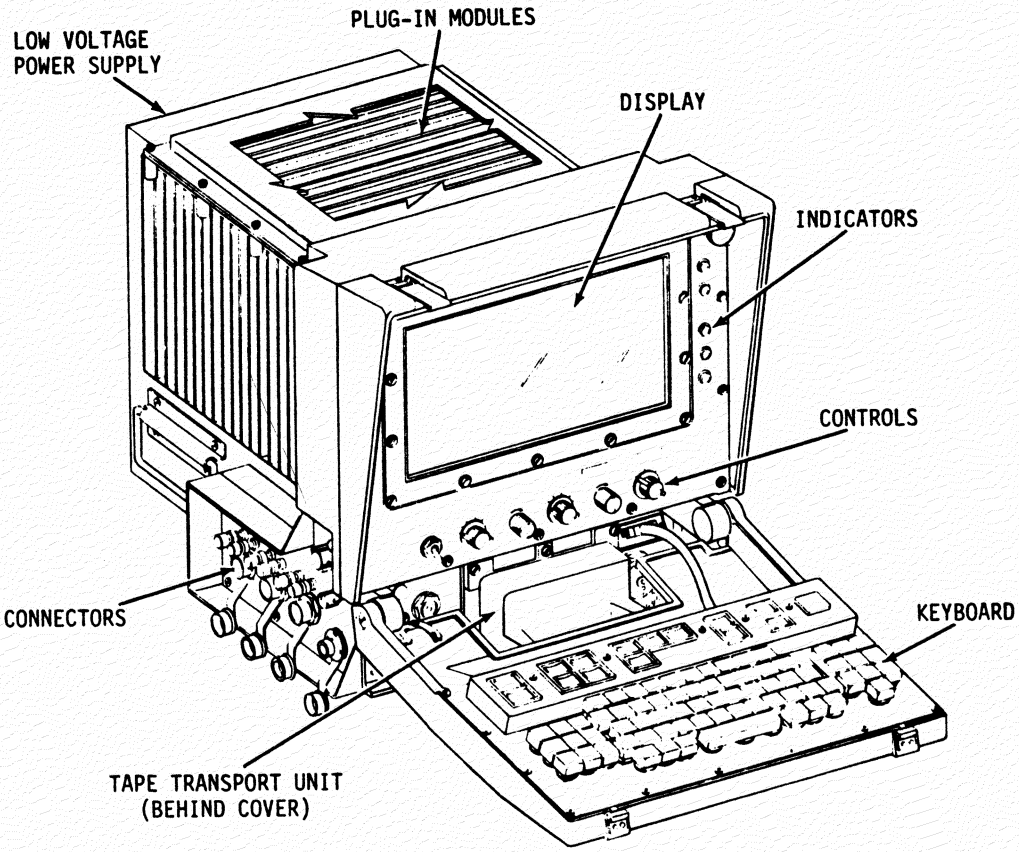
    Upper - mission status

    Middle - gun and file status

    Lower - messages (fill-in-the-blanks format)
    prompts
    error and warning messages

1-12. LOCATION AND DESCRIPTION - CONTINUED

3. BCU - CONTINUED



. Controls

. Front panel

Power ON/OFF

Panel illumination

Alarm volume

Display brightness

Operator headset volume and channel select

Panel test

Program load

. Left side

FDO handset volume and channel select

1-12. LOCATION AND DESCRIPTION - CONTINUED

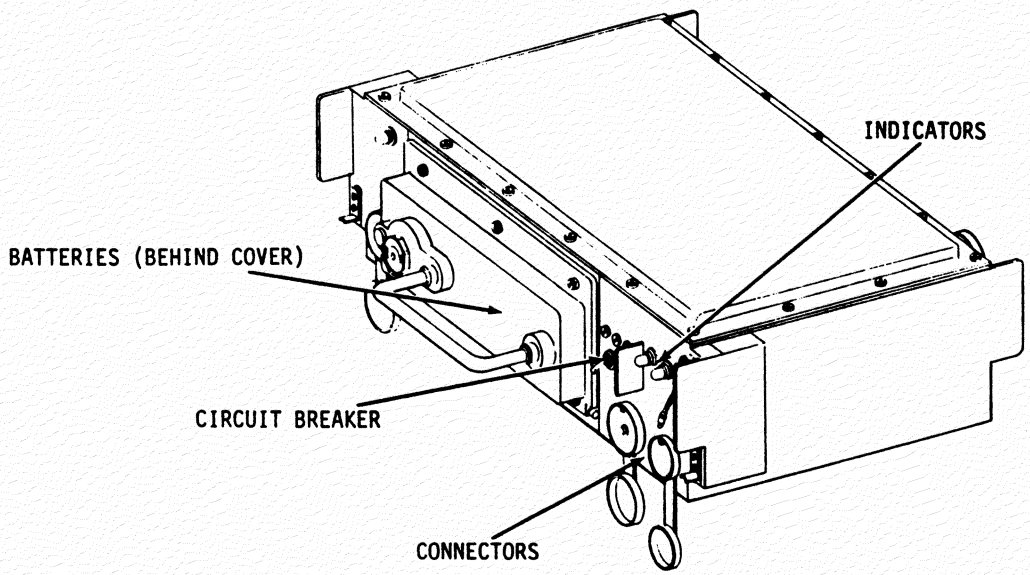
3. BCU - CONTINUED

- Indicators
  - Front panel
    - BIT status lamps
    - Power
    - Incoming fire mission messages
    - Communications channels busy
    - Memory circuits
    - Load program
  - External message lamp
  - Audible alarm
- Connectors
  - Front and sides of BCU
  - Connections for:
    - BCU input power
    - KG-31 COMSEC
    - Radio communications
    - Wire line communications
    - Operator headset
    - FDO handset
    - Printer
- Modules
  - 13 plug-in modules
    - Memory
    - Data processing and control
    - Display character generation
    - Internal and external interface
  - Low voltage power supply mounted on rear of BCU
  - Comm channel filter
- Program Load Unit
  - Tape transport unit slides into BCU below keyboard
  - Tape electronics unit in bottom of BCU

1-12. LOCATION AND DESCRIPTION - CONTINUED

4. PDU

- Circuit breaker on front controls power to BCS
- Connectors
  - Two connectors on rear for prime power input
  - Five connectors (three on front/two on rear) for output power to other BCS equipment
- Indicators
  - Two lamps on front indicate prime power available to BCS
  - One lamp on front indicates battery power applied to BCU
- Rechargeable nickel-cadmium batteries supply power to BCU memory when prime power fails



1-13. DATA

1. COMPUTER, GUN DIRECTION
   - . Length: 25 Inches
   - . Width: 16.5 Inches
   - . Height: 16.5 Inches
   - . Weight: 106 Pounds
   - . Input Power: +20 - +35 VDC

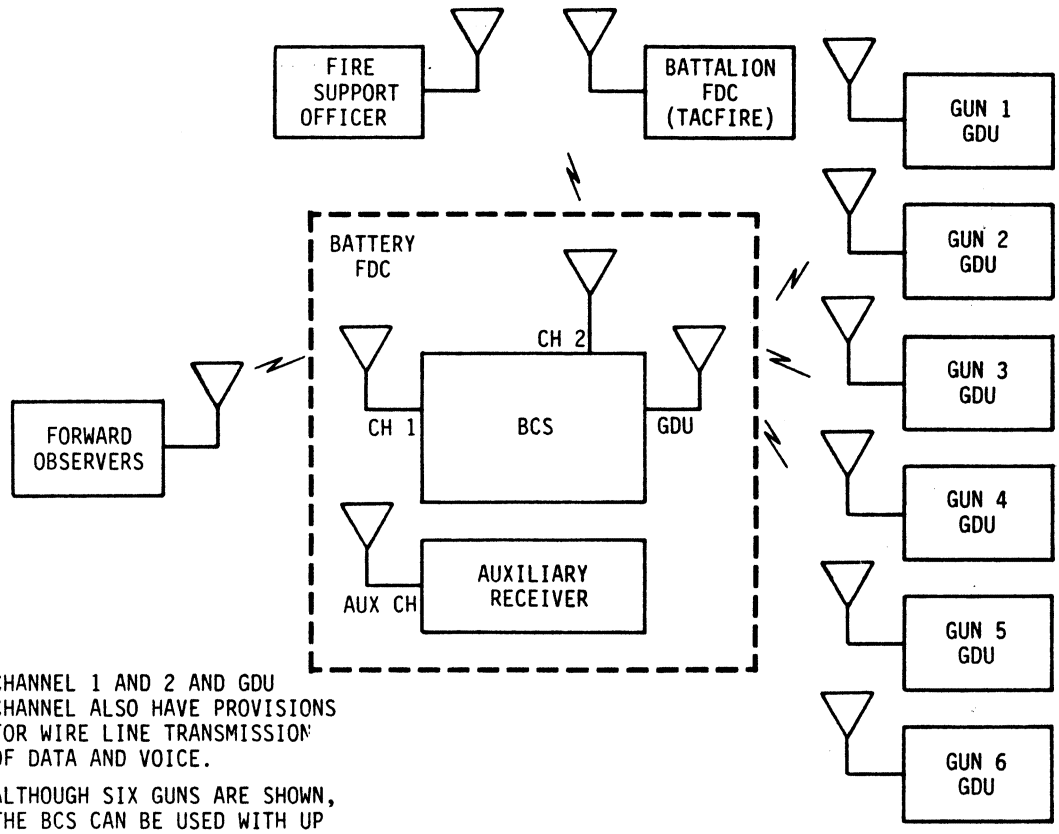
2. POWER DISTRIBUTION GROUP
   - . Length: 13 Inches
   - . Width: 19 Inches
   - . Height: 5.5 Inches
   - . Weight: 16 Pounds
   - . Input Power: +20 - +35 VDC
   - . Output Power: +20 - +35 VDC
   - . Power Consumption: 1160 Watts, Max.

SECTION III. TECHNICAL PRINCIPLES

1-14. TYPICAL SYSTEM OPERATION

1. FORWARD OBSERVERS (FIST'S)
   - . Send fire requests to TACFIRE or BCS
   - . Send commands to fire
   - . Receive ready, shot, and splash messages
2. BCS
   - . Receives fire requests from forward observers
   - . Receives fire messages from TACFIRE
   - . Receives fire plans from TACFIRE
   - . Computes fire data
   - . Performs special computations
   - . Sends fire data and commands to GDU's
   - . Receives mission status messages from GDU's
   - . Sends fire mission messages to FSO
3. FIRE SUPPORT OFFICER
   - . Receives fire mission messages from BCS
4. TACFIRE
   - . Receives fire requests from forward observers
   - . Generates fire plan for supporting BCS
   - . Sends fire messages to BCS
   - . Sends fire plans to BCS
5. GDU'S
   - . Receive fire data and commands from BCS
   - . Send gun status messages to BCS
6. AUXILIARY CHANNEL
   - . Allows FDC the capability of monitoring other radio nets

1-14. TYPICAL SYSTEM OPERATION - CONTINUED



NOTE:

- CHANNEL 1 AND 2 AND GDU CHANNEL ALSO HAVE PROVISIONS FOR WIRE LINE TRANSMISSION OF DATA AND VOICE.
- ALTHOUGH SIX GUNS ARE SHOWN, THE BCS CAN BE USED WITH UP TO 12 GUNS.

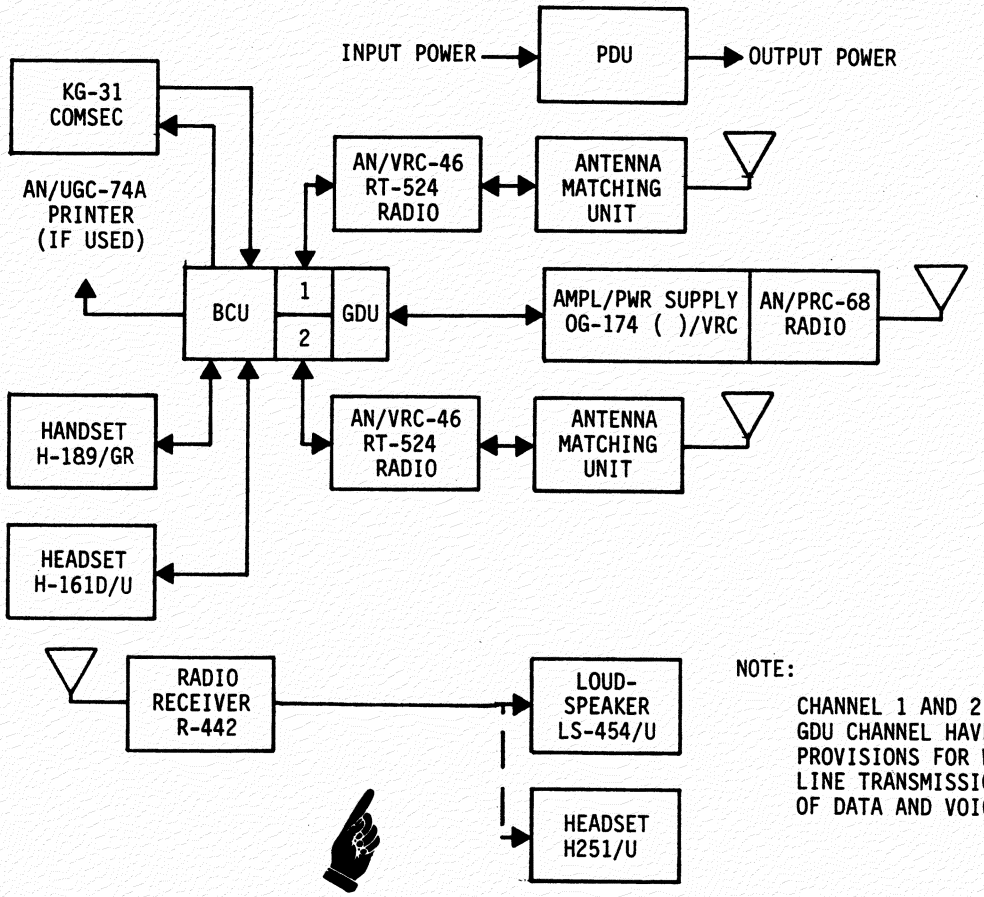
1-15. TYPICAL BCS OPERATION

1. POWER
   - Received from:
     - Vehicle electrical system
     - Gasoline generator
     - Auxiliary batteries
   - PDU supplies to:
     - BCU
     - KG-31
     - PRC-68 radio
     - Radios
     - Printer (if used)

2. OPERATOR/FDO INTERFACE
   - BCU displays mission status data and fill-in-the-blanks type displays for operator inputs
   - BCU keyboard lets operator edit messages and update file data
   - Handset gives FDO voice communications over channel 1, channel 2, and GDU channel
   - Headset gives operator voice communications over channel 1, channel 2, and GDU channel
   - Printer interface allows connection of auxiliary printing unit to give printed record of events

3. CHANNEL 1 OR 2 TRANSMISSION
   - KG-31 used to encrypt messages transmitted by BCU
   - BCU routes voice/digital transmission to radio
   - Radio sends transmission to prescribed receiver

1-15. TYPICAL BCS OPERATION - CONTINUED



NOTE:

CHANNEL 1 AND 2 AND GDU CHANNEL HAVE PROVISIONS FOR WIRE LINE TRANSMISSION OF DATA AND VOICE.

1-15. TYPICAL BCS OPERATION - CONTINUED

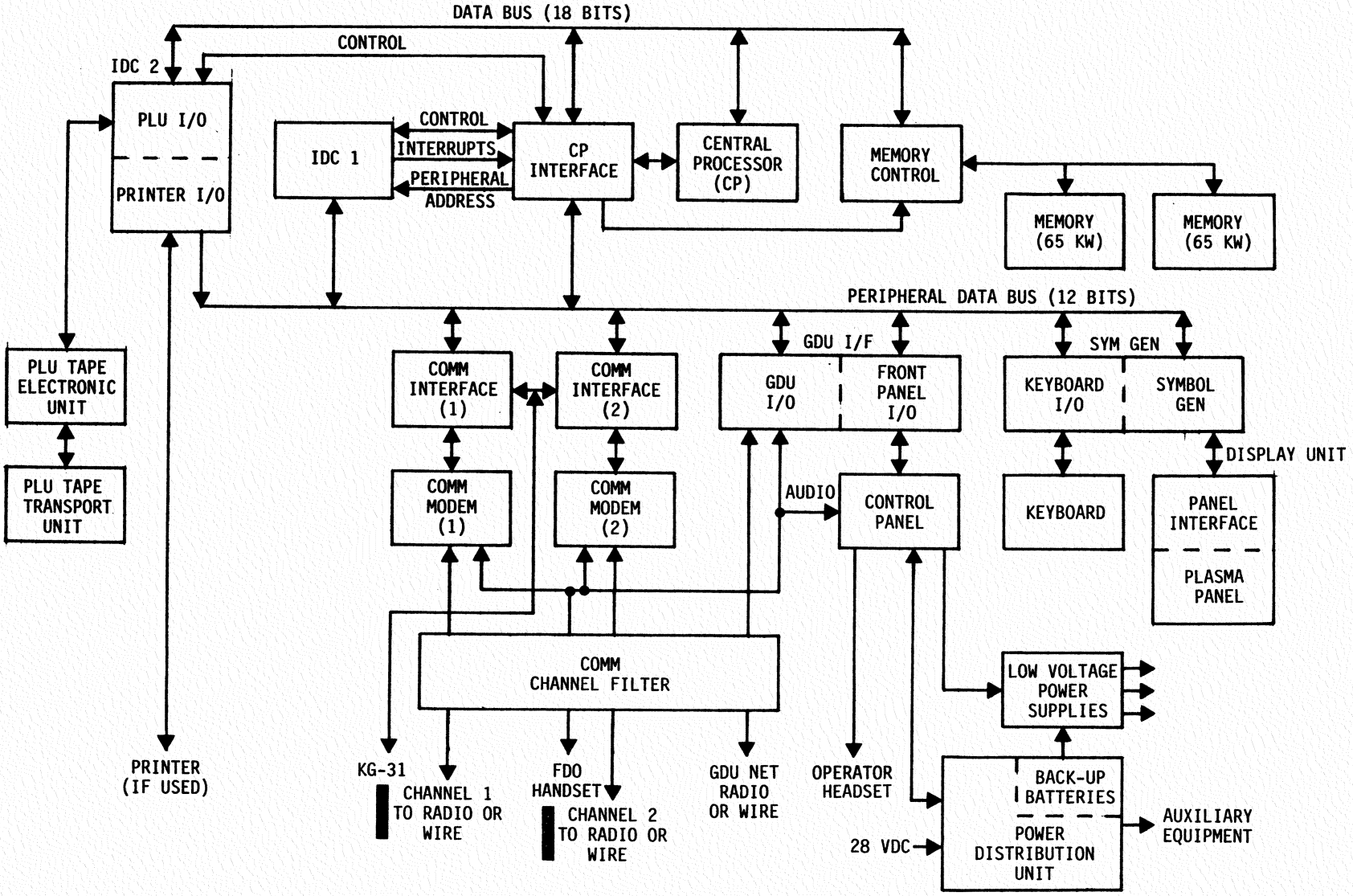
4. CHANNEL 1 OR 2 RECEPTION
   - . Voice/digital communication received by radio
   - . Radio routes communication to BCU
   - . BCU routes communication to headset/handset and lights message indicators. If digital data encrypted, BCU routes it through KG-31.
   - . KG-31 decrypts digital data

5. GDU CHANNEL
   - . BCU routes GDU transmission through Ampl/Pwr Supply Group OG-174( )/VRC to PRC-68 radio
   - . PRC-68 radio transmits signal to GDU
   - . Signal from GDU received by PRC-68 radio
   - . PRC-68 radio routes signal through Ampl/Pwr Supply Group OG-174( )/VRC to BCU
   - . BCU routes voice communication to headset/handset or displays digital data

6. AUXILIARY CHANNEL
   - . Voice transmissions received by receiver
   - . Receiver routes voice transmissions to loudspeaker (LS-454/U) or headset (H251/U) for monitoring

1-16. BCU OPERATION

1. COMPUTER
   - Seven modules between two data busses
   - IDC-1 controls data flow to and from communications channels, GDU's, and keyboard/display
   - IDC-2 controls data flow to and from PLU and printer interface
   - Central processor performs all calculations and provides all other data processing and control
   - CP interface controls central processor and is interface for the two data busses
   - Memory modules store all data for BCS operating program
   - Memory controller is interface between memory and data bus
2. KEYBOARD/DISPLAY
   - Keyboard contains operating keys for data entry and BCU control
   - Display shows mission, gun, and file status and displays messages for editing
   - Symbol generator provides timing and character generation for display and transfers data between keyboard, display, and data bus
3. COMMUNICATIONS
   - Comm channel filter connects radios and wire lines to BCU and provides FDO communications connection and control
   - Comm modem modules perform FSK data conversion
   - Comm interface modules perform digital processing of communication channel data and COMSEC control
   - GDU I/O processes and controls GDU network signals and interfaces with control panel lamps
   - Control panel provides operator communications control
4. COMM CHANNEL FILTER ASSEMBLY
   - Provides connections and filters for channel 1 and 2 and GDU channel radio and wire line communications
   - Contains connection and volume control for FDO handset and FDO communication channel selector


DATA BUS (18 BITS)
CONTROL
IDC 2
PLU I/O
PRINTER I/O
IDC 1
CONTROL
INTERRUPTS
PERIPHERAL ADDRESS
CP INTERFACE
CENTRAL PROCESSOR (CP)
MEMORY CONTROL
MEMORY (65 KW)
MEMORY (65 KW)
PERIPHERAL DATA BUS (12 BITS)
PLU TAPE ELECTRONIC UNIT
PLU TAPE TRANSPORT UNIT
COMM INTERFACE (1)
COMM INTERFACE (2)
GDU I/F
GDU I/O
FRONT PANEL I/O
SYM GEN
KEYBOARD I/O
SYMBOL GEN
DISPLAY UNIT
COMM MODEM (1)
COMM MODEM (2)
AUDIO
CONTROL PANEL
KEYBOARD
PANEL INTERFACE
PLASMA PANEL
COMM CHANNEL FILTER
LOW VOLTAGE POWER SUPPLIES
PRINTER (IF USED)
KG-31
CHANNEL 1 TO RADIO OR WIRE
FDO HANDSET
CHANNEL 2 TO RADIO OR WIRE
GDU NET RADIO OR WIRE
OPERATOR HEADSET
BACK-UP BATTERIES
28 VDC
POWER DISTRIBUTION UNIT
AUXILIARY EQUIPMENT

1-16. BCU OPERATION - CONTINUED

5. CONTROL PANEL
   - . BIT lamps indicate faulty BCU modules
   - . Indicator lamps indicate:
     - Power is on
     - A message has been received and the type of message
     - The BCS operating program has been loaded
     - The BCU memory is clear
     - A communications channel is busy
   - . PWR circuit breaker applies power to BCU
   - . Switches and controls provide:
     - BCU program load control
     - A check of all control panel BIT and indicator lamps
     - Control of panel illumination lamps
     - Control of display and indicator brightness
     - Control of audible alarm volume
     - Control of operator headset volume and channel selection

6. PROGRAM LOAD UNIT
   - . Storage device and memory load unit for program and data for specific weapon and model applications
   - . Tape transport unit contains magnetic tape with operating programs.
   - . Tape electronics unit controls program loading and interfaces tape transport unit and BCU computer

7. LOW VOLTAGE POWER SUPPLY
   - . Provides regulated voltages for BCU operation
   - . Contains overvoltage protection circuitry

1-17. PDU OPERATION

1. PRIME POWER

. Power applied to PDU prime input No. 1 and No. 2 from
  Vehicle electrical system or
  Gasoline generator or
  Auxiliary batteries (emergency operation only)
. PDU filters prime power
. Power ON/OFF circuit breaker applies prime power No. 1 to
  BCU
  KG-31
  Ampl/Pwr Supply Group OG-174( )/VRC
  Printer (if used)
. Power ON/OFF circuit breaker applies prime power No. 2 to
  Radios
. BCS POWER BCU and AUX lamps indicate prime power applied to BCS

2. BATTERY POWER

. Two batteries in PDU for BCU memory retention if prime power is lost.
. BAT PWR lamp indicates battery power applied to BCU
. PDU battery charging circuit charges batteries when prime power on

1-18. GDU OPERATION

. Case assembly provides data reception, transmission, and power conversion
. SCA provides display of fire data and commands to fire
. Gun assemblies provides indications of deflection and elevation
. Power supplied from internal battery or external source

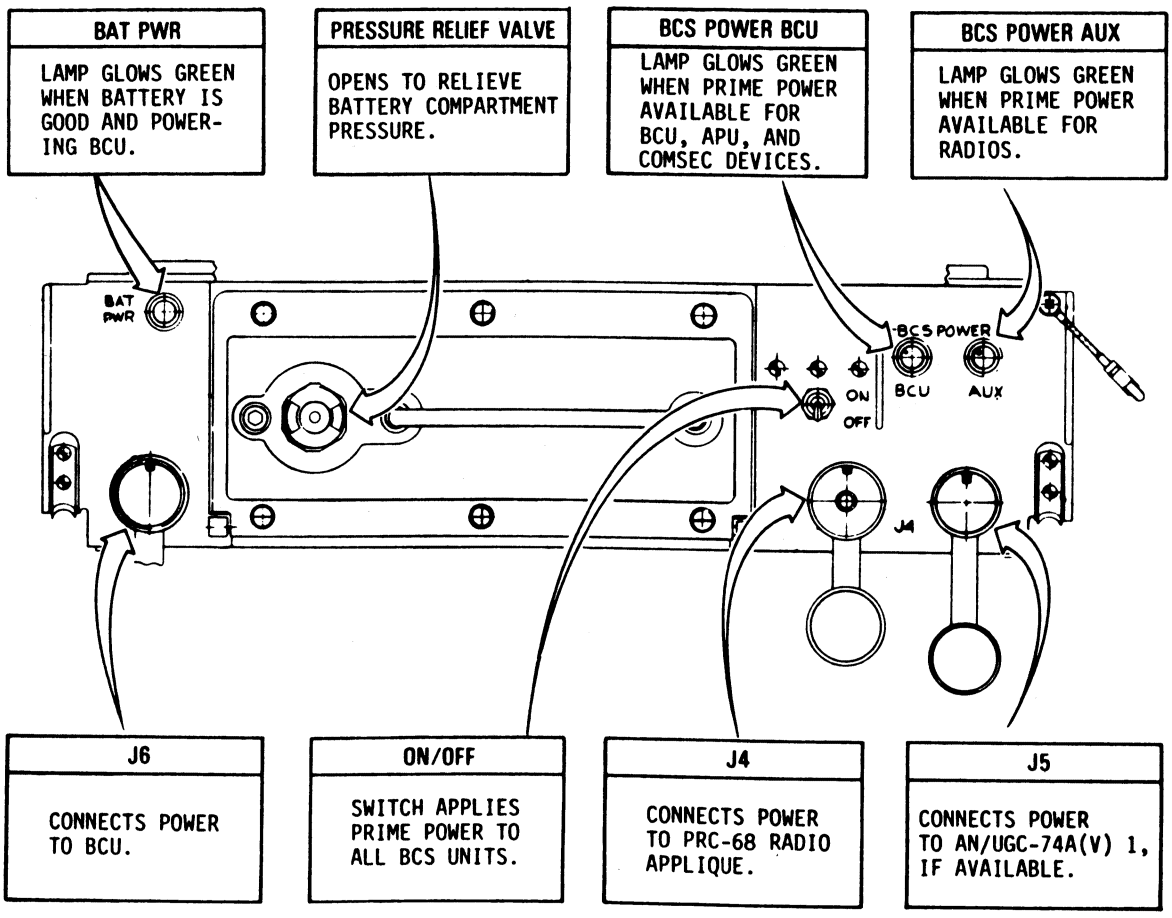
CHAPTER 2
OPERATING INSTRUCTIONS

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SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

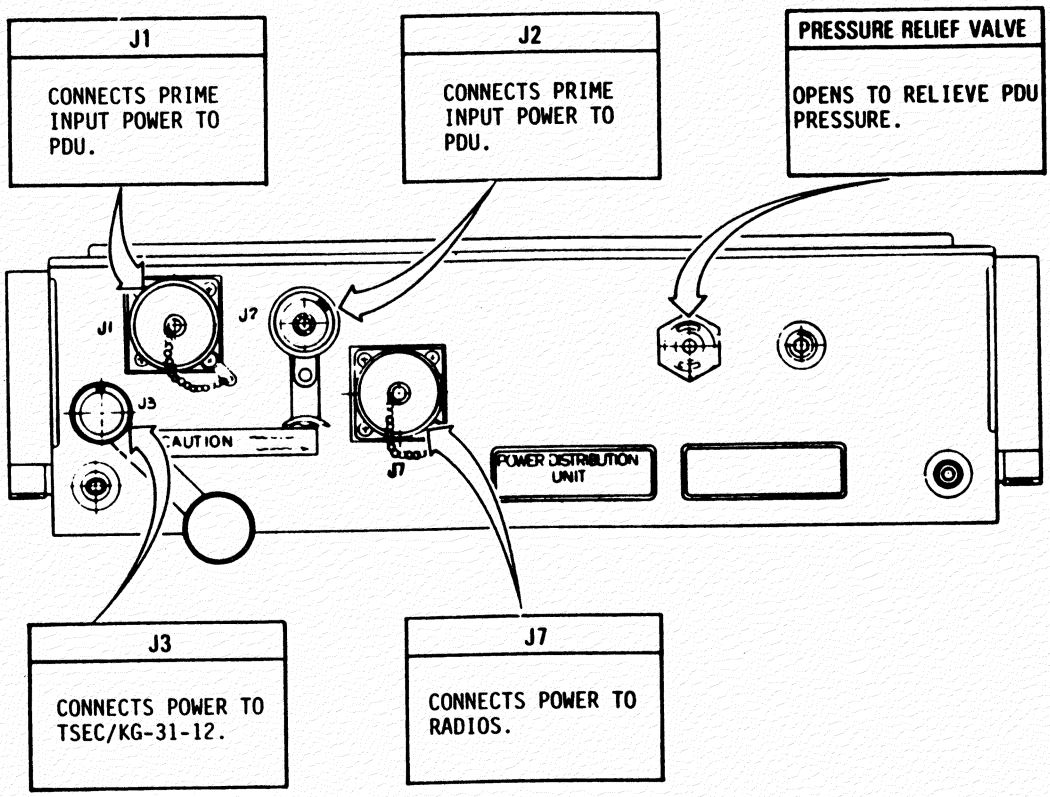
2-1. PDU CONTROLS, INDICATORS, AND CONNECTORS

1. FRONT



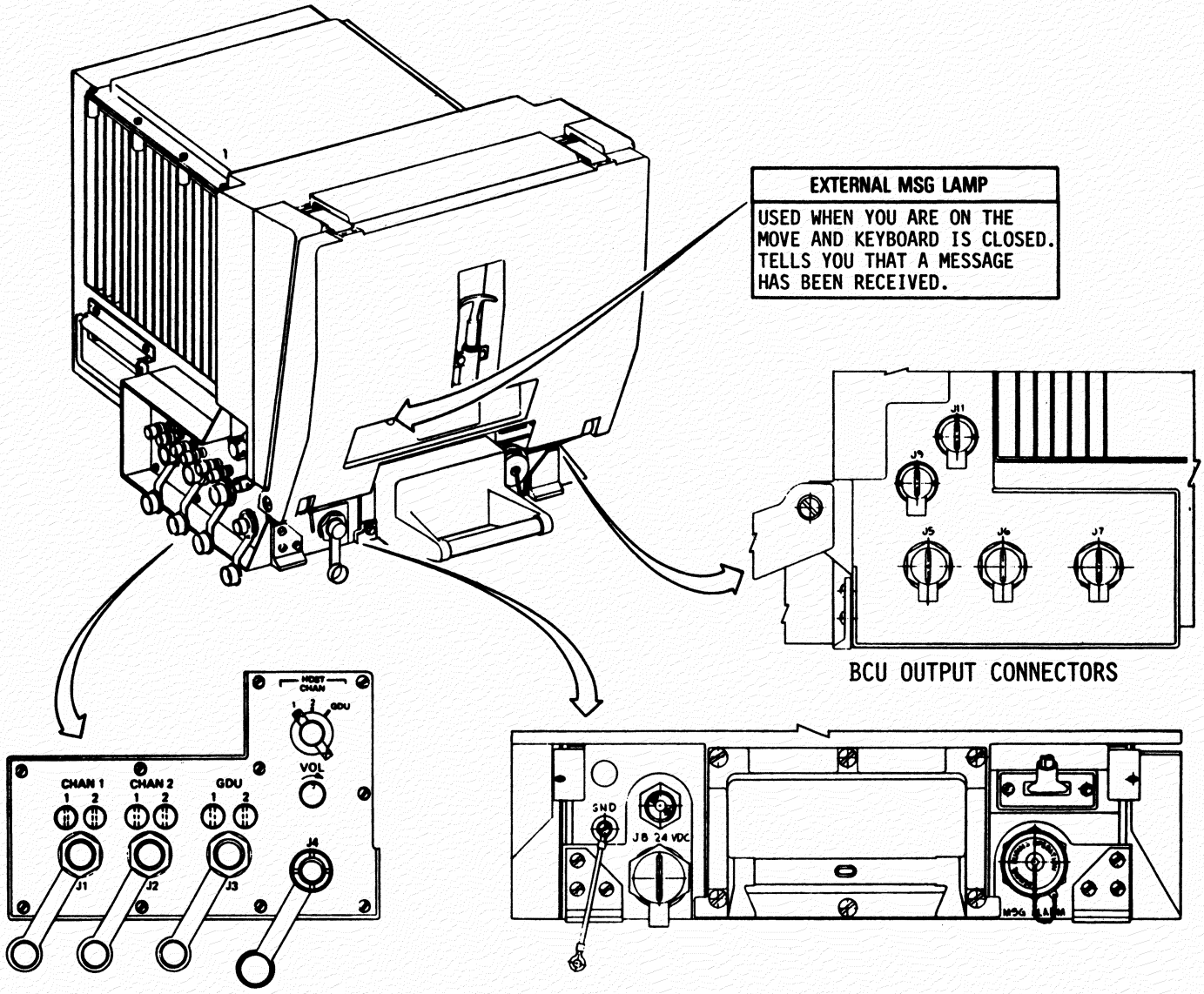
2-1. PDU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

2. BACK



2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS

1. BCU OVERALL CONNECTORS AND CONTROLS

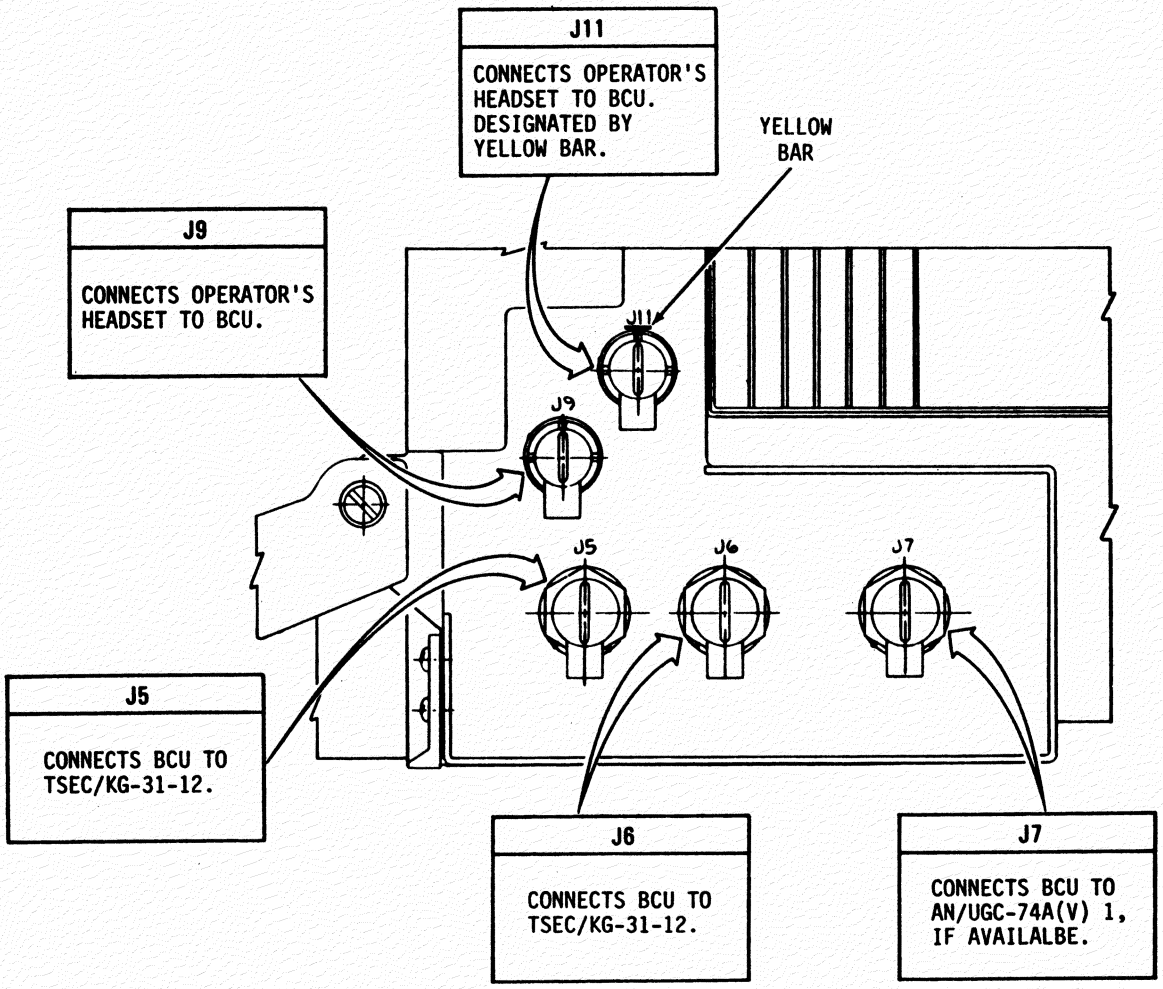


BCU OUTPUT CONNECTORS

FDO CONTROLS AND OUTPUT CONNECTORS

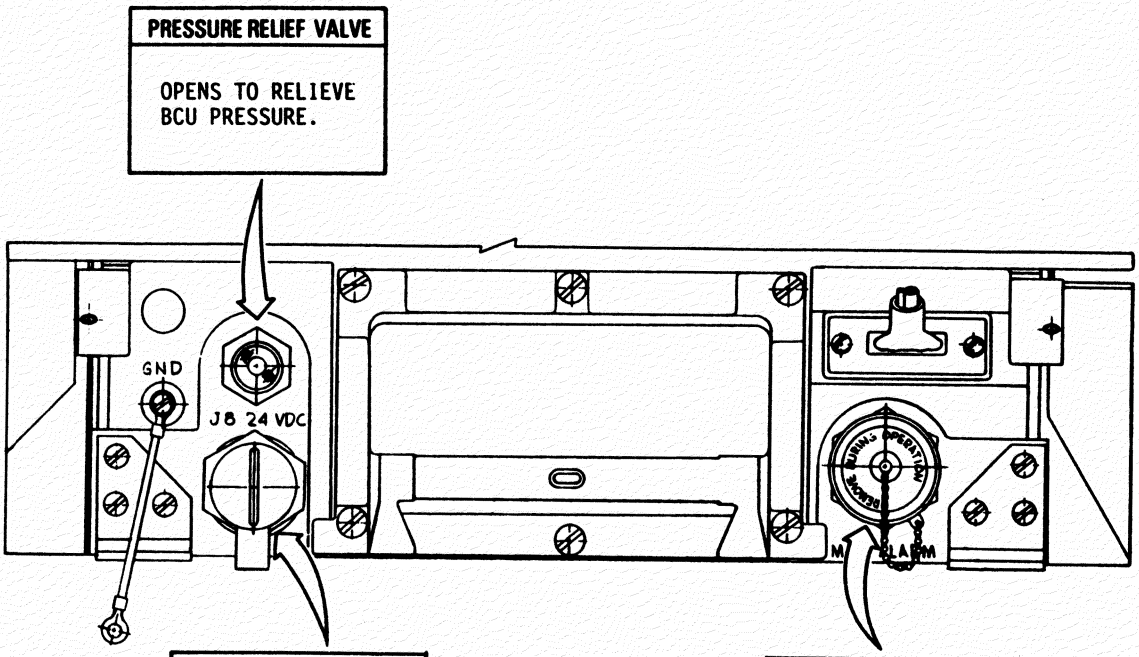
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

2. BCU OUTPUT CONNECTORS



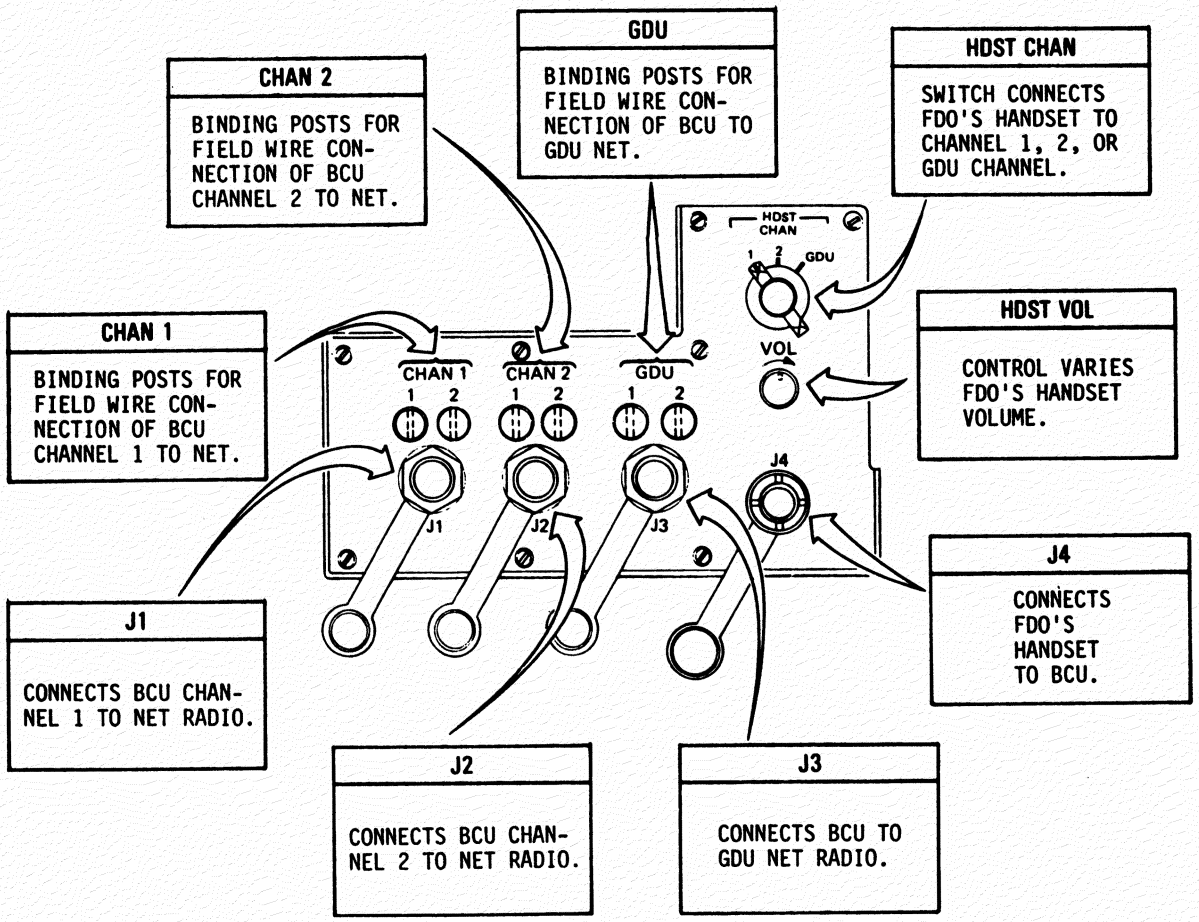
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

3. LOWER BCU



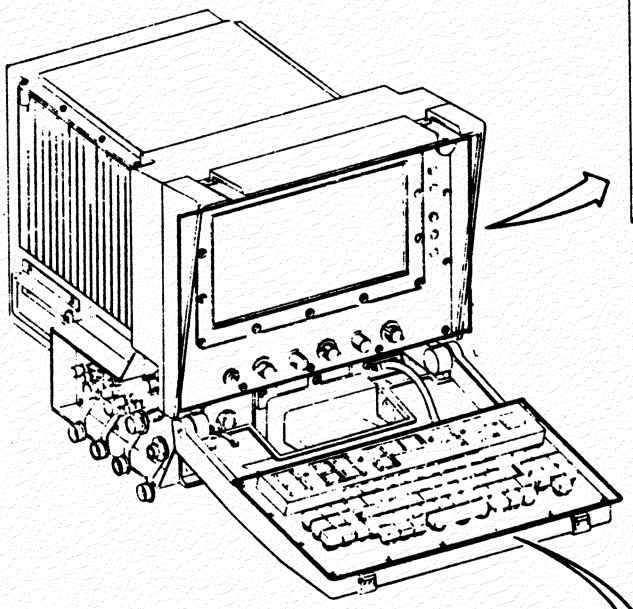
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

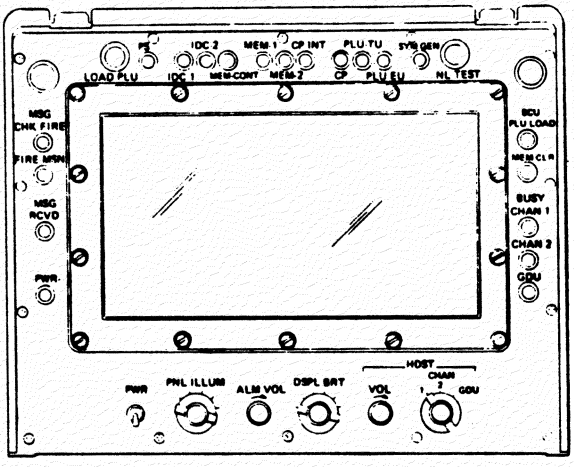
4. FDO CONTROLS AND OUTPUT CONNECTORS



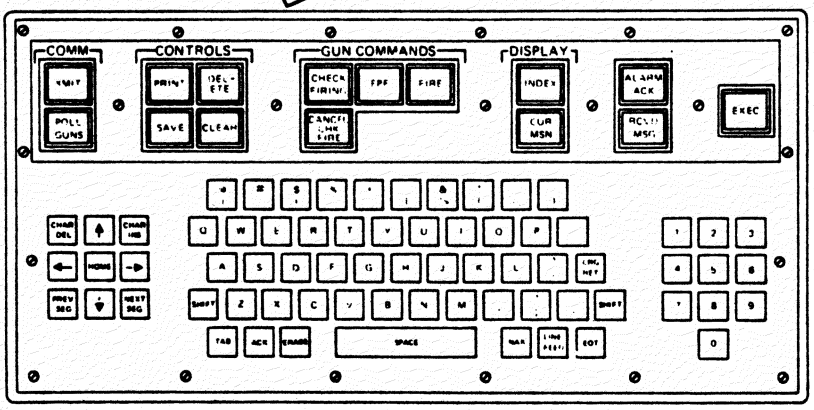
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

5. BCU - OVERALL





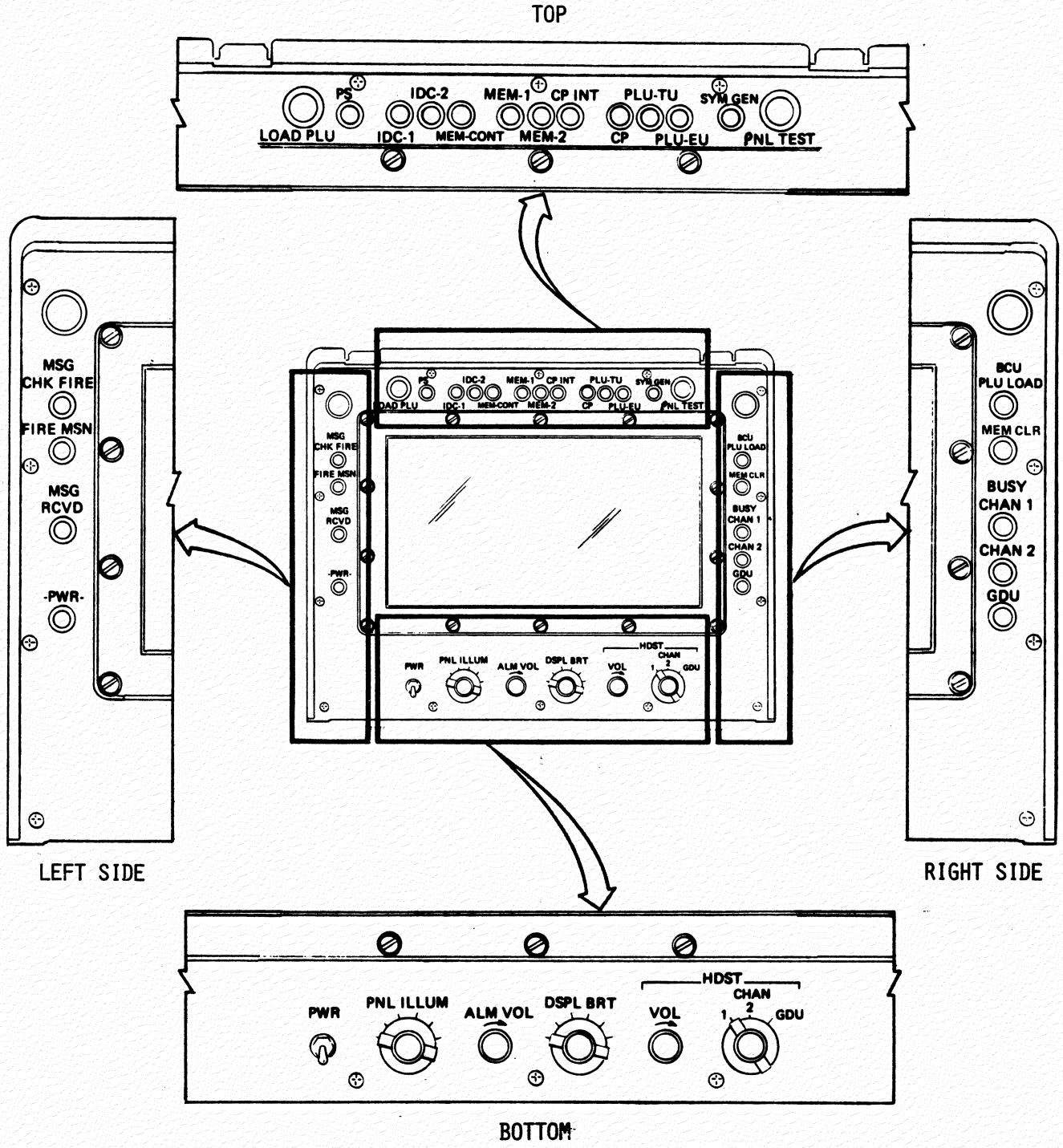
FRONT PANEL



KEYBOARD

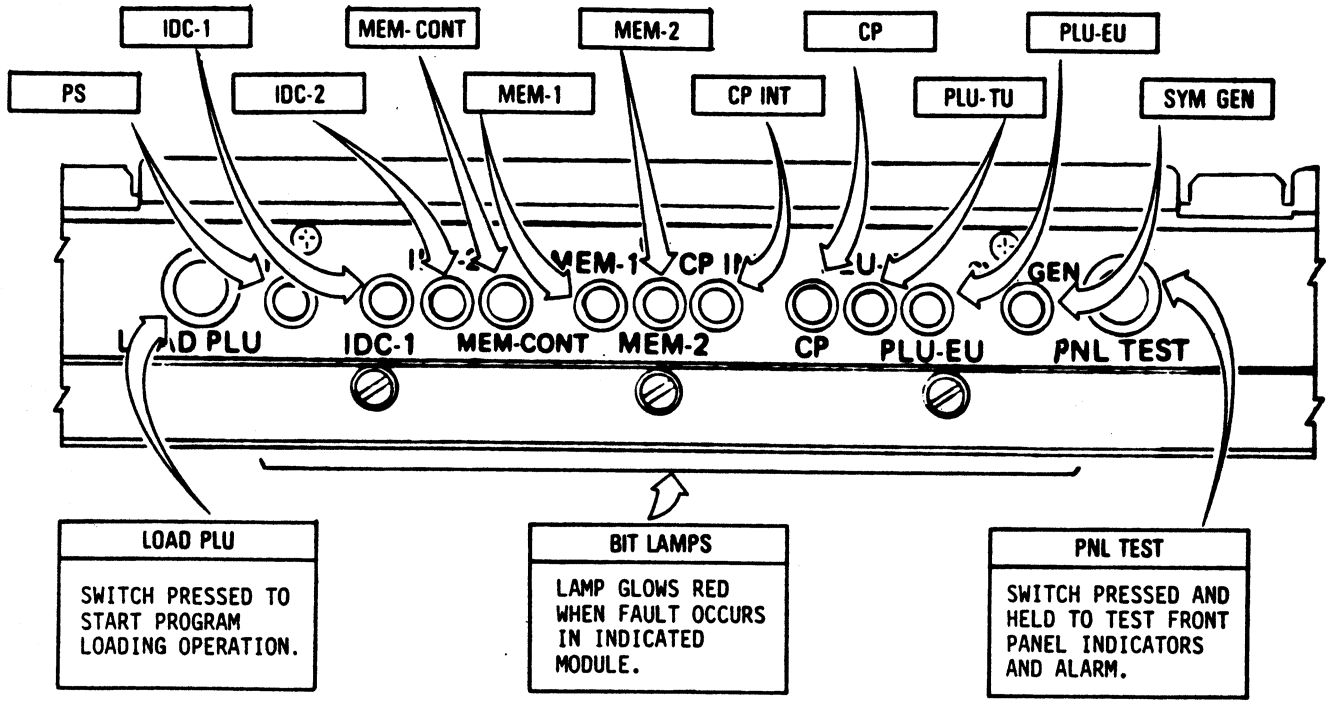
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

6. FRONT PANEL - OVERALL



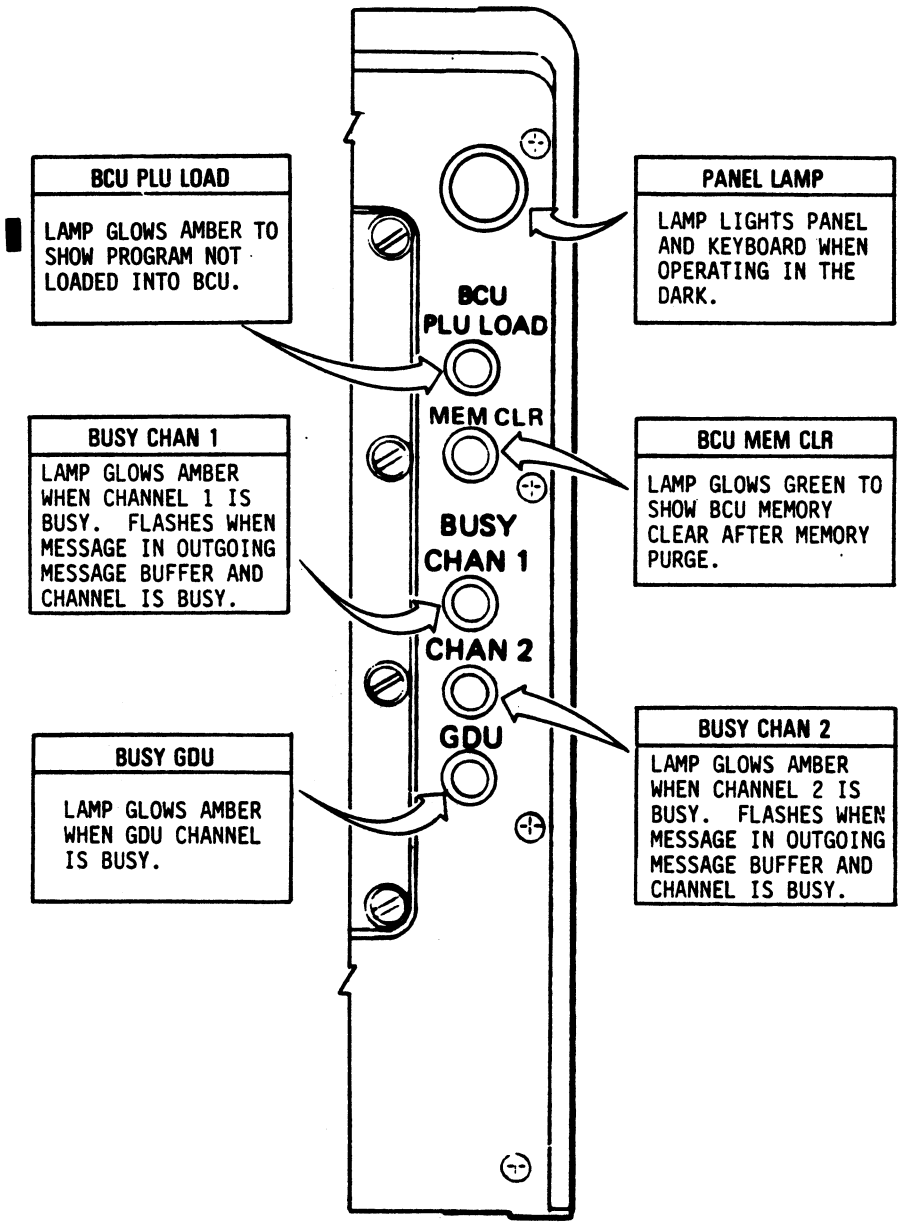
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

7. FRONT PANEL - TOP



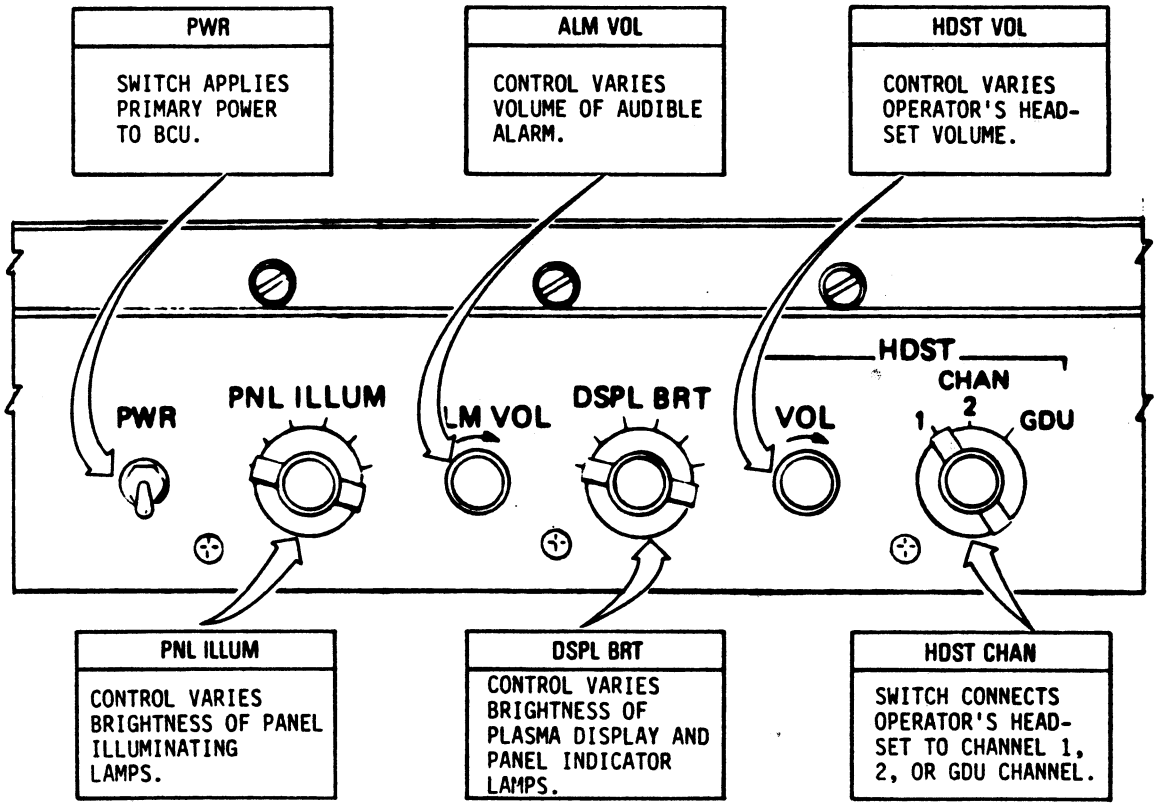
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

8. FRONT PANEL - RIGHT SIDE



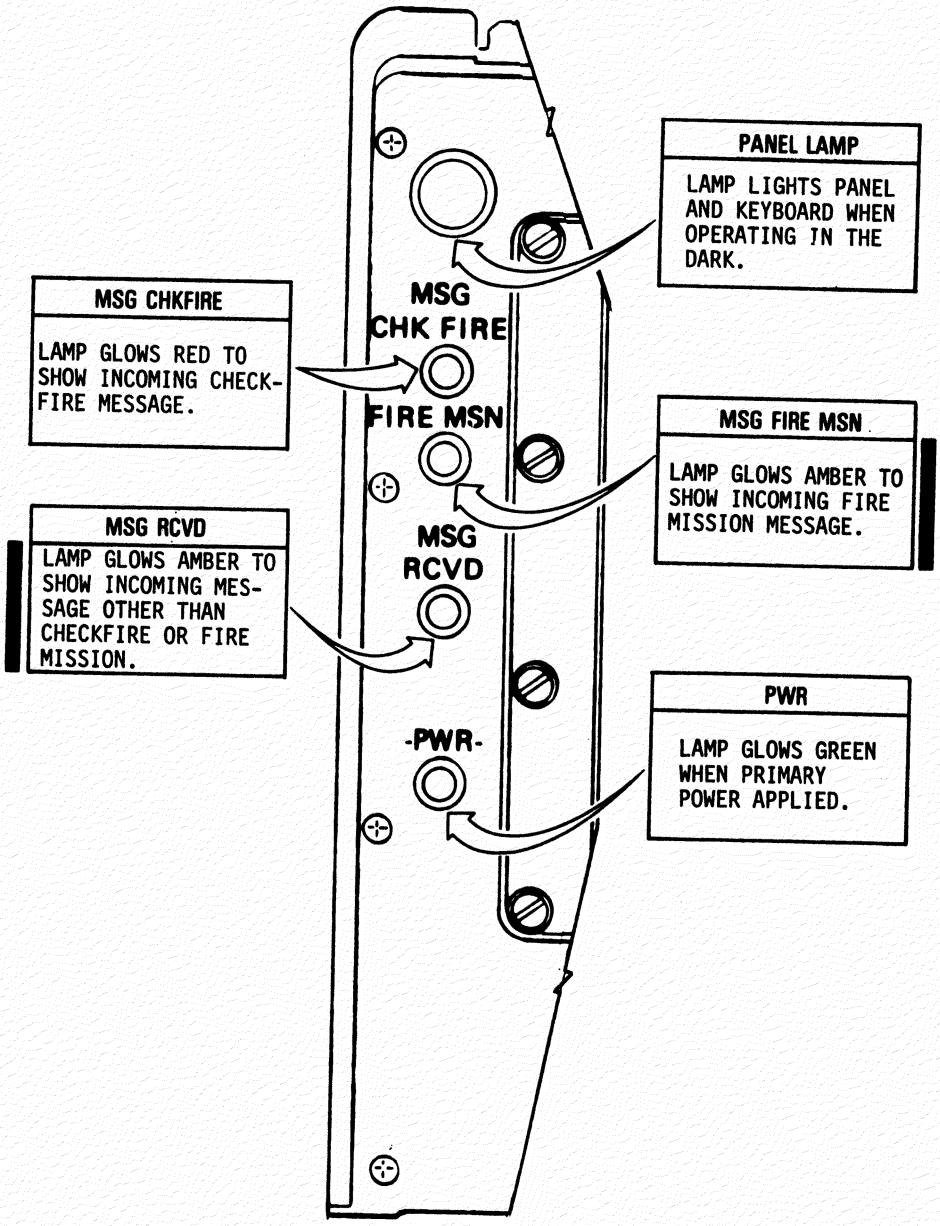
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

9. FRONT PANEL - BOTTOM



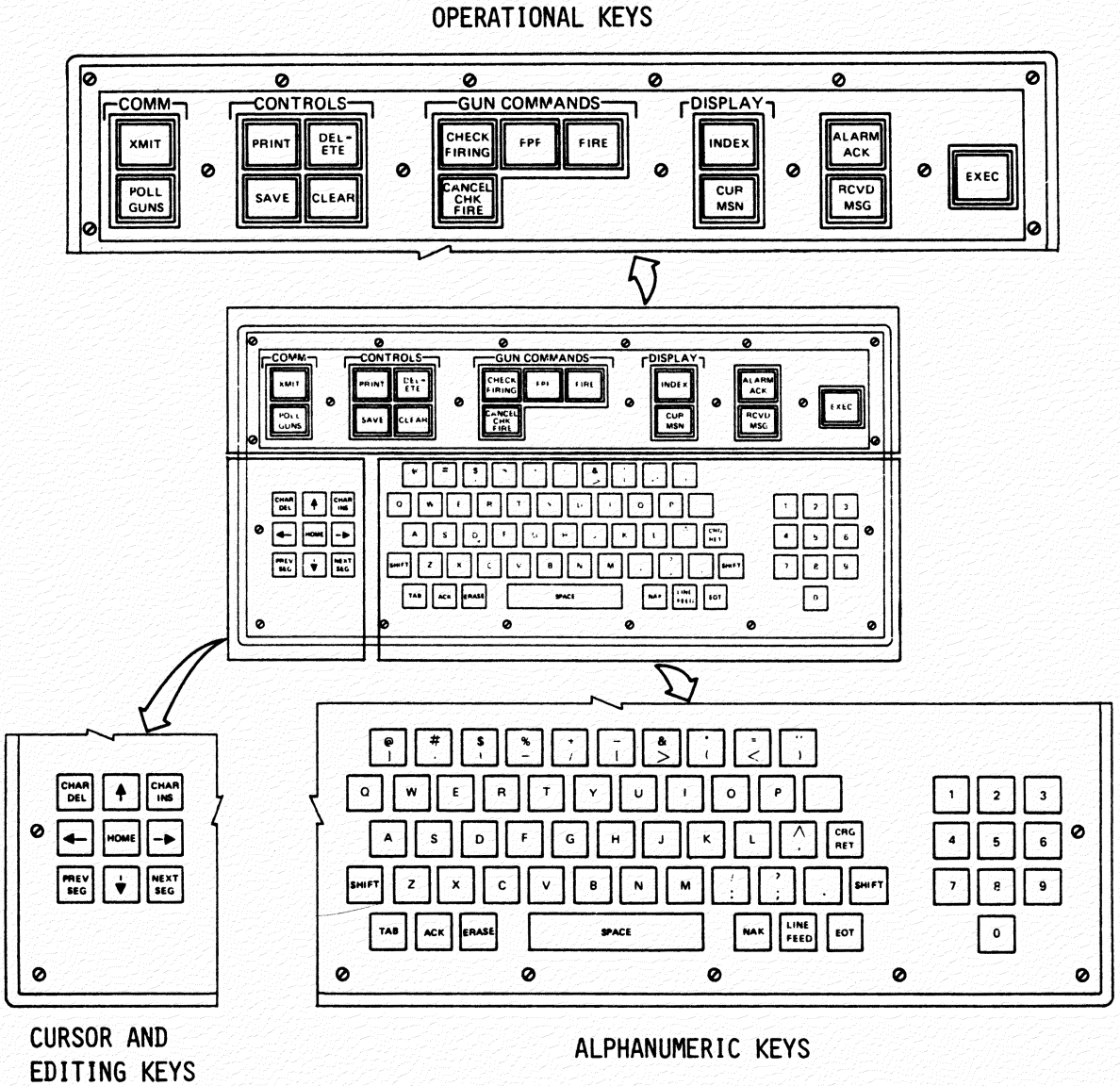
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

10. FRONT PANEL - LEFT SIDE



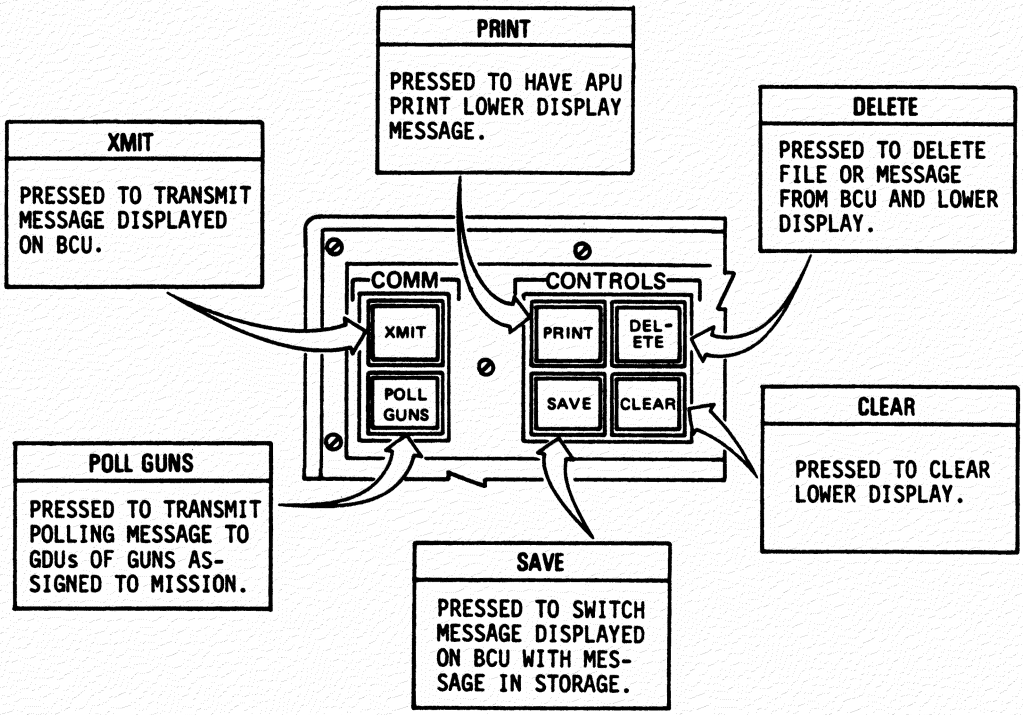
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

11. KEYBOARD - OVERALL



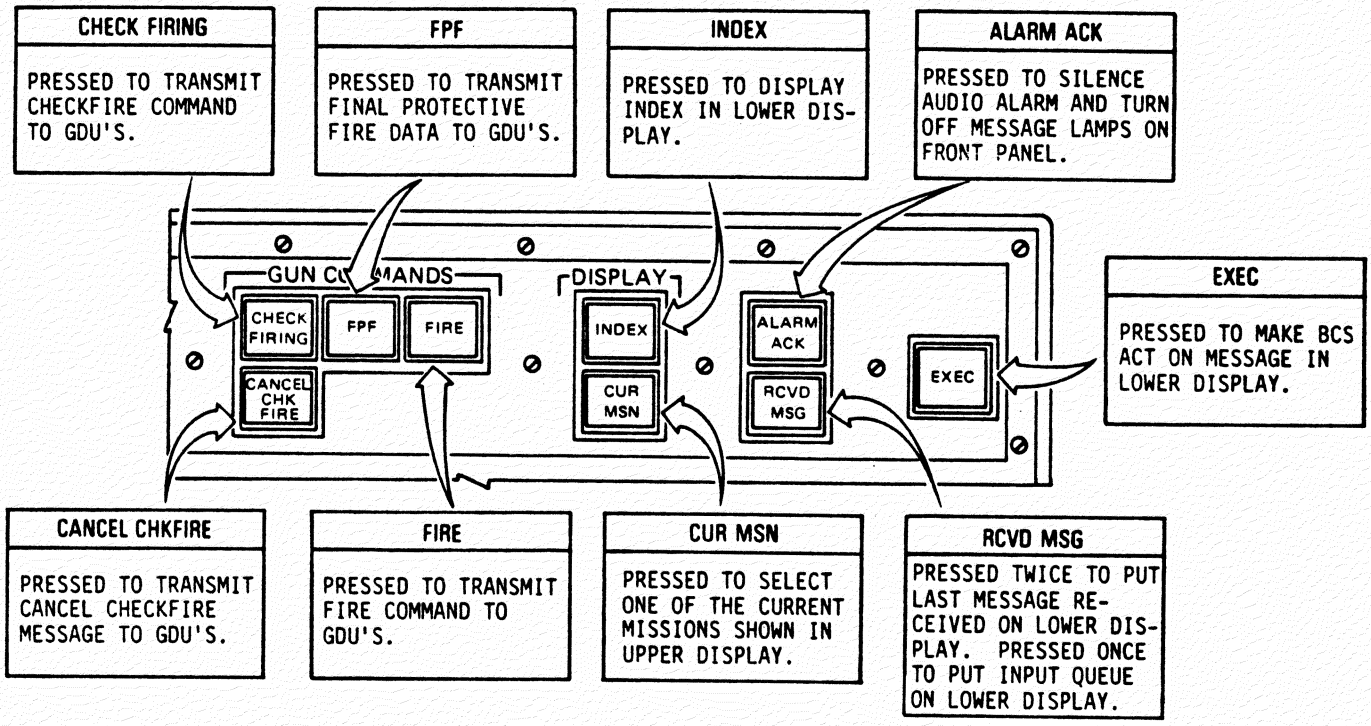
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

12. OPERATIONAL KEYS



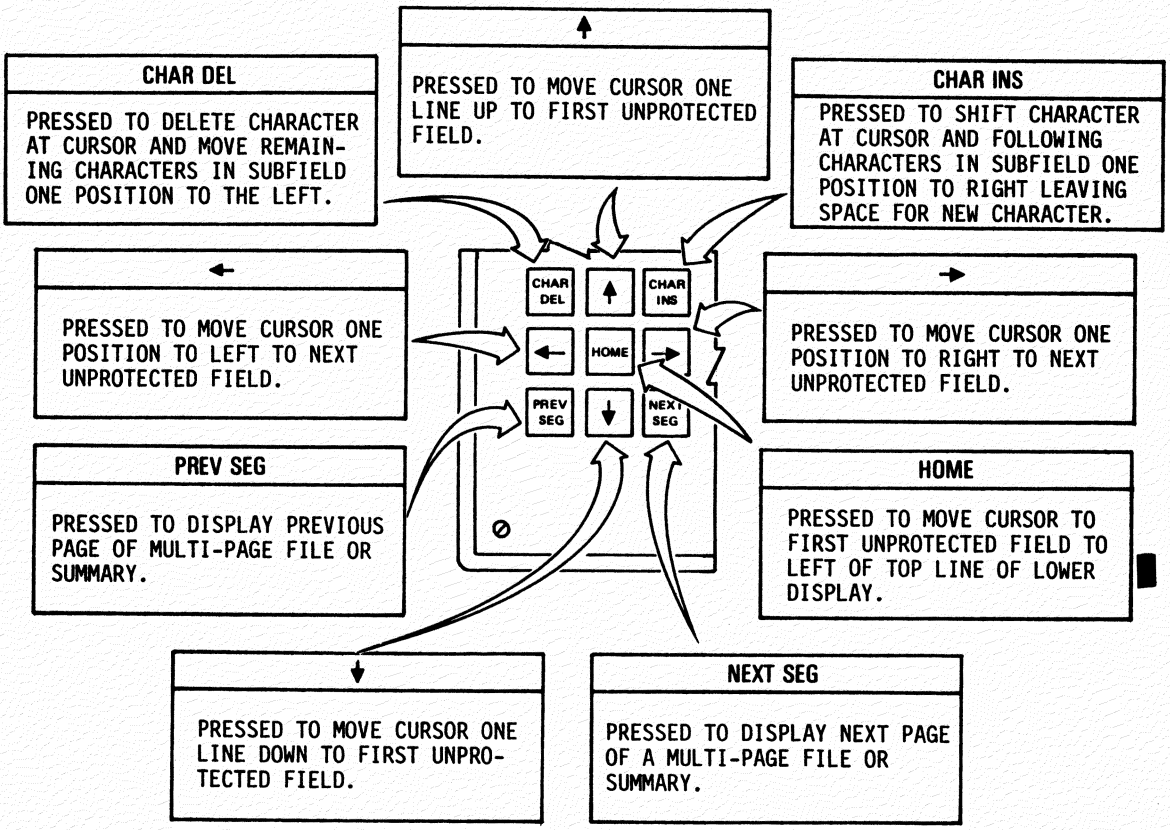
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

12. OPERATIONAL KEYS - CONTINUED



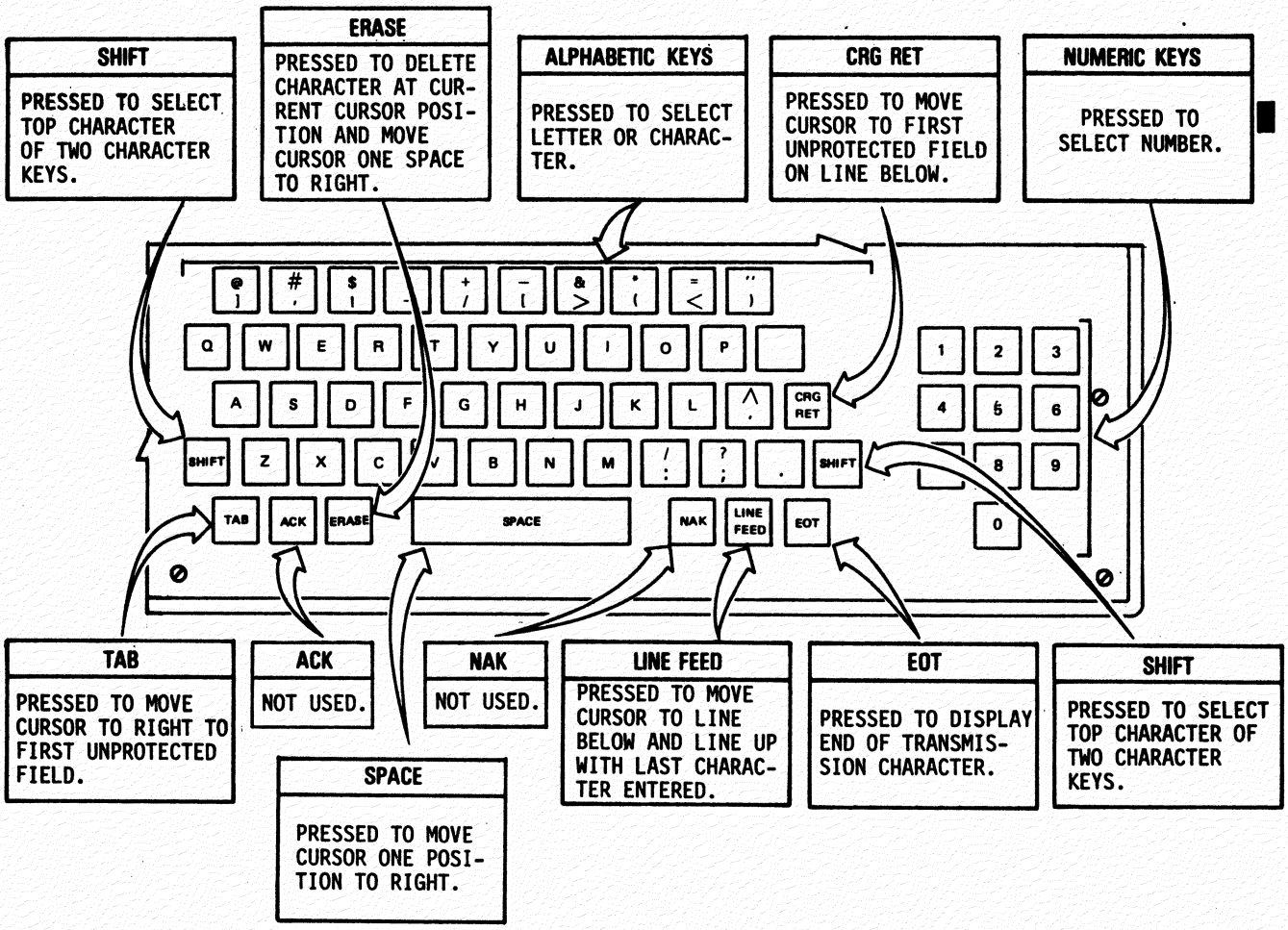
2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

13. CURSOR AND EDITING KEYS



2-2. BCU CONTROLS, INDICATORS, AND CONNECTORS - CONTINUED

14. ALPHANUMERIC KEYS



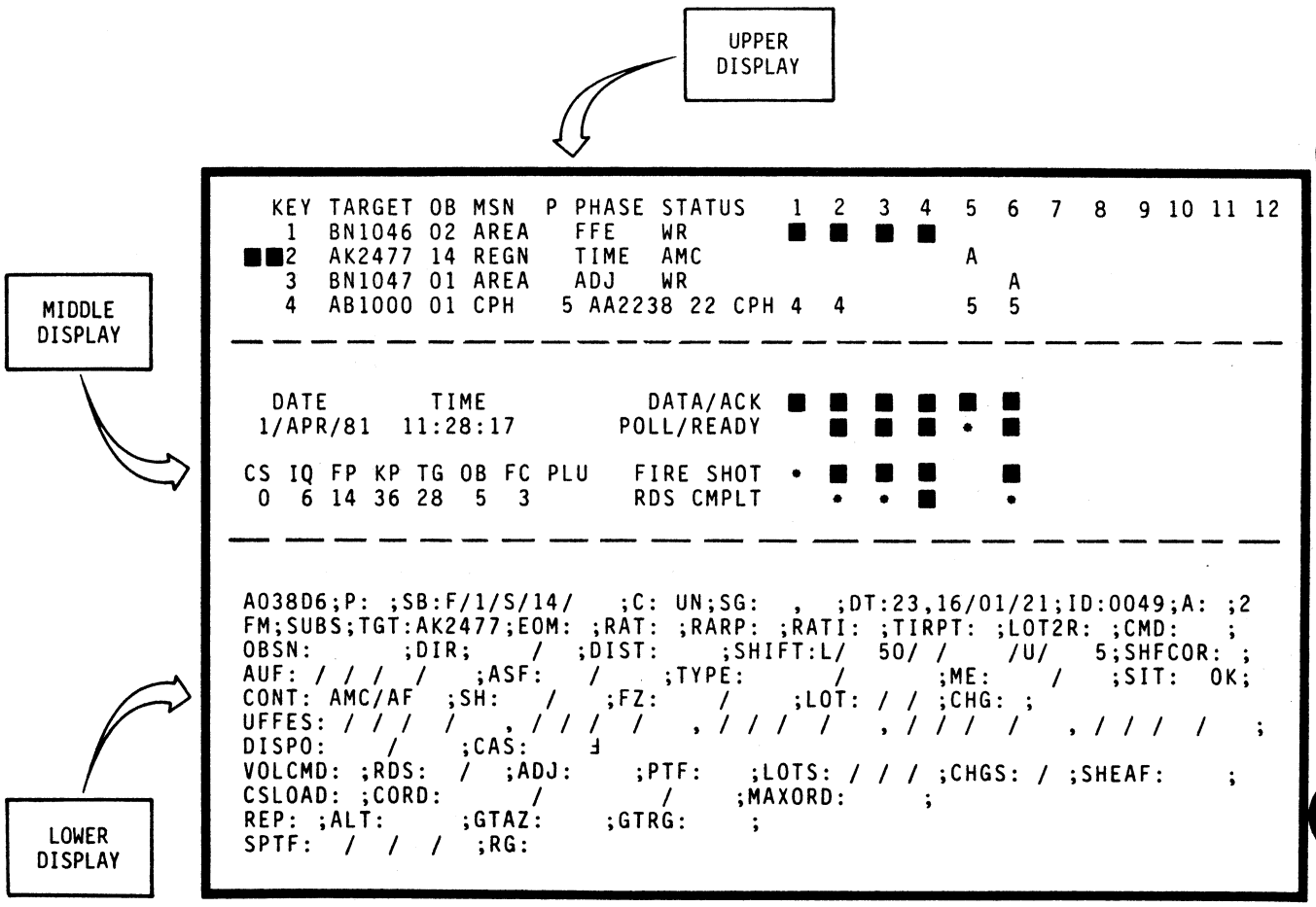
2-3. BCU DISPLAYS

When you look at the BCU with the keyboard down, you see a glass screen in the middle of the front panel. A typical display which you might see on that screen when you are using the BCU is shown below. You can see that the display is divided into three separate sections with single dashed line separating the sections. These sections are:

- Upper display - shows mission status
- Middle display - shows gun status and file status
- Lower display - shows messages with prompts and error and warning messages.

NOTE

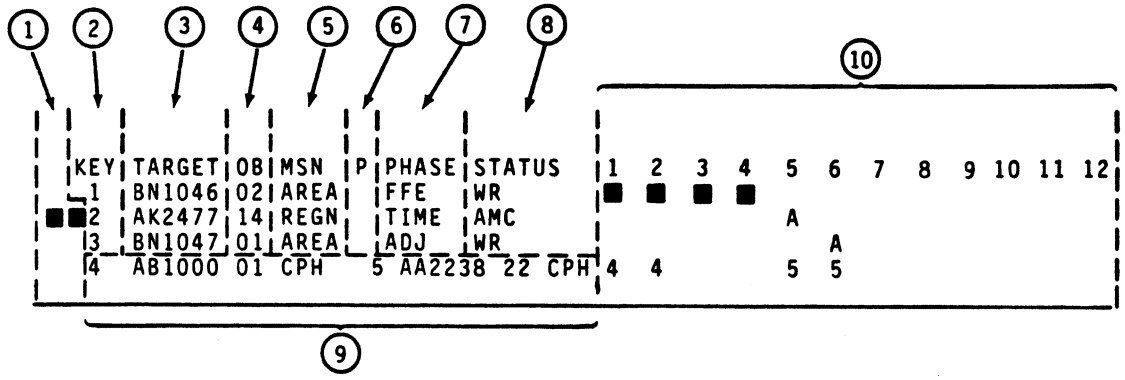
In the BCU displays shown, the number of guns displayed is six even though the BCS can be used with up to 12 guns.



2-3. BCU DISPLAYS - CONTINUED

1. UPPER DISPLAY

The upper display shows you the current mission status. Each element or column (see key number) of the upper display is shown and described below.



Key No.	Element	Function
(1)	Current Mission Indicator	Two solid squares shows current mission processing on the lower display for missions 1, 2, 3 or 4 only.
(2)	KEY (Mission Number)	This column shows the current missions (1, 2 or 3), Final Protective Fire (FPF) mission (4), or Copperhead Priority missions (4 or 5).
(3)	TARGET (Target Number)	This column shows target number assigned to the mission.
(4)	OB (Observer Number)	This column shows observer number assigned to the mission.
(5)	MSN (Mission)	This column shows type of mission. The possible entries you will see are: AREA - Area Fire Mission FPF - Final Protective Fire Mission REGN - Registration Mission DEST - Destruction Mission DRAW - Laser Draw Mission TRAK - Laser Track Mission TRIL - Laser Trilateration RESC - Laser Resection

2-3. BCU DISPLAYS - CONTINUED

1. UPPER DISPLAY - CONTINUED

Key No.	Element	Function
		TOT - Time on Target CPH - Copperhead Target of Opportunity CTIL - Continuous Illumination CDIL - Coordinated Illumination MPI - Mean Point of Impact HB - High Burst
(6)	P (Priority)	This column shows mission priority. The possible entries you will see are: P - Priority U - Urgent Blank - Normal
(7)	PHASE	This column shows mission phase. The possible entries you will see are: ADJ - Adjust FFE - Fire for Effect LOT 1 - Lot 1 Portion of Registration LOT 2 - Lot 2 Portion of Registration TIME - Time Portion of LOT 1 Registration REPL - Replot HB - High Burst Registration MPI - Mean Point of Impact Registration TRIL - Trilateration
(8)	STATUS (Mission Control)	This column shows the current status for each mission. The possible entries you will see are: MAN XMIT - Fire commands have not been sent to the guns. They must be manually transmitted. AMC - Mission is not TOT or moving target and fire commands have been sent to the guns with at my command (AMC) or the FPF key has been pressed. FIRE XXX - Firing commands have been sent to the guns with AMC control in a TOT or moving target mission. XXX equals countdown seconds to fire. Example: FIRE 120 is 2 minutes to fire.

2-3. BCU DISPLAYS - CONTINUED

1. UPPER DISPLAY - CONTINUED

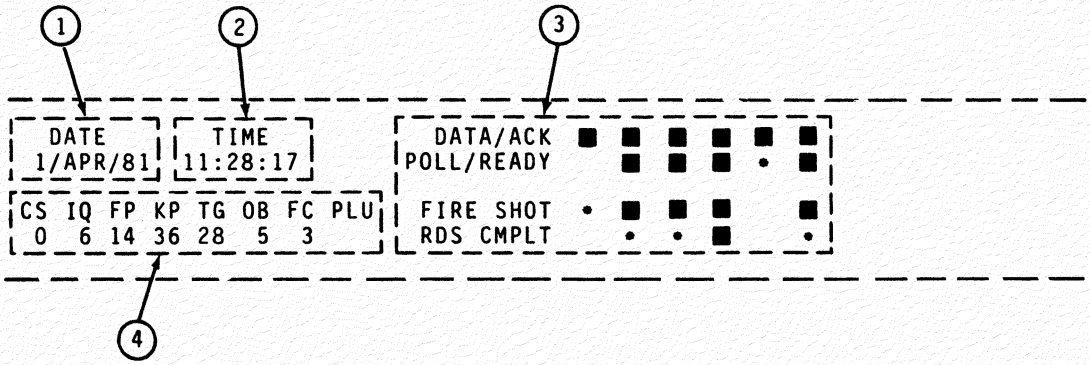
Key No.	Element	Function
		WR - When ready; sections fire when loaded and ready. CKFIRE - Checkfire has been sent to all GDU's. DNL - Do not load control has been sent to all guns assigned to mission. ABORTED - Computation of fire commands stopped before completion. XMT FIRE - Command to fire must be sent to GDU's. REPLOT - Replotting target coordinates.
(9)	Current Missions 4 and 5	These missions are reserved for one cannon FPF and one copperhead priority mission or two copperhead priority missions. There are three entries per mission: target number, observer number, and type of FPF mission. The possible types of mission entries you will see are: FPF - Cannon Final Protective Fire CPH - Copperhead Priority Mission
(10)	Numbers 1 to 12	A solid square (■) under a gun number indicates the gun is assigned to a mission and has been sent fire commands. The letter "A" under gun number indicates that the gun will do the adjusting. The number 4 or 5 appearing under a gun number indicates that it is the gun assigned to fire current mission 4 or 5 if the mission is copperhead priority.

2. MIDDLE DISPLAY

The middle display shows you the current date, time, status of the guns assigned to the current mission, BCU files status and PLU motion. Each element or column (see key number) of the middle display is shown and described as follows:

2-3. BCU DISPLAYS - CONTINUED

2. MIDDLE DISPLAY - CONTINUED



Key No.	Element	Function
(1)	DATE	Shows current date (day, month and year) if entered by operator.
(2)	TIME	Shows current time in hours, minutes and seconds (entered by operator).
(3)	Gun Status	Shows the status of the guns assigned to the current mission. Gun status is shown by an asterisk (*) or by a square (■) under the appropriate gun number. These symbols change to show an exchange of messages between the BCU and the GDU's. This exchange of messages is known as polling. When the BCU polls a gun, the BCU sends a message and the symbol* appears under the gun number. When the gun's GDU responds, the * changes to a ■. If a GDU does not respond to a message, the * changes to an X. The BCU will no longer poll this gun. There are two methods of polling. To understand the two methods, go to figure 1-1 for AMC control and go to figure 1-2 for WR control.

2-3. BCU DISPLAYS - CONTINUED

2. MIDDLE DISPLAY - CONTINUED

Key No.	Element	Function
(4)	BCS Data Files	Shows status of the following files. When you see **, it means the file is full. CS - Checksum error count, 0 to 99; when greater than 99, displays **. IQ - Number of messages in the input queue. When you see **, the input queue is full. FP - Number of fire plan targets. This file can hold up to 64 fire plan targets. KP - Number of known points. This file can hold up to 60 known points. TG - Number of targets. This file can hold up to 60 targets. OB - Number observers. This file can hold up to 30 observers. FC - Number of fire support coordination areas. This file can hold up to 10 circular FCA's. PLU - PLU motion indicator. Shows a ■ when the PLU is running.

2-3. BCU DISPLAYS - CONTINUED

2. MIDDLE DISPLAY - CONTINUED

GUN STATUS DISPLAYED	1 ■	2 ■	MEANING
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT			SHOWS YOU THAT NO DATA SENT TO THE GDU
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	*	*	SHOWS YOU THAT FIRE COMMANDS ARE SENT TO GDU
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ *	X	SHOWS YOU THAT GDU 2 HAS NOT RECEIVED DATA AND IS REMOVED FROM POLLING SEQUENCE. GDU 1 HAS RECEIVED THE DATA. THE SECTION CHIEF ACKNOWLEDGED RECEIPT OF FIRE COMMANDS. THE GDU IS NOW BEING POLLED FOR READY
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ ■	X	SHOWS YOU THAT THE SECTION CHIEF REPORTED THE GDU IS READY TO FIRE
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	*	X	SHOWS YOU THAT THE COMMAND TO FIRE IS SENT TO GDU
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ *	X	SHOWS YOU THAT THE SECTION CHIEF ACKNOWLEDGES RECEIPT OF COMMAND TO FIRE AND THE GDU BEING POLLED FOR SHOT
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ ■ ■ *	X	SHOWS YOU THAT THE SECTION CHIEF REPORTED THE FIRST ROUND FIRED AND THE GDU IS BEING POLLED FOR ROUNDS COMPLETE
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ ■ ■ ■	X	SHOWS YOU THAT THE SECTION CHIEF REPORTED ROUNDS COMPLETE

NOTE:

1. IN THIS EXAMPLE, TWO GUNS ARE USED TO SHOW THE POLLING SEQUENCE
2. *SHOWS DATA SENT TO GDU
   ■ SHOWS GDU ACKNOWLEDGED MESSAGE
3. X SHOWS THAT GDU DOES NOT ACKNOWLEDGE THE BCU POLLING AND THE BCU REMOVES THAT GDU FROM POLLING SEQUENCE

Figure 2-1. BCU/GDU polling sequence (AMC).

2-3. BCU DISPLAYS - CONTINUED

2. MIDDLE DISPLAY - CONTINUED

GUN STATUS DISPLAYED	1 ■	2 ■	MEANING
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT			SHOWS YOU THAT NO DATA SENT TO THE GDU
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	*	*	SHOWS YOU THAT FIRE COMMANDS ARE SENT TO GDU
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ *	X	SHOWS YOU THAT GDU 2 IS REMOVED FROM POLLING SEQUENCE AND THE SECTION CHIEF FOR GUN 1 HAS ACKNOWLEDGED RECEIPT OF FIRE COMMANDS AND THAT THE GDU IS NOW BEING POLLED FOR SHOT
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ ■ ■ *	X	SHOWS YOU THAT THE SECTION CHIEF REPORTED THE FIRST ROUND FIRED AND THE GDU IS BEING POLLED FOR ROUNDS COMPLETE
DATA/ACK POLL/READY FIRE SHOT RDS COMPLT	■ ■ ■ ■	X	SHOWS YOU THAT THE SECTION CHIEF REPORTED ROUNDS COMPLETE

NOTE:

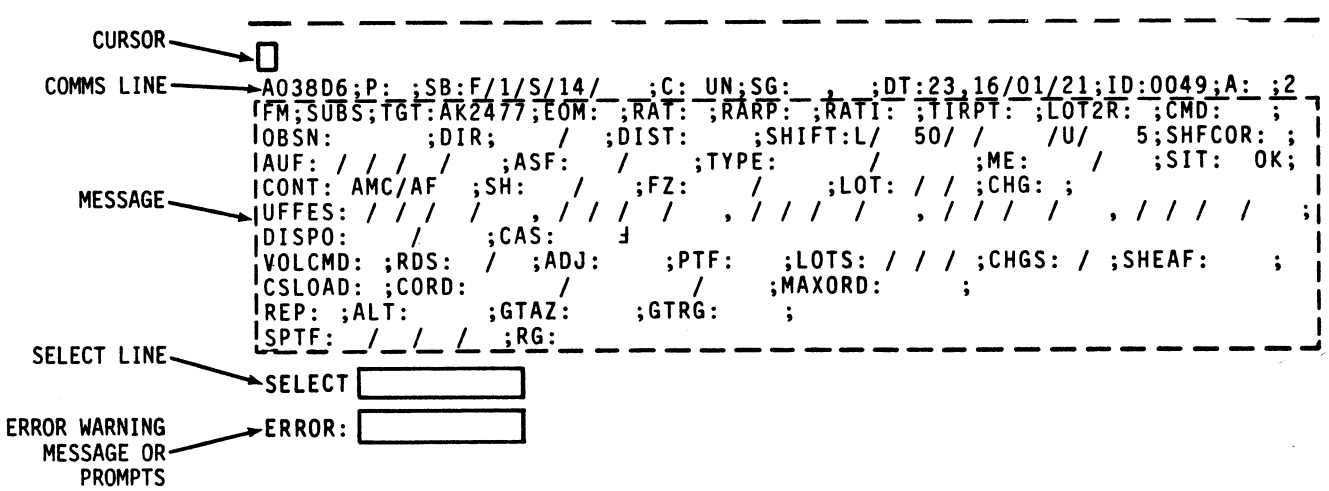
1. IN THIS EXAMPLE, TWO GUNS ARE USED TO SHOW THE POLLING SEQUENCE
2. *SHOWS DATA SENT TO GDU
   ■SHOWS GDU ACKNOWLEDGED MESSAGE
3. X SHOWS THAT GDU DOES NOT ACKNOWLEDGE THE BCU POLLING AND THE BCU REMOVES THAT GDU FROM POLLING SEQUENCE

Figure 2-2. BCU/GDU polling sequence (WR).

2-3. BCU DISPLAYS - CONTINUED

3. LOWER DISPLAY

- . COMMS Line - First line of the message. You enter data when sending a message. Seen also on a received message.
- . Cursor - A moveable square used to edit and make up messages. Located in the first space in upper left hand corner (home position).
- . ERROR Message - Last line on the lower display. Displayed if you make a mistake when making up or editing a message.
- . SELECT Line - Appears on a summary, index, or file to help you select desired message format.
- . Message Prompts - Appear when cursor is positioned in certain fields of a message. Provide you with a choice of legal data to enter in the field.
- . Message - Digital message containing fixed fields identified by a series of letters (ex: TGT for target) and blank spaces for entering specific data.



2-3. BCU DISPLAYS - CONTINUED

4. SAMPLE DISPLAY

This paragraph shows you a typical display and explains the data in each display area.

```
  KEY TARGET OB MSN  P PHASE STATUS   1  2  3  4  5  6  7  8  9 10 11 12
   1  BN1046 02 AREA   FFE   WR       ■  ■  ■  ■
■■2  AK2477 14 REGN   TIME  AMC                  A
   3  BN1047 01 AREA   ADJ   WR                     A
   4  AB1000 01 CPH    5 AA2238 22 CPH 4  4        5  5
— — — — — — — — — — — — — — — — — — — — — — — — — — — —


  DATE       TIME          DATA/ACK  ■  ■  ■  ■  ■  ■
 1/APR/81  11:28:17       POLL/READY    ■  ■  ■  •  ■

 CS IQ FP KP TG OB FC PLU   FIRE SHOT  •  ■  ■  ■     ■
  0  6 14 36 28  5  3       RDS CMPLT     •  •  ■     •
— — — — — — — — — — — — — — — — — — — — — — — — — — — —


A038D6;P: ;SB:F/1/S/14/   ;C: UN;SG:  ,  ;DT:23,16/01/21;ID:0049;A: ;2
FM;SUBS;TGT:AK2477;EOM: ;RAT: ;RARP: ;RATI: ;TIRPT: ;LOT2R: ;CMD:   ;
OBSN:      ;DIR;    /  ;DIST:    ;SHIFT:L/  50/ /    /U/   5;SHFCOR: ;
AUF: / / /  /   ;ASF:   /    ;TYPE:      /      ;ME:    /   ;SIT:  OK;
CONT: AMC/AF  ;SH:   /   ;FZ:    /    ;LOT: / / ;CHG: ;
UFFES: / / /  /   , / / /  /   , / / /  /   , / / /  /   , / / /  /   ;
DISPO:    /    ;CAS:    4
VOLCMD: ;RDS:  /  ;ADJ:    ;PTF:   ;LOTS: / / / ;CHGS: / ;SHEAF:    ;
CSLOAD: ;CORD:      /        /    ;MAXORD:     ;
REP: ;ALT:     ;GTAZ:    ;GTRG:    ;
SPTF:  /  /  /  ;RG:
```

UPPER DISPLAY

The upper display shows five missions. Missions 1, 2, and 3 are current missions in different phases. Missions 4 and 5 are copperhead priority missions. The data for each mission is as follows:

- Mission 1 - The target number is BN1046 for observer number 02. This is an area fire mission in the FFE phase. The command to fire was sent to the GDU's as shown by WR. Sections 1, 2, 3, and 4 are assigned to the mission.
- Mission 2 - This is the current mission. The message in the lower display is a message that concerns this mission. The target number is AK2477 for observer number 14. This is a registration in the time phase. Section 5 is assigned to the mission. The command to fire will be transmitted to the GDU's manually as shown by AMC.
- Mission 3 - The target number is BN1047 for observer number 01. This is an area fire mission in the adjust phase. Fire when ready (WR) has been sent to the GDU. Section 6 is assigned to this mission and is the adjusting piece.
- Mission 4 - This is a copperhead priority mission. It is identified by target number AB1000 for observer number 01. Sections 1 and 2 have been assigned to fire the mission when required.

2-3. BCU DISPLAYS - CONTINUED

4. SAMPLE DISPLAY - CONTINUED

. Mission 5 - This is a copperhead priority mission. It is identified by target number AA2238 for observer number 22. Section 5 and 6 have been assigned to fire the mission when required.

MIDDLE DISPLAY

The data shown in the middle display is as follows:

. The date is 1 APRIL 1981.
. The time is 11 hours, 28 minutes, and 17 seconds.
. CS (checksum) shows a count of 0.
. The IQ (input queue) show six messages in the input queue.
. The FP shows 14 fire plan targets on file.
. The KP shows 36 known points on file.
. The TG shows 28 targets on file.
. The OB shows five observers on file.
. The FC shows three fire support coordination areas on file.
. The PLU indicator shows that the PLU is in motion.
. DATA/ACK - The solid squares show that all guns (1, 2, 3, 4, 5, and 6) have acknowledged they received fire commands.
. POLL/READY - The solid squares show that guns 2, 3, 4, and 6 have been polled and have reported that they are ready. The * for gun 5 shows that the gun was polled but has not yet reported ready.
. FIRE SHOT - Gun 1 is being polled for shot. Guns 2, 3, 4, and 6 have fired the first round.
. RDS COMPLT - Guns 2, 3, and 6 are being polled for rounds complete. Gun 4 has completed firing its assigned number of rounds.

LOWER DISPLAY

The lower display shows a fire mission message (FM;SUBS) which is displayed for current mission 2. You will receive messages like this one.

SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-4. GENERAL

Operator's Preventive Maintenance Checks and Services (PMCS) are the required daily and weekly inspection and care of your BCS necessary to keep it in good operating condition.

2-5. PREVENTIVE MAINTENANCE CHECKS AND SERVICES PROCEDURES

NOTE

If your BCS must be in use all the time, check and service those items that can be checked and serviced without stopping its operation. Make complete checks and services only when the BCS is finally shut down.

ROUTINE CHECKS

Routine checks like equipment inventory, cleaning, dusting, washing, checking for frayed cables, stowing items not in use, covering unused receptacles, and checking for loose nuts and bolts are not listed as PMCS checks. They are things that you should do any time you see they must be done. If you find a routine check like one of those listed in your PMCS, it was listed because other operators reported problems with this item.

EXPLANATION OF INTERVAL COLUMN OF PMCS CHART

NOTE

Always keep in mind all WARNINGS and CAUTIONS when PMCS are performed.

2-5. PREVENTIVE MAINTENANCE CHECKS AND SERVICES PROCEDURES - CONTINUED

BEFORE OPERATION - Do your Before (B) PMCS to be sure the BCS is ready to use.

DURING OPERATION - Do your During (D) PMCS while you operate your BCS to help spot small problems before they become big problems.

WEEKLY OPERATION - Do your Weekly (W) PMCS to insure that the BCS is functioning properly after a week of operation.

NOTE

All PMCS must be done as regularly scheduled and also under the following conditions:

- Before the BCS is used on a mission.
- When the BCS is first installed.
- When a component of the BCS is reinstalled after being removed for any reason.

EXPLANATION OF "EQUIPMENT IS NOT READY IF:" COLUMN OF PMCS CHART

This column tells why your equipment cannot be used to perform its assigned mission.

NOTE

The Procedures column in your PMCS chart tells you how to perform the required checks and services. Carefully follow these instructions. If tools are needed or the chart instructions tell you, get organizational maintenance to do the necessary work.

NOTE

If any portion of your BCS fails to operate, refer to Chapter 3 under Troubleshooting for possible problems. Report any malfunctions or failures on the proper DA Form 2404 or see your supervisor.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE OPERATION D-DURING OPERATION W-WEEKLY OPERATION

ITEM NO.	INTERVAL B	D	W	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
1	●			Battery Computer System AN/GYK-29(V)	
				Perform operation as described in TM 11-7440-283-12-1-1.	Operation cannot be performed as described in the manual.
2	●			Computer, Gun Direction CP-1317/GYK-29(V) Power Distribution Group ON-188/GYK-29(V)	
				Perform diagnostic self-test as described in Chapter 3.	Equipment fails diagnostic self-test.
3	●			COMSEC Devices	Equipment fails to pass traffic.
4	●			Radios	
				Perform PMCS as described in applicable operator TM's.	Equipment fails PMCS.

SECTION III. OPERATION

2-6. GENERAL

This section provides a general outline of BCS operation. The detailed operating procedures are contained in the "Operator's Manual", TM 11-7440-283-12-1-1.

2-7. TYPICAL OPERATION

- Battery moves into a position.
- BCS is turned on and initialized.
- Voice and digital communication is established.
- The map location is entered into files.
- The ammunition and fire unit data is entered into files.
- Observer locations are then entered.
- Observers and TACFIRE send messages to the BCS requesting artillery fire and the BCS performs the fire mission processing.
- When operations are over, the BCS is shut down and the unit moves to a new location.
- At the new location, the BCS is restarted, communications are re-established, and the data base is checked for accuracy.
- Fire mission processing now continues as described above.

2-8. DETAILED OPERATION

The Operator's Manual provides a BCS operator with the following information:

- Controls and Indicators - All controls and indicators for operation are identified with their function.
- Display Information - A typical upper, middle, and lower display are shown and explained.
- Basic BCS Operation - These procedures cover basic operation of the BCS.
- BCS Operation in an FDC - These procedures cover the operation of the BCS in a typical FDC and cover data base requirements, communications, and fire missions.
- Message and Text Data - All messages and texts used by the operator are shown and explained.
- Error and Warning Messages - The error and warning messages seen by the operator are shown and explained.

CHAPTER 3
MAINTENANCE

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SECTION I. REPAIR PARTS, SPECIAL TOOLS, TDME, AND SUPPORT EQUIPMENT

3-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-2. SPECIAL TOOLS, TDME, AND SUPPORT EQUIPMENT

No special tools, TDME and support equipment are required.

3-3. REPAIR PARTS

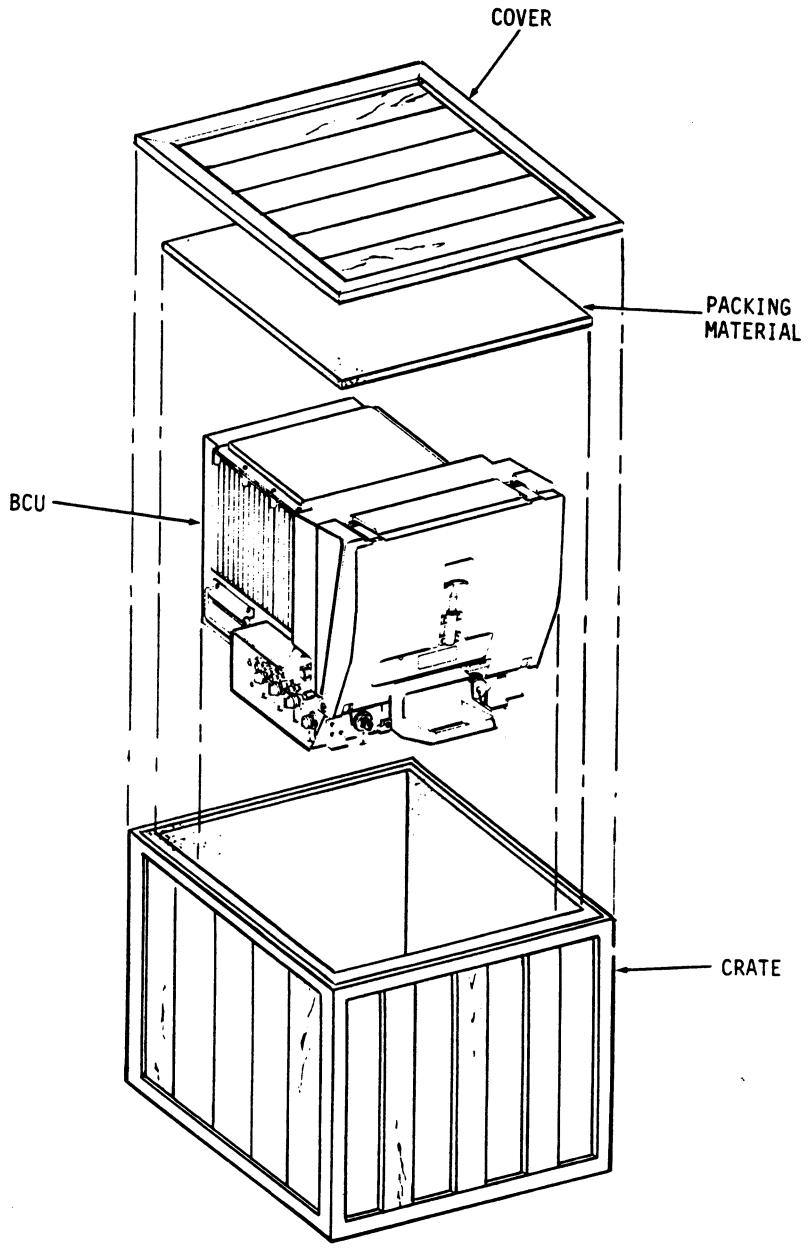
Repair parts are listed and illustrated in the repair parts and special tools list (TM-11-7440-283-20P) covering organizational maintenance for this equipment.

SECTION II. SERVICES UPON RECEIPT

3-4. UNPACKING

1. BCU

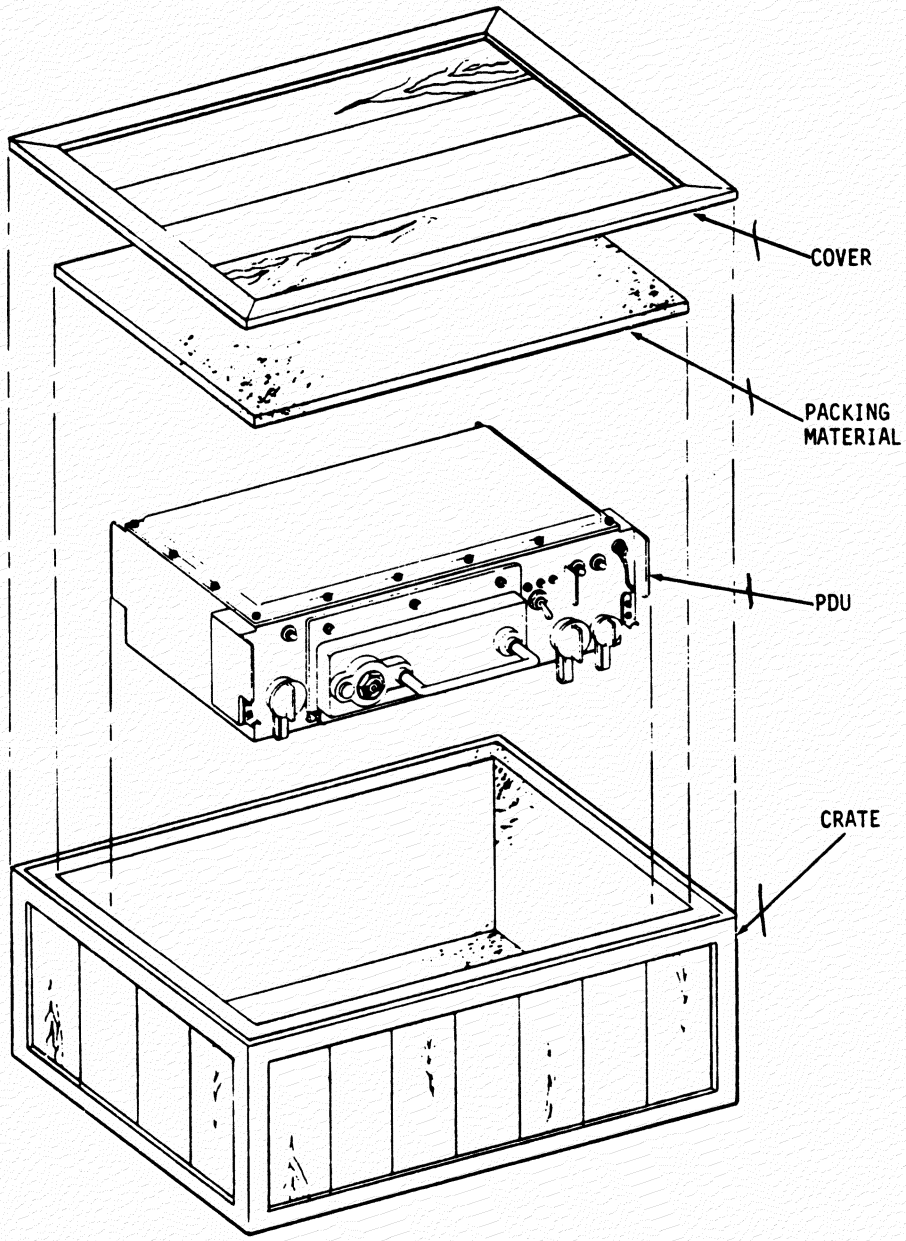
. Remove top cover.
. Securely grasp BCU and lift out of case.
. Place on clean dry surface.



3-4. UNPACKING - CONTINUED

2. PDU

. Remove top cover.
. Securely grasp PDU and lift out of case.
. Place on clean dry surface.



3-5. INSPECTION

Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on SF 364 (para. 1-3).

Check the equipment against the packing list to make sure everything is there. Report all discrepancies on SF 361 (para. 1-3).

Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number near the nomenclature plate.) Also make sure all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA Pam 310-1.)

3-6. INSTALLATION

1. BCU

NOTE

Although the M577 installation is shown, the procedures also apply to M561 installation.

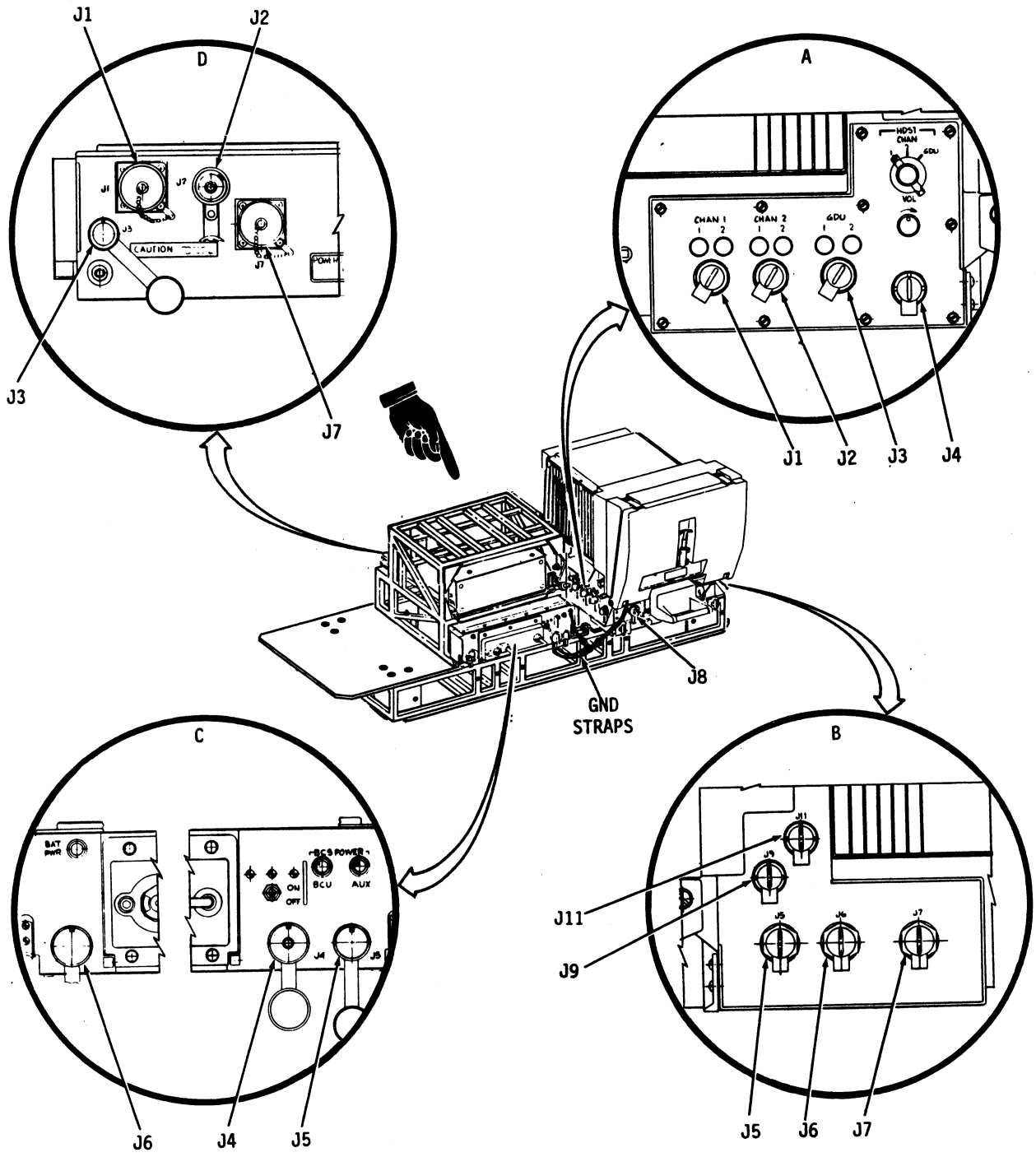
WARNING

To prevent injury to personnel and damage to equipment, do not attempt to install BCU unless two persons are available.

To prevent injury to personnel and damage to equipment, use the side handles and tape transport handle to carry the BCU.

- Place BCU on mounting tray, aligning mounting tray guide pins with holes in BCU.
- Slide BCU on mounting tray to engage guide pins in holes.
- Tighten thumbscrews on mounting tray clamps to secure BCU.
- Using safety wire, secure mounting tray clamps.
- Remove protective covers from all BCU connectors.

3-6. INSTALLATION - CONTINUED



3-6. INSTALLATION - CONTINUED

1. BCU - CONTINUED

NOTE

*The J11 connector on the BCU is marked with a yellow underscore, and the W26P3 headset is marked with a clear or yellow cable marker.

. Connect the following cables to BCU connectors:

CABLE	BCU CONNECTOR
W7P2/W10P2(1)	J1
W7P2/W10P2(2)	J2
W31P1	J3
W25P1 (handset)	J4
W8P1	J5
W9P1	J6
W11P1 (if available)	J7
W6P2	J8
W26P2 (headset)	J9
W26P3 (headset)*	J11*

. Connect BCU ground strap to mounting base.
. Install Tape Transport Unit (go to page 3-50).

2. PDU

. Remove protective covers from all PDU connectors.
. Slide PDU into frame support assembly leaving enough space to connect cables to PDU rear connectors.
. Connect the following cables to PDU connectors:

CABLE	PDU CONNECTOR
W1P1	J1
W2P1	J2
W12P1	J3
W3P1	J7

. Slide PDU all the way into frame support assembly.
. Tighten frame support assembly fasteners to secure PDU.
. Connect W32P1 to PDU connector J4.
. Connect W5P1, if available, to PDU connector J5.
. Connect W6P1 to PDU connector J6.
. Connect PDU ground strap to frame support assembly.
. Install BB-590/U batteries (go to page 3-46).

3-6. INSTALLATION - CONTINUED

3. KG-31/MOUNTING TRAY

NOTE

The KG-31 on its mounting tray is installed on the frame support assembly.

CAUTION

To affect proper KG-31 operation, make sure KG-31 strapping option has been verified for operation with BCS by qualified personnel.

- Place KG-31, installed on its mounting tray, into frame support assembly.
- Tighten frame support assembly fasteners to secure KG-31 mounting tray.
- Connect W8P2 to W17J1 on KG-31 interface bracket.
- Connect W9P2 to W18J1 on KG-31 interface bracket.
- Connect W12P2 to W16J1 on KG-31 interface bracket.
- Connect KG-31 mounting tray ground strap to frame support assembly.

4. AUXILIARY EQUIPMENT

Refer to the applicable technical manual and SB 11-131 for installation of vehicular radios.

SECTION III. TROUBLESHOOTING

3-7. SCOPE

This section contains troubleshooting procedures for the BCS. Troubleshooting will help you to isolate a malfunctioning BCS component or component assembly so that the BCS can be kept operating properly. The following pages explain trouble-shooting techniques and show you the BCS features that help you in troubleshooting.

3-8. TROUBLESHOOTING BY FUNCTION

NOTE

If your BCS must be in use all the time, check and service those items that can be checked and serviced without stopping its operation. Make complete checks and services only when the BCS is finally shut down.

The BCS has seven operating functions plus a power distribution function. Each function is automatically checked some time during the operation but you may have to do some additional troubleshooting if a malfunction occurs. The following pages discuss each function and provide troubleshooting methods and necessary cabling diagrams. The BCS operating functions are:

- Power Distribution Function
- Program Load Function
- Communication Function
- GDU Communication Function
- Data Entry Function
- Computation Function
- Standby Function
- Auxiliary Radio Channel Function

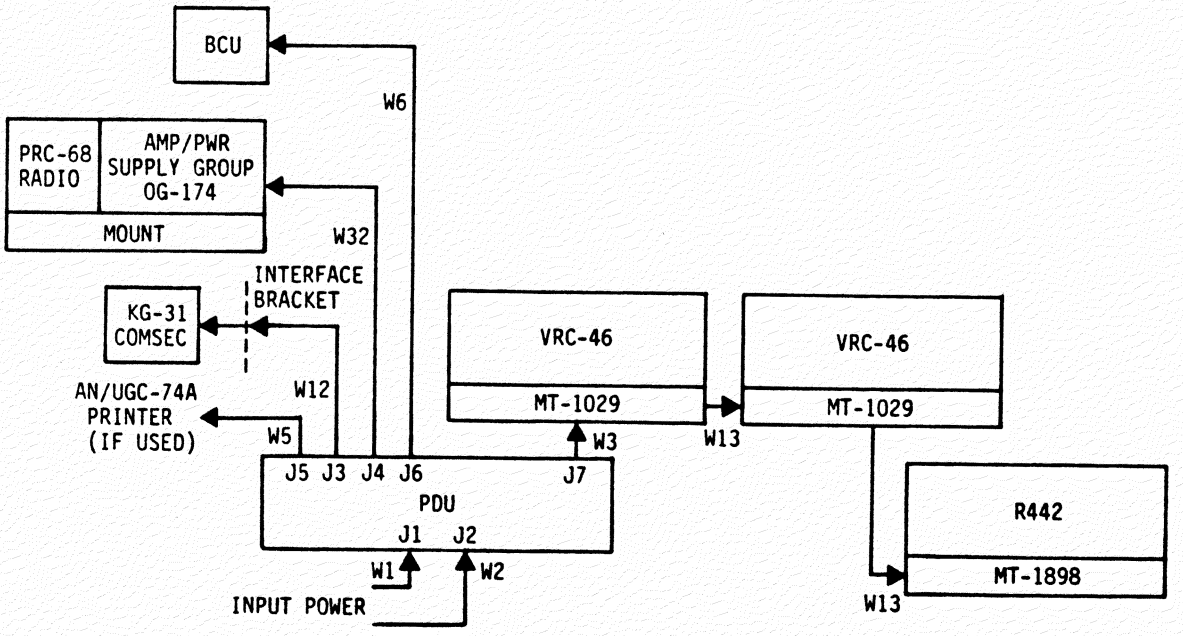


Figure 3-1. BCS power cabling diagram.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

1. POWER DISTRIBUTION FUNCTION

Power distribution is an important function. If power is lost, you may lose the contents of memory causing a mission abort. Several indicators on the BCU and PDU allow you to monitor the BCS input power conditions. These indicator lamps tell you if power is being applied to BCS components. The indicator lamp conditions you may see and what they tell are shown below. Figure 3-1 shows the power cabling between BCS components. Table 3-1 lists the BCS electrical grounding straps. Go to page 3-18 for power distribution malfunction symptoms.

BCS INPUT POWER CONDITIONS

. IF YOU SEE THIS LAMP CONDITION:

BCU		PDU	
PS(BIT)	PWR	BAT PWR	BCS POWER BCU
OFF	ON	OFF	ON

. IT TELLS YOU THAT:

- Input power to PDU J1 is OK
- Power is applied to all BCS components

. IF YOU SEE THIS LAMP CONDITION:

BCU		PDU	
PS(BIT)	PWR	BAT PWR	BCS POWER BCU
ON	OFF	ON	OFF

. IT TELLS YOU THAT:

- Input power to PDU J1 is not OK
- BCU is using battery power for memory saving
- Power is not applied to KG-31 or OG-174

. IF YOU SEE THIS LAMP CONDITION:

BCU		PDU	
PS(BIT)	PWR	BAT PWR	BCS POWER BCU
OFF	OFF	OFF	OFF

. IT TELLS YOU THAT:

- Input power to PDU J1 is not OK
- Battery power is not OK
- BCU memory is lost
- Power is not applied to KG-31 or OG-174

. IF YOU SEE THIS LAMP CONDITION:

PDU
BCS POWER AUX
ON

. IT TELLS YOU THAT:

- Input power to PDU J2 is OK
- Power is applied to radios.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

1. POWER DISTRIBUTION FUNCTION - CONTINUED

Table 3-1. BCS Electrical Grounding

FROM	TO	GROUND STRAP
BCU	Mounting Base	W-BS7
PDU	Mounting Base	W-BS6
KG-31	KG-31 Mounting Tray	W-BS14
KG-31 Interface Bracket	KG-31 Mounting Tray	W-BS15
KG-31 Mounting Tray	Mounting Base	W-BS3
MT-1029/VRC Radio Mount No. 1	Mounting Base	W-BS10
MT-1029/VRC Radio Mount No. 2	Mounting Base	W-BS9

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

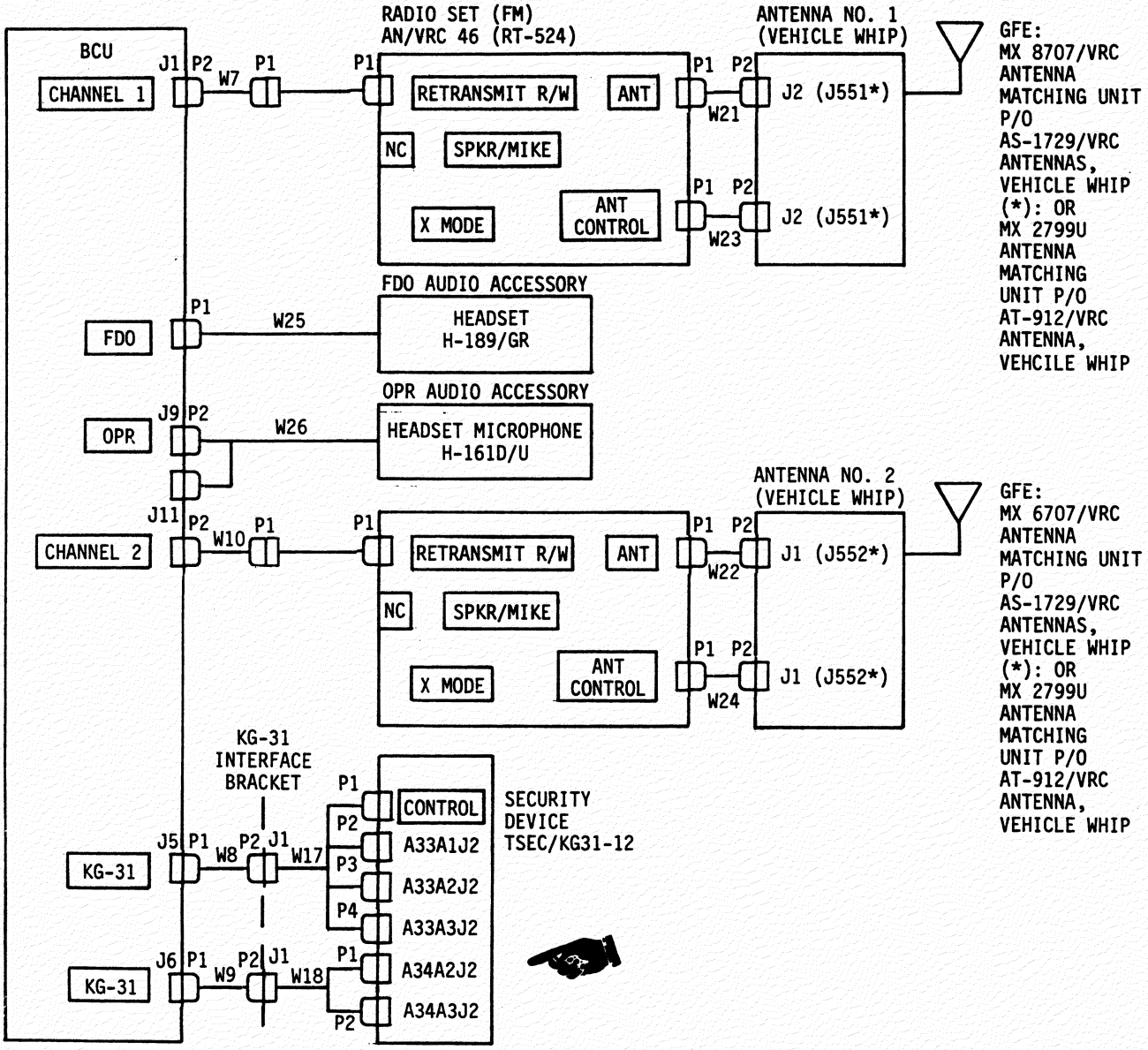


Figure 3-2. Radio channel cabling diagram.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

1. POWER DISTRIBUTION FUNCTION - CONTINUED

. IF YOU SEE THIS LAMP CONDITION:	. IT TELLS YOU THAT:
PDU BCS POWER AUX OFF	. Input power to PDU J2 is not OK . Power is not applied to radios.

2. PROGRAM LOAD FUNCTION

During the program load function, you initialize the system and load the operating program. The BCU automatically checks the system as you initialize and load the program. Go to page 3-19 for the program load malfunction symptoms.

3. COMMUNICATION FUNCTION

During the communication function you are communicating voice or digital messages with the FO (FIST), FSO, and TACFIRE. These communications may take place over wire lines or over radio channel No. 1 or No. 2.

. CHANNEL 1/2 RADIO COMMUNICATIONS

Using radio channel 1 and 2 is the normal method of communication. Figure 3-2 shows the radio channel cabling between the BCU, radios, and COMSEC device. Go to page 3-20 for radio channel 1 and 2 malfunction symptoms.

. CHANNEL 1/2 WIRE LINE COMMUNICATIONS

An alternate method of communication is the use of channel 1 and 2 wire lines. Go to page 3-22 for channel 1 and 2 wire line malfunction symptoms. You should call for supporting personnel to help you check all wire lines and connecting devices when isolating a malfunction to the wire lines.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

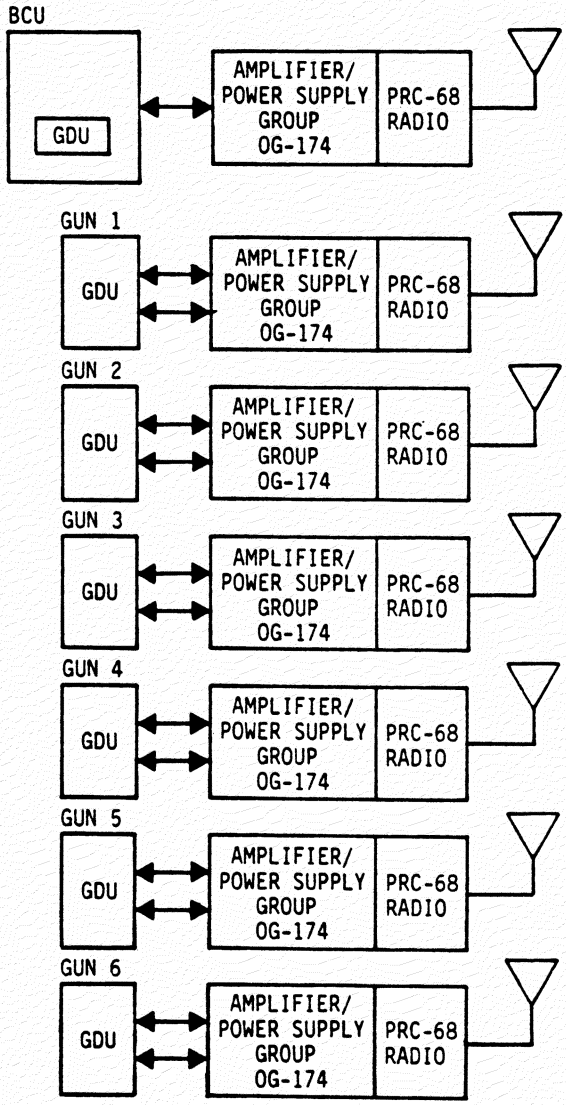


Figure 3-3. GDU channel radio diagram.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

4. GDU COMMUNICATION FUNCTION

During this function, the BCU is communicating with the GDU's at the firing sections. Besides gun data, the function allows voice communications between the BCU operator and the section chief over the GDU radio channel or GDU wire lines.

. GDU RADIO COMMUNICATIONS

Using the GDU radio channel is the normal method of communication. Figure 3-3 shows how the BCU and radios are interfaced with each GDU. Go to page 3-23 for GDU radio channel malfunction symptoms.

. GDU WIRE LINE COMMUNICATIONS

An alternate method of communication between the BCU and the GDU's is over the GDU wire lines. When isolating a GDU wire line malfunction, it is necessary for you to check all WD-1 wires between the BCU, MX-155, and each GDU, as shown in Figure 3-4. You should call for supporting personnel to help you make the required checks. If you determine the problem is not in MX-155 and wire line, go to page 3-24 for GDU wire line malfunction symptoms.

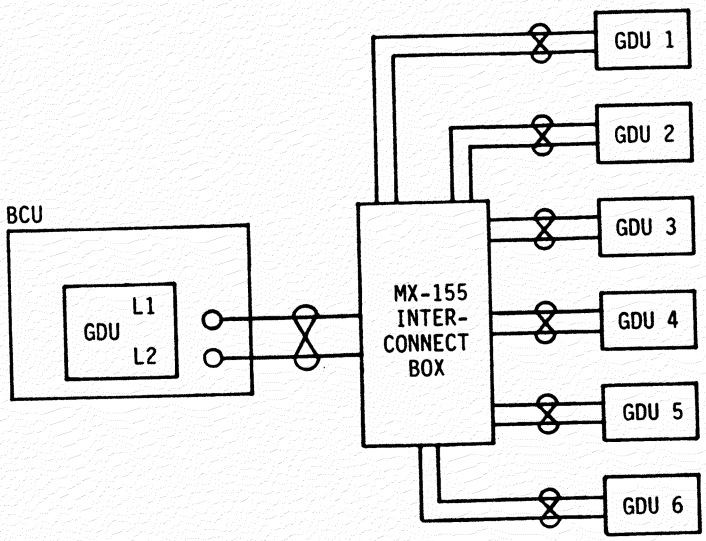


Figure 3-4. GDU channel wire connections.

3-8. TROUBLESHOOTING BY FUNCTION - CONTINUED

5. DATA ENTRY FUNCTION

During this function, you enter data into the BCU. As you enter data, the BCU operation is automatically checked. Go to page 3-25 for data entry malfunction symptoms.

6. COMPUTATION FUNCTION

During the computation function, the BCU computes the data needed by the firing sections. Automatic testing is taking place while the BCS is doing necessary computations. Go to page 3-25 for computation malfunction symptoms.

7. STANDBY FUNCTION

When you are not entering data or the BCU is not transmitting or doing computations, it is in the standby function. Again, the BCU is being checked automatically so that a failure would not cause you to start a mission with failed equipment. Go to page 3-25 for standby malfunction symptoms.

8. AUXILIARY RADIO CHANNEL FUNCTION

The auxiliary radio channel provides an additional communications channel for BCS operation as an FDC. Figure 3-5 shows the auxiliary radio cabling. Go to page 3-25 for auxiliary radio channel malfunction symptoms.

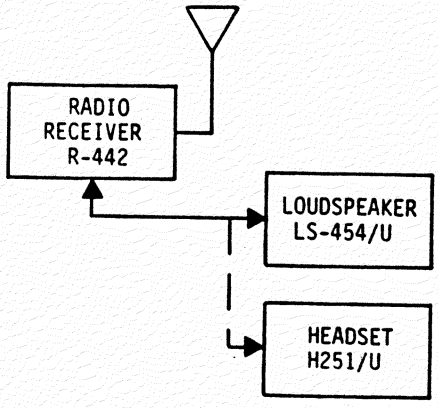


Figure 3-5. Auxiliary radio channel interface diagram.

3-9. TROUBLESHOOTING TECHNIQUES

1. METHODS

There are three methods you can use to troubleshoot the BCS to a BCS component or BCU replaceable assembly. You may use one or more of the methods, depending on the trouble symptom. The troubleshooting methods are:

- Method 1 - You see a BCU BIT lamp come on. This tells you to replace a BCU module.
- Method 2 - You do an operator assisted BCU diagnostic procedure. In this method, you select a series of semi-automatic tests in the BCU. You enter data into the BCU and the BCU checks itself for proper operation.
- Method 3 - You have to perform a manual type of troubleshooting. This is done by swapping cables (on BCU only), disconnecting or shutting-down equipment.

2. BIT LAMPS

The BIT lamps will tell you which BCU module or assembly has failed and should be replaced. THE LAMPS ARE ARRANGED IN ORDER OF PRIORITY, FROM LEFT TO RIGHT; THE HIGHEST PRIORITY LAMP ON THE LEFT AND THE LOWEST PRIORITY LAMP ON THE RIGHT. Figure 3-6 shows the BIT lamps, the module or assembly to be replaced for each lamp, and the priority for each lamp. You should always check the BIT lamps first when a malfunction occurs. When more than one BIT lamp comes on, you should always check the lamp priorities before replacing modules. For example: if you see the PS and IDC-2 lamps come on, check the lamp priorities. Since the PS lamp has a priority of 1 and the IDC-2 lamp has a priority of 3, you should replace the low voltage power supply first because the low voltage power supply failure could be causing the IDC-2 lamp to come on.

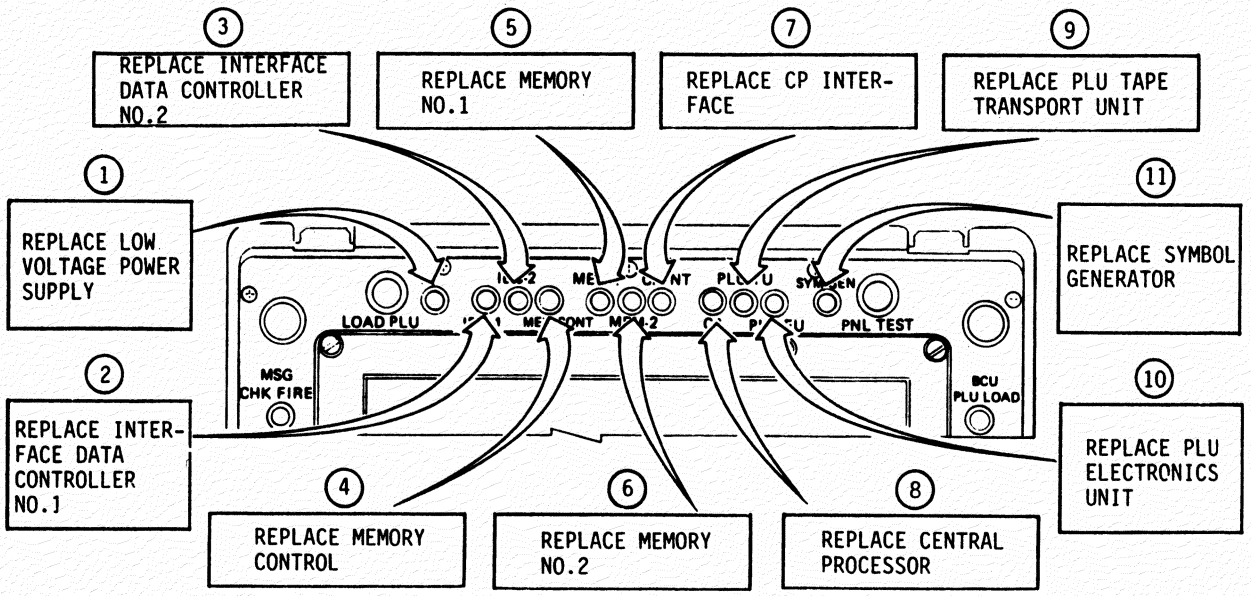
3. OPERATOR-ASSISTED DIAGNOSTIC PROCEDURES

These test procedures are called operator assisted because you start and control the test but the BCU checks itself; you start the tests and take the corrective action needed based on the outcome of the test. The results of the test are displayed on the BCU. The diagnostic procedures are for checking that only the BCU is operating properly.

4. MANUAL TROUBLESHOOTING

You do manual troubleshooting to isolate BCS malfunctions to the PDU, radios, COMSEC device, cabling, or to parts of the BCU that are not indicated by BIT lamps or checked by operator assisted diagnostic procedures. For example: if the PDU power circuit breaker trips to OFF, you go to the symptom table on page 3-20 and follow the instructions for this symptom. There are no BIT lamps or operator assisted diagnostic procedures to help you isolate the malfunction. There are also no tests or inspections listed for the symptom, so you go to referenced tables on pages 3-26 and 3-27 to perform the detailed manual trouble-shooting procedures.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED



(1) INDICATES HIGHEST PRIORITY LAMP

(11) INDICATES LOWEST PRIORITY LAMP

Figure 3-6. BIT lamps, modules, and lamp priorities.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION

TEST OR INSPECTION

CORRECTIVE ACTION

5. POWER DISTRIBUTION FUNCTION

(1) BCS POWER BCU LAMP ON PDU IS NOT ON WITH PDU POWER ON/OFF CIRCUIT BREAKER ON

Check if BCU has power

If BCU has power, replace lamp. If problem remains, replace PDU.

If BCU does not have power, check external power source (vehicle, generator, or batteries).

If external power is good, replace cables/PDU.

(2) BCS POWER AUX LAMP ON PDU IS NOT ON WITH PDU POWER ON/OFF CIRCUIT BREAKER ON

Check if VRC-46 radios have power

If radios have power, replace lamp. If problem remains, replace PDU.

If radios do not have power, check external power source (vehicle, generator, or batteries).

If external power is good, replace cables/PDU.

(3) POWER ON/OFF CIRCUIT BREAKER ON PDU TRIPS TO OFF

None

Go to page 3-26.

(4) BCS POWER BCU AND BAT PWR LAMPS ON PDU ARE NOT ON

Check BCU BIT PS lamp

If BIT PS lamp is on, replace PDU BAT PWR lamp. If problem remains, replace PDU.

If BIT PS lamp is not on, replace PDU.

If BCS POWER BCU lamp is still not on, go to malfunction indication (1).

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

5. POWER DISTRIBUTION FUNCTION - CONTINUED

(5) BCU AND/OR KG-31 AND/OR PRC-68 RADIO DOES NOT HAVE POWER (BCS POWER BCU LAMP ON PDU IS ON)

NONE

Call direct support

(6) RADIO DOES NOT HAVE POWER (BCS POWER AUX LAMP ON PDU IS ON)

NONE

Call direct support

(7) BCU DOES NOT HAVE POWER BUT BIT PS LAMP FLASHED ON MOMENTARILY WHEN BCU PWR SWITCH TURNED ON

NONE

Replace LVPS module

6. PROGRAM LOAD FUNCTION

(1) PLU LOAD LAMP DOES NOT GO OFF 1-1/2 SEC AFTER LOAD PLU SWITCH IS PRESSED

NONE

Replace CP module. If problem remains, replace the following modules in the order given: CP INTF, MEM CONT, IDC-1, IDC-2. Replace one module then recheck, then replace next module, etc.,

(2) PLU LOAD LAMP GOES OFF 1-1/2 SEC AFTER LOAD PLU SWITCH IS PRESSED BUT DISPLAY IS OFF OR ABNORMAL

Check display at an angle to see if edge lighting is on.

If display is off and edge lighting is on, replace IDC-2 module.

If display is abnormal and edge lighting is on, replace front panel.

If edge lighting is off, replace LVPS module.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

6. PROGRAM LOAD FUNCTION - CONTINUED

(3) DISPLAY DOES NOT SHOW KEYBOARD ENTRIES PROPERLY

Do BCU diagnostic procedures 1 and 2. (Go to page 3-29.)

(4) AUDIBLE ALARM DOES NOT SOUND WITH PNL TEST SWITCH PRESSED

Press and hold PNL TEST switch while varying the ALM VOL control.

If alarm sounds on and off depending on position of ALM VOL control, replace the front panel.

If alarm does not sound, do BCU diagnostic procedure 6. (Go to page 3-29.) If problem remains, call direct support.

(5) LAMPS DO NOT LIGHT WITH PNL TEST SWITCH PRESSED

NONE

Do diagnostic procedure 6. (Go to page 3-29.)

(6) PNL ILLUM OR DSPL BRT CONTROL DOES NOT WORK IN ONE OR MORE POSITIONS

NONE

Replace the front panel

7. CHANNEL 1 OR 2 RADIO COMMUNICATIONS FUNCTION

(1) FDO UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 AND CHANNEL 2 (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over channels 1 and 2

If communications are good with handset, call direct support.

If communications are not good with handset, replace handset.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

7. CHANNEL 1 OR 2 RADIO COMMUNICATIONS FUNCTION - CONTINUED

(2) OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 AND CHANNEL 2 (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over channels 1 and 2

If communications are good with handset, replace operator's headset.

If communications are not good with handset, replace front panel.

If problem remains, replace BCU.

(3) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 (HANDSET AND HEADSET OK)

NONE

Go to page 3-26.

(4) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 2 (HANDSET AND HEADSET OK)

NONE

Go to page 3-26.

(5) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER CHANNEL 1 (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, replace BCU.

(6) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER CHANNEL 2 (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, replace BCU.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

8. CHANNEL 1 OR 2 WIRE LINE COMMUNICATIONS FUNCTION

(1) FDO UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 AND CHANNEL 2 (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over channels 1 and 2

If communications are good with handset, call direct support.

If communications are not good with handset, replace handset.

(2) OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 AND CHANNEL 2 (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over channels 1 and 2

If communications are good with handset, replace operator's headset.

If communications are not good with handset, replace front panel. If problem remains, replace BCU.

(3) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 1 (HANDSET AND HEADSET OK)

Do diagnostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, check wire lines and wire line connections.

(4) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER CHANNEL 2 (HANDSET AND HEADSET OK)

Do diganostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, check wire lines and wire line connections.

(5) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER CHANNEL 1 (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, replace BCU.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

8. CHANNEL 1 OR 2 WIRE LINE COMMUNICATIONS FUNCTION - CONTINUED

(6) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER CHANNEL 2 (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 4. (Go to page 3-29.)

If diagnostic procedure 4 checks good, replace BCU.

9. GDU RADIO COMMUNICATIONS FUNCTION

(1) FDO UNABLE TO COMMUNICATE (VOICE) OVER GDU CHANNEL (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over GDU channel

If communications are good with handset, call direct support.

If communications are not good with handset, replace handset.

(2) OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER GDU CHANNEL (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over GDU channel

If communications are good with handset, replace operator's headset.

If communications are not good with handset, replace front panel. If problem remains, replace BCU.

(3) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER GDU CHANNEL (HANDSET AND HEADSET OK)

NONE

(Go to page 3-27.)

(4) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER GDU CHANNEL (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 5. (Go to page 3-29.)

If diagnostic procedure 5 checks good, replace BCU.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION

TEST OR INSPECTION

CORRECTIVE ACTION

10. GDU WIRE LINE COMMUNICATIONS FUNCTION

(1) FDO UNABLE TO COMMUNICATE (VOICE) OVER GDU WIRE LINE (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over GDU wire line

If communications are good with handset, call direct support.

If communications are not good with handset, replace handset.

(2) OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER GDU WIRE LINE (DIGITAL MESSAGES SENT AND RECEIVED)

Connect FDO's handset W25P1 to operator's headset connector J9 and check voice communications over GDU wire line

If communications are good with handset, replace operator's headset.

If communications are not good with handset, replace front panel. If problem remains, replace BCU.

(3) FDO OR OPERATOR UNABLE TO COMMUNICATE (VOICE) OVER GDU WIRE LINE (HANDSET AND HEADSET OK)

Do diagnostic procedure 5. (Go to page 3-29.)

If diagnostic procedure 5 checks good, check wire lines and wire line connections.

(4) OPERATOR UNABLE TO SEND OR RECEIVE DIGITAL MESSAGES OVER GDU WIRE LINE (VOICE COMMUNICATIONS OK)

Do diagnostic procedure 5. (Go to page 3-29.)

If diagnostic procedure 5 checks good, check wire lines and wire line connections.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

MALFUNCTION INDICATION
TEST OR INSPECTION
CORRECTIVE ACTION

11. DATA ENTRY OR COMPUTATION FUNCTION

(1) KEYBOARD WORKS BUT DISPLAY DOES NOT SHOW KEYBOARD ENTRIES PROPERLY

Do diagnostic procedures 1 and 2. (Go to page 3-29.)

If diagnostic procedures 1 and 2 check good, replace BCU.

(2) KEYBOARD IS TOTALLY INOPERATIVE

NONE

Replace keyboard. If problem remains, replace BCU.

12. STANDBY FUNCTION

(1) DISPLAY DOES NOT SHOW DATA CORRECTLY, AREA MISSING, LETTERS/NUMBERS/SYMBOLS INCOMPLETE

Do diagnostic procedure 1. (Go to page 3-29.)

If diagnostic procedure 1 checks good, replace BCU.

13. AUXILIARY RADIO CHANNEL FUNCTION

(1) UNABLE TO RECEIVE OVER AUXILIARY RADIO CHANNEL

Check auxiliary radio channel equipment in accordance with TM's in Appendix A.

If equipment does not check good, replace malfunctioning equipment.

If equipment checks good, call direct support.

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

Table 3-1A. Troubleshooting Power Distribution

ITEM		ACTION	IF INDICATION IS NORMAL	IF INDICATION IS ABNORMAL
(3)	a.	Check for reversed connections at power source if using cables W19 and W20.	Go to b.	Reconnect cables for proper connections
	b.	Disconnect equipment from PDU connectors J3 through J7, one at a time. Check if circuit breaker trips after each item is disconnected.	If circuit breaker does not trip after an equipment is disconnected, call direct support.	If circuit breaker still trips after all equipments are disconnected, replace PDU.

Table 3-2. Troubleshooting Radio Communications

ITEM		ACTION	IF INDICATION IS NORMAL	IF INDICATION IS ABNORMAL
(3)	a.	Do BCU diagnostic procedure 4. (Go to page 3-29.)	Go to b.	Replace faulty module as indicated by diagnostic procedure
	b.	Connect channel 2 radio line to BCU channel 1 radio connector and check for voice communications over channel 1.	Go to c.	Replace BCU
	c.	Check channel 1 radio equipment in accordance with equipment TM's listed in Appendix A.	Call direct support	Replace malfunctioning equipment
(4)	a.	Do BCU diagnostic procedure 4. (Go to page 3-29.)	Go to b.	Replace faulty module as indicated by diagnostic procedure

3-9. TROUBLESHOOTING TECHNIQUES - CONTINUED

Table 3-2. Troubleshooting Radio Communications - Continued

ITEM	ACTION	IF INDICATION IS NORMAL	IF INDICATION IS ABNORMAL
(4) cont.	b. Connect channel 1 radio line to BCU channel 2 radio connector and check for voice communications over channel 2.	Go to c.	Replace BCU
	c. Check channel 2 radio equipment in accordance with equipment TM's listed in Appendix A.	Call direct support	Replace malfunctioning equipment

Table 3-3. Troubleshooting GDU Radio Communications

ITEM	ACTION	IF INDICATION IS NORMAL	IF INDICATION IS ABNORMAL
(3)	a. Do BCU diagnostic procedure 5. (Go to page 3-29.)	Go to b.	Replace faulty module as indicated by diagnostic procedure
	b. Check GDU channel radio equipment in accordance with equipment TM's listed in Appendix A.	Call direct support	Replace malfunctioning equipment

3-10. BCU DIAGNOSTIC PROCEDURE

1. HOW TO RUN THE DIAGNOSTIC PROCEDURE

You run the BCU diagnostic procedure as follows:

- You display the DIAGNOSTICS index as shown in figure 3-7
- You select any one of the six following tests from the DIAGNOSTICS index or you select "8:RUN 1-7" to run all six tests consecutively:
  - 1: DISPLAY TEST
  - 2: KEYBOARD TEST
  - 3: PRINTER TEST
  - 4: COMMUNICATION CHANNELS TEST
  - 5: GDU CHANNEL TEST
  - 6: FRONT PANEL TEST
- The BCU displays all necessary instructions
- The BCU gives you the results of the automatic test
- The BCU tells you what BCU module to replace if test fails

2. OPERATING NOTES

The following give you information on how to understand and operate the diagnostic test procedure:

- If you are doing a test with more than one page, the bottom left of the display will show: "PRESS EXECUTE FOR NEXT PAGE". This means that when the first page of tests is finished, you press the EXEC key to display the next page of tests.
- If a page is the last page of tests or is the only page, the bottom left of the display will show: "PRESS EXECUTE FOR NEXT TEST". If you are running only one diagnostic test, when this page of tests is finished and you press the EXEC key, the DIAGNOSTICS index is displayed. If you are running the six diagnostic tests consecutively, when this page of tests is finished and you press the EXEC key, the next test is displayed.
- If you select "7:EXIT DIAGNOSTICS" on the DIAGNOSTICS index, the upper, middle, and lower displays are returned to operational status. The BCS is restored to the status it had just before selecting the diagnostic procedure.

3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED

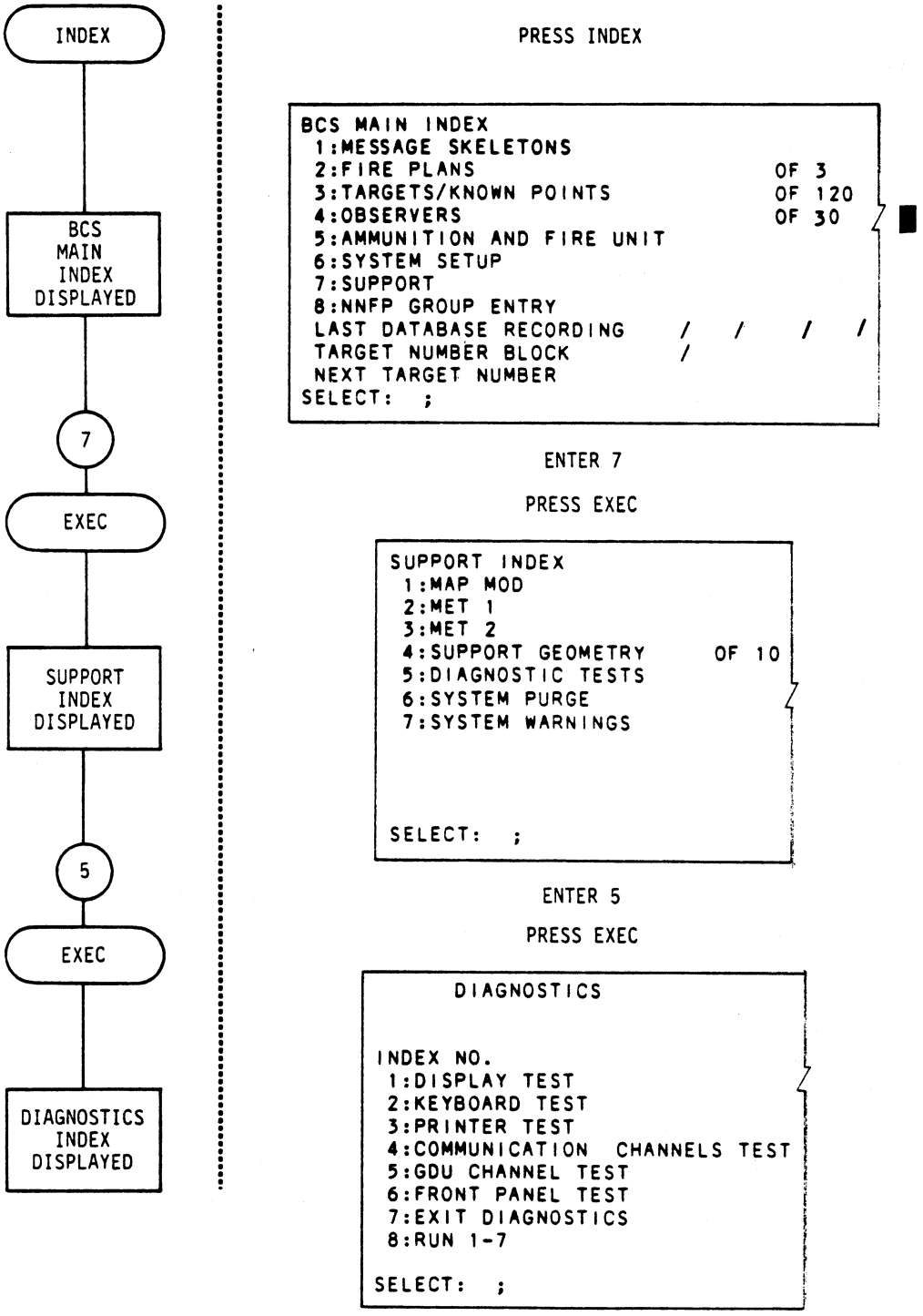


Figure 3-7. Displaying the DIAGNOSTICS index.

3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED

3. DIAGNOSTIC TEST DISPLAYS

The BCU diagnostic test displays are shown on the following pages to help you see and understand what is involved in running the diagnostic procedure.

DIAGNOSITCS INDEX



WHEN YOU DECIDE WHAT TEST YOU WANT TO RUN, PRESS THE NUMBER FOR THAT TEST. THE CURSOR WILL JUMP ONE SPACE TO THE LEFT AND THE TEST NUMBER WILL APPEAR WHERE THE CURSOR WAS. WHEN THE TEST NUMBER APPEARS, PRESS THE EXEC KEY TO START THE TEST YOU SELECTED. (SEE EXAMPLE)

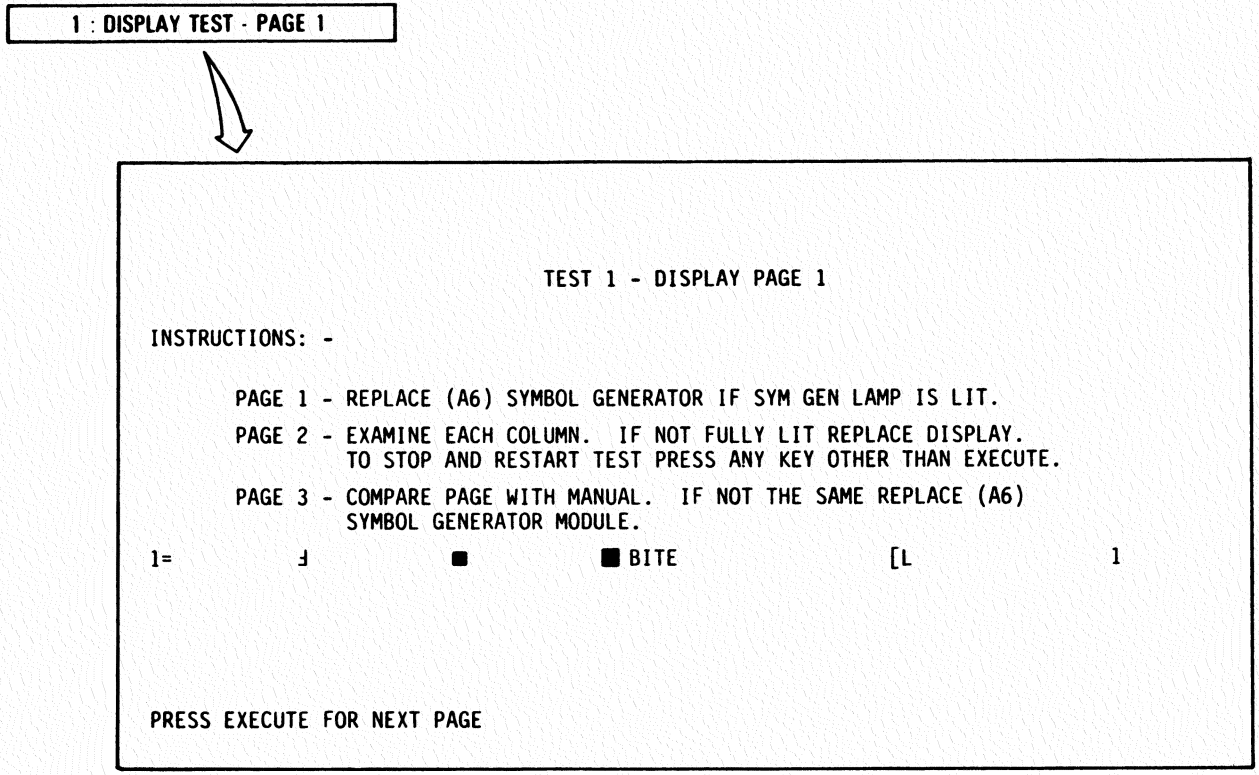
```
                    DIAGNOSTICS

          INDEX NO.

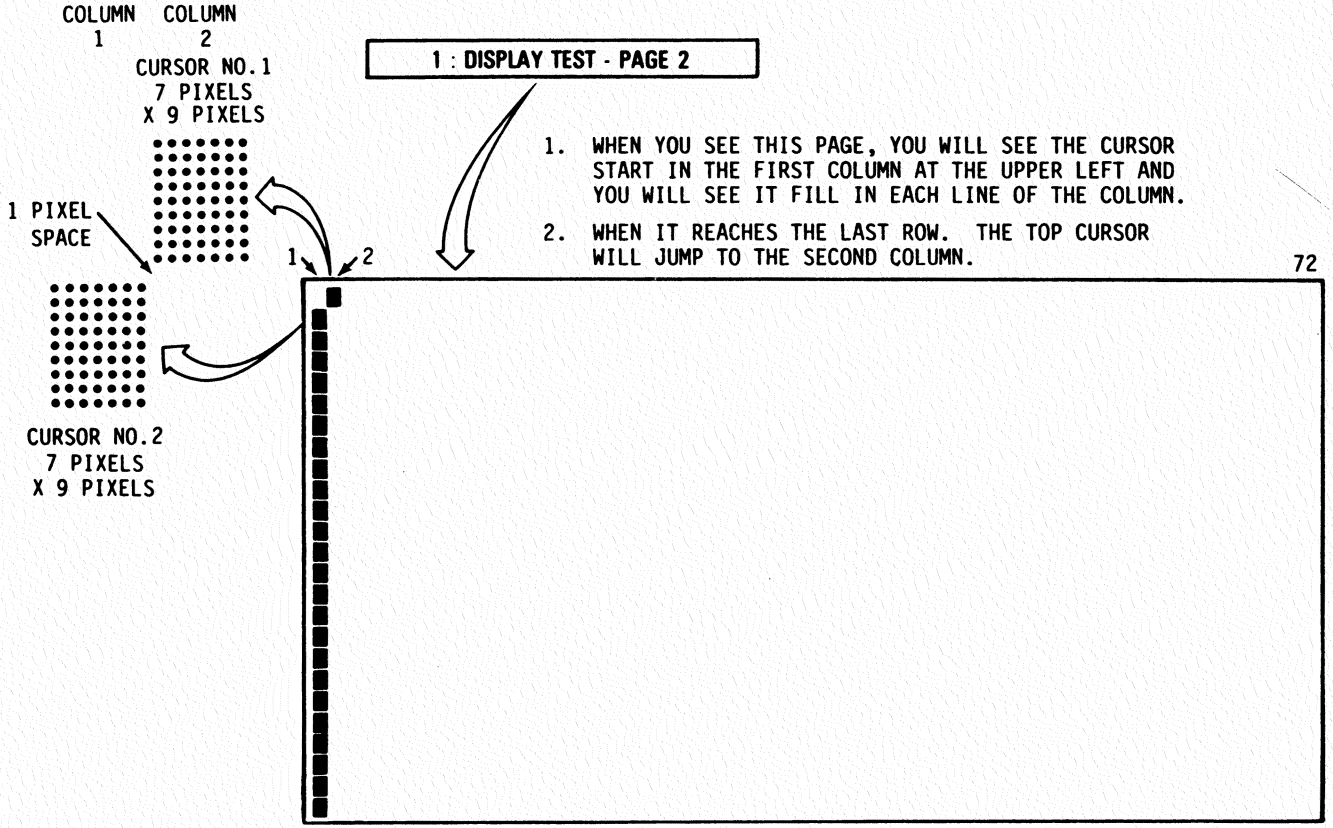
          1:    DISPLAY TEST
          2:    KEYBOARD TEST
          3:    PRINTER TEST
          4:    COMMUNICATION CHANNELS TEST
          5:    GDU CHANNEL TEST
          6:    FRONT PANEL TEST
          7:    EXIT DIAGNOSTICS
          8:    RUN 1-7

SELECT: □;
```

1. YOU START WITH "SELECT: □;"
2. YOU DECIDE TO RUN TEST 1: DISPLAY TEST.
3. YOU PRESS 1 KEY AND YOU SEE "SELECT: □1;"
4. PRESS EXEC KEY.


1 : DISPLAY TEST - PAGE 1
TEST 1 - DISPLAY PAGE 1
INSTRUCTIONS: -
PAGE 1 - REPLACE (A6) SYMBOL GENERATOR IF SYM GEN LAMP IS LIT.
PAGE 2 - EXAMINE EACH COLUMN. IF NOT FULLY LIT REPLACE DISPLAY.
TO STOP AND RESTART TEST PRESS ANY KEY OTHER THAN EXECUTE.
PAGE 3 - COMPARE PAGE WITH MANUAL. IF NOT THE SAME REPLACE (A6)
SYMBOL GENERATOR MODULE.
BITE
PRESS EXECUTE FOR NEXT PAGE

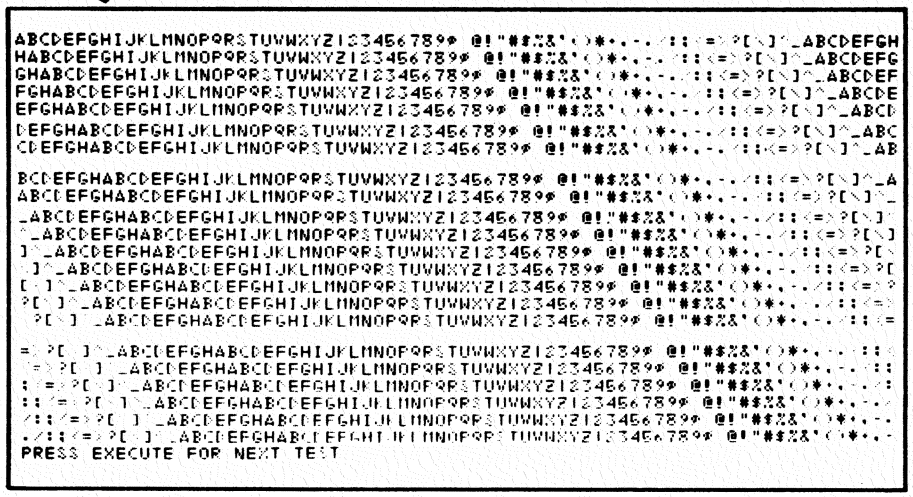
3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED



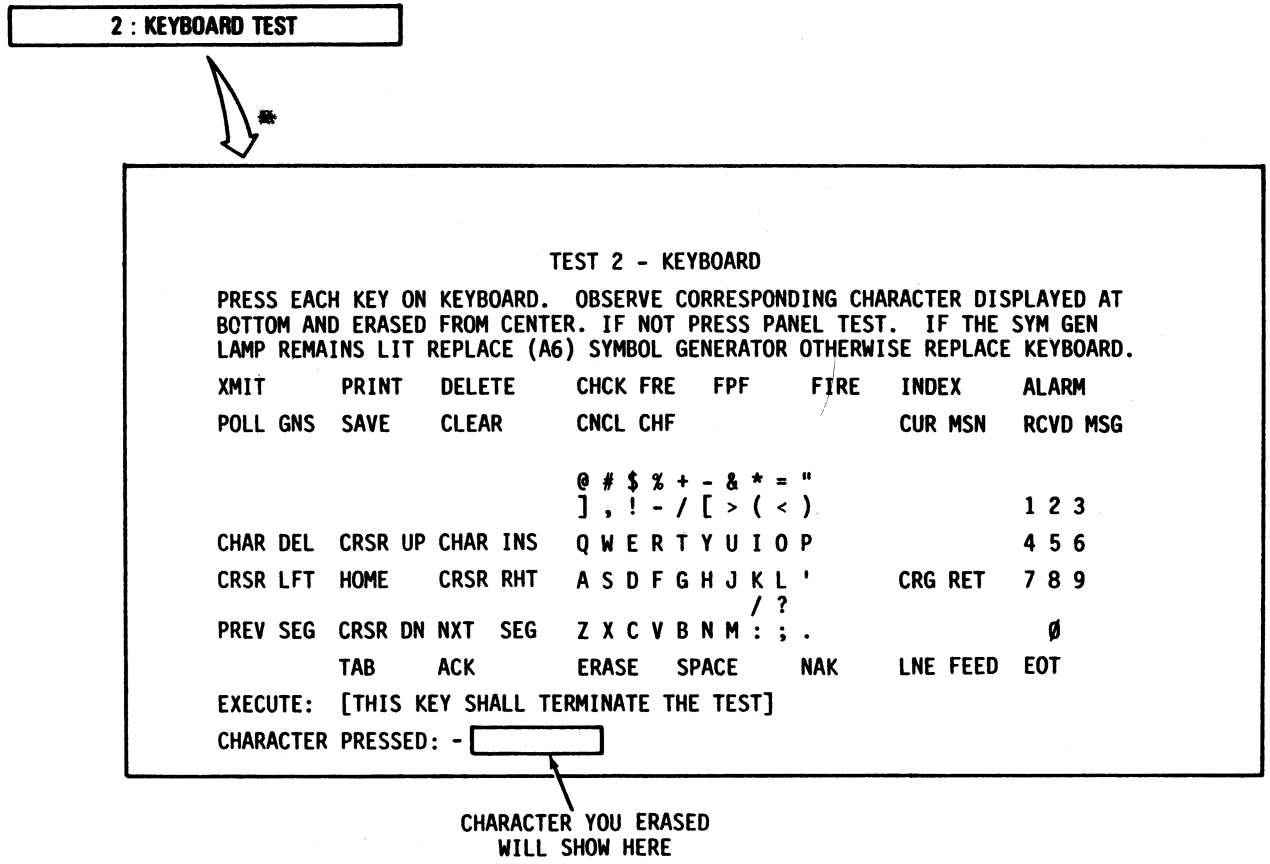
1. WHEN YOU SEE THIS PAGE, YOU WILL SEE THE CURSOR START IN THE FIRST COLUMN AT THE UPPER LEFT AND YOU WILL SEE IT FILL IN EACH LINE OF THE COLUMN.
2. WHEN IT REACHES THE LAST ROW. THE TOP CURSOR WILL JUMP TO THE SECOND COLUMN.
3. WHEN THE CURSORS HAVE MOVED TO THE BOTTOM OF THE SECOND COLUMN, THEY WILL MOVE TO THE THIRD.
4. THIS COLUMN MOVEMENT WILL CONTINUE UNTIL IT HAS MOVED ALL THE WAY ACROSS THE DISPLAY TO COLUMN NO. 72 AND THEN WILL REPEAT UNTIL THE EXEC KEY IS PRESSED.

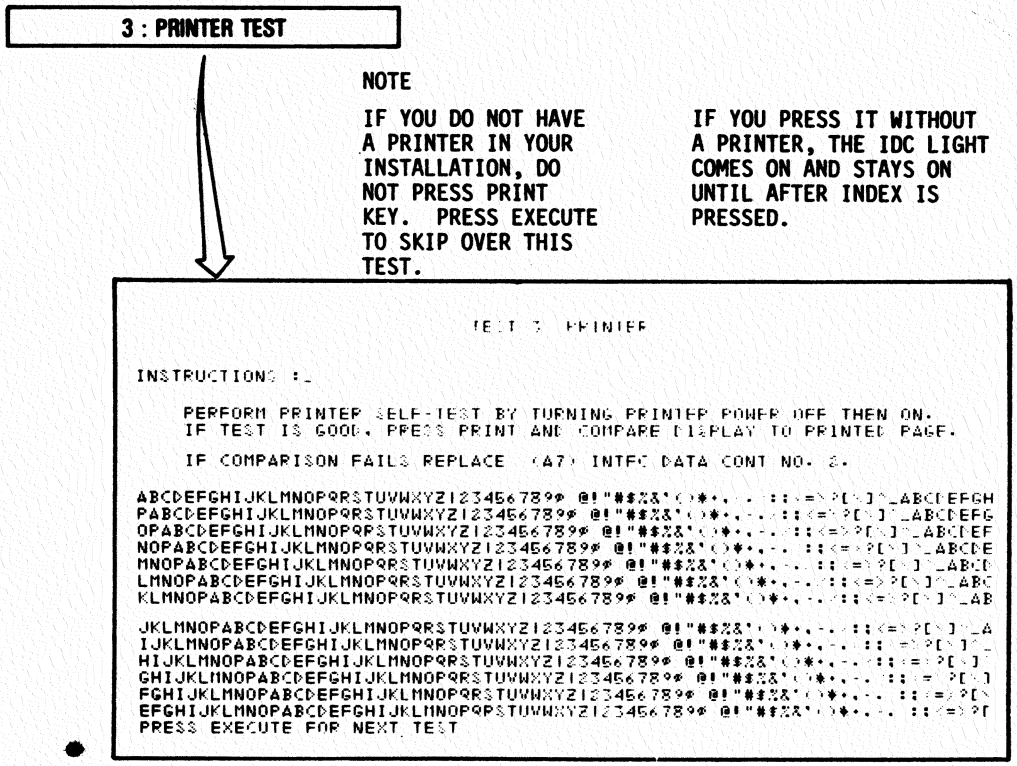
1 : DISPLAY TEST - PAGE 3

WHEN YOU SEE THIS PAGE, YOU SHOULD LOOK AT EACH CHARACTER ON EACH LINE AND CHECK THAT IT APPEARS CORRECTLY. COMPARE THE PICTURE BELOW WITH WHAT YOU SEE ON THE DISPLAY.



3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED

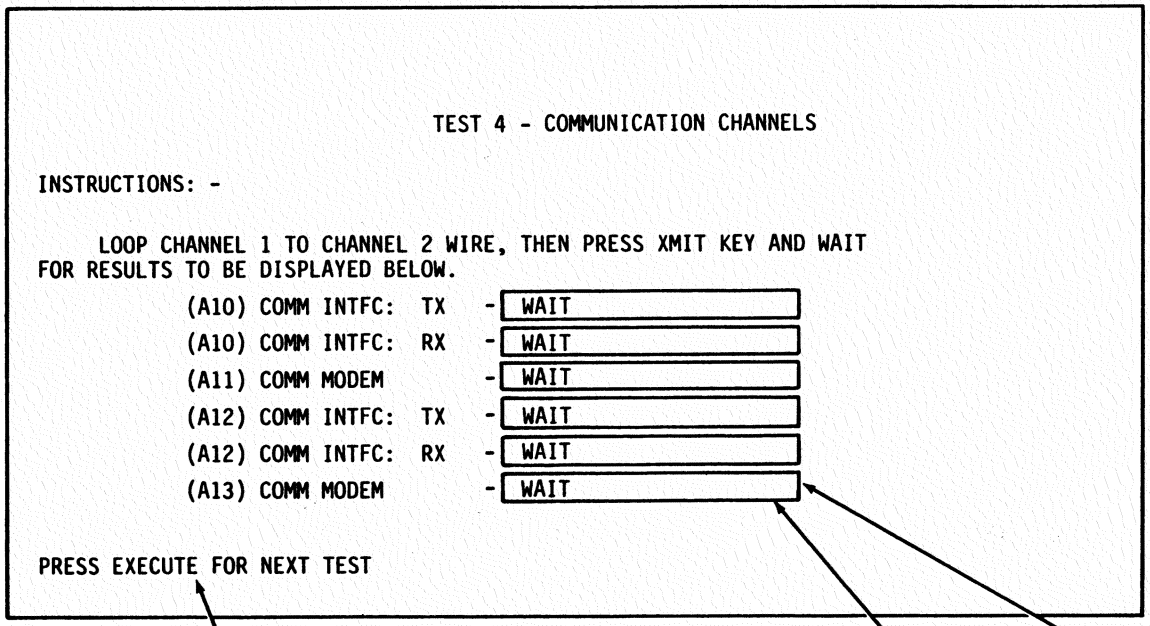



3 : PRINTER TEST
NOTE
IF YOU DO NOT HAVE A PRINTER IN YOUR INSTALLATION, DO NOT PRESS PRINT KEY. PRESS EXECUTE TO SKIP OVER THIS TEST.
IF YOU PRESS IT WITHOUT A PRINTER, THE IDC LIGHT COMES ON AND STAYS ON UNTIL AFTER INDEX IS PRESSED.
TEST 3 PRINTER
INSTRUCTIONS :_
PERFORM PRINTER SELF-TEST BY TURNING PRINTER POWER OFF THEN ON.
IF TEST IS GOOD, PRESS PRINT AND COMPARE DISPLAY TO PRINTED PAGE.
IF COMPARISON FAILS REPLACE (A7) INTFC DATA CONT NO. 8.
ABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFGH
PABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFG
OPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEF
NOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABCDE
MNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABCD
LMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_ABC
KLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_AB
JKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_A
IJKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]^_
HIJKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\]
GHIJKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[\
FGHIJKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?[
EFGHIJKLMNOPABCDEFGHIJKLMNOPQRSTUVWXYZ123456789# @!"#$%&'()*+,-./:;<=>?
PRESS EXECUTE FOR NEXT TEST

3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED

4 : COMMUNICATIONS CHANNELS TEST

1. WHEN YOU SELECT THIS TEST, YOU WILL SEE THE DISPLAY BELOW. LOOP CHANNEL 1 TO CHANNEL 2 BY CONNECTING A SHORT LENGTH OF WD1/TT WIRE BETWEEN CHANNEL 1 BINDING POST 1 AND CHANNEL 2 BINDING POST 1. REPEAT FOR BINDING POSTS 2.
2. PRESS XMIT KEY.
3. WHEN TEST IS FINISHED, YOU WILL SEE "PASS" OR "FAULTY-REPLACE MODULE" NEXT TO EACH MODULE.

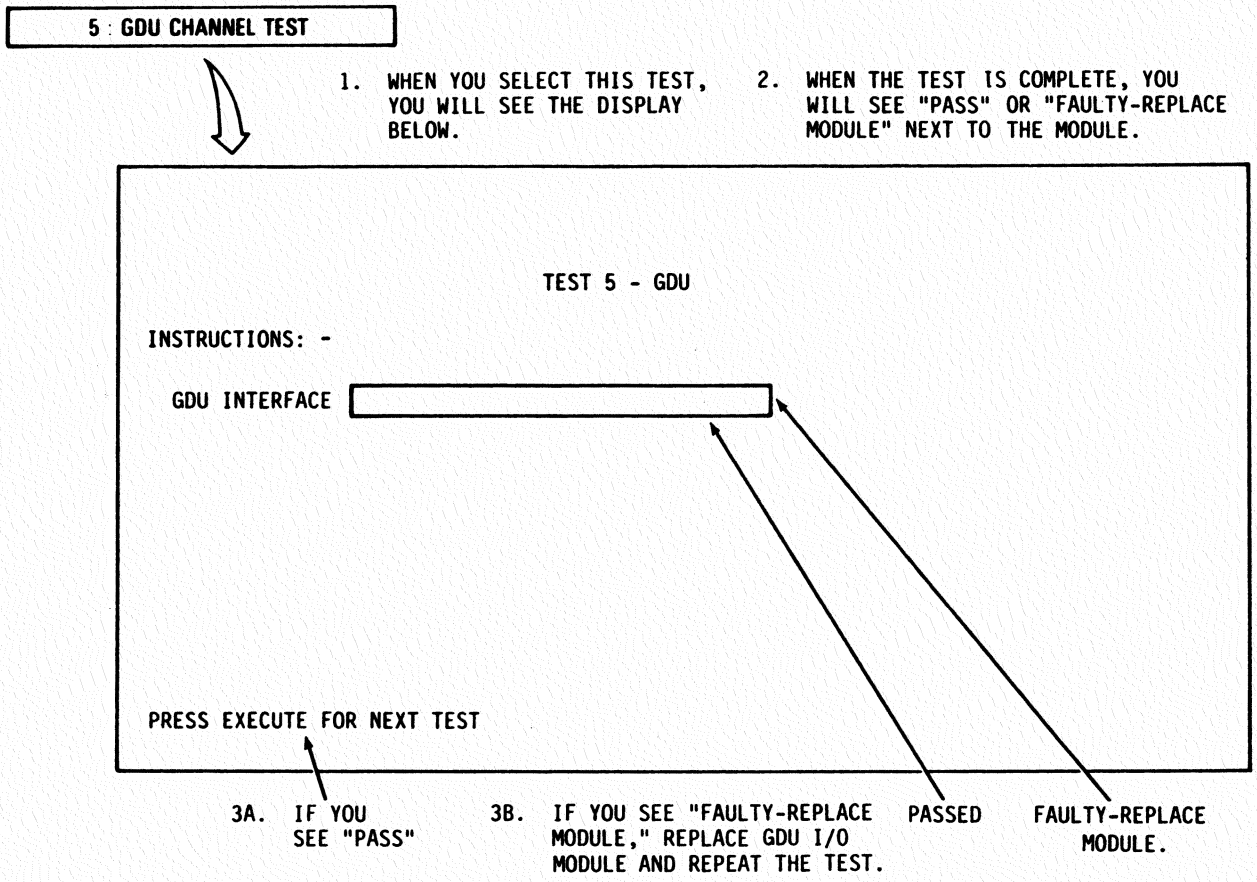


4A. IF YOU SEE "PASS" FOR EACH MODULE:

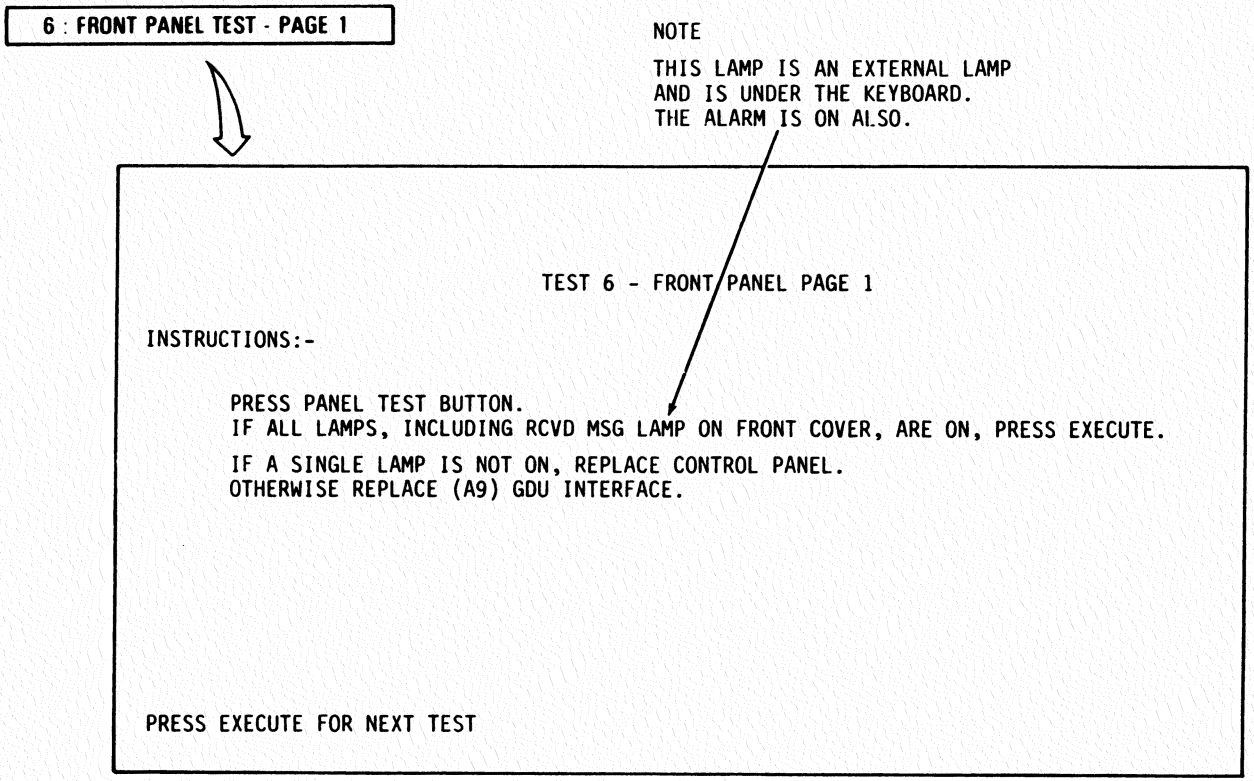
4B. IF YOU SEE "FAULTY-REPLACE MODULE" NEXT TO ANY MODULE, REPLACE THAT MODULE AND REPEAT THE TEST.

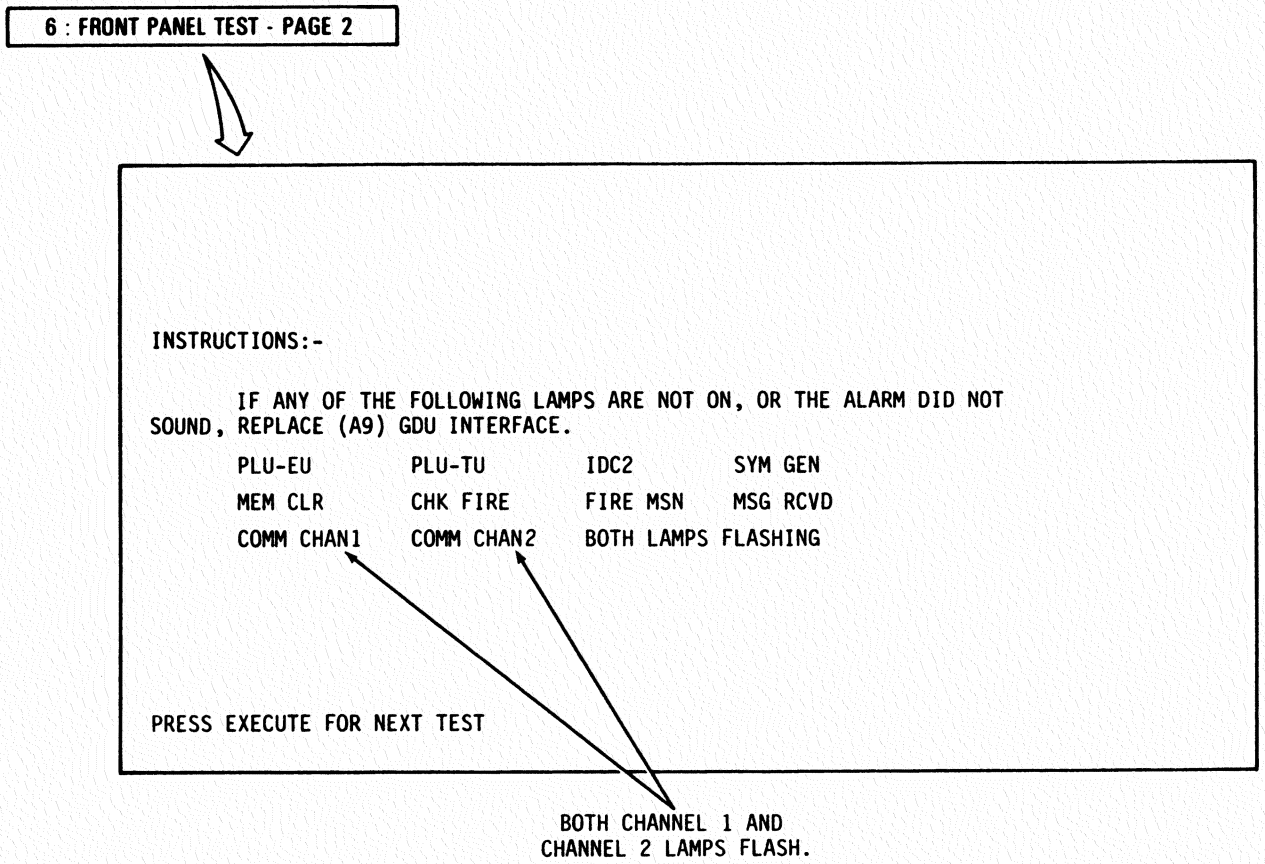
PASS.

FAULTY-REPLACE MODULE.


5 : GDU CHANNEL TEST
1. WHEN YOU SELECT THIS TEST, YOU WILL SEE THE DISPLAY BELOW.
2. WHEN THE TEST IS COMPLETE, YOU WILL SEE "PASS" OR "FAULTY-REPLACE MODULE" NEXT TO THE MODULE.
TEST 5 - GDU
INSTRUCTIONS: -
GDU INTERFACE
PRESS EXECUTE FOR NEXT TEST
3A. IF YOU SEE "PASS"
3B. IF YOU SEE "FAULTY-REPLACE MODULE," REPLACE GDU I/O MODULE AND REPEAT THE TEST.
PASSED
FAULTY-REPLACE MODULE.

3-10. BCU DIAGNOSTIC PROCEDURE - CONTINUED




6 : FRONT PANEL TEST - PAGE 2
INSTRUCTIONS:-
IF ANY OF THE FOLLOWING LAMPS ARE NOT ON, OR THE ALARM DID NOT SOUND, REPLACE (A9) GDU INTERFACE.
PLU-EU
PLU-TU
IDC2
SYM GEN
MEM CLR
CHK FIRE
FIRE MSN
MSG RCVD
COMM CHAN1
COMM CHAN2
BOTH LAMPS FLASHING
PRESS EXECUTE FOR NEXT TEST
BOTH CHANNEL 1 AND CHANNEL 2 LAMPS FLASH.

SECTION IV. MAINTENANCE

3-11. SCOPE

This section contains the following BCS maintenance instructions:

- Inspection
- Cleaning
- Repair

3-12. INSPECTION

1. EXTERNAL

Inspect the BCS for external damage as follows:

ITEM	INSPECT FOR
PDU	. Dented, scratched, or cracked housing; chipped or peeling paint . Broken or loose switch or indicator lamps . Broken or loose connectors; broken or missing connector caps . Broken or inoperative pressure relief valves . Broken ground strap
BCU	. Dented, scratched, or cracked housing; chipped or peeling paint; broken or loose handles . Broken or loose indicator or panel illuminating lamps . Broken, loose, or missing control knobs or switch . Cracked or scratched polarized filter . Broken or loose connectors; broken or missing connector caps . Loose or broken keyboard latch or lock . Broken or missing keyboard keys . Broken or inoperative pressure relief valve . Broken ground strap
Cables	. Broken or loose connectors . Damaged insulation
Auxiliary Equipment	Refer to associated TM listed in Appendix A

3-12. INSPECTION - CONTINUED

2. INTERNAL

Inspect the BCS for internal damage as follows:

ITEM	INSPECT FOR
BCU	. Damaged plug-in modules . Broken or loose connectors . Bent, broken, or loose connector pins . Damaged wiring

3-13. CLEANING

Clean the BCS as follows:

PDU Exterior Surface	. Remove dust and loose dirt with a clean, dry cloth. . Remove ground-in dirt, grease, and fungus with a clean cloth moistened with a mild soap and water solution. Wipe dry with a clean, dry cloth.
BCU Exterior Surface	. Remove dust and loose dirt with a clean, dry cloth. . Remove ground-in dirt, grease, and fungus with a clean cloth moistened with a mild soap and water solution. Wipe dry with a clean, dry cloth.
Controls and Connectors	. Remove dust and dirt with a soft bristle brush.
Cables	. Remove dust and dirt with a soft bristle brush.
Pressure Relief Valves	. Remove dust and dirt with a soft bristle brush.
BCU Keyboard	. Remove dust and dirt with a soft bristle brush. . Remove ground-in dirt, grease, and fungus with a clean cloth moistened with a mild soap and water solution. Wipe dry with a clean, dry cloth.
BCU Polarized Filter	. Remove ground-in dirt, grease, and fungus with a clean cloth moistened with a mild soap and water solution. Wipe dry with a clean, dry cloth.
Auxiliary Equipment	Refer to associated TM listed in Appendix A

3-14. REPAIR

WARNING

To prevent injury to personnel and damage to equipment, make sure all electrical power is turned off when doing any repair except: keyboard latch adjustment, PDU and BCU lamp replacement, operational key barrier replacement, polarized filter replacement, control knob replacement and PDU battery replacement.

NOTE

If your BCS must be in use all the time, check and service those items that can be checked and serviced without stopping its operation. Make complete checks and services only when the BCS is finally shut down.

Repair of BCS consists of:

- Removal of BCU, PDU, COMSEC device and radios
- Repair of PDU (removal and replacement of PDU parts)
- Repair of BCU (adjustments, removal and replacement of BCU parts)

3-14.1 REMOVAL OF BCS COMPONENTS

1. BCU

WARNING

To prevent injury to personnel and damage to equipment, do not attempt to remove BCU unless two persons are available.

- Make sure all electrical power is turned off and keyboard is closed.
- Disconnect BCU ground strap from mounting base.
- Disconnect the following cables from BCU connectors:

CABLE	BCU CONNECTOR
W7P2/W10P2	J1
W7P2/W10P2	J2
W31P1	J3
W25P1 (handset)	J4
W8P1	J5
W9P1	J6
W11P1 (if available)	J7
W6P2	J8
W26P2 (headset)	J9
W26P3 (headset)	J11

3-14.1 REMOVAL OF BCS COMPONENTS - CONTINUED

1. BCU - CONTINUED

. Place protective covers on all BCU connectors and on alarm.
. Disconnect any wire lines from BCU binding posts.
. Remove safety wire and loosen thumbscrews on clamps that secure BCU to mounting tray.
. Slide BCU forward on mounting tray to disengage guide pins.
. Using two side handles and tape transport cover handle, remove BCU from mounting tray.

2. PDU

. Make sure all electrical power is turned off.
. Disconnect PDU ground strap from frame support assembly.
. Disconnect W32P1 from PDU connector J4.
. Disconnect W5P1, if available, from PDU connector J5.
. Disconnect W6P1 from PDU connector J6.
. Loosen frame support assembly fasteners securing PDU.
. Slide PDU forward in frame support assembly to get to rear connectors. Leave enough slack in rear mating cables to allow for disconnection.
. Disconnect the following cables from PDU connectors:

CABLE	PDU CONNECTOR
W1P1	J1
W2P1	J2
W12P1	J3
W3P1	J7

. Place protective covers on all PDU connectors.
. Remove PDU from frame support assembly.

3. KG-31/MOUNTING TRAY

NOTE
The KG-31 is removed from the frame support assembly with its mounting tray. Refer to illustration on page 3-6.

. Make sure all electrical power is turned off.
. Disconnect KG-31 mounting tray ground strap from frame support assembly.
. Disconnect W8P2 from W17J1 on KG-31 interface bracket.
. Disconnect W9P2 from W18J1 on KG-31 interface bracket.
. Disconnect W12P2 from W16J1 on KG-31 interface bracket.
. Loosen frame support assembly fasteners securing KG-31 mounting tray.
. Remove KG-31 on mounting tray from frame support assembly.

3-14.1 REMOVAL OF BCS COMPONENTS - CONTINUED

4. AUXILIARY EQUIPMENT

Refer to the applicable technical manual and SB-11-131 for removal of vehicular radios.

3-15. REMOVAL OF MOUNTING BASE KIT

1. M577

- Remove BCU, PDU, and KG-31/mounting tray. (Refer to paragraph 3-14.1.)
- Remove screw and two lockwashers securing vehicle jumper assembly to vehicle ground post.
- Disconnect W7/W10-P1 from each of two AN/VRC-46 radios.
- Disconnect W31-P2 and W32-P2 from amplifier/power supply group OG-174( )/VRC.
- Disconnect W3-P2 from radio mount MT-1029/VRC.
- Disconnect W1-P2 and W2-P2 from connectors on power connector bracket.
- Remove all tie-down and nylon straps securing BCS cables to vehicles. (Leave cables attached to mounting base kit.)

WARNING

To prevent injury to personnel and damage to equipment, two persons must be available to remove the mounting base kit from the vehicle.

- Remove eight hex-head screws, 16 flatwashers, and eight locknuts securing electrical equipment table to top plate assembly.
- Carefully lift mounting base kit from top plate assembly and remove from vehicle, making sure not to damage cables secured to mounting base kit.
- Unfold and extend legs on electrical equipment table and place it on a suitable surface.

NOTE

When installing PDU, do not connect cables W1, W2 or W3.

- Install BCU, PDU, and KG-31/mounting tray. (Refer to paragraph 3-6.)
- Connect W19-P1 to PDU connector J1.
- Connect W20-P1 to PDU connector J2.
- Connect terminal lugs of W19 and W20 to external generator.
- Connect W7/W10-P1 to two, jeep-mounted AN/VRC-46 radios.
- Connect W32-P2 to amplifier/power supply group OG-174( )/VRC connector J103.
- Connect W31-P2 to amplifier/power supply group OG-174( )/VRC AR/T connector.
- Energize external generator.
- Apply power to AN/VRC-46 radios.
- Turn on BCS. (Refer to Operator's Manual TM 11-7440-283-12-1-1.)

3-15. REMOVAL OF MOUNTING BASE KIT - CONTINUED

2. M561

- Remove BCU, PDU, and KG-31/mounting tray. (Refer to paragraph 3-14.1.)
- Remove wingnut and two washers securing jumper assembly to carrier forward wall.
- Disconnect W7/W10-P1 from each of two AN/VRC-46 radios.
- Disconnect W31-P2 and W32-P2 from amplifier/power supply group OG-174( )/VRC.
- Disconnect W3-P2 from radio mount MT-1029/VRC.
- Disconnect W1-P2 and W2-P2 from connectors on carrier forward wall.
- Remove all tie-down and nylon straps securing BCS cables to vehicle and radio mount. (Leave cables attached to mounting base kit.)

WARNING

To prevent injury to personnel and damage to equipment, two persons must be available to remove the mounting base kit from the vehicle.

- Remove eight hex-head screws, 16 flatwashers, and eight locknuts securing electrical equipment table to radio mount.
- Carefully lift mounting base kit from radio mount and remove from vehicle, making sure not to damage cables secured to mounting base kit.
- Unfold and extend legs on electrical equipment table and place it on a suitable surface.

NOTE

When installing PDU, do not connect cables W1, W2 or W3.

- Install BCU, PDU, and KG-31/mounting tray. (Refer to paragraph 3-6.)
- Connect W19-P1 to PDU connector J1.
- Connect W20-P1 to PDU connector J2.
- Connect terminal lugs of W19 and W20 to external generator.
- Connect W7/W10-P1 to two, jeep mounted AN/VRC-46 radios.
- Connect W32-P2 to amplifier/power supply group OG-174( )/VRC connector J103.
- Connect W31-P2 to amplifier/power supply group OG-174( )/VRC AR/T connector.
- Energize external generator.
- Apply power to AN/VRC-46 radios.
- Turn on BCS. (Refer to Operator's Manual TM 11-7440-283-12-1-1.)

3-16. REPAIR OF PDU

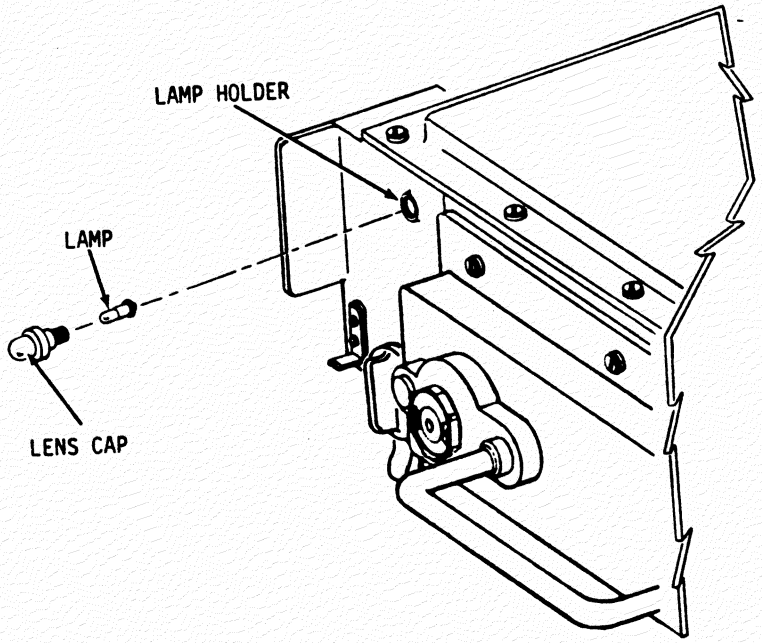
1. INDICATOR LAMPS

TOOLS: NONE

NOTE
. Use this procedure to replace all three PDU indicator lamps.
. You can perform this procedure with electrical power applied.

REMOVE
. Unscrew lens cap counterclockwise and remove with lamp.
. Pull lamp from lens cap.

REPLACE
. Check lampholder to ensure that seal has not been damaged.
. If damaged, call direct support.
. Push lamp into lens cap.
. Screw lens cap with lamp into lampholder.



3-16. REPAIR OF PDU - CONTINUED

2. BATTERIES

TOOLS: Flat-Tip Screwdriver

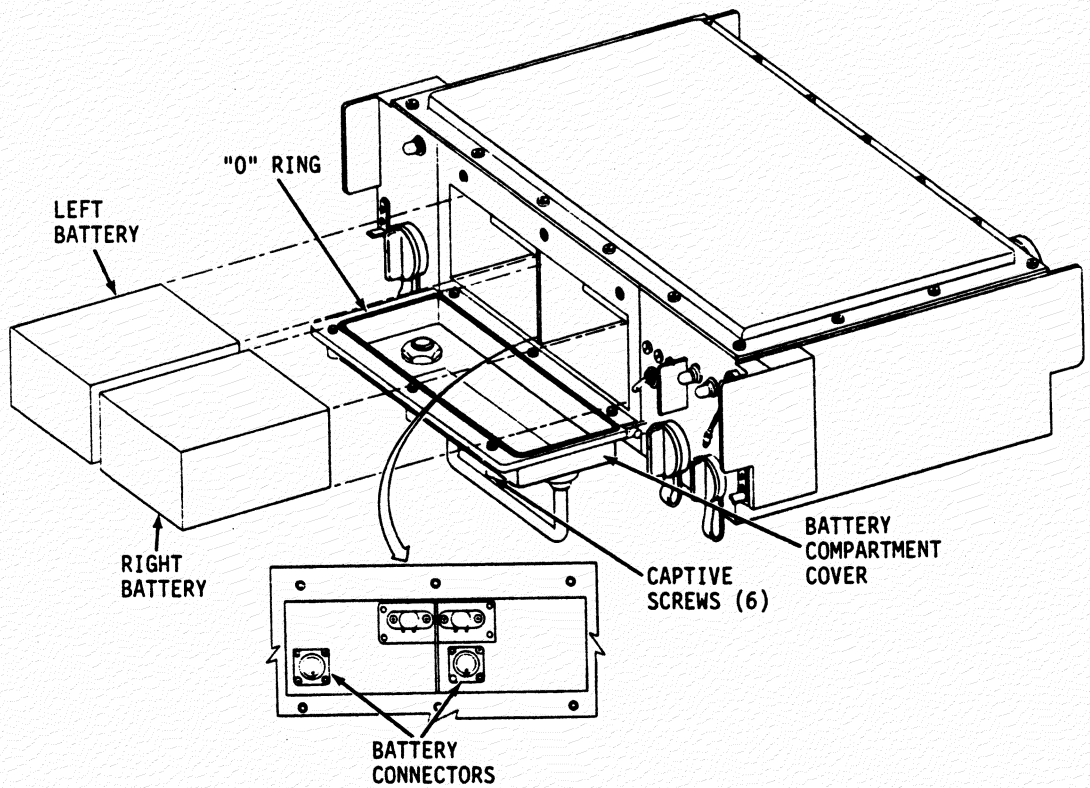
NOTE
You can perform this procedure with electrical power applied.

REMOVE

- Using flat-tip screwdriver, loosen six captive screws and open battery compartment cover.
- Grasp right battery and pull out.
- Grasp left battery and pull out.
- Check "O" ring on battery compartment cover. If "O" ring is damaged, call direct support.

REPLACE

- Place left battery in battery compartment and carefully push in to seat battery on connector.
- Place right battery in battery compartment and carefully push in to seat battery on connector.
- Close battery compartment cover and tighten six captive screws with flat-tip screwdriver.



3-17. REPAIR OF BCU

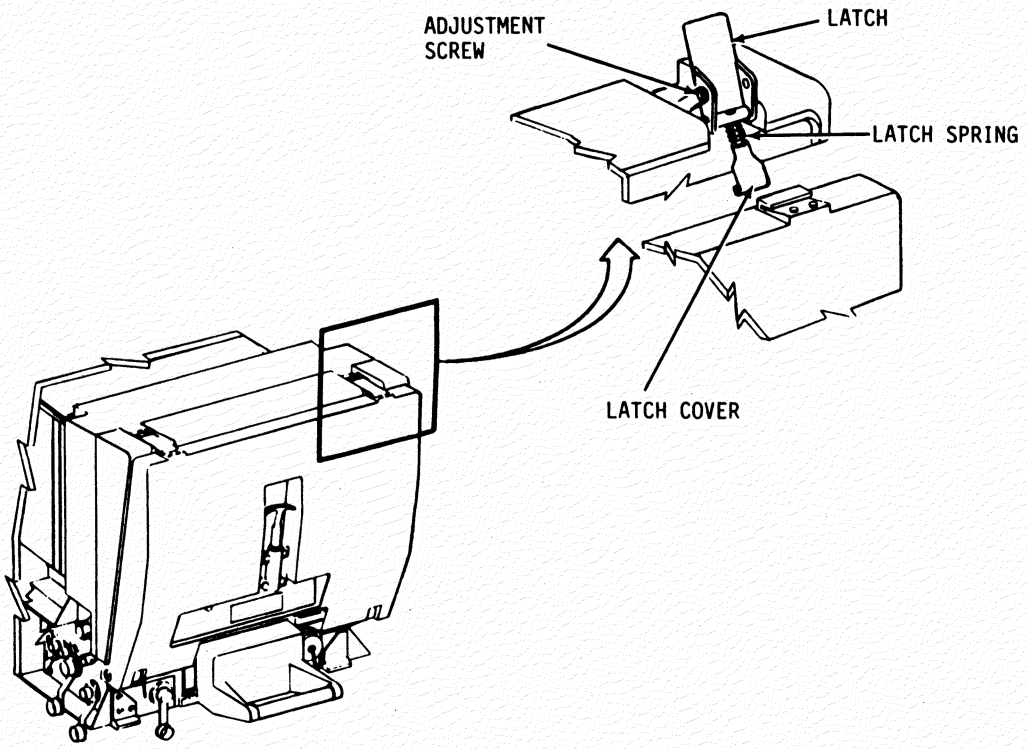
1. KEYBOARD LATCHES

TOOLS: Flat-Tip Screwdriver

NOTE
You can perform this procedure with electrical power applied.

ADJUST

- Hold keyboard closed and be sure keyboard is unlatched.
- Lift keyboard latch cover up to expose slotted, captive screw on latch.
- Tighten or loosen slotted, captive screw to adjust latch tension.
- Close latch and check that latch holds keyboard tightly.



3-17. REPAIR OF BCU - CONTINUED

2. PLUG-IN MODULES

TOOLS: Flat-Tip Screwdrivers

NOTE
Use this procedure to replace all plug-in modules

WARNING

To prevent injury to personnel, be sure power is off.

REMOVE

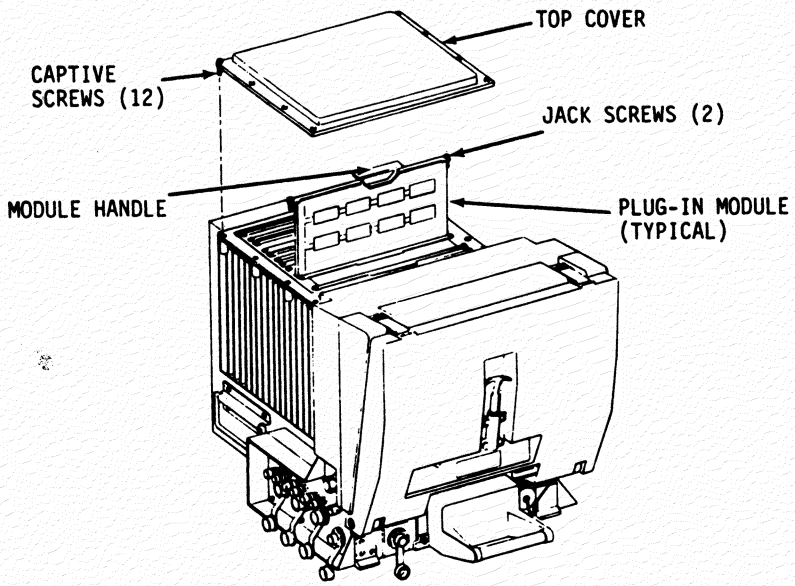
- Using flat-tip screwdriver, loosen 12 captive screws and remove BCU top cover.
- Locate module to be removed on MODULE LOCATION GUIDE on next page.

CAUTION

- You must alternately loosen jack screws, one turn at a time. Repeat alternately loosening screws to allow easy removal of module without damaging the module or module guides.

CAUTION

WHEN YOU REMOVE A PLUG-IN MODULE, BE VERY CAREFUL HOW YOU HOLD IT. DO NOT TOUCH COMPONENTS OR PRINTED CIRCUIT SIDE OF MODULE. STATIC ELECTRICITY MAY DESTROY CMOS COMPONENTS. HOLD MODULE BY THE HANDLE OR ALONG THE SIDES TO PREVENT DAMAGE.



3-17. REPAIR OF BCU - CONTINUED

2. PLUG-IN MODULES - CONTINUED

REMOVE - continued

- Using flat-tip screwdriver, alternately loosen jack screws until both screws are loose.
- Grasp module handle and carefully lift module out of BCU.
- Check "O" ring on BCU top cover. If "O" ring is damaged, call direct support.

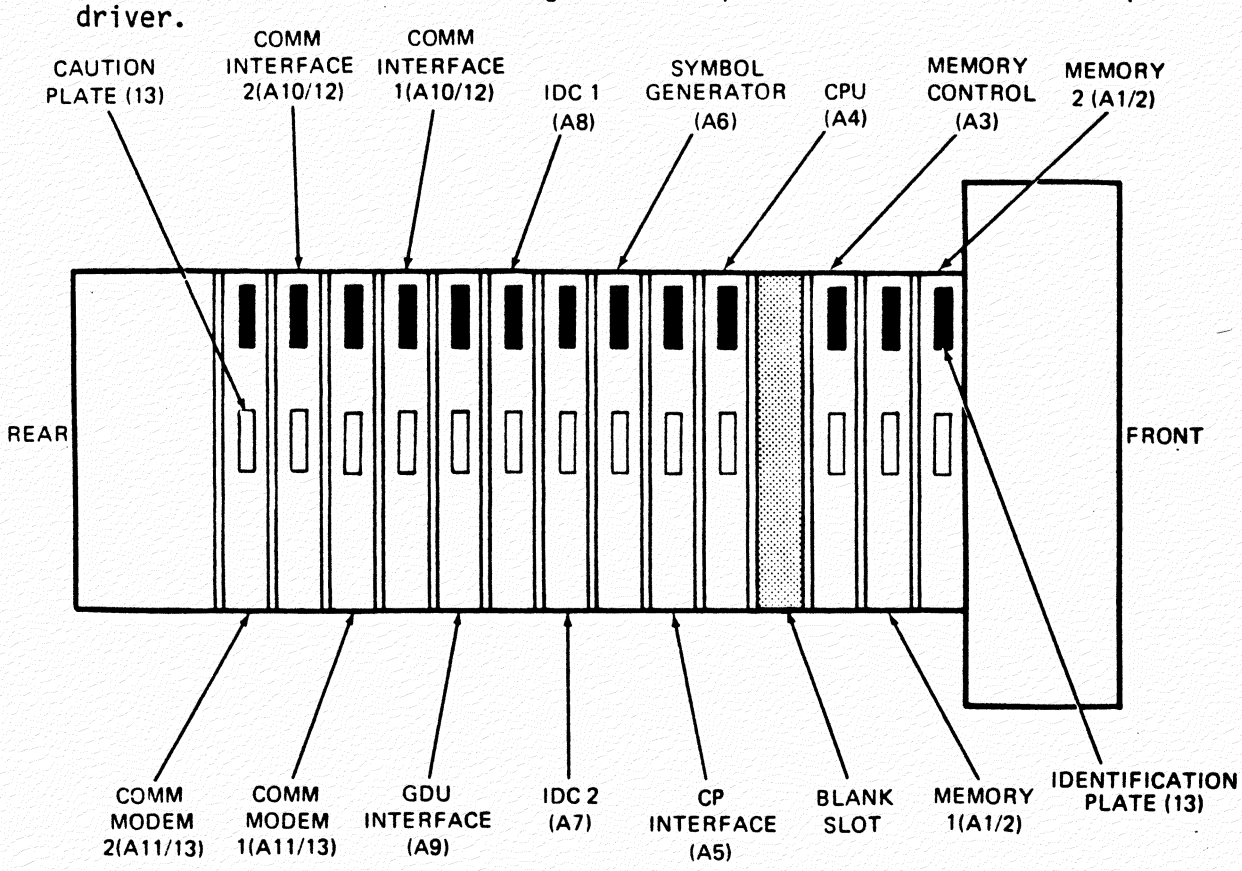
REPLACE

- Insert module into module guides and carefully push down on handle to seat module.

CAUTION

To prevent damaging module or module guides, alternately tighten jack screws, one turn at a time.

- Using flat-tip screwdriver, alternately tighten module jack screws until both screws are tight.
- Place top cover on BCU and tighten 12 captive screws with flat-tip screwdriver.



MODULE LOCATION GUIDE

3-17. REPAIR OF BCU - CONTINUED

3. TAPE TRANSPORT UNIT

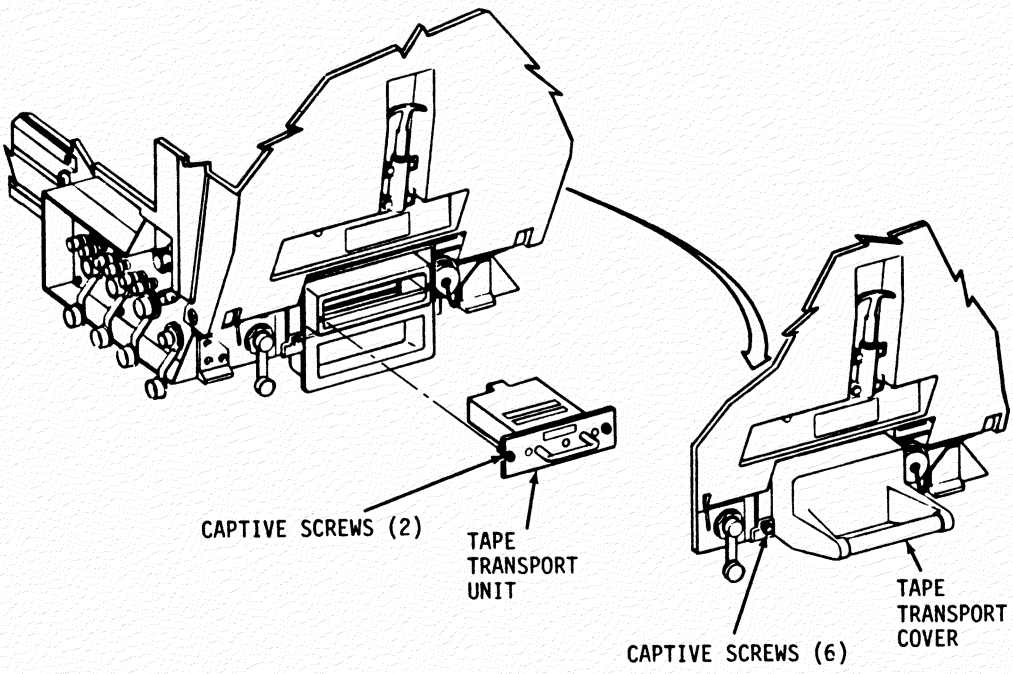
TOOLS: Flat Tip Screwdriver

REMOVE

- Close and latch keyboard.
- Using flat-tip screwdriver, loosen six captive screws and open tape transport unit cover.
- Using flat-tip screwdriver, loosen two captive screws on tape transport unit.
- Using handle, pull tape transport unit to disengage connector and slide unit out of BCU.
- Check "O" ring on tape transport unit cover. If "O" ring is damaged, call direct support.

REPLACE

- Carefully slide tape transport unit into BCU to fully engage connector.
- Using flat-tip screwdriver, tighten two captive screws on tape transport unit.
- Close tape transport unit cover and tighten six captive screws with flat-tip screwdriver.



3-17. REPAIR OF BCU - CONTINUED

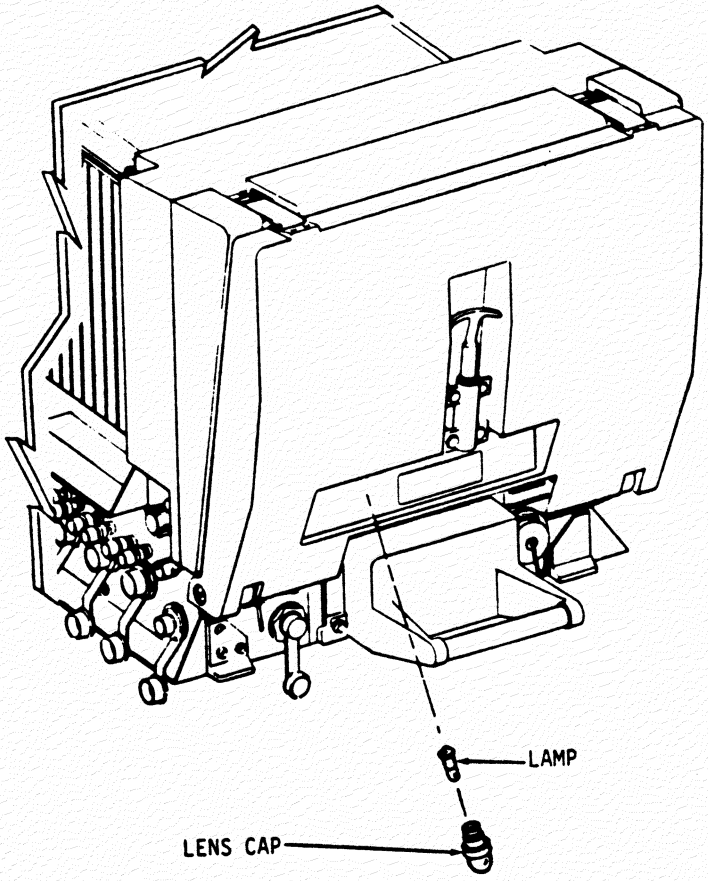
4. EXTERNAL MSG LAMP

TOOLS: None

NOTE
You can perform this procedure with electrical power applied.

REMOVE
- Make sure keyboard is closed and latched.
- Unscrew lens cap counterclockwise and remove with lamp.
- Pull lamp from lens cap.

REPLACE
- Check lens cap to ensure that seal has not been damaged.
- Push lamp into lens cap.
- Screw lens cap clockwise with lamp into lampholder.



3-17. REPAIR OF BCU - CONTINUED

5. POWER SUPPLY

TOOLS: Flat-Tip Screwdrivers

REMOVE

. Remove BCU. (Go to page 3-43.)

CAUTION

To prevent damage to power supply, hold it securely when loosening screws and rest it on a suitable work area when you remove it from the BCU.

WARNING

To prevent injury to personnel, be sure power is off.

. Using flat-tip screwdriver, loosen 14 captive screws on power supply.
. Carefully slide power supply back from BCU and rest it on its back on a suitable work area.
. Using flat-tip screwdriver, alternately loosen two connector screws and separate connector P2 from connector J2.
. Using flat-tip screwdriver, alternately loosen two connector screws and separate connector P3 from connector J1.

REPLACE

. Rest power supply on its handle on a suitable work area near BCU.
. Join connector P2 to connector J2 and connector P3 to connector J1.
. Using flat-tip screwdriver, alternately tighten two screws on each connector.

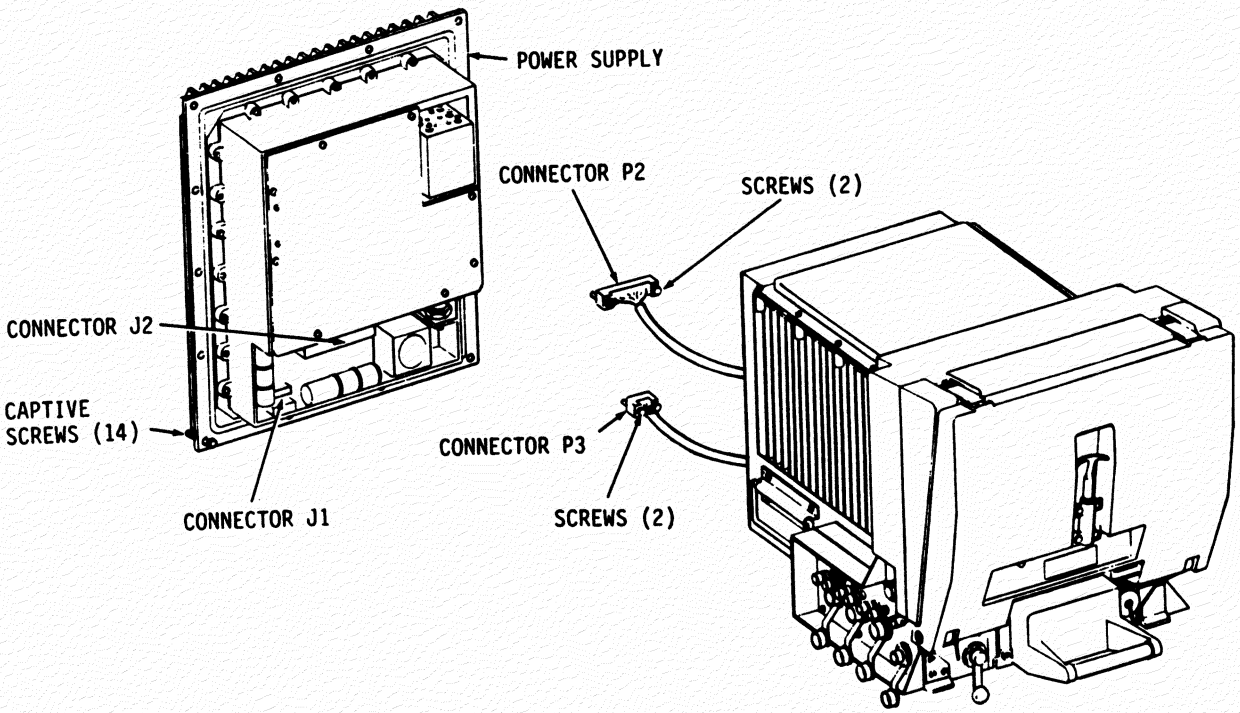
CAUTION

Be careful not to damage wiring harness when replacing power supply.

. Carefully place power supply on BCU. (Align pins on power supply with mating holes in housing.)
. Using flat-tip screwdriver, tighten 14 captive screws on power supply.
. Install BCU. (Go to page 3-5.)

3-17. REPAIR OF BCU - CONTINUED

5. POWER SUPPLY - CONTINUED



3-17. REPAIR OF BCU - CONTINUED

6. TAPE ELECTRONICS UNIT

TOOLS: Flat-Tip Screwdriver, 5/32" Allen Wrench

REMOVE

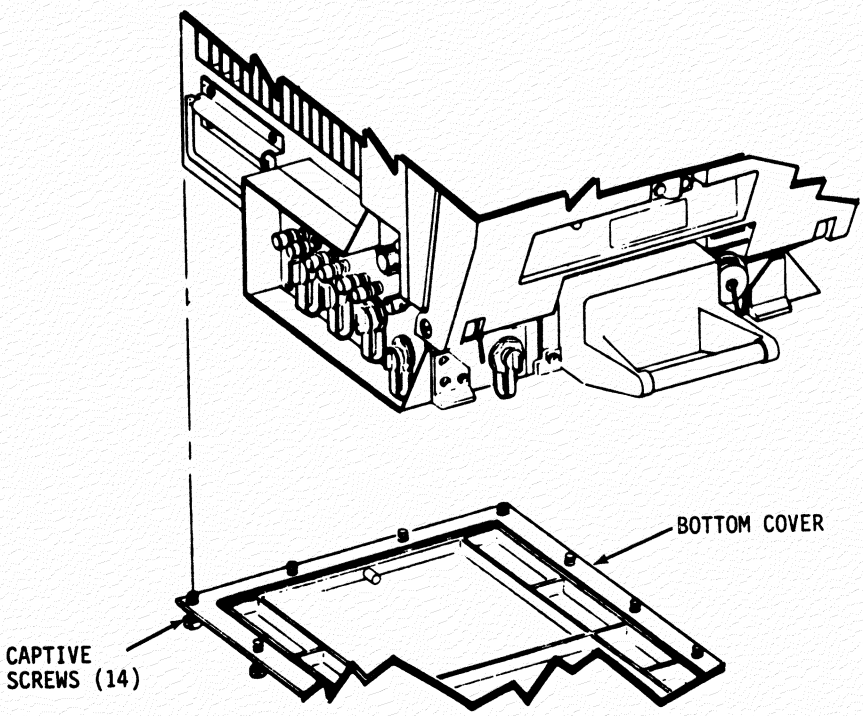
. Remove BCU. (Go to page 3-43.)

WARNING

. To prevent injury to personnel and damage to equipment, do not attempt to turn BCU on its side unless two persons are available.
. To prevent injury to personnel, be sure power is off.

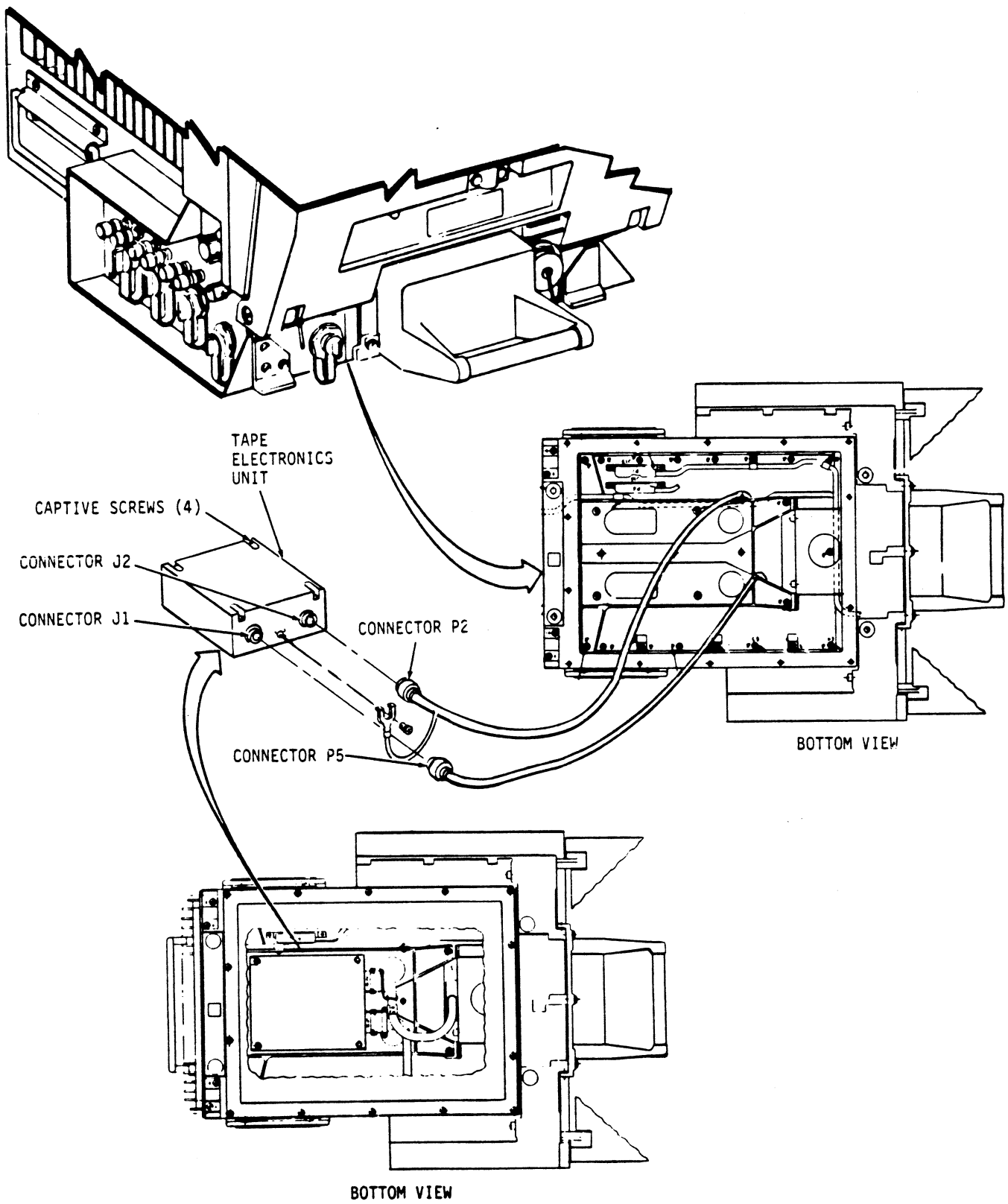
CAUTION

To prevent damage to BCU when turning it on its side, make sure that a suitable work area has been located to place it.



3-17. REPAIR OF BCU - CONTINUED

6. TAPE ELECTRONICS UNIT - CONTINUED



3-17. REPAIR OF BCU - CONTINUED

6. TAPE ELECTRONICS UNIT - CONTINUED

REMOVE - continued

- Carefully turn BCU on its side and place it on a suitable work area.
- Using flat-tip screwdriver, loosen 14 captive screws and remove BCU bottom cover.
- Check "O" ring on BCU bottom cover. If "O" ring is damaged, call direct support.
- Loosen twist-lock connector P2 from J2 connector and separate.
- Loosen twist-lock connector P5 from J1 connector and separate.
- Loosen four allen-head, captive screws on tape electronics unit.
- Carefully lift tape electronics unit out of BCU.

REPLACE

- Carefully place tape electronics unit into BCU and tighten four allen-head captive screws.
- Join connector P5 to connector J1 and connector P2 to connector J2.
- Place bottom cover on BCU and tighten 14 captive screws with flat-tip screwdriver.
- Install BCU. (Go to page 3-5.)

3-17. REPAIR OF BCU - CONTINUED

7. KEYBOARD

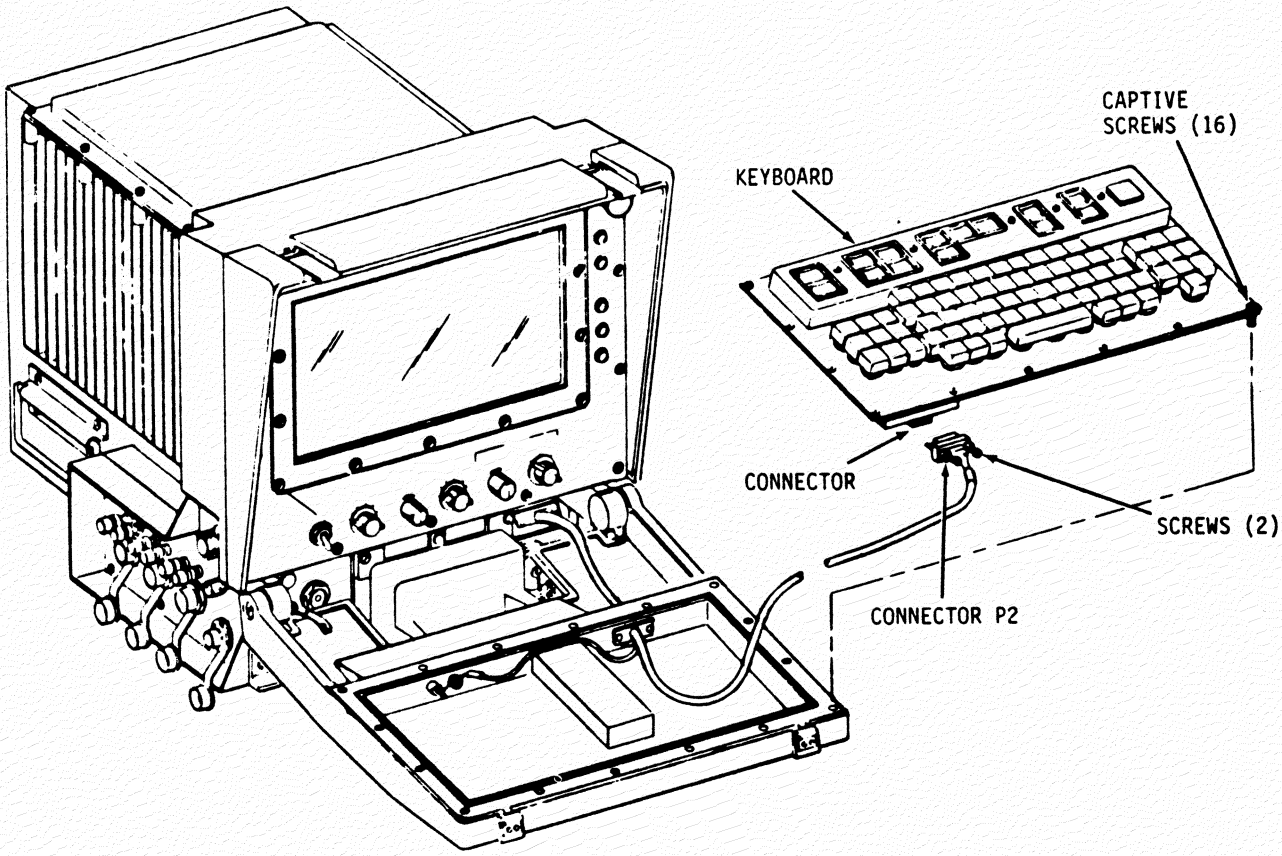
TOOLS: Flat-Tip Screwdrivers

WARNING

To prevent injury to personnel, be sure power is off.

REMOVE

- Turn BCU power circuit breaker OFF.
- Unlatch keyboard and lower until it locks into position.
- Using flat-tip screwdriver, loosen 16 captive screws on keyboard.
- Carefully lift keyboard out of keyboard housing to gain access to connector.
- Place keyboard upside down on keyboard housing.
- Using flat-tip screwdriver, alternately loosen two connector screws and separate connector P2 from keyboard connector.
- Check "O" ring on keyboard housing. If "O" ring is damaged, call direct support.

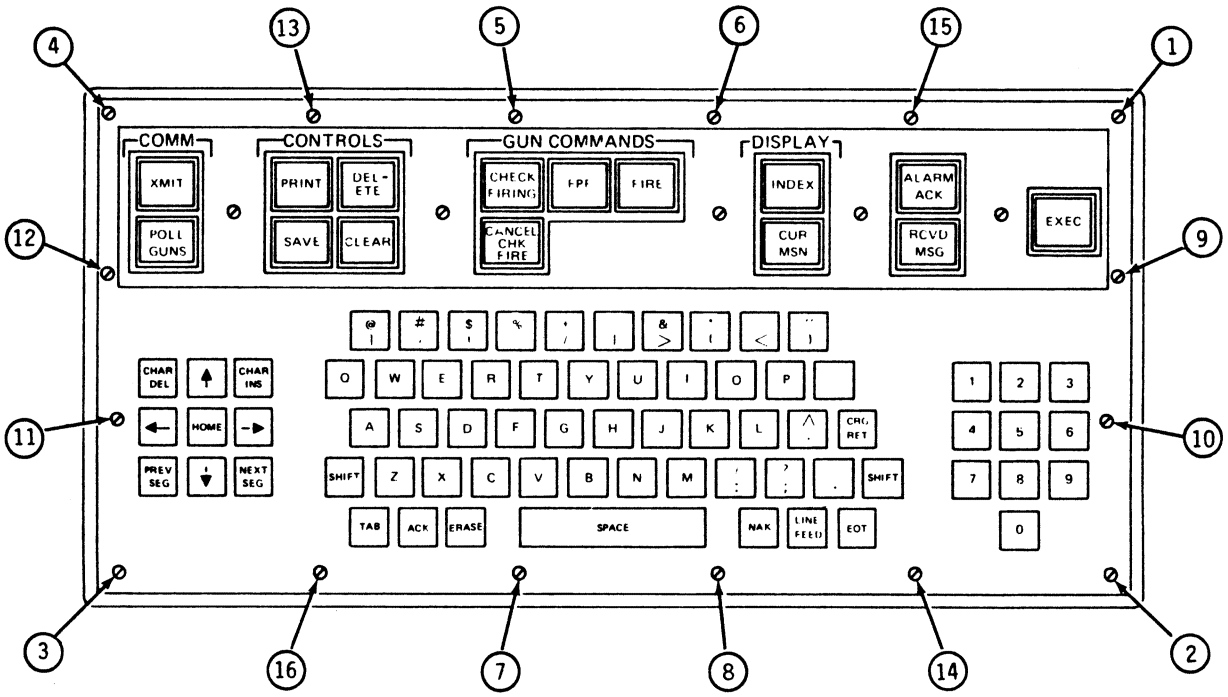


3-17. REPAIR OF BCU - CONTINUED

7. KEYBOARD - CONTINUED

REPLACE

- Join connector P2 to keyboard connector and alternately tighten two connector screws.
- Carefully place keyboard in the keyboard housing.
- Using flat-tip screwdriver, tighten 16 captive screws in the numbered sequence shown.



SCREW TIGHTENING SEQUENCE

3-17. REPAIR OF BCU - CONTINUED

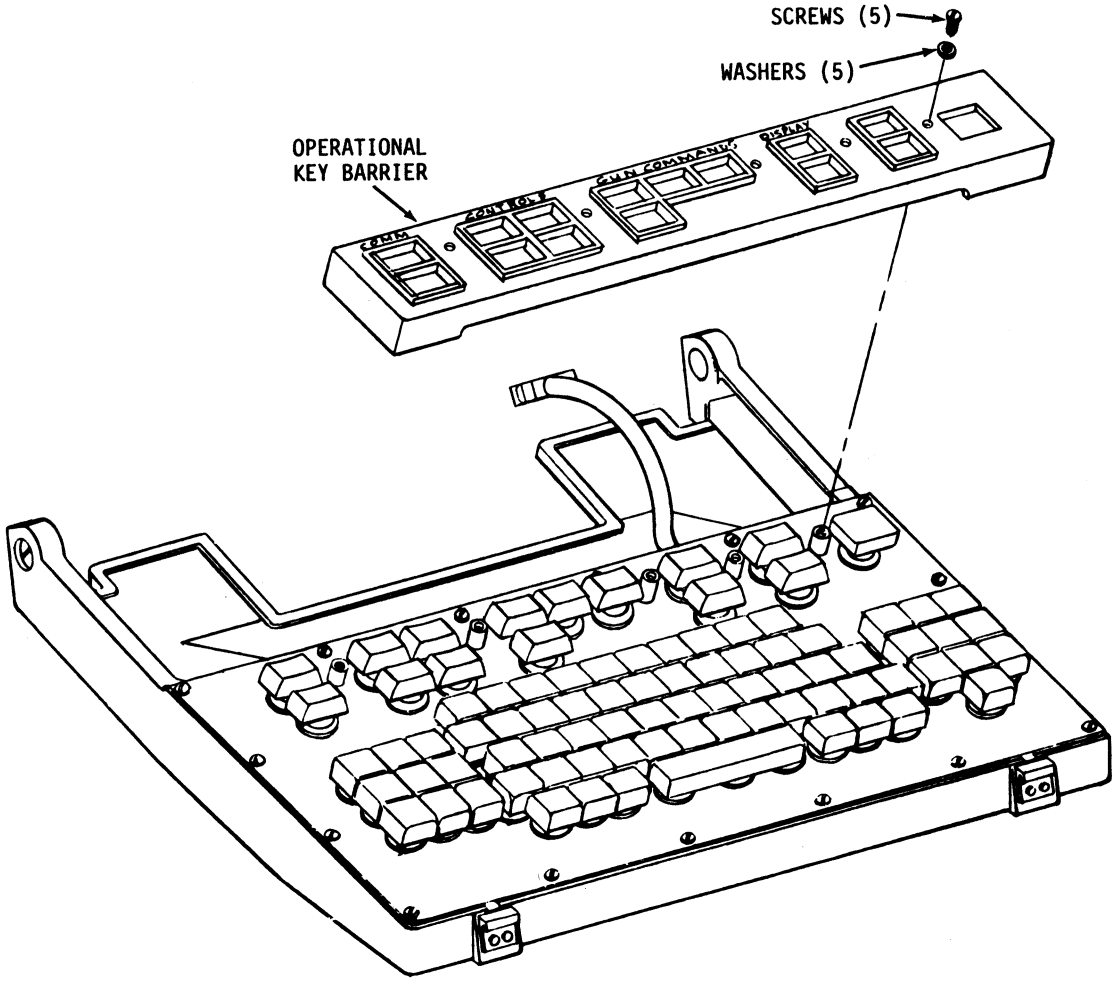
8. OPERATIONAL KEY BARRIER

TOOLS: Flat-Tip Screwdriver

NOTE
You can perform this procedure with electrical power applied.

REMOVE
- Unlatch keyboard and lower to operating position.
- Using flat-tip screwdriver remove five screws and washers and remove barrier.

REPLACE
- Place barrier over operational keys on keyboard.
- Install five screws and washers and tighten screws with flat-tip screwdriver.



3-17. REPAIR OF BCU - CONTINUED

9. POLARIZED FILTER

TOOLS: Flat-Tip Screwdriver

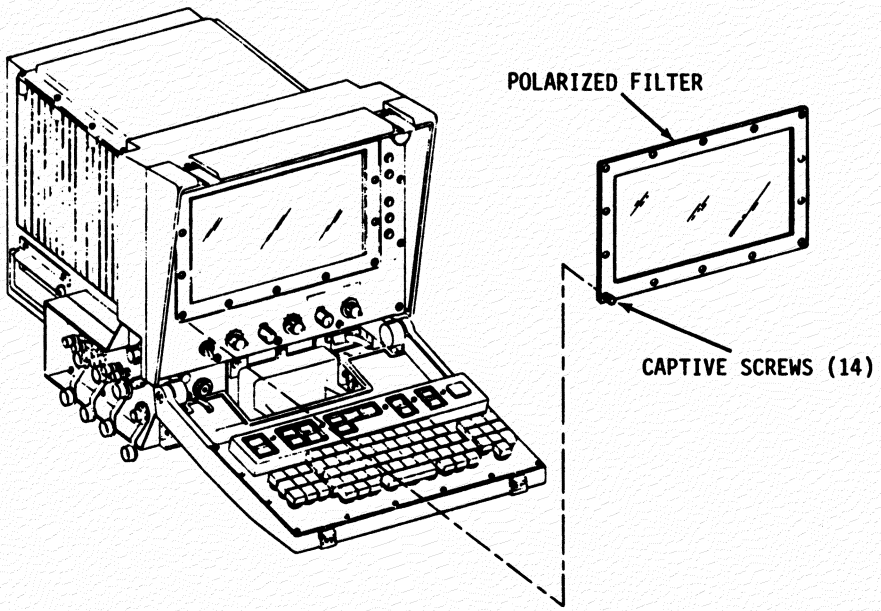
NOTE
You can perform this procedure with electrical power applied.

CAUTION

To avoid scratching the plastic surface on the display, when removing filter be sure not to touch the plastic surface.

REMOVE
- Unlatch keyboard and lower to operating position.
- Using flat-tip screwdriver, loosen 14 captive screws and remove polarized filter from front panel.

REPLACE
- Place polarized filter in position on front panel.
- Using flat-tip screwdriver, tighten 14 captive screws.



3-17. REPAIR OF BCU - CONTINUED

10. CONTROL KNOBS

TOOLS: 1/32" Allen Wrench

NOTE

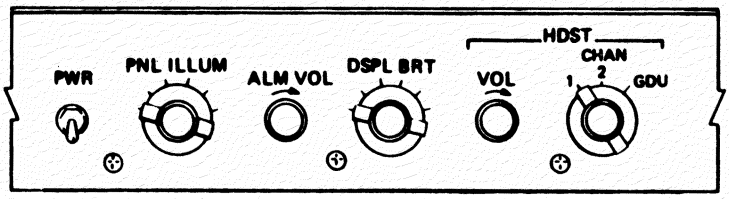
- Use this procedure to replace all BCU control knobs. For front panel control knobs, unlatch keyboard and lower to operating position.
- You can perform this procedure with electrical power applied.

REMOVE

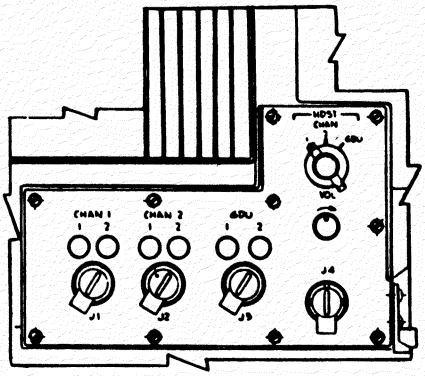
- Turn knob as far counterclockwise as possible.
- Loosen two set screws in control knob.
- Remove knob from control shaft.

REPLACE

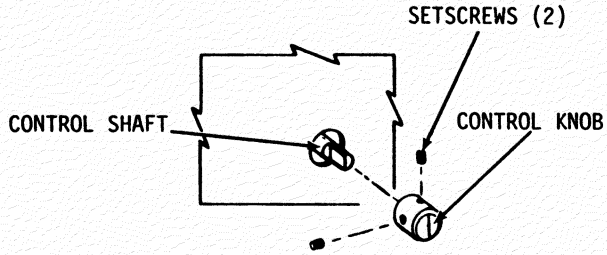
- Place knob on control shaft with knob marking fully counterclockwise.
- Tighten two set screws to secure knob to shaft.



P/O FRONT PANEL



FDO CONTROLS



TYPICAL

3-17. REPAIR OF BCU - CONTINUED

11. PANEL ILLUMINATION LAMPS

TOOLS: None

NOTE
You can perform this procedure with electrical power applied.

REMOVE

Unlatch keyboard and lower to operating position.

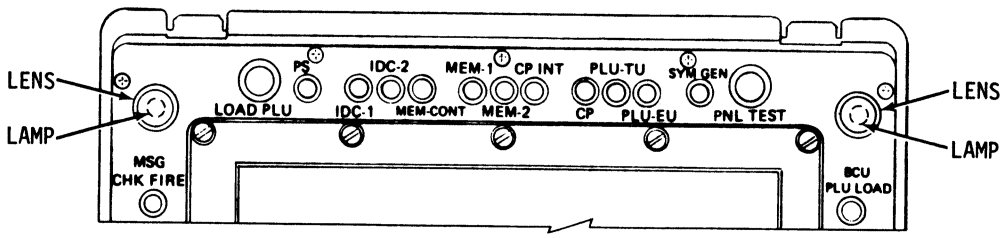
WARNING

Lamp lens may be hot. To avoid injury, wait until lens is cool to the touch before attempting to replace lamp.

- Unscrew lens counterclockwise and remove.
- Push in and turn counterclockwise to remove lamp from holder.

REPLACE

- Push lamp into holder and turn clockwise to secure.
- Screw lens onto lamp holder.



3-17. REPAIR OF BCU - CONTINUED

12. FRONT PANEL

TOOLS: Flat-Tip Screwdrivers

WARNING

To prevent injury to personnel, be sure power is off.

REMOVE

- Unlatch keyboard and lower to operating position.
- Turn BCS power circuit breaker OFF.

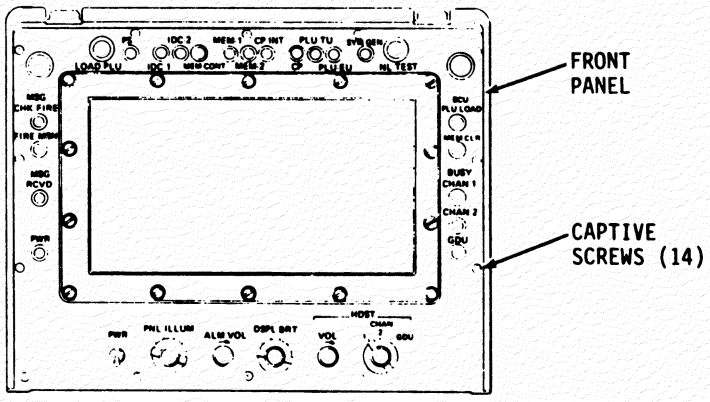
CAUTION

To prevent damage to front panel, hold front panel securely when loosening captive screws.

- Using flat-tip screwdriver, loosen 14 captive screws on front panel.
- Carefully pull front panel forward to disengage alignment pins and swing down to rest face down on keyboard.
- Using flat-tip screwdriver alternately loosen two connector screws and separate connector P2 from connector J1 on front panel.
- Using flat-tip screwdriver, alternately loosen two connector screws and separate front panel connector P2 from connector J12 inside BCU housing.
- Using flat-tip screwdriver, alternately loosen two connector screws and separate front panel connector P1 from connector J13 inside BCU housing.
- Carefully remove front panel from keyboard.

REPLACE

- Apply a light film of aircraft instrument lubricating oil (MIL-L-27694A) to two alignment pins on BCU housing.
- Apply a light film of aircraft instrument lubricating oil (MIL-L-27694A) to internal surface of two bushings in BCU housing.
- Apply a light film of silicone heat sink compound (MIL-C-47113) to two mating surfaces on BCU housing.



3-17. REPAIR OF BCU - CONTINUED

12. FRONT PANEL - CONTINUED

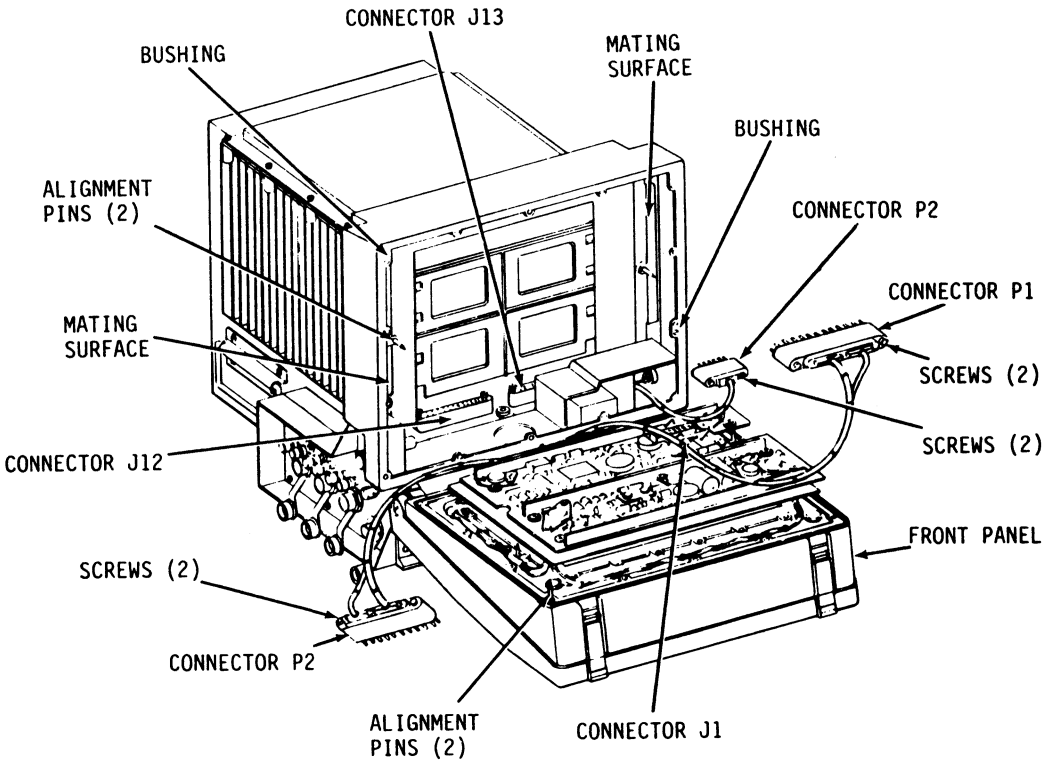
REPLACE - continued

- Place front panel down on keyboard.
- Join connector P2 to connector J1 on front panel and alternately tighten two connector screws with flat-tip screwdriver.
- Join front panel connector P2 to connector J12 in BCU housing and alternately tighten two connector screws with flat-tip screwdriver.
- Join front panel connector P1 to connector J13 in BCU housing and alternately tighten two connector screws with flat-tip screwdriver.

CAUTION

To prevent damage to wiring harness, make sure that harness will not be pinched between front panel and housing when front panel is in place.

- Check that wiring that runs on both sides of front panel is straight and does not interfere with front panel mounting screws.
- Lift front panel off keyboard and position front panel to align alignment pins with mating holes and push front panel into BCU housing.
- Using flat-tip screwdriver, tighten 14 captive screws on front panel.



3-17. REPAIR OF BCU - CONTINUED

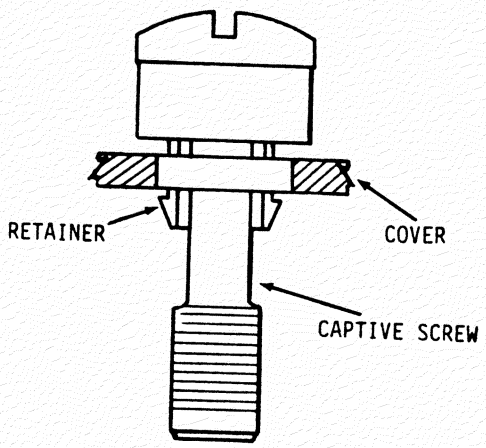
13. CAPTIVE SCREWS

TOOLS: None

NOTE
The following procedure applies to captive screws on the top cover, bottom cover, and tape transport unit cover.

REMOVE
- Remove cover from BCU.
- Press in both sides of captive screw retainer and pull captive screw through hole in cover.

REPLACE
- Push captive screw into hole in cover until retainer is through hole to captivate screw.



APPENDIX A
REFERENCES

Here is a list of publications available to the operator of the Computer, Gun Direction, CP-1317/GYK-29.

DA PAM 310-1	Consolidated Index of Army Publications and Forms.
SB 11-131	Vehicular Radio Sets and Authorized Installations.
TB SIG 219	Safety Measures to be Observed When Installing and Using Whip Antennas, Field Type Masts, Towers, and Antennas, and Metal Poles That Are Used With Communications, Radar, and Direction Finders Equipment.
TM 11-5820-401-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), AN/VRC-49 (5820-00-223-7437), AN/VRC-54 (5820-00-223-7567), and AN/VRC-55 (5820-00-402-2265); Mounting MT-1029/VRC (5820-00-893-1323) and Mounting MT-1898/VRC (5820-00-893-3124); Antenna AT-912/VRC (5820-00-897-6357); Control, Frequency Selector C-2742/VRC (5820-00-892-3343) and Control, Radio Set C-2799/VRC (5820-00-892-3340).
TM 11-5820-882-10	Operator's Manual: Radio Set AN/PRC-68 (NSN 5820-01-079-9260).
TM 11-5965-262-13	Operator's, Organizational, and DS Maintenance Manual Including Repair Parts and Special Tools Lists: Headset Microphone H-161/U and H-161 A/U. (FSN 5965-082-4037 and 5965-824-4871).
TM 11-5965-280-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tools List, Handset H-189/GR.
TM 11-7440-283-12-1-1	Operator's Manual: Computer Group, Gun Direction OL-200/GYK-29(V) (NSN 7025-01-134-2331) (Part of Computer System, Gun Direction AN/GYK-29(V)).
TM 11-7440-283-12-2	Operator's and Organizational Maintenance Manual: Data Display Group, Gun Direction OD-144(V)1/GYK-29(V) (NSN 7025-01-134-2329), OD-144(V)2/GYK-29(V) (NSN 7025-01-134-3218) and OD-144(V)3/GYK-29(V) (NSN 7025-01-134-3219) (Part of Computer System, Gun Direction AN/GYK-29(V)).

TM 38-750	The Army Maintenance Management System (TAMMS).
TM 750-244-2	Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1 General

This appendix provides a summary of the maintenance operations for the battery computer system. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C - Operator/Crew
O - Organizational (performed by operator)
F - Direct Support
H - General Support
D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. Tool and Test Equipment Requirements (Sect. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

B-5. Remarks (Sect. IV)

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

(Next printed page is B-3)

SECTION II MAINTENANCE ALLOCATION CHART FOR

BATTERY COMPUTER SYSTEM AN/GYK-29

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	BATTERY COMPUTER SYSTEM AN/GYK-29	Inspect	1.0						
		Test		0.5					A
		Service		0.5					
		Repair		0.5				1,18 thru 27	
01	COMPUTER GROUP, GUN DIRECTION OL-200/GYK-29	Inspect	1.0						
		Test		0.5					
		Service		0.5					
		Repair		0.5				1,18 thru 27	
0101	COMPUTER, GUN DIRECTION CP-1317/GYK-29	Service	0.1						
		Inspect	0.1						
		Install	0.5						
		Test		0.2					A
		Replace		0.3				1,18 thru 27	
		Repair		0.3				1,18 thru 27	
		Test			0.5			5,28,29	A,B
		Repair			0.8			3,4,12,13	
		Test					2.0	5,28,29	B
		Repair					1.0		
		Overhaul					25.0	2,4 thru 11, 17,28,29	
010101	CENTRAL PROCESSOR ASSEMBLY B4009150	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010102	INTERFACE DATA CONTROLLER 1 ASSEMBLY B4009160	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010103	INTERFACE DATA CONTROLLER 2 ASSEMBLY B4009170	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010104	GUN DISPLAY UNIT INTERFACE ASSEMBLY B4009250	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010105	COMMUNICATION INTERFACE ASSEMBLY (2 PER BCU) B4009190	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010106	COMMUNICATION MODEM ASSEMBLY (2 PER BCU) B4009210	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010107	65 KW MEMORY ASSEMBLY (2 PER BCU) B4009240	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010108	MEMORY CONTROL ASSEMBLY B4009180	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010109	SYMBOL GENERATOR ASSEMBLY B4009220	Replace		0.2				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010110	LOW VOLTAGE POWER SUPPLY ASSEMBLY B4009260	Replace		0.4				1,18 thru 27	
		Test				0.2		7	M
		Repair				1.0		4,7	M
01011001	LVPS MAIN BOARD BCS ASSEMBLY B4009175	Replace				0.4		4,7	
		Repair				1.0			G
01011002	LVPS BACK UP BOARD ASSEMBLY B4009178	Replace				0.4		4,7	
		Repair				1.0			G
010111	FRONT PANEL ASSEMBLY (BCU) B4009270	Repair		0.3				1,18 thru 27	C
		Replace		0.5				1,18 thru 27	
		Repair			1.0			3	
01011101	PLASMA PANEL ASSEMBLY B4009273	Replace			0.4			3	
		Test				0.2		7,10	M
		Repair				2.0		4,7,10	M
		Test					0.2	10	
		Repair					2.0		D

SECTION II MAINTENANCE ALLOCATION CHART
FOR
BATTERY COMPUTER SYSTEM AN/GYK-29

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
0101110101	INTERFACE BOARD ASSEMBLY B4009169	Replace				0.2		3	
		Test				0.2		7	M
		Repair				1.0		4,7	M
0101110102	ROW DRIVER (RIGHT) PCB ASSEMBLY B4009255	Replace				0.5		4,7	
		Repair				2.0			G
0101110103	ROW DRIVER (LEFT) PCB ASSEMBLY B4009258	Replace				0.5		4,7	
		Repair				2.0			G
0101110104	COLUMN DRIVER (TOP) PCB ASSEMBLY B4009761	Replace				0.5		4,7	
		Repair				2.0			G
0101110105	COLUMN DRIVER (BOTTOM) PCB ASSEMBLY B4009778	Replace				0.5		4,7	
		Repair				2.0			G
01011102	CONTROL PANEL ASSEMBLY B4009272	Replace			0.4			3	
		Test			0.5			5	
		Repair			1.0			3,4	
010112	KEYBOARD B4009143	Replace		1.0				1,18,27	
		Repair							E
010113	TAPE ELECTRONICS UNIT B4009141	Replace		0.3				1,18,27	
		Repair							E
010114	CENTRAL PROCESSOR INTERFACE ASSEMBLY B4009230	Replace		0.2				1	
		Test				0.2		7	M
		Repair				1.0		4,7	M
010115	HOUSING ASSEMBLY B4009201	Inspect			0.2				
		Test			0.5			5	
		Repair			0.8			3,4	F
		Repair				1.0		4	
01011501	BCU HARNESS ASSEMBLY/HARNESS BOARD ASSEMBLY, B4009173 B4009264	Replace					1.0	4	
		Test					2.0	5	
		Repair					10.0	4,11	
01011502	COMM CHANNEL FILTER ASSEMBLY B4009157	Replace			0.2			3,4	
		Test				0.3		6,7	M
		Repair				2.0		4	M
0102	TAPE TRANSPORT UNIT RD-439/GYK-29 B4009186	Install	0.1					3	
		Replace		0.2				3	
		Repair							E
0103	POWER DISTRIBUTION GROUP ON-188/GYK-29 B4009280	Install	0.2						
		Repair		0.2				3	J
		Replace		0.4				3	
		Test			0.5			5	
		Repair			1.0			3,4,12 thru 15	
010301	POWER DISTRIBUTION UNIT B4009290	Install	0.2						
		Repair		0.2				3	J
		Replace		0.4				3	
		Test			0.5			7	
		Repair			1.0			3,4,12 thru 15	
010302	CABLE ASSEMBLY, POWER W19 (B4009395) W20 (B4009396)	Inspect		0.1					
		Replace		0.1				3,16	
		Test			0.5			5	
		Repair					8.0	2,4	
010303	CABLE ASSEMBLY, SPECIAL PURPOSE W6 (B4009385)	Inspect		0.1					
		Replace		0.1				3,16	
		Test			0.5			7	
		Repair					8.0	2,4	
0104	INTERCONNECTING KIT MK-1829/GYK-29 B4009174	Install			0.5			3,16	
		Inspect		0.1					
		Replace			0.3			3,16	

SECTION II MAINTENANCE ALLOCATION CHART FOR

BATTERY COMPUTER SYSTEM AN/GYK-29

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
010401	CABLE ASSEMBLIES, POWER	Test			0.5			5	
	W3 (B4009383)	Replace			0.5			3	
	W13 (B4009391)	Repair							E
	W32 (B4009398-1)								
010402	CABLE ASSEMBLIES, SPECIAL PURPOSE	Test			0.5			5	
	W5 (B4009384)	Replace			0.5			3	
	W7/10 (B4009388)	Repair							E
	W8 (B4009386)								
	W9 (B4009387)								
	W11 (B4009389)								
	W12 (B4009390)								
	W16 (B4009392)								
	W17 (B4009193)								
	W18 (B4009394)								
	W31 (B4009397)								
0105	MOUNTING BASE, COMPUTER GUN	Replace		0.5				3	H
	DIRECTION (MT-4938/GYK-29)	Replace			0.5			4	
	(B4009183)	Repair			0.5			4	
02	DATA DISPLAY GROUP, GUN DIRECTION OD-144/GYK-29 (B4010000)								I
03	MOUNTING KIT ASSEMBLY	Install		8.0				3,16	K
	MK-1831/GYK-29 (FOR M561)	Inspect		0.1					
	(B4009184)	Replace			2.0			3,16	
		Repair			0.5			3	
0301	CABLE ASSEMBLY, POWER	Test			0.5			5	
	W1 (B4009381)	Replace			0.5			3	
	W2 (B4009382)	Repair							E
04	MOUNTING KIT ASSEMBLY	Install		8.0				3,16	L
	MK-1832/GYK-29 (FOR M-577)	Install			0.5			3,16	L
	(B40099185)	Inspect		0.1					
		Replace			2.0			3,16	
		Repair			0.5			3	
0401	CABLE ASSEMBLY, POWER	Test			0.5			5	
	W1 (B4009381)	Replace			0.5			3	
	W2 (B4009382)	Repair							E

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR BATTERY COMPUTER SYSTEM AN/GYK-29

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	TOOL KIT TK-224	5180-00-626-8965	
2	D	POTTING MOLDS		
3	C,O,F,H	TOOL KIT TK-226	5180-00-626-8966	
4	F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
5	F,H,D	MULTIMETER AN/USM-451	6625-01-060-6804	
6	F,H,D	SPANNER WRENCH TUBULAR 1-1/4"	5120-00-293-2631	
7	H,D	MAINTENANCE FACILITIES CONSISTING OF: OQ-290(V)1/MSM OA-8991/MSM	 6625-01-095-9312 6625-01-070-4404	
8	F,H,D	SPANNER WRENCH, TUBULAR 1-1/8"	5120-00-523-2067	
9	D	FUNCTION CHECK TEST TAPE (FCT)		
10	H,D	HOLDING FIXTURE FOR DISPLAY UNIT		
11	D	HOLDING FIXTURE FOR HARNESS/GMB		
12	F	WRENCH SET, SOCKET, 1/2" DRIVE	5120-00-081-2307	
13	F	WRENCH, BOX TYPE	5120-00-288-9681	
14	F	WRENCH, SOCKET, FIXED HANDLE	5120-00-235-5922	
15	F	WRENCH, BOX, DOUBLE OFFSET, DOUBLE HEAD	5120-00-224-3118	
16	C,O,F	TIEDOWN TOOL MS90387	5120-00-781-7891	
17	F,H,D	SPANNER WRENCH, TUBULAR 13/16"	5120-00-237-4961	
18	O	BRUSH, TYPE CLEANING, PAINT BRUSH SHAPE, 5-1/4" LG, H-B-006P1	7510-00-178-8322	
19	O	KEY SET, SOCKET HEAD SCREW, HEX TYPE, L-TYPE HNDL, SHORT SERIES	5120-00-729-6392	
20	O	KNIFE, POCKET	5110-00-240-5943	
21	O	SCREWDRIVER, CROSS TIP, PHILLIPS, PLASTIC HANDLE, NO. 2 POINT SIZE, 3 IN., LONG BLADE	5120-00-240-8716	
22	O	SCREWDRIVER, CROSS TIP, PHILLIPS, PLASTIC HANDLE, NO. 2 POINT SIZE, 4 IN. LONG BLADE	5120-00-234-8913	
23	O	SCREWDRIVER FT, PLASTIC HANDLE, W/PKT CLIP 1/8 IN. WD TIP, 2 IN. LONG BLADE 4 IN O/A	5120-00-236-2140	
24	O	SCREWDRIVER FT, PLASTIC HANDLE, FLAT TIP, 3/16 IN. WIDE TIP X 5 IN. LONG BLADE, 8" O/A	5120-00-278-1270	
25	O	SCREWDRIVER FT, PLASTIC HANDLE, 1/4" WIDE TIP 4 IN. LONG BLADE, 7" O/A	5120-00-222-8852	
26	O	PLIERS, LINEMAN'S, 8"	5120-00-756-1156	
27	C,O	WRENCH: BOX & OPEN SIZE 1/2"	5120-00-228-9506	
28	F,D	AN/TSM-141	4940-01-082-8342	

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SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR

BATTERY COMPUTER SYSTEM AN/GYK-29

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
29	F,D	INTERCONNECTING TEST CABLE (PDU-PWR SUPPLY) CONSISTS OF:		
		W1 (B4009381)	5995-01-119-4118	
		W2 (B4009382)	5995-01-119-4119	
		W3 (B4009383)	5995-01-119-9271	
		W5 (B4009384)	5995-01-119-9278	
		W6 (B4009385)	7025-01-121-1449	
		W12 (B4009390)	5995-01-119-9281	
		W13 (B4009391)	5995-01-138-0896	
		W16 (B4009392)	5995-01-119-9282	
		W19 (B4009395)	7025-01-121-1445	
		W20 (B4009396)	7025-01-121-1446	
		W32 (B4009398-1)	5995-01-119-9270	

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SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	TEST IS ACCOMPLISHED USING SYSTEM BUILT-IN-TEST EQUIPMENT (BITE) AND MANUAL TEST PROCEDURES.
B	P.D.U. REQUIRED
C	BY REPLACEMENT OF LAMPS, KNOBS, ETC.
D	REPLACEMENT OF PLASMA PANEL AT DEPOT ONLY.
E	RETURN TO MANUFACTURER.
F	BY REPLACEMENT OF ALARM, RELIEF VALVE, AND RF1 ENCLOSURE IN HOUSING ASSEMBLY.
G	OPTIONAL REPAIR BY MANUFACTURER PER GENERAL SUPPORT OR DEPOT DETERMINATION. REPAIR REQUIRES NEXT HIGHER ASSEMBLY FOR TEST BED.
H	REMOVE AND REPLACE FOR GROUND MOUNTING AND TRAINING.
I	SEE TM 11-7440-283-12-2.
J	BY REPLACEMENT OF BATTERIES OR POWER LAMPS.
K	SEE TM 11-2300-467-14-2.
L	SEE TM 11-2300-467-14-1.
M	TEST OR REPAIR IS TO BE PERFORMED AT THE FOLLOWING SRA AND DEPOT ONLY. 1. SRA IN KOREA 2. PCMC, GERMANY 3. TOAD

APPENDIX C
COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists integral components of and basic issue items for the battery computer system to help you inventory items required for safe and efficient operation.

C-2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the battery computer system and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are minimum essential items required to place the battery computer system in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the battery computer system during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorized of the end item.

C-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) Figure number. Indicates the figure number of the illustration on which the item is shown.

(2) Item number. The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. Part Number. Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. USABLE ON codes are included to help you identify which component items are used on the different models. Identification of the codes used in these lists are:

Code	Used on
PAA	Truck M561
PAB	Carrier, Command Post M577A1

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

C-4. Special Information

National stock numbers (NSN's) that are missing from section II have been applied for and will be added to this manual by future change/revision when they are entered in the Army Master Data File (AMDF). Until the NSN's are established and published, submit exception requisitions to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-MM, Fort Monmouth, New Jersey 07703 for the part required to support your equipment.

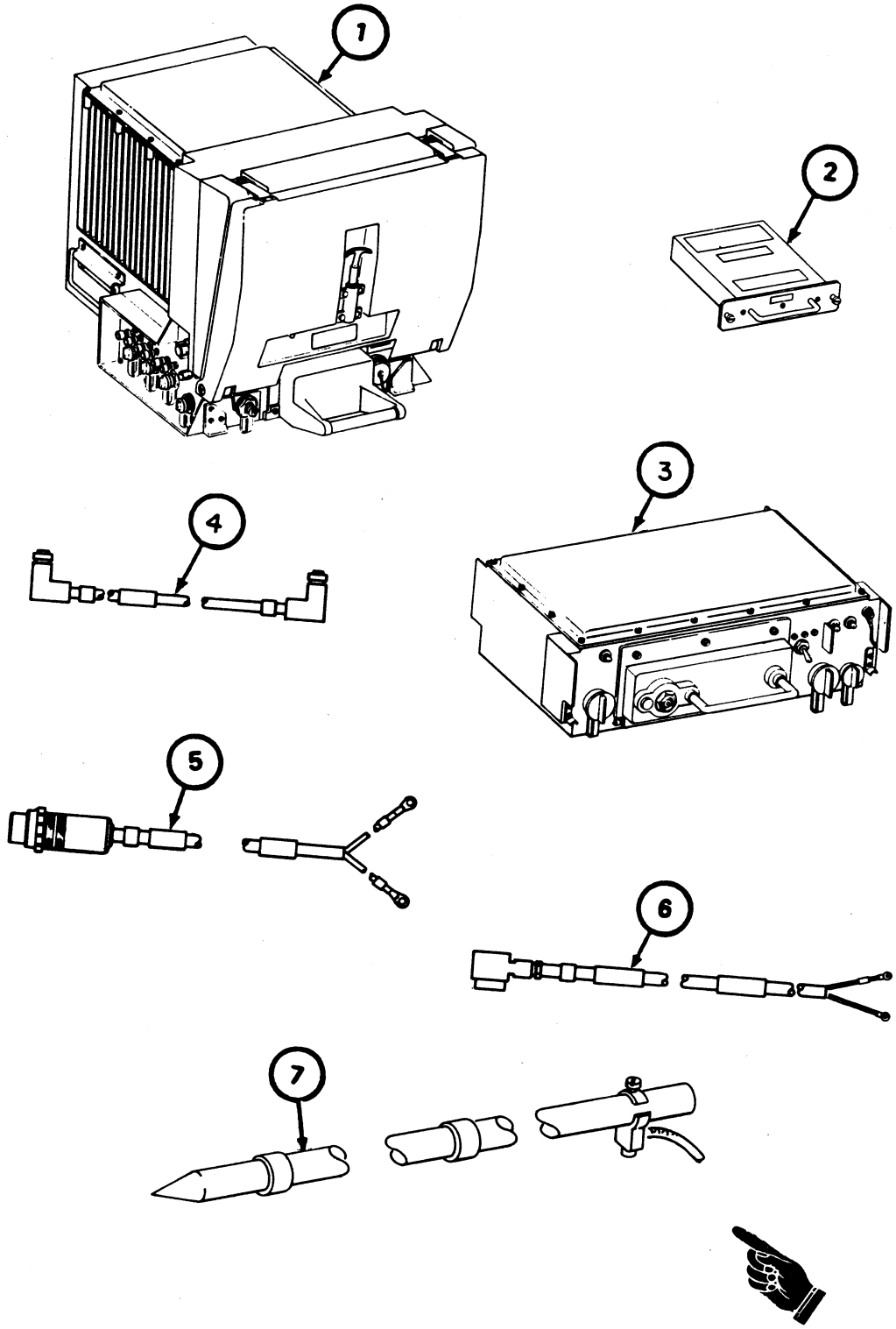


Figure C-1. Computer Group, Gun Direction, OL-200/GYK-29.

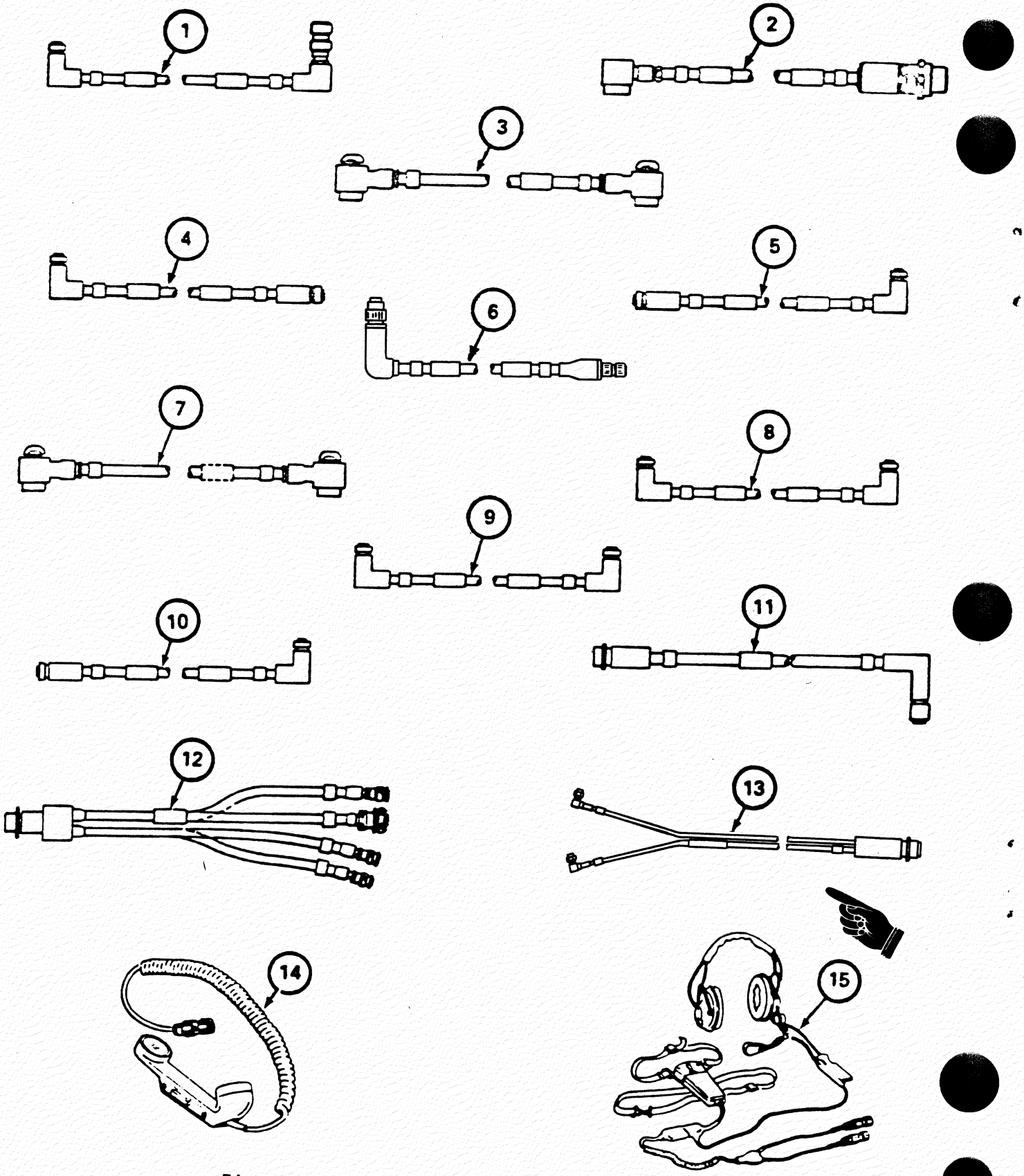


Figure C-2. Interconnecting Kit MK-1829/GYK-29.

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
C-1	1	7021-01-135-0027	COMPUTER, GUN DIRECTION CP-1317/GYK-29 (V) B4009200 (56996)			1		
C-1	2	7035-01-134-3761	TAPE TRANSPORT UNIT RD-439/GYK-29 (V) B4009186 (56996)			1		
		7025-01-135-0026	POWER DISTRIBUTION GROUP ON-188/GYK-29(V) (80058) B4009280 (56996)			1		
			CONSISTING OF:					
C-1	3	7025-01-121-1341	PDU ASSEMBLY B4009290 (95542)			1		
C-1	4	7025-01-121-1449	CABLE ASSEMBLY W6 B4009385 (56996)			1		
C-1	5	7025-01-121-1445	CABLE ASSEMBLY W19 B4009395 (56996)			1		
C-1	6	7025-01-121-1446	CABLE ASSEMBLY W20 B4009396 (56996)			1		
C-1	7	5975-00-X07-8007	GROUND STAKE KIT			1		
		7035-01-134-3762	INTERCONNECTING KIT MK-1829/GYK-29 (V) (80058) B4009174 (56996)					
			CONSISTING OF:					
C-2	1	5995-01-119-9277	CABLE ASSEMBLY W7/W10 B4009388 (56996)			2		
C-2	2	5995-01-119-9272	CABLE ASSEMBLY W13 B4009391 (56996)			2		
C-2	3	5995-01-119-9271	CABLE ASSEMBLY W3 B4009383 (56996)			1		
C-2	4	5995-01-119-7519	CABLE ASSEMBLY W11 B4009389 (56996)			1		
C-2	5	5995-01-119-9278	CABLE ASSEMBLY W5 B4009384 (56996)			1		
C-2	6	5995-01-119-7527	CABLE ASSEMBLY W31 B4009397 (56996)			1		
C-2	7	5995-01-119-9270	CABLE ASSEMBLY W32 B4009398-1 (56996)			1		
C-2	8	5995-01-119-9279	CABLE ASSEMBLY B4009386 (56996)			1		
C-2	9	5995-01-119-9280	CABLE ASSEMBLY B4009387 (56996)			1		
C-2	10	5995-01-119-9281	CABLE ASSEMBLY W12 B4009390 (56996)			1		
C-2	11	5995-01-119-9282	CABLE ASSEMBLY W16 B4009392 (56996)			1		
C-2	12	5995-01-119-9283	CABLE ASSEMBLY W17 B4009393 (56996)			1		
C-2	13	5995-01-119-9284	CABLE ASSEMBLY W18 B4009394 (56996)			1		
C-2	14	5965-01-096-8732	HANDSET H-250/GR (81349)			1		
C-2	15	5965-01-104-0947	HEADSET-MICROPHONE H-161D/U (81349)			1		

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER	(FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
		7035-01-134-3760	MOUNTING BASE, COMPUTER GUN DIRECTION MT-4938/GYK-29 (V)						
			B4009183	(56996)					
			CONSISTING OF:						
C-3	1		ASSEMBLY TABLE, ELECTRICAL EQUIPMENT MT-4394/GSG-10				1		
			SC-C-690584	(80063)					
C-3	2		ASSEMBLY, ADAPTER PLATE				1		
			B4009722	(56996)					
C-3	3		ASSEMBLY, FRAME SUPPORT				1		
			B4009720	(56996)					
C-3	4		MOUNTING ASSEMBLY KG-31 TRAY				1		
			B4009723	(56996)					
C-3	5		ANGLE, CLAMPING				7		
			B4009724	(56996)					
C-3	6		MOUNTING ASSEMBLY BCU TRAY				1		
			B4009721	(56996)					
		7010-01-134-2330	MOUNTING KIT ASSEMBLY M561			PAA	1		
			MK-1831/GYK-29 (V)	(80058)					
			B4009184	(56996)					
			CONSISTING OF:						
C-4	1		SUB-BASE, MOUNT			PAA	1		
			SC-D-866281	(80063)					
C-4	2		MOUNT, RADIO MT-6188			PAA	1		
			B4005076	(56996)					
C-4	3		SUPPORT ASSEMBLY, REAR			PAA	1		
			B4009818	(56996)					
C-4	4		ASSEMBLY, STIFFENER			PAA	2		
			B4009819	(56996)					
C-4	5	5995-01-119-4118	CABLE ASSEMBLY W1			PAA	1		
			B4009381	(56996)					
C-4	6	5995-01-119-4119	CABLE ASSEMBLY W2			PAA	1		
			B4009382	(56996)					
		7025-01-134-2328	MOUNTING KIT ASSEMBLY M577			PAB	1		
			MK-1832/GYK-29 (V)	(80058)					
			B4009185	(56996)					
			CONSISTING OF:						
C-5	1		ASSEMBLY PLATE, TOP			PAB	1		
			B4009337	(80063)					
C-5	2		ASSEMBLY PLATE, BOTTOM			PAB	1		
			SC-D-866100	(80063)					
C-5	3	5995-01-119-4118	CABLE ASSEMBLY W1			PAB	1		
			B4009381	(56996)					
C-5	4	5995-01-119-4119	CABLE ASSEMBLY W2			PAB	1		
			B4009382	(56996)					
C-5	5		BLOCK TABLE SUPPORT			PAB	3		
			B4009820	(56996)					
C-5	6		BRACKET, POWER CONNECTOR			PAB	1		
			B4009821	(56996)					
C-5	7		BRACKET, ANTENNA CONNECTOR			PAB	1		
			B4009822	(56996)					

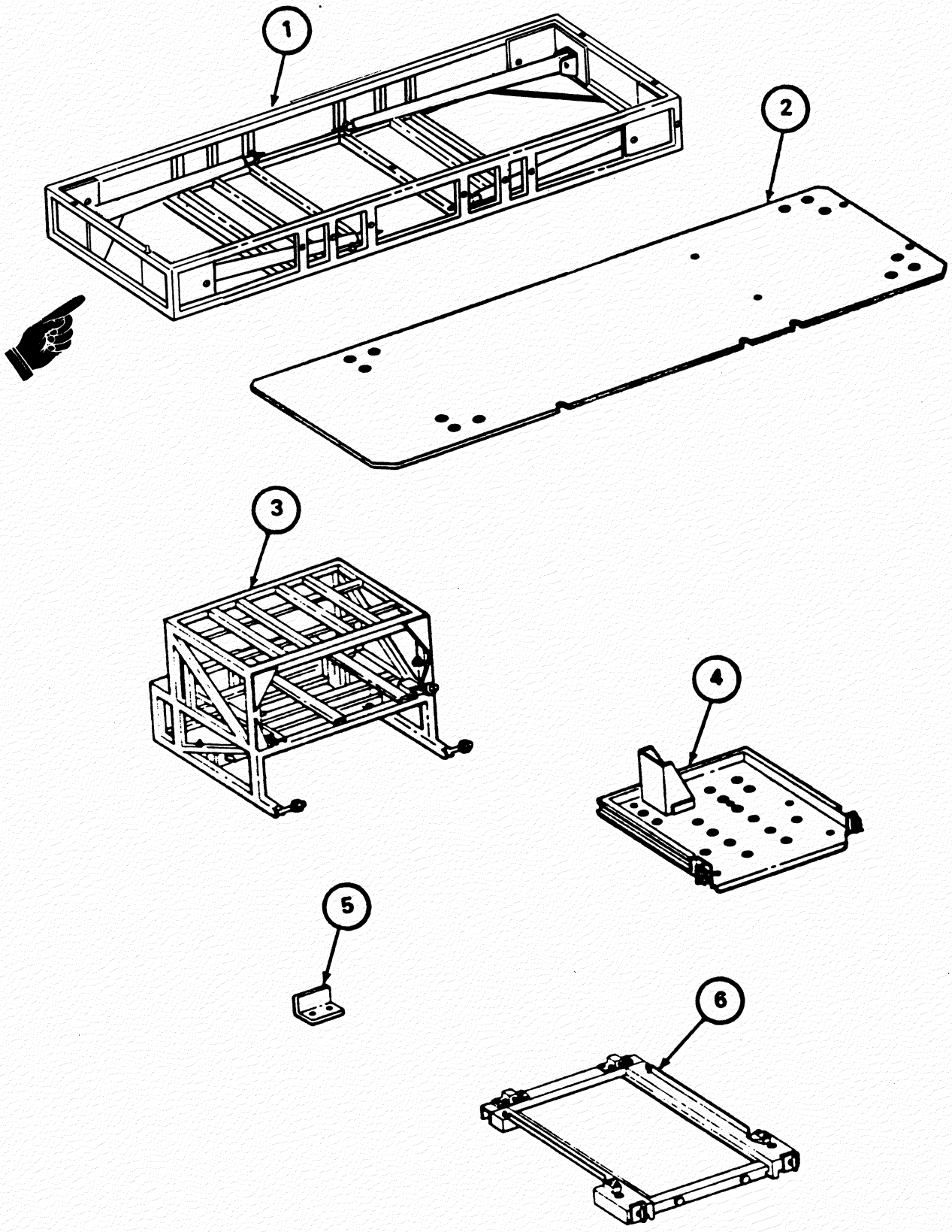


Figure C-3. Mounting Base, Computer Gun Direction MT-4938/GYK-29.

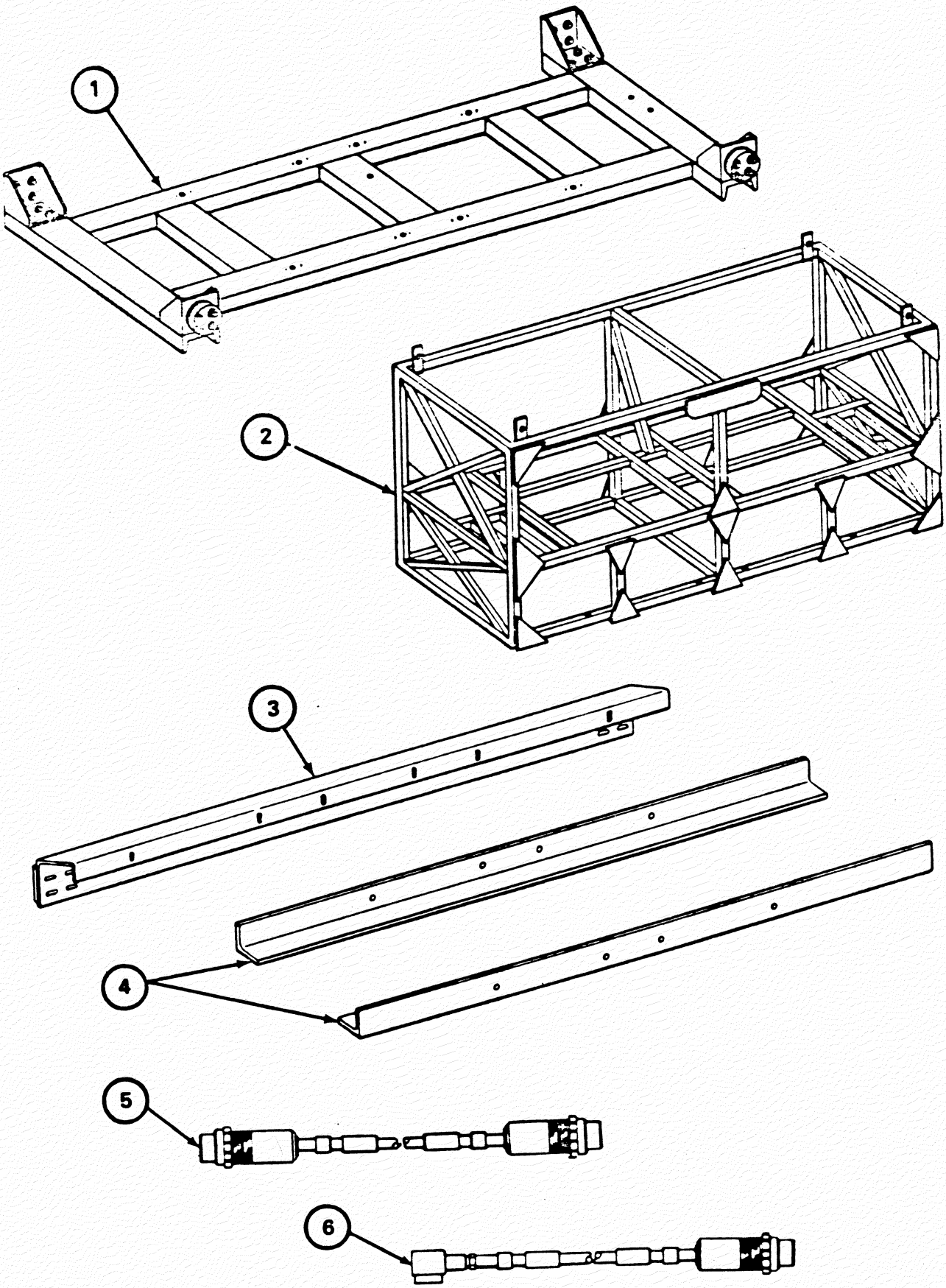


Figure C-4. Mounting Kit Assembly M561, MK-1831/GYK-29.

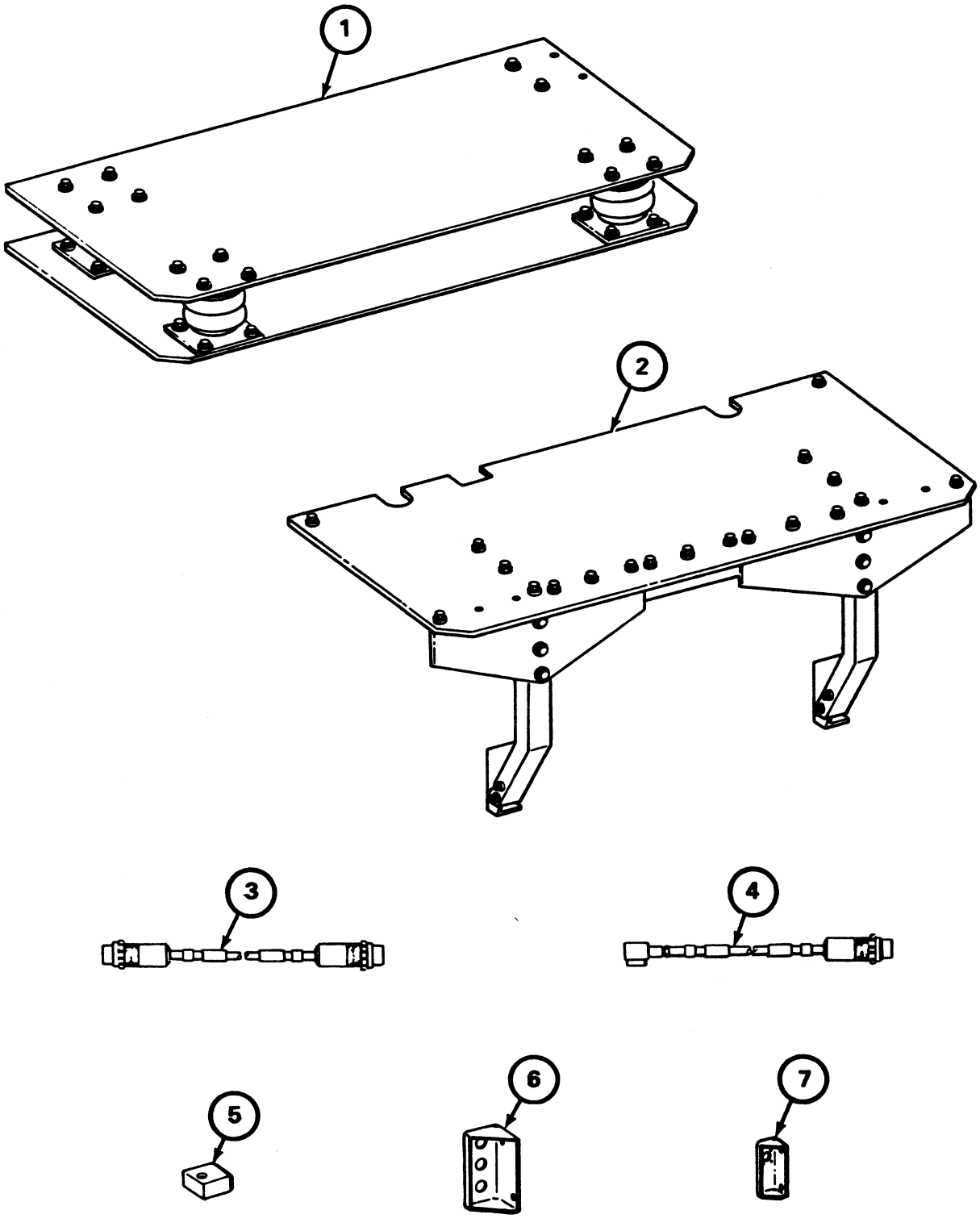


Figure C-5. Mounting Kit Assembly M577, MK-1832/GYK-29(V).

SECTION III BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			TECHNICAL MANUAL TM 11-7440-283-12-1 TM 11-7440-283-12-1-1			1 1		

APPENDIX D
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. Scope

This appendix lists additional items you are authorized for the support of the battery computer system.

D-2. General

This list identifies items that do not have to accompany the battery computer system and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	AMPLIFIER/POWER SUPPLY GROUP OG-174( )/VRC	EA	1
5985-00-985-9024	ANTENNA AS-1729/VRC (AN/VRC-46)	EA	2
5820-00-889-3803	ANTENNA AT-892/PRC-25 (AN/PRC-68)	EA	2
5820-00-397-6357	ANTENNA AT-912/VRC	EA	2
	ANTENNA, RADIO RECEIVER R-442 CONSISTING OF:		
5985-00-199-8831	WHIP ANTENNA SECTION MS-116A	EA	1
5985-00-115-7149	WHIP ANTENNA SECTION MS-117A	EA	1
5985-00-238-7474	WHIP ANTENNA SECTION MS-118A	EA	1
5820-00-474-6163	MAST BASE AB-558/GR	EA	1
6140-00-059-3528	AUXILIARY BATTERY MS75047-1	EA	1
6135-01-094-6536	BATTERY, MERCURIC OXIDE BA-1558 538626-803	EA	1
6135-01-036-3495	BATTERY, LITHIUM BA-5590	EA	2
6140-01-063-5318	BATTERY, NICAD BB-590( )/U 538626-804	EA	1
5995-00-677-7193	CABLE ASSEMBLY W21/W22, CG-1773/U	EA	3
5995-00-823-2819	CABLE ASSEMBLY W23/W24, CX-4722	EA	3
6115-00-017-8236	GENERATOR, 28 VDC, 1.5 KW, MEP-025A	EA	1
5820-00-893-1323	MOUNT, RADIO MT-1029/VRC	EA	2
5820-00-893-1324	MOUNT, RADIO RECEIVER MT-1898/VRC	EA	1
5820-00-882-0642	RADIO RECEIVER R-442/VRC	EA	1
5820-00-892-0622	RADIO SET R-524/VRC-46	EA	2
5810-00-463-3260	SECURITY DEVICE KG-31-12	EA	1
6145-00-226-8812	WIRE, FIELD WD-1/TT	ROLL	1

APPENDIX E
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. General

This appendix lists expendable supplies and materials you will need to operated and maintain the battery computer system. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item5, Appx D).

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM	(5) UNIT OF MEAS
1	C	6850-00-880-7616	SILICONE COMPOUND MIL-S-8860 (81349)	OZ
2	C	9150-00-190-0918	GRAPHITE GREASE, NON-SEIZING COMPOUND VVG-671 (81348)	LB

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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