

EMULOGIC, INC.

MICROPROCESSOR DEVELOPMENT SYSTEM

ECL-3211

INSTALLATION MANUAL

MAN 1002-01

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## PREFACE

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The purpose of this manual is to help you install and test your Emulogic ECL-1132 Microprocessor Development System. The manual is divided into two main sections. The first section discusses installation and cabling procedures as well as basic diagnostics. For those customers who have not purchased the complete ECL-3211 packaged system, but are building on a system they already have, installation procedures for the AMR and AMS are given in the appendix. Those customers who have purchased only the BMS should refer to the pages in the first section which describe installation of the BMS. Emulogic is not responsible for any damage occurring during shipping. However, if you are missing any part of the ECL-3211 system which you ordered, or if you should have any problems getting the system to function, call Emulogic Customer Service, (617) 329-1031.

The second section of this manual describes various software functions. The Emulogic ECL-3211 Microprocessor Development System runs under RT-11 V4. A brief description of how to boot up and various other RT-11 commands has been included for the convenience of the less experienced user. Those users who have not purchased the ECL-3211 packaged system will not receive RT-11 on their disks or diskettes, and will have to copy RT-11 system files and the boot from one of their own disks or diskettes. For any questions concerning RT-11, refer to the RT-11 V4 System User's Guide.

A few basic emulation commands are included in Section II. these are not RT-11 commands and are included to enable you to start using your ECL-3211 Microprocessor Development system immediately. For a more detailed explanation of the commands, refer to the ECL-3211 Microprocessor Development System User's Guide.

## TABLE OF CONTENTS

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|                                                                                          |      |
|------------------------------------------------------------------------------------------|------|
| Preface .....                                                                            | iii  |
| SECTION I: ECL-3211 INSTALLATION                                                         |      |
| Cabling Procedures .....                                                                 | 1-2  |
| Preparing the BA11-NE Expander<br>Box for cabling .....                                  | 1-2  |
| Connecting the VT-100 to<br>BA11-NE Expander Box .....                                   | 1-2  |
| Connecting the Emulator Pod<br>to the BA11-NE Expander Box .....                         | 1-3  |
| Connecting the Disk Drive (RX02 or RL02)<br>to BA11-NE Expander Box .....                | 1-4  |
| RX02 Floppy Disk .....                                                                   | 1-4  |
| RL02 Hard Disk .....                                                                     | 1-4  |
| RX02/RL02 Disk Drive combination .....                                                   | 1-4  |
| Two or more RL02 Disk Drives .....                                                       | 1-5  |
| Connecting the power cables .....                                                        | 1-5  |
| Powering up the ECL-3211 system .....                                                    | 1-5  |
| Powering up the RX02 .....                                                               | 1-6  |
| Powering up the RL02 .....                                                               | 1-6  |
| Loading the RX02 .....                                                                   | 1-6  |
| Loading the RL02 .....                                                                   | 1-7  |
| Powering the ECL-1132 System down .....                                                  | 1-9  |
| Solving common problems in powering up .....                                             | 1-9  |
| What to do if the system does not power<br>up after installing or moving equipment ..... | 1-10 |
| Other problems .....                                                                     | 1-10 |

## SECTION II: SOFTWARE

|                                                                    |      |
|--------------------------------------------------------------------|------|
| Booting up the system .....                                        | 2-1  |
| Preparing floppy diskettes for<br>use with the RT-11 system .....  | 2-2  |
| Formatting the RX02 Floppy Diskettes .....                         | 2-2  |
| Initialization .....                                               | 2-3  |
| Initializing floppy diskettes .....                                | 2-3  |
| Initializing hard disks when there<br>are two RL02 drives .....    | 2-4  |
| Initializing hard disks when there<br>is only one RL02 drive ..... | 2-5  |
| Making a backup or a copy .....                                    | 2-5  |
| Copying the system files and boot<br>onto floppy diskette .....    | 2-5  |
| Making a copy or a backup with<br>only one RL02 unit .....         | 2-7  |
| Checking that files have been copied .....                         | 2-9  |
| Inspecting files .....                                             | 2-9  |
| Deleting files .....                                               | 2-9  |
| The 'SQUEEZE' command .....                                        | 2-10 |
| Creating and editing files .....                                   | 2-11 |
| Creating a new file .....                                          | 2-11 |
| Ending the editing session .....                                   | 2-11 |
| Editing an existing file .....                                     | 2-11 |
| Running a program and emulation .....                              | 2-12 |

## APPENDIX A

|                                                      |     |
|------------------------------------------------------|-----|
| Installation instructions for the ECL-3211 AMR ..... | A-3 |
| Installation instructions for the ECL-3211 AMS ..... | A-4 |

TABLE of FIGURES

ECL-3211-BA System (11/02 with RX02) ..... 1-10a

ECL-3211-KA System (11/23 with RX02) ..... 1-10b

ECL-3211-MA System (11/23 with RL02) ..... 1-10c

RX02 and RL02 ..... 1-10d

ECL-3211 AMR ..... A-3a

## SECTION I: ECL-3211 INSTALLATION

-----

This section describes the installation procedures for the Emulogic ECL-3211 Microprocessor Development System. Drawings relevant to the instructions are included at the end of this section. This section also includes instructions for powering up the system and basic diagnostics. Should you have any difficulty in getting your ECL-3211 Microprocessor Development system to function please call Emulogic Customer Service at (617) 329-1031.

The ECL-3211 system shipment consists of five boxes. The contents of these boxes are as follows:

- BOX NUMBER 1: Accessories and software
- BOX NUMBER 2: RT-11 documentation
- BOX NUMBER 3: VT-100 video terminal
- BOX NUMBER 4: Basic module system
- BOX NUMBER 5: RX02/RL02 disk drives

Tools needed to unpack and install the Emulogic ECL-3211 Development System:

- Knife
- Cutting pliers
- Small slotted screwdriver
- Large slotted screwdriver

Remove units from boxes and set all three system pieces and pod on a workbench or table. Allow room for working on back of each unit.

A complete ECL-3211 system consists of:

1. One VT-100 (box number 3)
2. One BA11-NE Expander Box (box number 4) containing:
  - a. LSI-11/2 CPU or LSI-11/23 CPU
  - b. 64 K bytes of memory or 128 K bytes of memory
  - c. MXV11-A dual port and bootstrap module
  - d. RX02 Controller or RL02 Controller
  - e. ECL 3211 Map and Control board
  - f. BC20N-5 cable

3. One RX02 Dual Floppy Disk Drive and Controller or RL02 10.4 MB Hard Disk Drive and Controller (box number 5).
4. Emulator Pod (box number 1)

Please refer to appropriate figure for specific installation instructions on your Emulogic ECL-3211 Development System.

#### CABLING PROCEDURES

-----

The following section explains the procedures for connecting the various components of the ECL-1132. Interconnecting cables are packaged with one end already connected to the hardware. Power cords are packaged separately in box 1, labeled 'OPEN ME FIRST'. Power cords for all Digital Equipment Corporation equipment is AC. The Emulation Pod power cord is the only DC cord in the system.

#### PREPARING THE BA11-NE EXPANDER BOX FOR CABLING

-----

1. Loosen black 1/4 screws on back door, open door and insure that each board in the Expander Box is seated properly and has not come loose from the backplane.
2. The cards are clearly labeled. Check that they are in the correct order.

Correct order of cards in box:

(for LSI 11/2 CPU, 64K  
B RAM see figure A)

-----

M7270 CPU (LSI 11/2)  
M8044 64K bytes memory  
M8047 MXV11-A module  
M8029 Floppy or Hard  
Disk Controller  
ECL-3211 Controller  
ECL-3211 Map

(for LSI 11/23 CPU, 128K  
B RAM see figures B and C)

-----

M8186 CPU (LSI 11/23)  
M8044 64K bytes memory  
M8044 64K bytes memory  
M8047 MXV11-A module  
M8029 Floppy or Hard  
Disk Controller  
ECL-3211 Controller  
ECL-3211 Map

#### CONNECTING THE VT-100 TO BA11-NE EXPANDER BOX

-----

One end of the BC20N-5 communication cable is already connected to the M8047 (MXV11-AA) card in the BA11-NE Expander Box.

1. Check that this connection is well seated and that the

cable is connected to port #1 (the far right socket) on the M8047 board.

2. Connect large black amp (RS232) connector at free end of cable to VT100 slot marked 'COMM' and tighten screws. The cables are keyed and will only fit one way.
3. Connect the keyboard to back of the VT-100. The coiled cable plugs into the socket marked "KEYBOARD" on the lower left side on the back of the VT-100. Be certain the plug is firmly seated.

#### CONNECTING THE EMULATOR POD TO THE BALL-NE EXPANDER BOX

---

The ECL-3211 Emulator Pod is packed in box number 1. It has three ribbon cables and a power cord. Two of the ribbon cables are labeled 'MAP' and 'CONTROL' and are used to connect the pod to the map and control boards within the expander box. The third ribbon cable connects the pod to the target.

1. Connect ribbon cable marked 'MAP' to the ECL-3211 Map module in the BALL-NE Expander Box.
2. Connect ribbon cable marked 'CONTROL' to the ECL-3211 control module in the BALL-NE Expander Box.
3. Remove anti-static foam from the pod target cable and ensure the end is not touching any metal.

**WARNING:** ANTI-STATIC FOAM IS CONDUCTIVE AND MUST BE REMOVED BEFORE POWER IS APPLIED.

4. Connect the tri-colored DC power cord on the pod to the matching cable attached to the map board. To do this, fit the ends of the cord together, twist and gently push together till you hear a click.

The two ends of the cord are keyed and will only fit together one way - do not force the connection.

## CONNECTING THE DISK DRIVE (RX02 OR RL02) TO THE

---

### BA11-NE EXPANDER BOX

---

(REFER TO FIGURE A AT THE BACK OF THIS MANUAL FOR LSI/2 AND FIGURES B AND C AT THE BACK OF THIS MANUAL FOR LSI/23).

### RX02 FLOPPY DISK

---

1. Remove white restrainer clip from BA11-NE Expander Box.
2. Remove M8029 card from expander box.

NOTE: BE CAREFUL NOT TO DRAG CARD ALONG OTHER CARDS WHILE REMOVING IT.

3. Connect ribbon cable from back of RX02 unit to M8029 (Floppy Controller) card in expander box.

Red stripe on cable should be on left side as you face back of unit.

NOTE: BE SURE TO PUSH THE CONNECTOR AT THE END OF THE RIBBON CABLE ONTO THE CONNECTOR ON THE M8029 UNTIL YOU HEAR A CLICK. AN INCOMPLETE CONNECTION WILL RESULT IN A FAILURE TO POWER UP.

4. Replace M8029 card in the unit.

### RL02 HARD DISK

---

1. Connect black terminator to back of RL02 (see figure B or C).
2. Connect cable (BC80M-06) from back of RL02 unit to hard disk Controller Card (M8061) in expander box.

### RX02/RL02 DISK DRIVE COMBINATION

---

Follow individual procedures for installation of RX02 floppy disk and RL02 hard disk (see instructions given above).

## TWO OR MORE RL02 DISK DRIVES

---

1. Connect first RL02 disk to second RL02 with the cable provided (see Figure C at the back of this manual).
2. Connect terminator to back of last RL02.
3. Connect cable (BC80M-06) from back of first RL02 unit to M8061 (hard disk Controller) card in expander box.

## CONNECTING THE POWER CABLES (BOX NUMBER 1, ACCESSORIES)

---

There are three (3) AC power cords in the box labeled "OPEN ME FIRST" (box number 1). Each cord is labeled to indicate which piece of equipment it connects.

- A. Be sure each unit is switched to 'off' position.

Connect all power cables onto backs of each unit.

The VT-100 has a toggle switch on lower right side of back. It is marked 0 and 1. The "1" position, or up is the 'on' position.

## POWERING UP THE ECL-3211 SYSTEM

---

The equipment may be powered up either by using a power strip or a separate outlet for each unit.

If all power cables are plugged into a power strip, turn each unit on separately and then turn on the power strip.

If units are plugged into separate outlets, power up the RX02 or RL02 and VT-100 first. Then power up the expander box containing the CPU and ECL-3211 system.

If everything has been properly installed, the VT-100 will "beep". If no diskettes or disks are in the RX02 or RL02, a flashing cursor or an '@' will appear on the VT100 screen.

## POWERING UP THE RX02

-----

To power up the RX02, push the 'ON-OFF' button located on the back of the RX02 to 'ON'.

If a system using the RX02 has been correctly installed, the RX02 will 'click' when it is powered up.

If the RX02 fails to 'click', power the unit down and check that all connections are secure and have been correctly joined. If the cabling for the RX02 is correct, power down the entire system and check that all cabling is correct.

## POWERING UP THE RL02

-----

To power up the RL02, push the 'ON-OFF' button located on the back of the unit to 'ON'.

If a system using an RL02 has been correctly installed, the yellow 'LOAD' light on the front of the unit will come on.

If the system has not been correctly installed, the red 'FAULT' light will come on. When this happens, the system should be powered down and all cabling checked.

NOTE: YOU MUST HAVE RT-11 V4 TO RUN THE ECL-3211 SYSTEM.

-----

## LOADING THE RX02

-----

For the ECL-3211 systems using the RX02, several floppy diskettes are enclosed in box number 1:

1. EALP-XXXX-AF Emulation Master Diskettes with RT-11
2. Blank diskettes

NOTE: XXXX STANDS FOR THE MICROPROCESSOR IDENTIFICATION NUMBER. XXXX WILL BE USED THROUGHOUT THE REST OF THESE INSTRUCTIONS IN LIEU OF A SPECIFIC NUMBER.

The Emulation Master Disk is clearly labeled. It contains software relevant to the emulation pod. The blank diskettes may be used for back up.

The Emulation Master disk should be backed up immediately. The procedure for back up is discussed in Section II of this manual.

To boot up the RT-11 Operating System

1. Place the EALP-XXXX-AF Emulation Master disk in Drive 0'.

If you are uncertain above the drives, refer to Figure D at the end of this section.

The disk should be inserted so that the 'Digital' label is on the side facing up and the end of the disk with the slot enters the drive first.

2. Close the drive door.

The following should appear on the VT100 screen:

```
RSJ-11SJ      V04.00
.SET TT:      SCOPE
.SET EDIT     KED
.SET LP:      CSR=176500
.SET LP:      VECTOR=300
```

NOTE: IF THE SYSTEM HAS BEEN POWERED UP FOR SOME MINUTES BEFORE THE DISKETTE WAS LOADED, THE SYSTEM WILL NOT BOOT UP AUTOMATICALLY FROM THE DISKETTE. THE FLASHING CURSOR OR THE '@' WILL REMAIN ON THE SCREEN. IF THIS SHOULD HAPPEN, DEPRESS THE 'BREAK' KEY AND TYPE IN "173000G". THE ECL-3211 WILL AUTOMATICALLY BOOT UP IF THE SYSTEM HAS BEEN CORRECTLY ASSEMBLED AND THE CORRECT DISKETTE IS IN DRIVE 0.

#### LOADING THE RL02

-----

For ECL-3211 systems using the RL02, one hard disk is enclosed in box number 1. This disk contains:

1. RT-11 V4 software
2. EALP-XXXX-AF Emulation Master software

NOTE: XXXX STANDS FOR THE MICROPROCESSOR IDENTIFICATION NUMBER. XXXX WILL BE USED THROUGHOUT THE REST OF THESE INSTRUCTIONS IN LIEU OF A SPECIFIC NUMBER.

The Emulation Master Disk is clearly labeled. It contains software relevant to the emulation pod.

The RL02 has 4 lights on the front:

|      |       |       |       |
|------|-------|-------|-------|
| LOAD | READY | FAULT | WRITE |
|      |       |       | PROT  |

Only one disk can be loaded into the RL02 at a time. The disk is loaded into the RL02 by raising the cover. This cannot be done until the RL02 has been powered up and the 'LOAD' light has come on.

To open the RL02:

1. Push 'LOAD' button. Wait for the 'LOAD' light to come on.
2. Raise cover of RL02 by squeezing handle on top of RL02 and lifting the cover.

Before a disk can be loaded into the RL02, the metal head restrainer located at the back of the drive must be lowered. This restrainer is used to protect the head during shipping or when moving the equipment. Once you have lowered the restrainer, it may be left in that position. Refer to Figure E for the location of the restrainer.

To lower the head restrainer:

1. With a small screwdriver, loosen the screw in the lower right corner until the restrainer drops.
2. Tighten the screw to hold the restrainer in the lowered position.

The RL02 is now ready to have the disk inserted. To insert the disk:

1. Pull the handle of the disk up. At the same time slide the bottom section of the handle to the side.

This will cause the bottom cover to break loose.

2. Remove bottom cover and place disk on the spindle inside the RL02 drive.

The disk will only fit on the spindle one way - DO NOT FORCE THE DISK.

3. When the disk is in place, place the bottom cover over the disk for protection.
4. Close cover to the RL02.
5. Depress the 'LOAD' button.
6. Wait for 'READY' light to come on. This will happen when the disk comes up to full speed. While the disk is building up to full speed, the ready light will flash.

The system will boot up from the disk. When this happens, the following will appear on the screen:

```
RSJ-11SJ      V04.00
.SET TT:      SCOPE
.SET EDIT     KED
.SET LP:      CSR=176500
.SET LP:      VECTOR=3000
```

NOTE: IF THE SYSTEM HAS BEEN POWERED UP FOR SOME MINUTES BEFORE THE DISK WAS LOADED, THE SYSTEM WILL NOT BOOT UP AUTOMATICALLY FROM THE DISK. THE FLASHING CURSOR OR THE '@' WILL REMAIN ON THE SCREEN. IF THIS SHOULD HAPPEN, DEPRESS THE 'BREAK' KEY AND TYPE IN "173000G". RT-11 WILL THEN AUTOMATICALLY BOOT UP IF THE SYSTEM HAS BEEN CORRECTLY ASSEMBLED AND THE DISK HAS BEEN INSERTED CORRECTLY.

#### POWERING THE ECL-3211 SYSTEM DOWN

-----

If all the units are connected to a power strip you may power the entire system down from the power strip - it is not necessary to power down each unit separately if they are all on the same strip.

If the units are plugged into separate outlets, power down by turning off each unit separately beginning with the BALL-NE Expander Box. After the expander box has been powered down other units may be powered down in any order you wish.

#### SOLVING COMMON PROBLEMS IN POWERING UP

-----

If neither a flashing cursor nor an "@" appears on the VT-100 screen, depress the 'BREAK' key on the VT100. This should bring either a flashing cursor or an '@' onto the screen.

If the "@" still does not appear, turn off the BALL-NE Expander Box, wait twenty seconds, and turn power back on.

## WHAT TO DO IF THE SYSTEM DOES NOT POWER UP

### ----- AFTER INSTALLING OR MOVING EQUIPMENT -----

Disconnect the pod power cable and the ribbon cable connecting the emulation pod to the BA11-NE Expander Box and the Map board.

Power up the VT-100, BA11-NE Expander Box and RX02 OR RL02. If the system comes up, the problem is in the connection between the emulation pod and the BA11-NE Expander Box.

Reconnect the pod to the controller and map boards making sure that the red stripe is on the left as you face the back of the BA11-NE Expander Box.

Reconnect the pod power cable.

Check that all connections are secure.

If power up still fails, inspect emulation pod connections for faults.

If system does not power up without emulator pod, go back to installation procedures and insure all cards are installed correctly and all cables are connected.

Power up.

If system still fails to power up, contact Emulogic Customer Services (617) 329-1031 or your local representative.

## OTHER PROBLEMS

-----  
The power up sequence on the BA11-NE Expander Box backplane is very critical. You may only have to power down and wait at least thirty (30) seconds, before powering up again.

Experience so far indicates that cards not seated correctly or cables not connected properly constitute most other known power up problems.

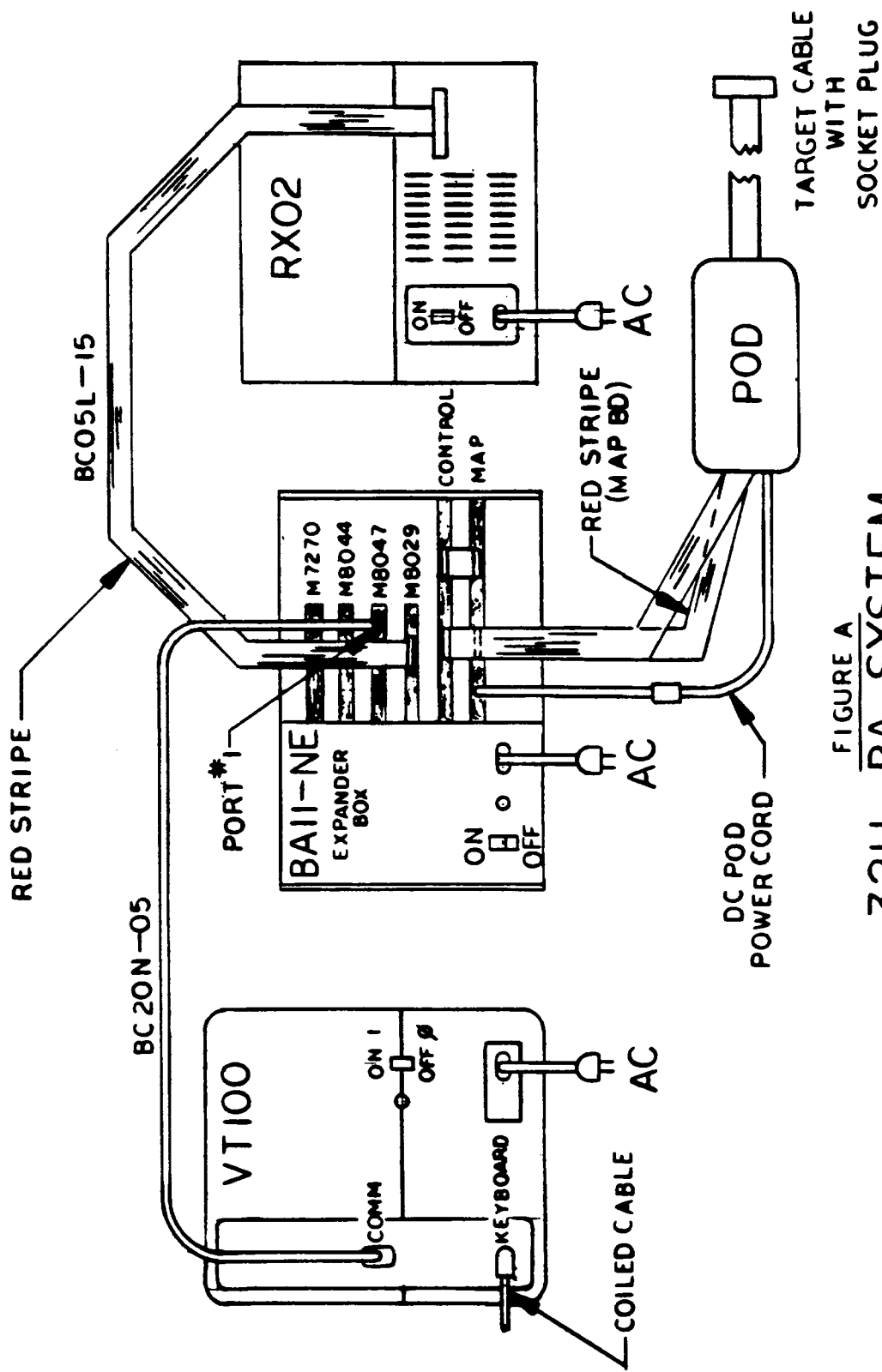
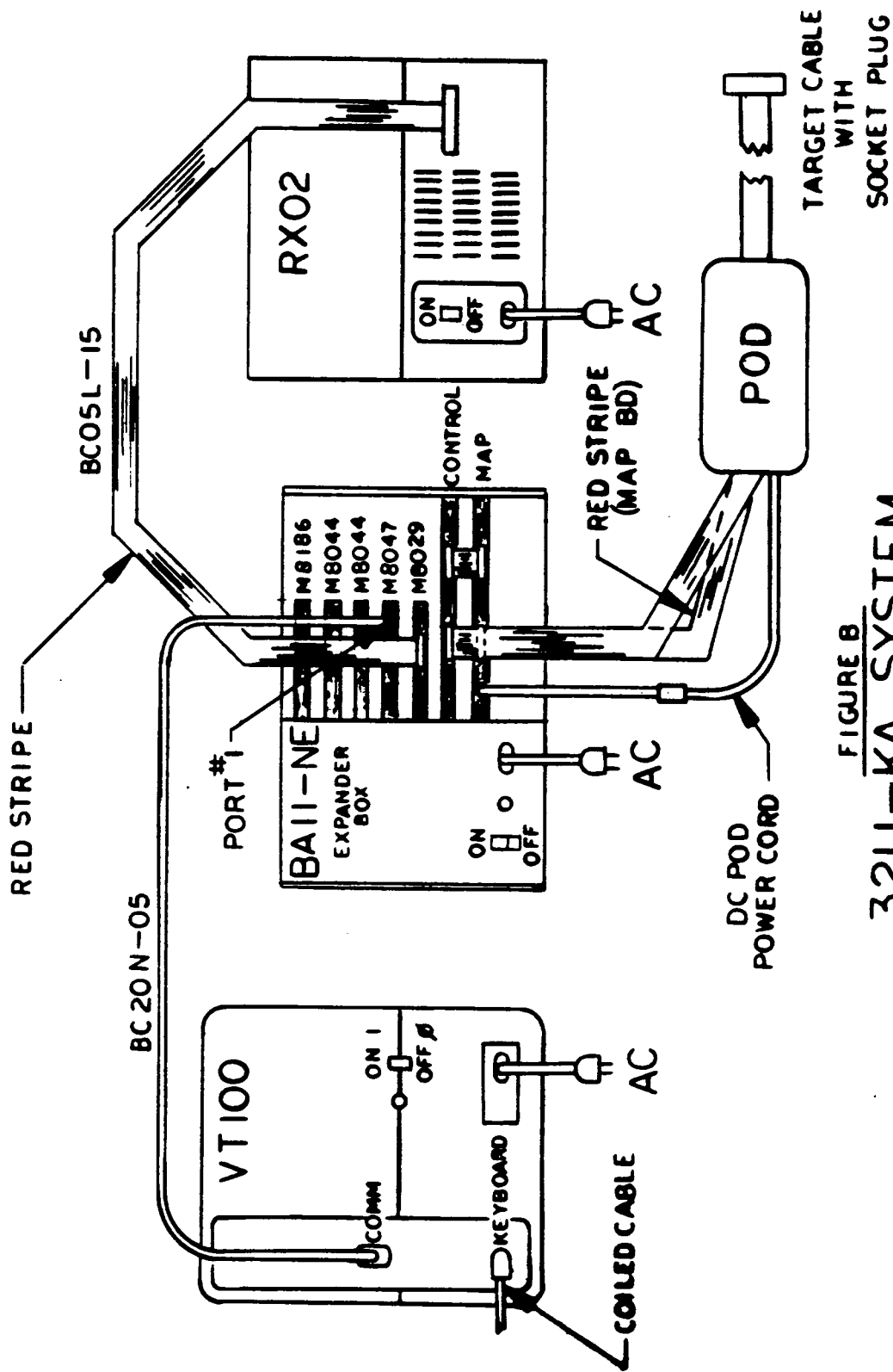


FIGURE A  
**3211-BA SYSTEM**  
 (11/02 WITH RX02)



**FIGURE B**  
**3211-KA SYSTEM**  
**(11/23 WITH RX02)**

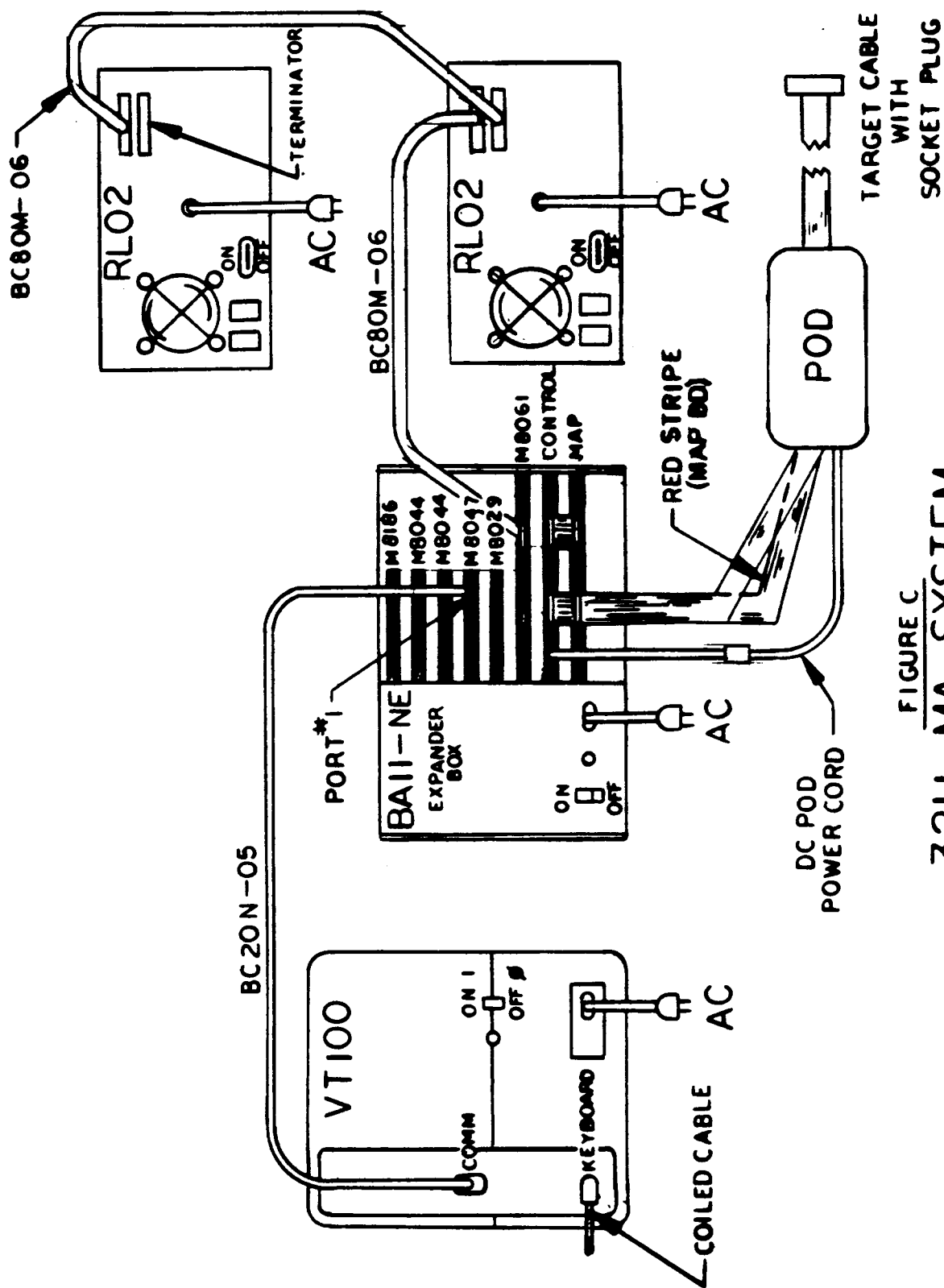


FIGURE C  
**3211-MA SYSTEM**  
 (11/23 WITH RLO2)

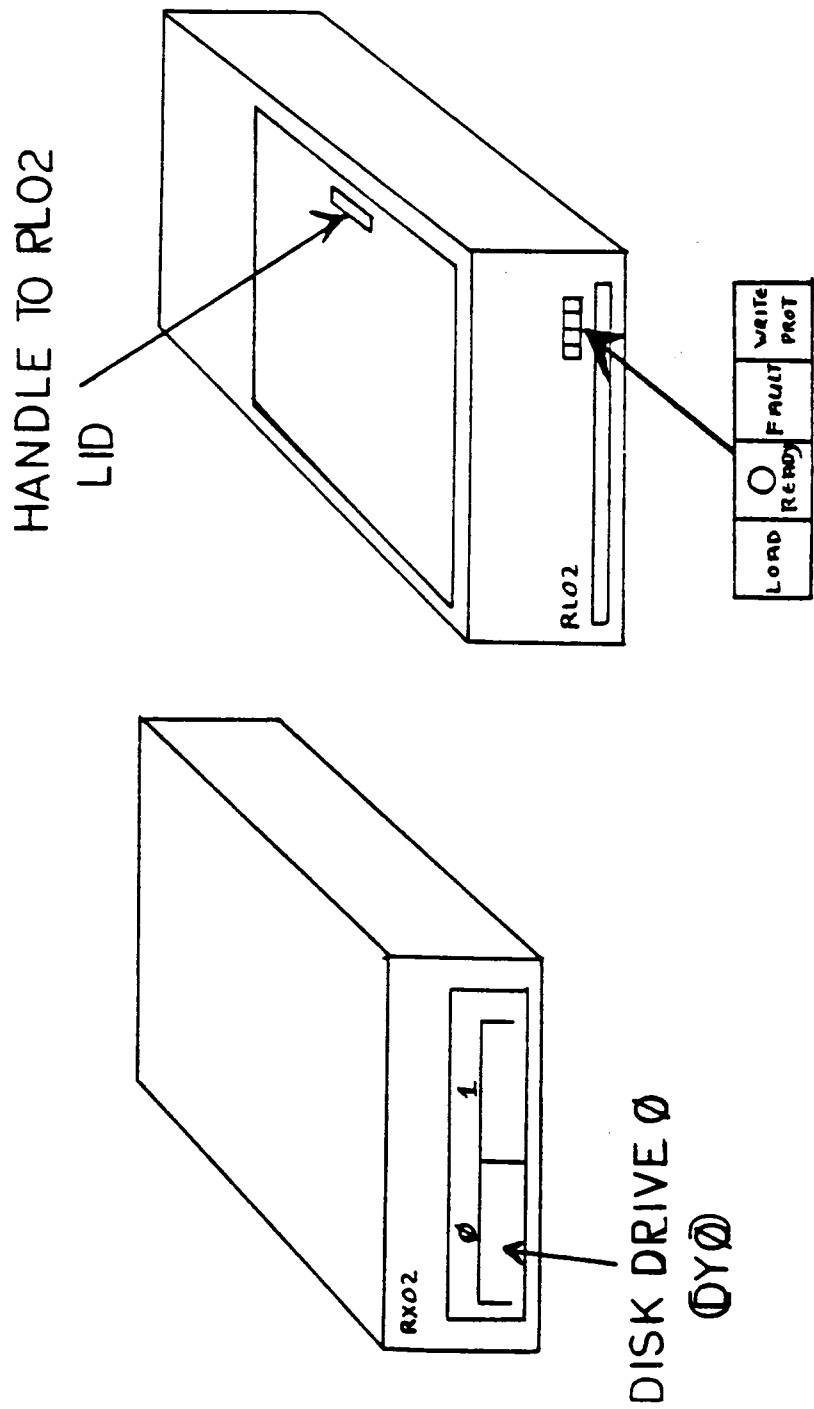


FIGURE D  
RX02 AND RL02

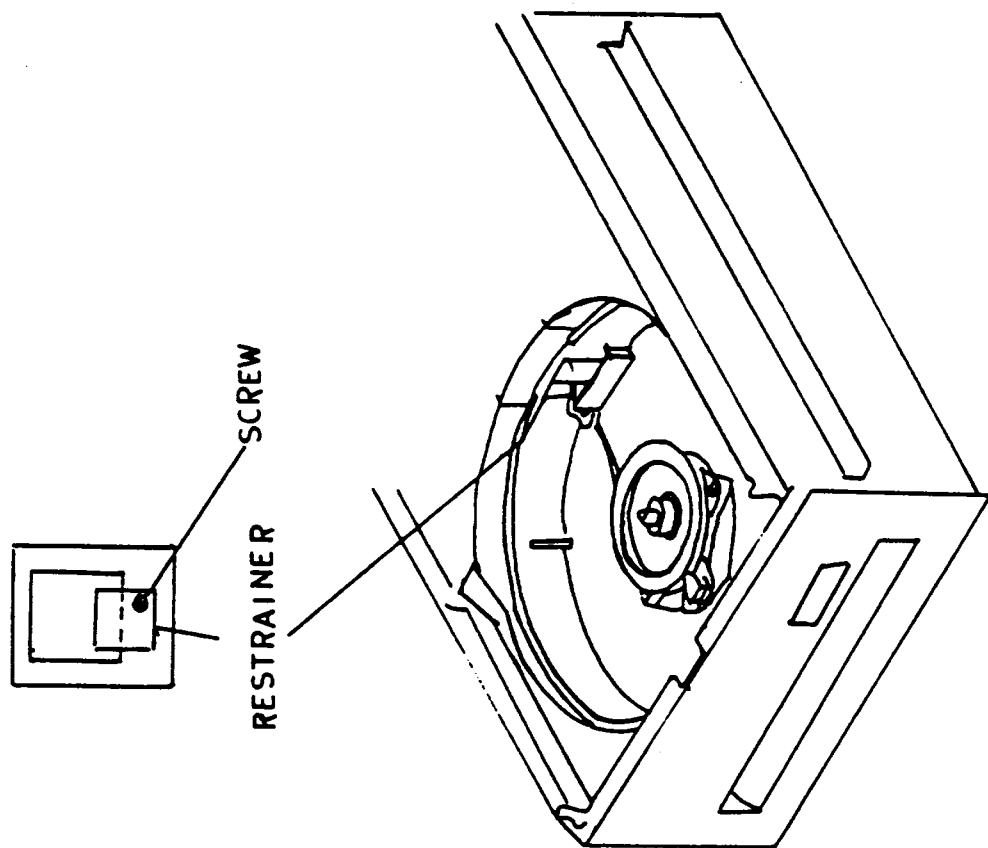


FIGURE E  
RLO2 HEAD RESTRAINER

## SECTION II: SOFTWARE

-----

This section of the ECL-3211 Installation Manual concerns itself with the software. It reviews the booting up procedure already discussed in Section I and the procedure for readying disks or diskettes for use with RT-11. It also explains the use of various commands. This section should enable you to begin to use the RT-11 system immediately.

For information on the use of files for software development, or for a more detailed explanation of the commands discussed here refer to the following manuals:

RT-11 Documentation  
ECL-3211 User's Guide  
Software Development Guide  
Prom Burner Guide

The ECL-3211 Microprocessor Development System uses either an RX02 or an RL02 Mass Storage unit. The RX02 units use floppy diskettes. Blank diskettes must be formatted and initialized before they can be used with RT-11.

The hard disks shipped for use with the RL02 are already formatted but must be initialized.

NOTE: YOU MUST HAVE RT-11 V4 TO RUN THE ECL-3211 SYSTEM. THE EALP-XXXX-AF EMULATION MASTER DISK CONTAINS RT-11 SYSTEM FILES AND A BOOT.

### BOOTING UP THE SYSTEM

-----

The system will boot automatically from the EALP-XXXX-AF Emulation master disk or diskette. Refer to Section I for loading procedures for the RX02 and RL02.

When the system has booted up, the following will appear on the CRT screen:

```
RSJ-11SJ      V04.00
.SET TT:      SCOPE
.SET EDIT     KED
.SET LP:      CSR=176500
.SET LP:      VECTOR=3000
```

The system will not boot automatically from your disk or diskette if the system has been powered up for some minutes before the disk or diskette was loaded. The flashing cursor or the '@' sign will remain on the screen. If this should happen, depress the 'BREAK' key and type in '173000G'(please note that the 'G' must be upper case). This will cause the system to boot.

If you have a combination RX02 and RL02, you may use either one to boot up.

#### PREPARING FLOPPY DISKETTES FOR USE WITH THE RT-11 SYSTEM

-----

Several diskettes are shipped with every ECL-3211 Microprocessor Development System using floppy diskettes. These contain RT-11 system files, the boot and the EALP-XXXX-AF Emulation Master. A few blank diskettes are also included for your convenience.

The Emulation Master needs no other preparation than the optional addition of the system files and boot. Blank floppy diskettes must be formatted initialized.

#### FORMATTING THE RX02 FLOPPY DISKETTES

-----

All blank floppy diskettes must be formatted before they are usable to the RT-11 system.

Formatting is a procedure which prepares a disk in such a way as to make it usable with a system - in this case RT-11.

To format your blank diskette:

1. Put an existing RT-11 system diskette in drive 0 (left side of RX02 as you face it, refer to Figure D).
2. Put blank diskette in drive 1. Be sure the 'Digital' label is on the side facing up. The end of the disk with the slot should enter the drive first.
3. Type in the portion of the following dialogue in quotes ' '. DO NOT ENTER THE QUOTES, ONLY WHAT IS WITHIN THE QUOTES. Follow each entry with a carriage return <cr>. Be sure to wait

for the system to respond as indicated before typing in your next entry.

```
. 'FORMAT<cr>'
```

```
device? 'DY1:<cr>'
```

```
DY1:/format-Are you sure?'Y<cr>'
```

```
- (Cursor flashes while the diskette is being formatted.)
```

```
.
```

```
?FORMAT-I-formatting complete
```

The formatting procedure for the blank diskette is now completed. Remember to format all blank diskettes before using them.

## INITIALIZATION

-----

Initialization is a procedure which cleans the disk or diskette by destroying any data already existing in the files. Initialization will also allow the system to scan the disk, looking for sections of the disk which are not suitable for use. These areas are called bad blocks.

All disks and diskettes must be initialized. The floppy diskettes for use with the RX02 should be initialized immediately after they are formatted. RL02 hard disks, are formatted before shipment. Therefore, initialization is the first operation you will perform on the RL02 hard disks.

The initialization command causes the system to scan for bad blocks and writes .BAD files over them. It gives them the file name FILE.BAD. This assures the system will not attempt to access them to store data during routine operation.

If the system finds a bad block in the boot block or volume directory, it prints an error message and the disk or diskette is not usable.

## INITIALING FLOPPY DISKETTES FOR THE RX02

-----

To initialize floppy diskettes and check for bad blocks, enter the portion of the following dialogue in quotes ' '. DO NOT ENTER THE QUOTES, ONLY WHAT IS WITHIN THE QUOTES. Follow each entry with

a carriage return.

```
. 'INITIALIZE/BADBLOCKS DY1:<cr>'
```

```
DY1:/Initialize; Are you sure?'Y<cr>'
```

.

When initialization has been completed, the system will come back with a '.'. This is the system prompt and the signal that it is ready to accept further instructions.

#### INITIALIZING HARD DISKS WHEN THERE ARE TWO RL02 DRIVES

-----

If you have a system using two RL02 Mass Storage units, use the following procedure for initialization:

1. On the front of the RL02 unit, there are four buttons. On the 'READY' button is either a '0' or a '1'. Insert the disk containing the RT-11 system disk in the unit labeled '0'.

This drive is referred to as 'DL0'.

2. Insert the blank disk in the unit labeled '1'.

This drive is referred to as 'DL1'.

3. Type in the portion of the following dialogue in quotes:

```
. 'INITIALIZE/BADBLOCKS DL1:<cr>'
```

```
DL1:/Initialize; Are you sure?'Y<cr>'
```

.

When initialization has been completed, the system will come back with a '.'. This is the system prompt and the signal that it is now ready to accept further instructions.

## INITIALIZING HARD DISKS WHEN THERE IS ONLY ONE RL02 DRIVE

---

If your system has only one RL02 mass storage unit, use the following procedure for initialization:

1. Insert the disk containing the RT-11 system in the RL02.
2. Type in the portion of the following dialogue contained within quotes. Do not type in the quotes:

. 'INITIALIZE/WAIT/BADBLOCKS DLO<cr>'

DY0:/Initialize; Are you sure?'Y <cr>'

Mount Input volume in DLO;;Continue?

(Take the RT-11 disk out of Drive 0 and insert blank disk. Then type in 'Y<cr>'.)

Mount System volume in DLO;;Continue?

(Take blank disk out of Drive 0 and insert RT-11 disk. Then type in 'Y<cr>'.)

When initialization has been completed, the system will come back with a '.'. This is the system prompt and the signal that it is now ready to accept further instructions.

## MAKING A BACKUP OR A COPY

---

For your convenience, you may want to copy the EALP-XXXX-AF Emulation Master onto a blank disk or diskette. Before this can be done, the blank disk or diskette should be initialized, and if necessary, formatted. See the sections above on formatting and initialization for details of those procedures.

## COPYING THE SYSTEM FILES AND BOOT ONTO FLOPPY DISKETTE

---

The system files must be copied before the boot can be copied.

To copy the system files from the diskette with RT-11 onto the blank diskette:

1. Put diskette with RT-11 system files in Drive 0.
2. Put blank diskette in Drive 1.
3. Wait for the system to boot up automatically. Then type in

.COPY/SYS DY0:\*.SYS DY1:<cr>

4. Wait for the system prompt '.' to appear on the CRT.

When the prompt appears, the system has finished copying the system files.

To copy the boot from the RT-11 diskette onto the blank diskette:

1. Put RT-11 diskette in Drive 0.
2. Put blank diskette in Drive 1.
3. Wait for the system to boot up automatically. Then type in

.COPY/BOOT DY0:RT11SJ DY1:<cr>

4. Wait for the system prompt '.' to appear on the CRT.

When the prompt appears, the system has finished copying the boot.

To make a back up of a particular file - for example, a file named FILE.EXT, from one diskette to another:

1. Put diskette containing file FILE.EXT in Drive 0.
2. Wait for system to boot up automatically. Then type in

.COPY DY0:FILE.EXT DY1:FILE.EXT<cr>

3. Wait for the system prompt '.' to appear on the CRT.

When the prompt appears, the system has finished copying the file.

## MAKING A COPY OR A BACKUP WITH ONLY ONE RL02 UNIT

---

For convenience, it is recommended that users with only one RL02 mass storage unit make backups on a floppy diskette if possible.

When making a copy using a system with only one RL02 mass storage unit, it is necessary to change disks during the procedure. For this reason, '/WAIT' must be inserted into the commands. This tells the system to pause while you change the disks. If you have any problems copying your files with the /WAIT command, contact your Digital equipment Representative.

To copy the system files from a disk containing RT-11 to a blank disk:

1. Put RT-11 master disk in the RL02 drive.
2. Wait for the system to boot up automatically. Then type in the portion of the following dialogue contained within quotes. Do not type in the quotes:

```
.'COPY/WAIT/SYS<cr>'
```

```
Device?'DLO:<CR>'
```

```
Mount Input volume in DLO;;Continue?
```

(Take the master disk out of DY0 and insert blank disk.  
Then type in 'Y<cr>'.)

```
Mount system volume in DLO;;Continue?
```

(Take the blank disk out of Drive 0 and insert master  
disk again. Then type in 'Y<cr>'.)

```
._
```

When the system prompt '.' and flashing cursor appear  
on the CRT, the system files have been copied.

To copy the boot from the RT-11 disk:

1. Put the RT-11 master disk in the RL02 drive.
2. Wait for the system to boot up automatically. Then type in the portion of the following dialogue contained within quotes. Do not type in the quotes:

```
.'COPY/WAIT/BOOT<cr>'
```

```
Mount Input volume in DLO;;Continue?
```

(Take master disk out of RL02 and insert blank disk.  
Then type in 'Y<cr>'.)

Mount System volume in DL0;;Continue?

(Take blank disk out of RL02 and insert master disk.  
Then type in 'Y<cr>'.)

.\_

When the system prompt '.\_' and the flashing cursor appear on the CRT, the boot has been copied.

To backup a particular file - for example one named FILE.EXT - from one disk to another:

1. Put the disk containing FILE.EXT in RL02 drive.
2. Type in the portion of the following dialogue contained within quotes. Do not type in the quotes:

.\_'COPY/WAIT DL0:FILE.EXT DL0:<cr>'

Mount input volume in DL0;;Continue?

(put the disk you wish to copy the file onto into the RL02. Then type in 'Y<cr>'.)

Mount system volume in DL0;;Continue?

(put the original disk in the RL02 drive.  
Then type 'Y<cr>'.)

.\_ (When the '.\_' prompt and the flashing cursor come up on the screen, the system has completed copying the file.

NOTE: DEPENDING ON HOW LONG THE FILE IS THAT YOU ARE COPYING, YOU MAY HAVE TO CHANGE THE DISKS MORE THAN ONCE BEFORE THE BACK UP PROCEDURE IS COMPLETED.

## CHECKING THAT FILES HAVE BEEN COPIED

---

To be sure that files have been properly copied, list the directory for the second disk immediately, by check the directory. If you are using an RX02, enter:

DIR DY1:<cr>

If you are using two RL02 units, enter:

DIR DL1:<cr>

If you are using a single RL02 unit, enter:

DIR DL0:<cr>

This command will list all the files on the disk or diskette by name.

## INSPECTING FILES

---

To inspect a file - for example a file named FILE.EXT - type in the following command:

TYPE FILE.EXT<cr>

The file which has been specified in the command will appear on the VT100 screen for you to inspect.

NOTE: IF THE FILE IS NOT AN ASCII FILE, YOU MAY GET STRANGE RESULTS ON THE SCREEN.

## DELETING FILES

---

You may delete files by using the DELETE command followed by the name of the file you wish to delete. Up to six files may be specified at One time. If you specify more than one file, the names of the files must be separated by commas.

For example,

```
DELETE INSTAL.TXT,JUNK.MSR,MERG.TXT<cr>
```

will delete three files:

```
INSTALL.TXT  
JUNK.MSR  
MERG.TXT
```

NOTE: THE SYSTEM WILL ASK FOR CONFIRMATION BEFORE DELETING A FILE. WHEN THE SYSTEM ASKS 'ARE YOU SURE' YOU MAY EITHER STOP THE SYSTEM BY TYPING IN 'N' FOLLOWED BY A CARRIAGE RETURN, OR YOU MAY APPROVE THE DELETION BY TYPING IN 'Y' FOLLOWED BY A CARRIAGE RETURN.

#### THE SQUEEZE COMMAND

-----

The SQUEEZE command causes the system to move all the files to the beginning of a disk. This produces a single unused area after the group of files. This procedure does not change the bootstrap blocks of a disk.

The system asks for confirmation before it executes the command. You can stop the squeeze procedure by typing in an 'N' followed by a carriage return. To approve the squeeze procedure, type in a 'Y' followed by a carriage return.

To enter a SQUEEZE command for an RX02, insert the diskette in Drive 0 and enter the following:

```
SQUEEZE DY0:
```

To perform a SQUEEZE on a hard disk, insert the disk in the RL02 (if you have two or more RL02s, insert the disk in the one marked '0' on the 'READY' button). Then enter the following:

```
SQUEEZE DL0:
```

## CREATING AND EDITING FILES

---

Following are examples of how the EDIT may be used. Refer to the keypad Editors Manual for further details.

### CREATING A NEW FILE

---

To create a new file, use the EDIT/C command. For example, to create a file named FILE.EXT, type in the following command:

EDIT/C FILE.EXT<cr>

NOTE: THE FILENAME MUST NOT BE LONGER THAN SIX (6) ALPHANUMERIC CHARACTERS.

This command will cause the system to open a file named FILE.EXT. It will also blank the CRT screen and place the cursor at the top of the screen. You may now type in any data you wish.

### ENDING THE EDITING SESSION

---

When you have entered all the data you wish in the file you have just created, you may end the session by depressing the 'PF 1' and then the '7' keys on the right hand keyboard.

The Editor will now display 'COMMAND \_\_\_\_\_' at the top of the screen. Type in 'EXIT' and depress the 'ENTER' key on the right hand keyboard.

The system will now close the file. To verify the contents of the file you may use the 'TYPE' command discussed earlier.

### EDITING AN EXISTING FILE

---

To edit an existing file, for example, one named FILE.EXT, enter the following command followed by a carriage return:

.EDIT FILE.EXT<cr>

This will reopen the file and display the beginning of the file on the CRT screen. You may now use the capabilities of the editor to make any changes or insertions.

## RUNNING A PROGRAM AND EMULATION

-----

The following commands will enable you to run a program and to perform an emulation.

To load 'FILE.SAV' into memory and begin executing a program, enter the following command followed by a carriage return:

```
RUN FILE.SAV<cr>
```

If you are using more than one disk drive and have the program 'FILE.SAV' on the diskette in drive 1, enter the following command followed by a carriage return:

```
RUN DY1:FILE.SAV<cr>
```

This command will cause the RT-11 system to go to the diskette in DY1 to look for 'FILE.SAV'. When the system finds 'FILE.SAV' it will load it into memory and begin execution.

To begin execution of the Z-80 handler, enter the following command followed by a carriage return:

```
RUN L00500.SAV<cr>
```

L00500.SAV is the file name for the Z-80 Emulation package. The command shown above causes the RT-11 system to begin to execute the Z-80 handler. Further commands would now be those accepted by the ECL-3211 emulation system.

## APPENDIX A

---

### INSTALLATION INSTRUCTIONS FOR THE ECL-3211 AMR

---

The ECL-3211 AMR consists of the M9400YE Terminator board, which will be placed in your existing backplane, and the BA11-NE Expander Box containing four boards.

First loosen the black 1/4 screws on the back door, of the BA11-NE Expander Box. Open door and insure that each board in the Expander Box is seated properly and has not come loose from the backplane.

The cards are clearly labeled. Check that they are in the correct order:

- M9401
- ECL-3211 Control Board
- ECL-3211 Map Board
- TEV-11 Terminator

The M9400YE Terminator has been bubble packed and placed inside the BA11-NE for shipping purposes. Carefully remove the M9400YE Terminator from the the BA11-NE and the bubble packing.

The M9400YE is connected to the M9401 by a cable. These two boards and the connecting cable are collectively referred to as the BCV1B-06. The BCV1B-06 provides the interface between the ECL-3211 AMR and your existing system.

To provide interface between your system and the ECL-3211 AMR, insert the M9400YE Terminator directly under the last DEC module in your existing backplane. See Figure A-1 in this appendix.

See Section I of this manual for instructions regarding Pod cabeling, other equipment, and power up.

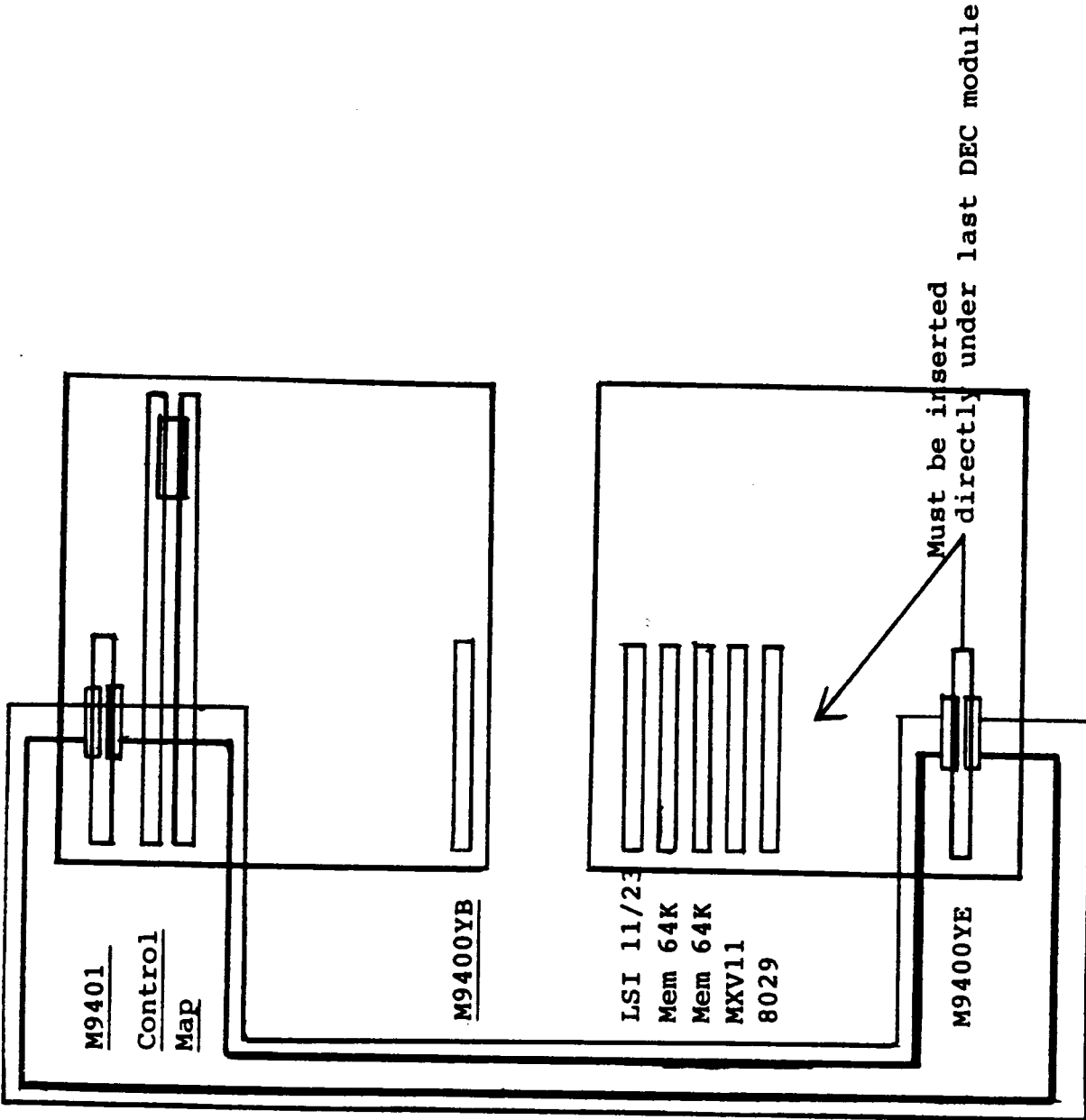


FIGURE A-1 :ECL-3211 AMR

## INSTALLATION INSTRUCTIONS FOR THE ECL-3211 AMS

---

The ECL-3211 AMS consists of BA11-NE Expander Box containing two ECL-1132 boards.

Loosen the black 1/4 screws on the back door and insure that each board in the Expander Box is seated properly and has not come loose from the backplane.

Interface between the ECL-3211 AMS and your existing system is accomplished by inserting your CPU and DEC modules into the BA11-NE.

Insert your existing boards into the BA11-NE in the following order depending on whether you have an LSI 11/2 CPU or an LSI 11/23 CPU: (Refer to Figures A, B and C in Section I of this manual.)

(for LSI 11/12 CPU, 64K  
B RAM see Figure A )

---

M7270 CPU (LSI 11/2)  
M8044 64K bytes memory  
M8047 MXV11-A module  
M8029 Floppy or Hard  
Disk Controller  
ECL-3211 Controller  
ECL-3211 Map

(FOR LSI 11/23 CPU, 128K  
B RAM see Figures B and C)

---

M8186 CPU (LSI 11/23)  
M8044 64K bytes memory  
M8044 64K bytes memory  
M8047 MXV11-A module  
M8029 Floppy or Hard  
Disk Controller  
ECL-3211 Controller  
ECL-3211 Map

For installation instructions for Pod Cabling, other equipment or power up, see Section I of this manual.

# PRELIMINARY

Appendix B  
(to Emulogic ECL-3211 System Installation Guide)

INSTALLATION INSTRUCTIONS  
for  
EMULOGIC HIGH-SPEED MEMORY SUBSYSTEM

# PRELIMINARY

## INSTALLATION INSTRUCTIONS FOR EMULOGIC HIGH-SPEED MEMORY

In addition to the 2k bytes of high-speed emulation memory provided on the ECL-3211 Map board, you may install additional increments of high-speed memory. Emulogic high-speed memory permits full-speed emulation (using internal memory) of high-speed target systems. Memory modules are available as 8k, 16k, and 32k byte dual-sized boards to fit the Ball-NE expander box. The Emulogic mapping logic will support up to XXX such boards.

### HIGH SPEED MEMORY KIT



The installation kit for high-speed memory includes:

- o High-speed memory board(s),
- o Single- or multi-board 20-wire memory cable,
- o Multi-board 40-wire expander cable.

Figure B-1 shows the high-speed memory components. Notice that multi-board installations use a 20-wire cable with connectors for two or more high-speed memory boards. Check your kit to be certain it contains the correct parts.

Figure B-1. EMULOGIC single and multi-board installation kits.

TOOLS REQUIRED

Installation of high-speed memory in the ECL-3211 requires only the tools below.

- o Wide-bladed, straight slot screwdriver,
- o Small needle-nosed pliers.

INSTALLATION PROCEDURE

To install Emulogic high-speed memory involves inserting the memory board or boards and making cable connections. The boards are designed to mount in the upper right-hand slots of the BALL-NE expander box. Cable connections join the control circuits of the Map board and memory board(s) -- via the 20-wire cable, and the data channels of the Map, memory, and Emulation Support Package -- via the 40-wire expander cable. In addition, you will disconnect and reconnect the 50-wire cable joining the Emulogic Map and Control boards.

The following steps detail the installation procedures. Perform each step in the correct sequence. Check off each step after it has been completed ( ).

1. ( ) Turn off the power switch to the BALL-NE expander box.
2. ( ) Remove the power cord from the A/C source.
3. ( ) Position the BALL-NE expander box so that the rear of the unit is facing you.
4. ( ) Locate the two black, slotted twist fasteners at the lower corners of the door (see Figure B-2).

Figure B-2. Rear of BALL-NE expander box.

5. ( ) Open the rear door for access to the card cage:
  - a. ( ) Using a screwdriver, turn each fastener counterclockwise ( ) until the slot is horizontal (see Detail B-2-1, Figure B-2).
  - b. ( ) With both fasteners released, raise the rear door.
6. ( ) Disconnect either end of the short 50-wire cable joining the Map and Control boards (see Figure B-3). Note that the red-coded wire of this cable is on the right.

\$

Figure B-3. Map board, 50-wire cable disconnected.

IF NO EMULATION SUPPORT PACKAGE POD IS PRESENTLY CONNECTED TO YOUR SYSTEM, SKIP THE NEXT STEP (7) AND PROCEED WITH STEP 8.

7. ( ) Disconnect the Map board end of the 40-wire cable joining the Map board to the ESP pod (this cable is clearly labeled "Map").
8. ( ) Connect the 20-wire cable to the Map board:
  - a. ( ) Pull the Map board out of the cage far enough to gain access to the 20-pin socket on the right-hand edge of the board (see Figure B-3).

THE 20-WIRE CABLE FOR YOUR INSTALLATION HAS AS MANY FINGER SOCKET CONNECTORS AS THERE ARE HIGH-SPEED MEMORY BOARDS. THE CABLE HAS A SINGLE MULTI-RECEPTACLED PLUG AT ONE END AND ONE OR MORE SLOTTED FINGER SOCKET CONNECTORS AT THE OTHER. BE SURE THAT YOU HAVE THE CORRECT CABLE ASSEMBLY.

- b. ( ) Position the Map board plug of the 20-wire cable with the red-coded wire at the side furthest from you. Insert the connector in the socket as shown in Figure B-4.

Figure B-4. Detail of 20-pin socket on Map board.

- c. ( ) Route the free end of the 20-wire cable down and under the Map board. Make a half twist in the cable and lead it out of the cage toward you, keeping it to the left of the Map board handle.
- d. ( ) Slide the Map board back into the cage and re-seat it firmly into the backplane connectors.

IF YOU ARE INSTALLING SINGLE-BOARD HIGH-SPEED MEMORY, DO THE NEXT STEP (9) AND SKIP TO STEP 11.

IF YOU ARE INSTALLING MULTI-BOARD HIGH-SPEED MEMORY, SKIP THE NEXT STEP (9) AND PROCEED WITH STEP 10.

- 9. ( ) Install and connect a single-board memory:
  - a. ( ) Refer again to Figure B-1 and position the memory board as shown, component-side up and 40-pin socket nearest you.
  - b. ( ) Slide the memory board into an open slot in the upper right area of the cage and seat it firmly into the backplane connectors.
  - c. ( ) Position the socket at the free end of the 20-wire cable with the red-coded wire to the right.
  - d. ( ) Slide the socket onto the 20-finger connector at the right near edge of the high-speed memory board.
  - e. ( ) Locate the 40-wire expander cable. Note that there is a 40-pin junction socket near one end of the cable. This is the memory board end of the cable.
  - f. ( ) Position the cable with the red-coded wire on the right and

insert the plug in the 40-pin memory board socket.

- g. ( ) Take the Map board connector plug at the free end of the 40-wire cable and position it with the red-coded wire to the right. Insert the plug of the cable into the 40-pin socket on the Map board.
  - h. ( ) Locate the twisted-pair cable assembly from the ESP pod marked "Map" so that the connector key aligns with the keyslot of the 40-pin junction on the upper end of the 40-wire expander cable.
  - i. ( ) Insert the plug of the twisted-pair cable in the junction connector of the expander cable.
10. ( ) Install and connect a multi-board memory:
- a. ( ) For each high-speed memory board, refer to Figure B-1 and position the memory board as shown and 40-pin socket nearest you. The boards are jumpered to electronically encode each one uniquely (board 1, board 2, and so on), and you may insert them in any sequence.
  - a. ( ) Slide the memory boards into sequential slots in the upper right area of the cage and firmly seat each into the backplane connectors.
  - b. ( ) Position the sockets at the free end of the 20-wire cable with the red-coded wire to the right.
  - c. ( ) Slide the sockets onto the 20-finger connectors at the right near edges of the high-speed memory boards.
  - d. ( ) Locate the multi-board 40-pin connector interface card shown in Figure B-1.
  - e. ( ) Position the connector card as shown in Figure B-5 and connect the spade lugs of the grounding wires to the matching ground blades of the card.

Figure B-5. Standard multi-board connector card positioned and grounded.

- f. ( ) Position the twisted-pair cable assembly from the ESP pod marked "Map" so that the connector key aligns with the key slot in the card's large socket.
- g. ( ) Insert the twisted-pair cable connector in the 40-pin socket.
- h. ( ) Carefully align the card/cable assembly with the 40-pin sockets on the board edges and press the connectors of the card into the sockets. BE SURE THAT THE EDGES OF THE CONNECTOR CARD AND THE EDGES OF THE MEMORY BOARD EXTENSIONS HOLDING THE SOCKETS ARE EVEN.
- i. ( ) Refer to Figure B-6 and position the 40-wire expander cable (light colored ribbon cable at top left of figure). Be sure the red-coded wire is to the right. Align the slots of the finger connector sockets on the cable with the pins at the top of the interface card.
- j. ( ) Carefully slide the expander cable plug onto the pins.

WITH THE MEMORY BOARDS INSTALLED AND CONNECTED ACCORDING TO THE DIRECTIONS ABOVE, COMPLETE THE INSTALLATION PROCEDURES AS FOLLOWS.

- 11. ( ) Locate the free-end plug of the 50-wire Map/Control cable. Keeping the red-coded wire on the right, re-insert the plug into the 50-pin socket on the near edge of the Map board.
- 12. ( ) Take the Map board connector plug at the free (lower) end of the 40-wire expander cable and position it with the red-coded wire to the right. Insert the plug of the cable into the 40-pin socket on the Map board.
- 13. Perform the following checks:

- o ( ) Check that all boards are fully inserted into the backplane connectors.
- o ( ) Check that the memory connector card (if used) is completely pressed onto the memory board fingers.
- o ( ) Check that all cables are correctly installed and that there are no loose cable ends.

**WARNING!**

New Emulogic Emulation Support Package (ESP) pods are shipped with a piece of conductive foam protecting the pins of the emulator plug from stray static charges. The pod components will be seriously damaged if this foam is not removed from the plug before power is returned to the BALL-NE. REMOVE ANY FOAM OR DEBRIS FROM THE EMULATOR PLUG BEFORE CONTINUING.

14. ( ) Plug the power cord of the BALL-NE into the A/C source.
15. ( ) Refer to the section "Powering Up the ECL-3211 System" in Chapter 1 of this manual and perform the power-up routines and checks.
16. ( ) When you have completed the power-up checks in Chapter 1, lower the rear door, being careful to route the external connector cables through the opening at the bottom of the door.
27. ( ) Hold the door down firmly against the expander box chassis with one hand. With a screwdriver, turn the slotted twist fasteners clockwise ( ) until the slot is vertical.
28. ( ) Turn the BALL-NE expander box back to its normal position.

This concludes the installation of Emulogic high-speed memory.

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