EMULOGIC, INC.

MICROPROCESSOR DEVELOPMENT SYSTEM

ECL-3211

INSTALLATION MANUAL

MAN 1002-01

REVISED: October 1982

PREFACE

The purpose of this manual is to help you install and test your
Emuulogic ECL-1132 Microprocessor Development System. The manual is
divided into two main sections. The first section discusses instal-
lation 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
who have purchased only the BMS should refer to the pages in the first
section which describe installation of the BMS.   Emulogic is not respon-
sible for any damage occuring 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 expl-
ation of the commands, refer to the ECL-3211 Microprocessor Development
System User's Guide.

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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)	(for LSI 11/23 CPU, 128K B RAM see figures B and C)
M7270 CPU (LSI 11/2)	M8186 CPU (LSI 11/23)
M8044 64K bytes memory	M8044 64K bytes memory
M8047 MXV11-A module	M8044 64K bytes memory
M8029 Floppy or Hard Disk Controller	M8047 MXV11-A module
ECL-3211 Controller	M8029 Floppy or Hard Disk Controller
ECL-3211 Map	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 BA11-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 BA11-NE Expander Box.

2. Connect ribbon cable marked 'CONTROL' to the ECL-3211
   control module in the BA11-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:

<div align="center">

LOAD   READY   FAULT   WRITE
PROT
</div>

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.

<div align="center">

1-8
</div>

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 AUTOMAT-
       ICALLY 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 BA11-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 BA11-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.

RED STRIPE

BCO5L—15

BC 20N—05

VT100

PORT *1

BA11-NE
EXPANDER
BOX

M7270
M8044
M8047
M8029

RXO2

COMM

ON 1

OFF Ø

CONTROL
MAP

ON
OFF

ON
OFF

KEYBOARD

COILED CABLE

AC

AC

RED STRIPE
(MAP BD)

AC

DC POD
POWER CORD

POD

TARGET CABLE
WITH
SOCKET PLUG
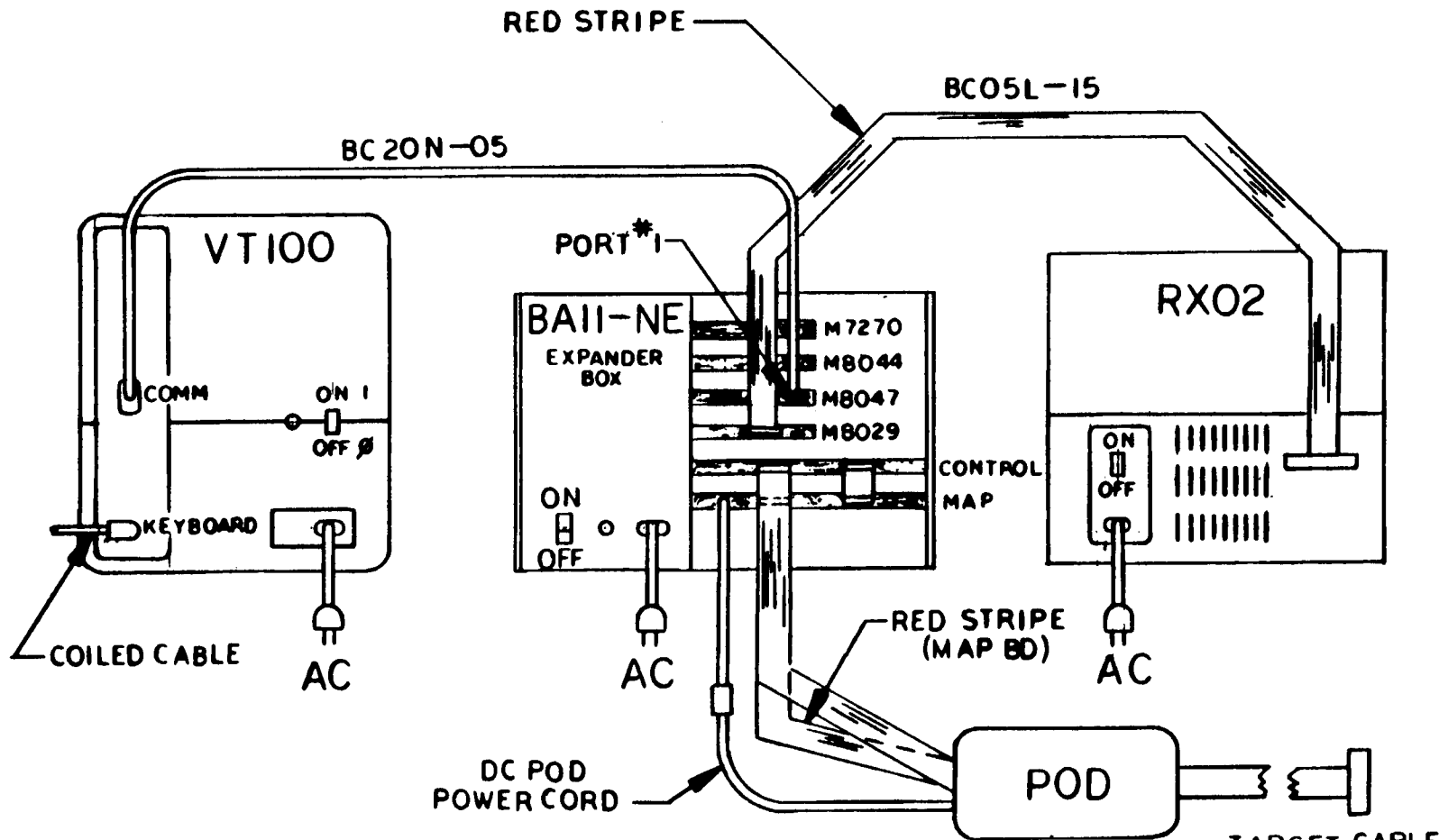
FIGURE A

3211—BA SYSTEM
(11/02 WITH RXO2)

1—10a

RED STRIPE

BC05L-15

BC20N-05

VT100

PORT #1

BA11-NE

EXPANDER BOX

M8186
M8044
M8044
M8047
M8029

CONTROL MAP

RXO2

COMM

ON 1
OFF 0

KEYBOARD

ON
OFF

ON
OFF

COILED CABLE

AC

AC

AC

RED STRIPE (MAP BD)

DC POD POWER CORD

POD

TARGET CABLE WITH SOCKET PLUG
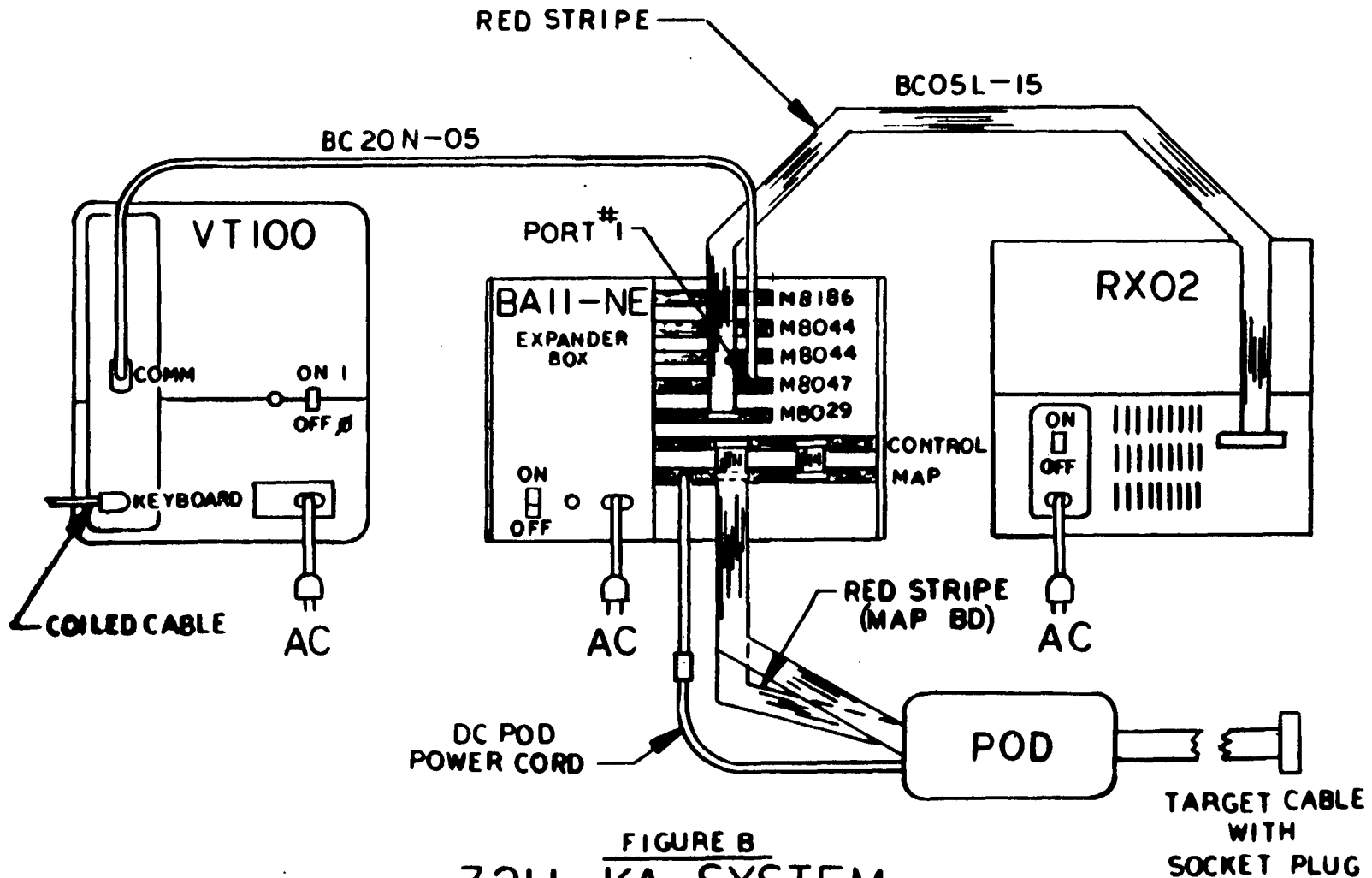
FIGURE B
3211-KA SYSTEM
(11/23 WITH RXO2)

1-10b

BC80M-06

RLO2

TERMINATOR

BC20N-05

VT100

PORT #1

COMM

ON I

OFF Ø

BA11-NE

EXPANDER BOX

M8186
M8044
M8044
M8047
M8029

M8061
CONTROL
MAP

BC80M-06

RLO2

KEYBOARD

ON

OFF

O

COILED CABLE

AC

AC

RED STRIPE
(MAP BD)

AC

DC POD
POWER CORD

POD

ON
OFF

AC

TARGET CABLE
WITH
SOCKET PLUG
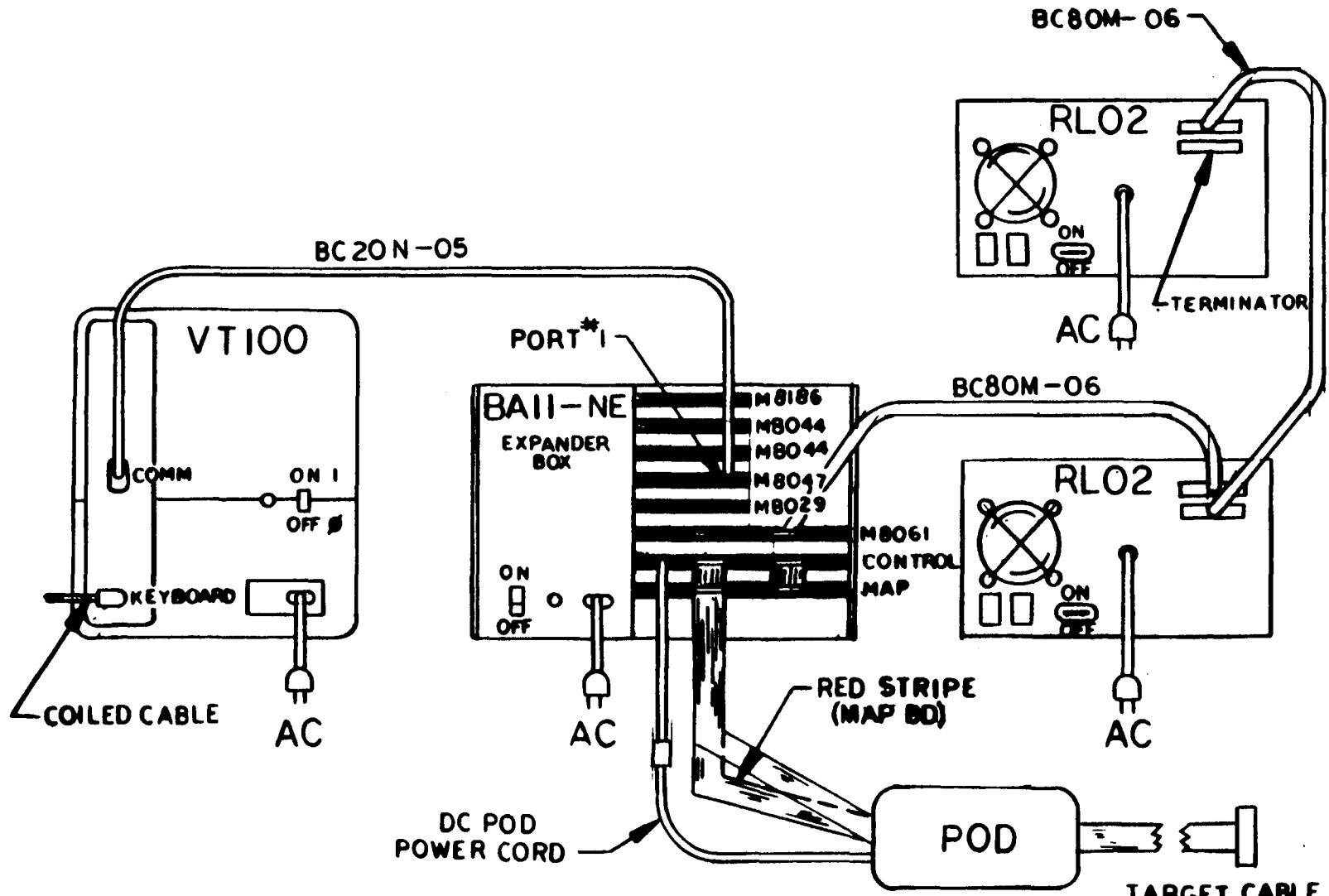
FIGURE C
3211-MA SYSTEM
(11/23 WITH RLO2)

1-10c

HANDLE TO RLO2
LID

RXO2

Ø   1

DISK DRIVE Ø
(DYØ)

RLO2

| LOAD | O READY | FAULT | WRITE PROT |
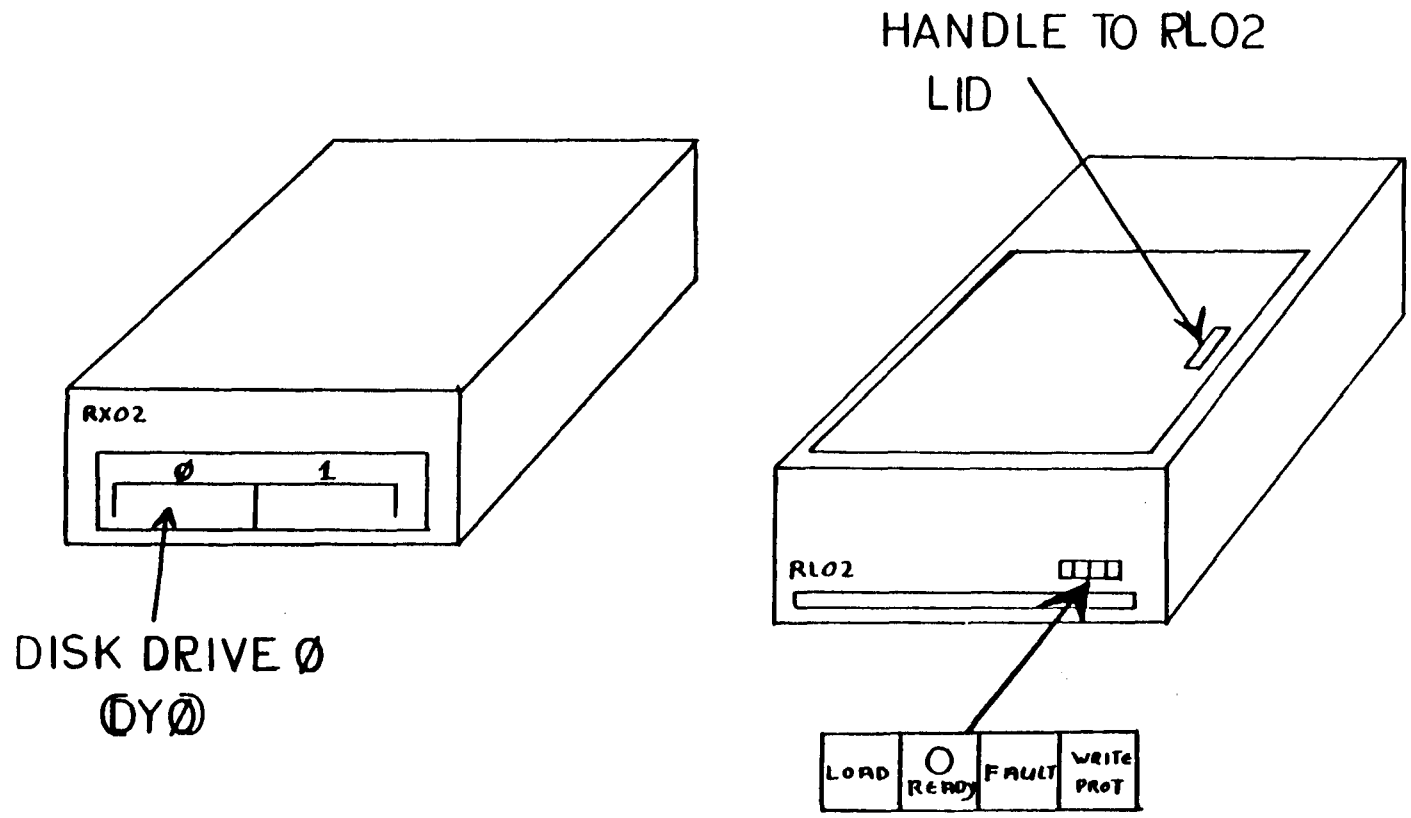
FIGURE D
RXO2 AND RLO2
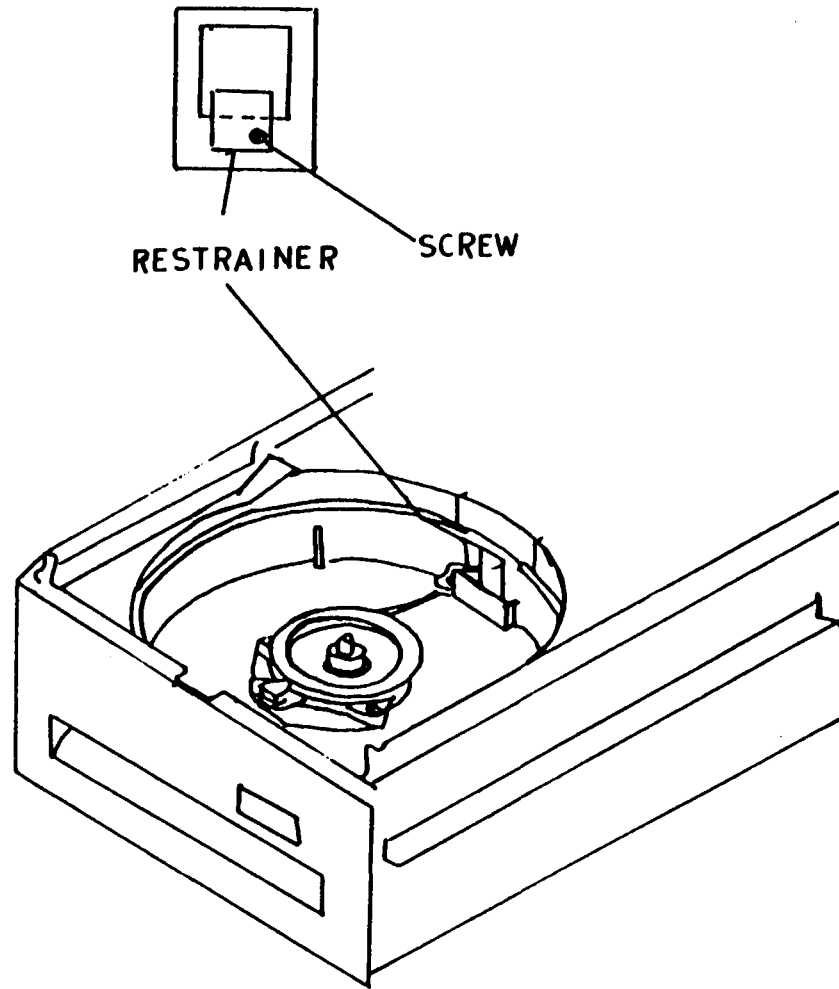
RESTRAINER   SCREW

FIGURE E

RLO2 HEAD RESTRAINER

1-10e

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 initalized 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 evey 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 shippment. 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 DISKETTESS 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 initalization:

      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 refered 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 RLO2 DRIVE

If you system has only one RLO2 mass storage unit, use the following
procedure for initialization:

> 1. Insert the disk contianing the RT-11 system in the
>   RLO2.
>
> 2. Type in the portion of the following dialogue contained
>   within quotes. Do not type in the quotes:
>
>   .'INITIALIZE/WAIT/BADBLOCKS DLO<cr>'
>
>   DYO:/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 initilaized, and if necessary, formatted.
See the sections above on fromatting and initialization for detials 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 RLO2 UNIT

For convenience, it is recommended that users with only one RLO2 mass
storage unit make backups on a floppy diskette if possible.

When making a copy using a system with only one RLO2 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 RLO2 drive.

        2. Wait for the sytem to boot up automatically. Then
            type in the portion of the following dialogue contained
            with in 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 DYO 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 RLO2 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 RLO2 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
    contianed wthin 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 diectory
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) ALPHANUMBERIC
      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 reguarding Pod
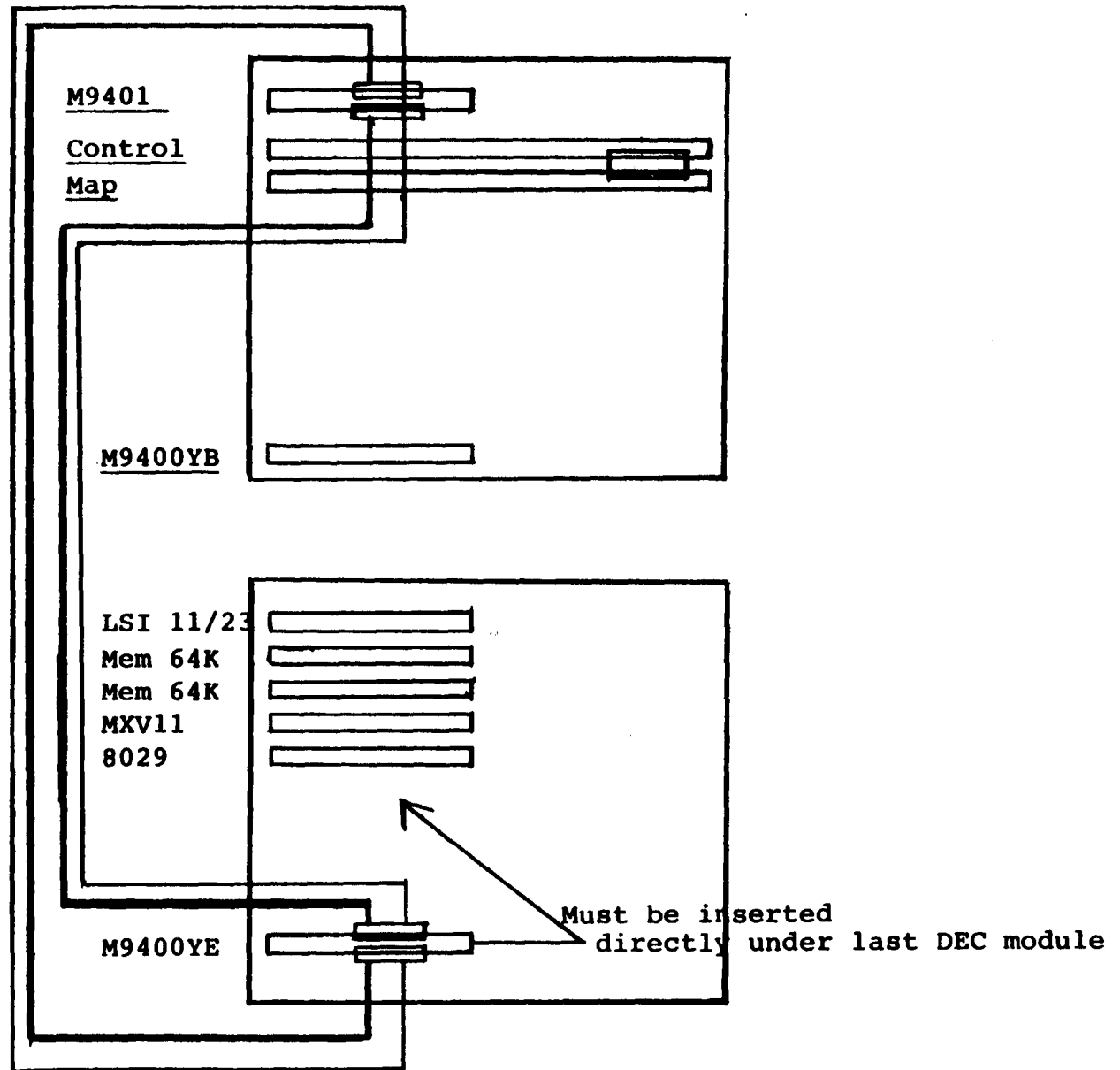cabeling, other equipment, and power up.

M9401

Control
Map

M9400YB

LSI 11/23
Mem 64K
Mem 64K
MXV11
8029

M9400YE

Must be inserted
directly under last DEC module

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

        M7270 CPU (LSI 11/2)            M8186 CPU (LSI 11/23)
        M8044 64K bytes memory          M8044 64K bytes memory
        M8047 MXV11-A module            M8044 64K bytes memory
        M8029 Floppy or Hard            M8047 MXV11-A module
             Disk Controller           M8029 Floppy or Hard
        ECL-3211 Controller                 Disk Controller
        ECL-3211 Map                   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

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 BA11-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 memo-
   ry board or boards and making cable connections. The boards are
   designed to mount in the upper right-hand slots of the BA11-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 recon-
   nect 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 BA11-NE expander box.

2. ( )   Remove the power cord from the A/C source.

3. ( )   Position the BA11-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 BA11-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 Fig-
           ure 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 COR-
   RECT 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 con-
           nector 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 DIREC-
 TIONS 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 con-
        nectors.

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 emu-
    lator 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 BA11-NE. REMOVE ANY FOAM OR
    DEBRIS FROM THE EMULATOR PLUG BEFORE CONTINUING.

14. ( )   Plug the power cord of the BA11-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 veritcal.

28. ( )   Turn the BA11-NE expander box back to its normal position.

This concludes the installation of Emulogic high-speed memory.