TLS-350 Series

Board and Software Replacement
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Introduction

This manual contains instructions for replacing the following components in

- CPU board
- ECPU board
- CPU PROMs
- ROM and RAM boards (ECPU)
- ECPU board E² integrated circuit
- CPU board backup battery
- ECPU board backup battery
- CPU and ECPU board software module
- Upgrading CPU board software from Version 1 to Version 2
- NVMEM board (ECPU)

This manual does not provide troubleshooting information.

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

**Level 1** Contractors holding valid Level 1 Certification are approved to perform wiring and conduit routing, equipment mounting, probe and sensor installation, tank and line preparation, and line leak detector installation.

**Level 2/3** Contractors holding valid Level 2 or 3 Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root Tank Monitoring Systems, including Line Leak Detection and associated accessories.

Warranty Registrations may only be submitted by selected Distributors.

Related Manuals

576013-879   TLS-3XX Series Consoles Site Prep Manual

Before You Begin

Before you begin component replacement, read the following guidelines:

- To avoid electrical shock, be sure AC power to the console is Off when performing the procedures in this manual.

- Failure to comply with these requirements could result in death, serious personal injury, property loss, or equipment damage.
Safety Precautions

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions.

**ELECTRICITY**
High voltage exists in, and is supplied to, the device. A potential shock hazard exists.

**TURN POWER OFF**
Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.

**INJURY**
Careless or improper handling of tools can cause bodily injury.

**STATIC SENSITIVE COMPONENTS**
Wear grounded anti-static wrist strap before handling the printed circuit board.

**READ ALL RELATED MANUALS**
Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

---

**WARNING**
This system operates on 115 VAC power. Serious injury or death from electrical shock could occur if the power ON/OFF warnings in this manual are not heeded.

1. Read and follow all instructions in this manual, including all safety warnings.
2. Remove rings from hands, metal watch bands and bracelets, and loose hanging neck jewelry before performing these procedures.
3. Do not modify or use service parts other than those provided by .

---

**Precautions Against Static Electricity**

Before removing electronic components from their antistatic bags read the following static electricity precautions.

1. Before handling any components, discharge your body’s static electric charge by touching a grounded surface.
2. Do not remove parts from their antistatic bags until you are ready to install them.
3. Do not lay parts on the antistatic bags! Only the insides are antistatic.
4. When handling parts, hold them by their edges and their metal mounting brackets.
5. Avoid touching components or edge connectors that plug into slots.
6. Never slide parts over any surface.
7. Avoid plastic, vinyl, and styrofoam in your work area.

8. Wear the antistatic wrist strap included in your component replacement kit.

9. The antistatic caution icon shown to the left appears in several places in this manual to remind you to wear an antistatic wrist strap (Part No. 576013-908) when handling static sensitive devices.

**Before Turning Off Power - All Procedures**

1. If you have a printer and it is usable, from the Operations Mode press the PRINT key to print out a copy of the system status [active alarms (if any), and in-tank inventory].

2. From the Setup Mode press the PRINT key to print out a copy of the system setup.

3. From the Diagnostic Mode press FUNCTION then PRINT for each of the Diagnostic Mode functions to print out copies of all of the system diagnostic reports.
Replacing the CPU Board

**Important!** All operating, setup and historical data will be lost when the console is turned off and the CPU board is replaced.

Switch Off power to console. Open the left front door of the Console and locate the CPU board [Figure 1].

4. Follow the steps in Figure 2 to remove the CPU board.
5. Place old and new CPU boards side by side on a clean work surface. Make sure the Battery Backup switches on both boards are in the Off position. Remove the SEM (see Figure 17 on page 29) and the PROM chips (see page 17) from the old CPU board and plug them into the identical sockets on the new CPU board.
6. Install the new CPU board by following the steps in Figure 3.

---

**Figure 3. Installing the CPU Board**

1. Attach one end of the antistatic wrist strap to your left wrist and adhere the other end to the comm board cage. With your right hand, hold the ribbon cables out of the way. Holding the CPU board in your left hand as shown, slide the board around the Comm Board cage and straight back into top and bottom guide slots. Place your thumbs on the front edge of the board at the top and bottom and push the board firmly toward the back of the console to seat the board connector in the motherboard connector.

2. Push board down onto each retention pin until it snaps through board (3 places).

3. Connect cables:
   - Top 16-pin cable from display to CPU board J10
   - Middle 16-pin cable from keyboard to CPU board J9
   - 6-pin cable from printer to J1 on the Local Printer Com Board. Pin 1 is identified by the number 1 screened on the surface of the board. Look at the connector on the end of the ribbon cable. On one side you will see embossed socket numbers 1 through 6. Orient connector so that the #1 socket is aligned over the #1 pin of the board connector before attaching it. (See diagram below for additional printer connection information.)

4. Push S2 down to turn battery backup OFF.

---

**Connect cables:**

- Top 16-pin cable from display to CPU board J10
- Middle 16-pin cable from keyboard to CPU board J9
- 6-pin cable from printer to J1 on the Local Printer Com Board. Pin 1 is identified by the number 1 screened on the surface of the board. Look at the connector on the end of the ribbon cable. On one side you will see embossed socket numbers 1 through 6. Orient connector so that the #1 socket is aligned over the #1 pin of the board connector before attaching it. (See diagram below for additional printer connection information.)

**Correct Printer Connector Orientation**

Make sure that tabs of the ribbon cable connector face the locking ridge of board connector J1 as you push the connector down over J1’s pins. (Check also that the locking ridge is centered between the tabs.)
Reentering System Setup Data

1. Restore AC power to the console.
2. The console front panel display will cycle through the following screens:

- CLEARING ALL RAM
- SYSTEM COLD START
- SYSTEM SELF TEST
- SYSTEM STARTUP COMPLETE

Wait until the printer prints:

*** SYSTEM RESET ***
MMM DD, YYYY HH:MM XM

and the front panel display reads:

MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF

3. Push the CPU board’s Battery Backup Switch (S2) up (ON).
4. Press the ALARM/TEST key to acknowledge the alarm. The printer prints:

MMM DD, YYYY HH:MM XM

SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL

and the front panel display reads:

MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL

5. Reenter the system setup data following the procedure outlined in your console System Setup manual while referencing the system setup data print-out and/or other setup information you have.
Replacing the ECPU Board

Record the System Setup Into the EEPROM Chip

1. If possible, from the Setup Mode press the FUNCTION key until the display reads:

   ![ARCHIVE UTILITY PRESS <STEP> TO CONTINUE]

2. Press the STEP key until the display reads:

   ![ARCHIVE UTILITY SAVE SETUP DATA: NO]

3. Press the CHANGE key:

   ![ARCHIVE UTILITY SAVE SETUP DATA: YES]

4. Press the ENTER key:

   ![SAVE SETUP DATA: YES PRESS <STEP> TO CONTINUE]

5. Press the STEP key:

   ![SAVE SETUP DATA: YES ARE YOU SURE?: NO]

6. Press the CHANGE key:

   ![SAVE SETUP DATA: YES ARE YOU SURE?: YES]

7. Press the ENTER key:

   ![ARE YOU SURE?: YES PRESS <STEP> TO CONTINUE]

8. Press the STEP key and the printer prints:

   ![ARCHIVE UTILITY SAVE SETUP DATA: START TIME: MMM DD, YYYY HH:MM:SS XM]

   And the front panel display reads:

   ![ARCHIVE UTILITY SAVE SETUP DATA: BUSY]
9. The console is now writing the current system setup to the EEPROM (E²) chip. After this task is completed, the printer prints:

```
ARCHIVE UTILITY
SAVE SETUP DATA:
END TIME:
MM DD, YYYY HH:MM:SS XM
BYTES: XXXX
```

And the front panel display reads:

```
ARCHIVE UTILITY
PRESS <STEP> TO CONTINUE
```

**Removing the ECPU Board**

**Important!** All operating, setup and historical data will be lost when the console is turned off and the ECPU board is replaced.

1. Switch Off power to the Console. Open the left front door of the console. Follow the steps in Figure 4 to remove the ECPU board.
1. Place old and new ECPU boards side by side on a clean work surface. Make sure that the Battery Backup switches on both boards are turned Off.
Removing the ECPU Board

Component leads pass through holes in the board and are soldered on the back side.

**Figure 5. ECPU Board Layout with Through-Hole Mounted Components**

**Figure 6. ECPU Board Layout with Surface Mounted Components**
2. Using a chip removal tool similar to the one shown (IC Extraction tool, Digikey Part No. K158-ND, or equivalent), follow the steps outlined in Figure 8 remove the E² chip from the old ECPU board and install it in the identical socket on the new board reversing the procedure shown in Figure 8. Observe chip orientation as shown in Figure 9.
3. Remove the SEM chip from the old board and install it in the SEM socket of the new board (ref Figure 17 on page 29). Note: Either type SEM will only plug in one way.

Remove the ROM board from the old ECPU board and install it on the new board (ref Figure 15 on page 21). If present, also remove the RAM or NVMEM board from the old ECPU board and install it on the new board (see Figure 15 on page 21 or Figure 20 on page 33 as appropriate).
Installing the ECPU Board

1. Install the new ECPU board in the console following the steps outlined in Figure 10.

- **Step 1**: Attach one end of the antistatic wrist strap to your left wrist and adhere the other end to the comm board cage. With your right hand, hold the ribbon cables out of the way. Holding the ECPU board in your left hand as shown, slide the board around the Comm Board cage and straight back into top and bottom guide slots. Place your thumbs on the front edge of the board at the top and bottom and push the board firmly toward the back of the console to seat the board connector in the motherboard connector.

- **Step 2**: Push board down onto each retention pin until it snaps through board (three places).

- **Step 3**: Connect cables:
  - Top 16-pin cable from display to ECPU board J3
  - Middle 16-pin cable from keyboard to ECPU board J4
  - 6-pin cable from printer to ECPU board J6 (see below for additional printer connection information)

- **Step 4**: Push SW1 down to turn battery backup OFF.

*Figure 10. Installing the ECPU Board*
Restoring System Setup Data

1. With the console’s left front door open, restore AC power to the console.

2. The console front panel display will cycle through the following screens:

   CLEARING ALL RAM

   SYSTEM COLD START

   SYSTEM SELF TEST

   SYSTEM STARTUP COMPLETE

   Wait until the printer prints:

   *** SYSTEM RESET ***
   MMM DD, YYYY HH:MM XM

   and the front panel display reads:

   MMM DD, YYYY HH:MM:SS XM
   RESTORE SETUP DATA: NO

3. Push the Battery Backup switch (SW1) up to the ON position.

4. Press the CHANGE key:

   MMM DD, YYYY HH:MM:SS XM
   RESTORE SETUP DATA: YES

5. Press the ENTER key:

   RESTORE SETUP DATA: YES
   PRESS <STEP> TO CONTINUE
6. Press the STEP key and the printer prints:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
START TIME:
MMM DD, YYYY HH:MM XM
```

The console begins the restoring process of copying the system setup data you archived in the E2 chip into the new ECPU board's RAM. Depending on how complicated your system setup data is, this procedure could last for several minutes. When the restoring process is complete the printer prints out:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
END TIME:
MMM DD, YYYY HH:MM XM
SYSTEM SETUP
MMM DD, YYYY HH:MM XM
```

This information is followed by a complete printout of the system setup. The front panel display should read:

```
MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF
```

7. Press the ALARM/TEST key to acknowledge the alarm. The printer prints:

```
MMM DD, YYYY HH:MM XM
SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL
```

And the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

8. Close and secure the left front door.

9. If necessary, refer to your System Setup manual to make any corrections or additions to your system setup. It is good practice to archive your system setup to the E2 chip after you have made any additions or corrections to the setup (see "Reentering System Setup Data" on page 7, for this procedure).
Replacing PROM Chips on A CPU Board

**Important!** All operating, setup and historical data will be lost when the console is turned off and the PROM chips are replaced.

**Replacing PROM Chips**

1. Open the left front door of the console. Remove AC power from the console and push the Battery Backup switch down to the OFF position. Refer to Figure 1 on page 4 to locate the CPU board.

2. If you want to remove the CPU board before replacing the PROMs, follow the board removal procedure in “Replacing the CPU Board” on page 4.

3. Refer to Figure 11 on page 17 and Figure 12 on page 17 to locate the PROM chips on the CPU board.

![Figure 11. Through-Hole Component Layout Version of the CPU Board](image1.png)

![Figure 12. Surface-Mount Component Layout Version of the CPU Board](image2.png)
4. Attach one end of the antistatic wrist strap around your wrist and adhere the other end to the base of the console.

5. On each PROM chip is a label with the part number and its circuit board position (U2 or U3). The PROM labeled U2 must go in the socket labeled U2, and the PROM labeled U3 must go in the socket labeled U3 (the socket labels are printed on the board). The console will not function if these PROMs are reversed.

6. Follow the procedure in Figure 13 to remove the old PROM chips and replace them with the new ones.

---

**Figure 13.** Removing and Installing PROM chips on the CPU Board
Restoring System Setup

7. Restore AC power to the console.

8. The front panel display will cycle through the following screens:

   - CLEARING ALL RAM
   - SYSTEM COLD START
   - SYSTEM SELF TEST
   - SYSTEM STARTUP COMPLETE

   At this point the printer prints:
   
   *** SYSTEM RESET ***  
   MMM DD, YYYY HH:MM XM

   and the front panel display reads:
   
   MMM DD, YYYY HH:MM:SS XM  
   BATTERY IS OFF

9. Push the CPU board's Battery Backup Switch (S2) up (ON).

10. Press the ALARM/TEST key to acknowledge the alarm. The printer prints:

    MMM DD, YYYY HH:MM XM
    SYSTEM STATUS REPORT
    ALL FUNCTIONS NORMAL

    and the front panel display reads:
    
    MMM DD, YYYY HH:MM:SS XM  
    ALL FUNCTIONS NORMAL

11. Reenter the system setup data following the procedure outlined in the console System Setup manual while referencing the System Setup printout.
Replacing ROM and RAM Boards on the ECPU Board

Archiving the System Setup

Follow the procedure “Record the System Setup Into the EEPROM Chip” on page 8.

Replacing the ROM or RAM Board

1. Switch Off power to the console. Open the front door of the console and locate the ECPU board Figure 4 on page 10.

2. Figure 14 shows the layout of a ROM and the two RAM boards (version with jumper J2 is out of production).

Figure 14. ROM and RAM Board Component Layouts
3. Follow the instructions in Figure 15 to install or replace a ROM or a RAM board. When adding or replacing a RAM board, read the note about J2 in Figure 14 on page 20.

![Figure 15. Removing and Installing a ROM or RAM Board](console/romin.png)

**Restoring System Setup**

1. Restore AC power to the console.

2. The front panel display cycles through the following screens:
3. Push the Battery Backup switch (SW1) up to the ON position.

4. Press the CHANGE key:

```
MMM DD, YYYY HH:MM XM
```

5. Press the ENTER key:

```
RESTORE SETUP DATA: YES
PRESS <SETUP> TO CONTINUE
```

6. Press the STEP key and the printer prints:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
START TIME:
MMM DD, YYYY HH:MM XM
```
The console begins the process of copying into the new RAM board, the system setup data you archived in the E² chip. Depending on how complicated your system setup data is, this procedure could last for several minutes. When the restoring process is complete the printer prints:

```
ARCHIVEUTILITY
RESTORE SETUP DATA
END TIME:
MMM DD, YYYY HH:MM XM
SYSTEM SETUP
MMM DD, YYYY HH:MM XM
```

This information is followed by a complete printout of the system setup.

The front panel display should read:

```
MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF
```

7. Press the ALARM/TEST key to acknowledge the alarm:

The printer prints:

```
MMM DD, YYYY HH:MM:SS XM
SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL
```

And the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

8. Close and secure the left front door.

9. If necessary, refer to your System Setup manual to make any corrections or additions to your system setup. [It is good practice to always archive your system setup after you have made any additions or corrections to it (see “Record the System Setup Into the EEPROM Chip” on page 8, for this procedure).]
Replacing the EEPROM Chip

This procedure assumes you are changing the EEPROM (E²) chip, but not the ECPU board.

1. Switch Off power to the console. Open the left front door of the console and locate the ECPU board [reference Figure 4 on page 10].
2. Remove the ECPU board following the instructions in “Removing the ECPU Board” on page 9 with one exception - DO NOT turn the Battery Backup switch OFF as instructed in that procedure.
3. Locate the E² chip on your ECPU board [see Figure 5 on page 11, Figure 6 on page 11, and Figure 7 on page 12 for the three possible ECPU board layouts].
4. Remove the E² chip following the instructions shown in Figure 8 on page 12.
5. Replace the E² chip following the instructions shown in Figure 9 on page 13.
6. Replace the ECPU board following the instructions shown in Figure 10 on page 14 with one exception. The exception is that you can ignore step 4 since you did not turn off battery backup when you removed the board.
7. Restore AC power to the console.
8. The display will cycle through the following screens:

   - SYSTEM WARM START
   - SYSTEM SELF TEST
   - SYSTEM STARTUP COMPLETE

   At this point front panel display reads:

   - MMM DD, YYYY HH:MM:SS XM
   - ALL FUNCTIONS NORMAL

9. You should archive the current system setup data in the blank E² chip following instructions in “Record the System Setup Into the EEPROM Chip” on page 8.
10. Close and secure the left front door.
Replacing the CPU/ECPU Board's Battery

CPU Board

**Important!** All operating, setup and historical data will be lost when the console is turned off and the battery is replaced.

1. Remove the CPU board following the instructions beginning on page 4. Push the Battery Backup switch (S2) down to the OFF position.
2. Locate battery BT1 on the CPU board layout in Figure 11 on page 17 or Figure 12 on page 17 as appropriate.
3. Following the instructions in Figure 16, pull off the battery cover and replace the battery. Replace CPU board following instructions in Figure 3 on page 6.

![Figure 16. Replacing Battery](image)

Reentering the System Setup

1. Restore AC power to the console.
2. The console front panel display will cycle through the following screens:

   **CLEARING ALL RAM**
At this point the printer prints:

```
*** SYSTEM RESET ***
MMM DD, YYYY HH:MM XM
```

and the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF
```

3. Push the CPU board’s Battery Backup Switch (S2) up (ON).

4. Press the ALARM/TEST key to acknowledge the alarm. The printer prints

```
MMM DD, YYYY HH:MM XM
SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL
```

and the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

5. Close and secure the left front door.

6. Reenter the system setup data following the procedure outlined in the console System Setup manual while referencing the system setup printout.
Replacing the ECPU Board’s Battery

ARCHIVING THE SYSTEM SETUP
Follow the instructions to “Record the System Setup Into the EEPROM Chip” on page 8.

REPLACING THE BATTERY
1. Remove the ECPU board following the instructions beginning on page 8. Make sure the Battery Backup switch (S1) is in the OFF position.
2. Locate battery BT1 on the ECPU board layout in Figure 5 on page 11 (battery’s location is similar on all ECPU board types).
3. Following the instructions in Figure 16 on page 25, pull off the battery cover and replace the battery. Replace ECPU board following instructions in Figure 10 on page 14.

RESTORING THE SYSTEM SETUP
1. Restore AC power to the console.
2. The console front panel display will display the following screens:
   - CLEARING ALL RAM
   - SYSTEM COLD START
   - SYSTEM SELF TEST
   - SYSTEM STARTUP COMPLETE

   At this point the printer prints:
   *** SYSTEM RESET ***
   MMM DD, YYYY HH:MM XM

   and the front panel display reads:
   MMM DD, YYYY HH:MM:SS XM
   RESTORE SETUP DATA: NO
3. Push the Battery Backup switch (SW1) up to the ON position.
4. Press the CHANGE key:

```
MMM DD, YYYY HH:MM:SS XM
RESTORE SETUP DATA: YES
```

5. Press the ENTER key:

```
RESTORE SETUP DATA: YES
PRESS <SETUP> TO CONTINUE
```

6. Press the STEP key and the printer prints:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
START TIME:
MMM DD, YYYY HH:MM:SS XM
```

7. The console begins restoring the system setup data you archived earlier. Depending on how complicated your system setup data is, this procedure could last for several minutes. When the restoring process is complete the printer prints:

```
ARCHIVE UTILITY
RESTORE SETUP DATA
END TIME:
MMM DD, YYYY HH:MM:SS XM
SYSTEM SETUP
MMM DD, YYYY HH:MM XM
```

8. This information is followed by a complete printout of the system setup. The front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF
```

9. Press the ALARM/TEST key to acknowledge the alarm. The printer prints:

```
MMM DD, YYYY HH:MM:SS XM
SYSTEM STATUS REPORT
ALL FUNCTIONS NORMAL
```

10. And the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

11. Close and secure the left front door.
Replacing the SEM Module on CPU/ECP Board

1. Remove AC power to the console.
2. Open the front door of the console and locate the CPU board [Figure 1 on page 4] or ECP Board [Figure 4 on page 10].
3. Locate the Software Enhancement Module (SEM) on your CPU board [Figure 1 on page 17] or ECP Board [Figure 5 on page 11]. The SEM is in the same general area of all CPU/ECP Board types.
4. Replace the SEM as shown in Figure 17. Note: Either type SEM will only plug in one way.

5. Restore AC power to the console. The display will cycle through the following screens:

   - SYSTEM WARM START
   - SYSTEM SELF TEST
   - SYSTEM STARTUP COMPLETE
At this point the front panel display reads:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

### Verifying New System Features

1. Press the MODE key until the front panel display reads

```
DIAG MODE
PRESS <FUNCTION> TO CONT
```

2. Press the FUNCTION key until the front panel display reads:

```
SYSTEM DIAGNOSTIC
PRESS <STEP> TO CONTINUE
```

3. Print out a description of the software currently in your system. Press the PRINT key and the printer prints:

```
SOFTWARE REVISION LEVEL
VERSION XXX.XX
SOFTWARE# XXXXXX-XXX-XXX
CREATED - YY.MM.DD.HH.MM
S-MODULE# XXXXXX-XXX-X
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

4. After the SEM (S-Module) part number prints, a list of your system’s current features follows.

5. Press the MODE key to return to the main screen:

```
MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL
```

6. Close and secure the left front door.

7. Refer to the System Setup manual to program the new features you added.
Upgrading CPU Board Software from Version 1 to 2

**Important!** All operating, setup and historical data will be lost when the console is turned off and the PROM and RAM chips are replaced.

1. Remove AC power from the console. Open the left front door of the console and push the Battery Backup switch down to the OFF position. Refer to Figure 1 on page 4 to locate the CPU board.

2. Remove the CPU board following the board removal procedure in “Replacing the CPU Board” on page 4.

3. Refer to Figure 18 and locate the PROM (U3 & U4) and RAM chips (U4 & U5) on the CPU board. Note: Later releases of Version 1 may only have one RAM chip in U4.

4. Replace the 2 PROM chips following the instructions in “Replacing PROM Chips” on page 17.

5. With a small straight-slot screwdriver, pry one end of the existing RAM chip or chips up and remove them from their sockets.

6. Take the single replacement Version 2 RAM chip and orient the notched end of the chip with the notched end of the U4 socket. Carefully position the chip pins in the socket holes and press it down until it rests on the socket base.

7. Perform a Cold Start following the instructions in “Restoring System Setup” on page 19.

---

**Figure 18. CPU Board RAM Chip Location**
Replacing an ISD NVMEM Board

1. Switch Off power to the console. Open the front door of the console and locate the ECPU board Figure 4 on page 10.

2. Figure 19 shows the general layout of the two types of ISD NVMEM boards.

3. The ISD NVMEM board is installed or removed as shown in Figure 20.
To Insert Board
Seat ISD NVMEM board in connector J1 at an angle with top side facing the front of the console. Make sure that notch in the bottom of the board is over ridge in base of connector, then push board back until retaining clips snap around the board’s edges. DON’T FORCE BOARD or you may damage socket! Check that notch and ridge are aligned correctly then try again.

First
Attach one end of an antistatic wrist strap to your wrist and the other end to the base of the console.

To Remove Board
Removing ISD NVMEM Board - Use your fingers to spread retaining clips away from the board’s edges, tilt the board to the front of the console and lift it out.

Turn ac power to console OFF. Push SW1 down to turn battery backup OFF.
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