S E R V I C E   N O T E

SUPERSEDES: None

HP 37714A PDH/SDH/Jitter Test Set

Build Status: 1.00 and above

Replacing the Processor Assembly (CPU)

To be Performed by: Qualified Service Personnel

Parts Required

Description	HP Part Number	Quantity
Replacement Processor Board	37714-60004	01

Situation

This Service Note gives information on parts and instructions required when changing a processor on the HP 37714A

Action

When changing the processor order the appropriate part from the table above and use the following procedure to fit.

Continued

DATE: October 1996

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

INFORMATION ONLY

AUTHOR:	ENTITY:	ADDITIONAL INFORMATION:
DBG	E610	

HEWLETT® **PACKARD**

Procedure

Use these instructions when fitting a new CPU Board Assembly into an HP 37714A

The instructions cover the following;

- Fitting some special parts from the old CPU Assembly onto the new CPU Assembly.

These parts need to be tranferred as they are not shipped with the new assembly.

- Initializing the new CPU data storage eeprom.

- Entering the instrument serial number and a list of all the firmware options fitted.

This needs to be done because this data is stored in the above eeprom on old CPU Assembly which cannot be transferred to the new CPU Assembly.

- Setting the current time and date.

This must be done for the calibration to run and timestamp correctly.

- Recalibrating the 10 MHz Reference Oscillator and VCX0.

This needs to be done because this data is stored in the above eeprom on old CPU Assembly which cannot be transferred to the new CPU Assembly.

CAUTION

This procedure should only be carried out by qualified Service Personnel. Anti-static precautions must be observed at all times. - Use the anti-static wrist-strap provided in this kit if an anti-static work-area conforming to Corporate Standard 741.808 is unavailable.

Remove the old CPU Assembly as follows:

1. Switch off the instrument and disconnect the power cord and any interconnecting cables.

2. Place the instrument face down on the workbench.

3. Remove the 4 screws securing the rubber feet to the rear panel.

4. If Optical Modules are fitted (option UH1 or UH2) unscrew the optical shield from the input and output connectors.

5. Withdraw the outer cabinet sleeve back and out of the instrument.

6. Remove the two clamp screws on the top and bottom right-hand side of the chassis which secure the CPU module.

7. Withdraw the CPU Module using the two knobs to help with removal.

Transferring Parts and Fitting the New CPU Assembly.

The following parts need to be transferred from the CPU board on your old module;

- Metalwork - fit the Module Front Panel from the old CPU. This is retained to the board by two screws.

NOTE

If the RS232 or HP-IB board (37714-60015) is fitted, this will need to be removed to gain access to these two screws.

- A4 U14 - fit this 8-pin DIL IC from the old CPU board. It is fitted in a socket.

- ROM Drawer Runners - Fit the two plastic runners from the old CPU. These are located with two screws and nuts each.

- ROM Drawer - Fit the A5 ROM Drawer from the old CPU. It is recommended that new eeproms are fitted in this board. Refer to Service Note 37714A-02B or contact the HP QTO Division Product Support Engineer to find out the latest part numbers for these eeproms.

- NVM Battery - A new battery (HP part number 1420-0380) should be fitted. If not available, you may fit the old battery provided the voltage is greater than 3.55 volts - TAKE CARE TO GET THE POLARITY CORRECT.

Once all these parts have been fitted, check the switches on the new CPU Assembly are set as follows:

Assembly Description	Switch Number	Finger Number	Position
A4 Processor Assembly	SW1	1 & 2	Closed
A4 Processor Assembly	SW1	3 & 4	Open
A4 Processor Assembly	SW2	1,2,3,4,5,6,7	Closed
A4 Processor Assembly	SW2	8	Open
A15 HP-IB/RS232 As-semby	S1	1,2,3,4	see board
A5 ROM Drawer As-semby	S1	1	Open
A5 ROM Drawer As-semby	S1	2,3,4	Closed

After checking the switches, fit the new CPU Module into the rear slot in the instrument

VERY IMPORTANT PRECAUTION

Use Module Replacement Tool HP part number 03776-00024 (or a piece of THIN card 130mm x 130mm) when fitting the CPU module. See Figure 1.

Place this tool over the RFI strip on the module to the left side of the processor. This will prevent the RFI strip from being dislodged as the CPU module is inserted into the Mainframe. When the CPU is fully home, remove the module replacement tool (or cardboard).

Replace all other parts as a direct reversal of the removal procedure.

Eeprom Initialization.

1. Switch on the instrument and check for a valid power-up routine on the HP 37714A.

2. Make the following key sequence to obtain the MODULE DEBUG page on the HP 37714A.

Press [OTHER]; [<^]; [MORE]; [<^]; [MORE]; [<^]; [MORE]; [OTHER].

Press [MORE] until MODULE DEBUG appears in the softkey menu.

CAUTION

When using the MODULE DEBUG display only modify parameters shown below. Altering other parameters can cause damage to the instrument - prevent accidental damage by leaving the Module Debug Page after setting up.

3. Move the cursor to [EEPROM INITIALIZE] field and press initialize.

4. After a short time, [OFF] will be displayed beside the [EEPROM INITIALIZE] field indicating that the initialization is complete.

5. Press [OTHER] key to exit the MODULE DEBUG page.

Internal Clock - Setting the Date and Time

Before performing calibration, you will need to set the HP 37714A internal clock to the correct time and date as this is used to log calibration information.

1. Switch on the instrument.

2. Press OTHER key, then [MORE] softkey until [TIME & DATE] softkey is displayed..

3. Press [TIME & DATE] softkey then move the cursor to CLOCK MODE.

4. Select [SETUP] then move the cursor to TIME. Set the clock to the correct time using [<],[>], and [INCREASE DIGIT], [DECREASE DIGIT] softkeys.

5. Move the cursor to DATE. Set the clock to the correct date using [<],[>], and [INCREASE DIGIT], [DECREASE DIGIT] softkeys.

6. Return the cursor to CLOCK MODE and press [RUN].

The HP 37714A internal clock is now set.

Restoring the Instrument Serial Number

The instrument serial number will need to be entered into the eeprom on the new CPU Assembly before the firmware options can be added.

Note

Restoring the serial number and options requires a special Codeword to be entered via the front panel. This Codeword is unique to every 37714A unit and can only be obtained by contacting the HP TNTD Product Support Engineer.

Enter the serial number by carrying out the following procedure.

1. Switch on the HP 37714A.

2. Make the following key sequence on the HP 37714A to obtain the OPTION ENABLE display.

   Press [OTHER]; [<^]; [MORE]; [<^]; [MORE]; [<^]; [MORE]; [OTHER].

   Press [MORE] until OPTION ENABLE appears in the softkey menu.

3. Press OPTION ENABLE softkey.

4. Move cursor down one place and select SERIAL NUMBER.

5. Move cursor down one place and enter the serial number (as shown on the rear panel label) using [<],[>], and [INCREASE DIGIT], [DECREASE DIGIT] softkeys.

6. Move cursor to CODEWORD field and insert the special codeword into this field using the [<],[>], and [INCREASE DIGIT], [DECREASE DIGIT] softkeys.

7. Move the cursor to TOGGLE TO SET OPTION field and enter the serial number by pressing the [SET OPTION] softkey. The display will flash momentarily and the message "Option Structure Changed" will be displayed. The unit will assume Default Settings.

Note

If an incorrect CODEWORD has been entered, the unit will freeze in the [OPTIONS ENABLE] page. If this happens, cycle the power by switching the HP 37714A off then on again. You can then re-enter the CODEWORD.

Restore the firmware options by carrying out the following procedure.

1. Return to FIRMWARE OPTION on the OPTION ENABLE page.

2. Enter the first option you need to restore (i.e US1).

3. Move cursor to CODEWORD field and insert the special codeword into this field using the [<],[>], and [INCREASE DIGIT], [DECREASE DIGIT] softkeys.

4. Move the cursor to TOGGLE TO SET OPTION field and enter the new option by pressing the [SET OPTION] softkey. The display will flash momentarily and the message "Option Structure Changed" will be displayed. The unit will assume Default Settings.

Note

If an incorrect CODEWORD has been entered, the unit will freeze in the [OPTIONS ENABLE] page. If this happens, cycle the power by switching the HP 37714A off then on again. You can then re-enter the CODEWORD.

5. Repeat steps 1 to 4 for each additional firmware option you need to add. Note that a different Codeword is required for each option.

Checking Firmware Options are Now Fitted.

After you have entered all the firmware options, check they have been correctly installed as follows;

6. Switch OFF the HP 37714A.

7. Press the OTHER key then [MORE] softkey until softkey labeled [OPTIONS] is displayed.

8. Press the [OPTIONS] softkey and ensure that the required option has now been added.

Calibration Procedures

NOTE

Carry out the following procedures only after fitting the new parts, initializing the CPU eeprom, setting the time and date, entering the serial number and restoring all firmware options.

Warm-Up Time

To ensure accuracy, the equipment must be switched on for a minimum of 30 minutes before carrying out these calibration procedures.

Calibration Sequence

The calibration should be performed in the sequence given below.

10MHz Reference Clock Frequency and VCXO Calibration

The 10MHz Reference Clock Source is calibrated by connecting to a Frequency Counter and adjusting within limits. The VCXO Calibration is automatic.

Equipment

Frequency Counter - HP 5335A Opt 001

10:1 Scope Probe - HP 10435A

Procedure

10 MHz Reference Clock Frequency

1. Select the CALIBRATION function on the OTHER display.

2. Select CALIBRATE PASSWORD and using the DECREASE DIGIT and INCREASE DIGIT softkeys set the password to [1243]

3. Select CALIBRATION ITEM : [10MHz] and MODE : [MANUAL].

4. Select FREQUENCY A and 1Mohm input impedance on the Counter.

5. Connect the Counter Input A via the 10:1 Divider Probe to TP14 on theHP 37714A CPU Assembly (A4). Ground the probe on TP7 (GND) on this assembly. These Test Points are accesible through a slot on the bottom of the instrument.

6. Adjust A4 R1 to obtain a reading of 10,000,000Hz on the counter.

7. Select the MEASURED FREQUENCY field on the HP 37714A display and enter the counter frequency reading using [INCREASE DIGIT] AND [DECREASE DIGIT] softkeys.

8. Disconnect the Counter.

VCXO Calibration

9. Select CALIBRATION : [VCXO's] and press RUN/STOP to start the calibration routine.

10. After approximately 5 minutes, the Calibration Complete message for each of the VCXO's should appear at the bottom of the HP 37714A display.

11. Disconnect all test equipment.

Testing

After the above calibration, ensure the instrument is operating correctly by carrying out all the selftests - see Calibation or Service Manual.

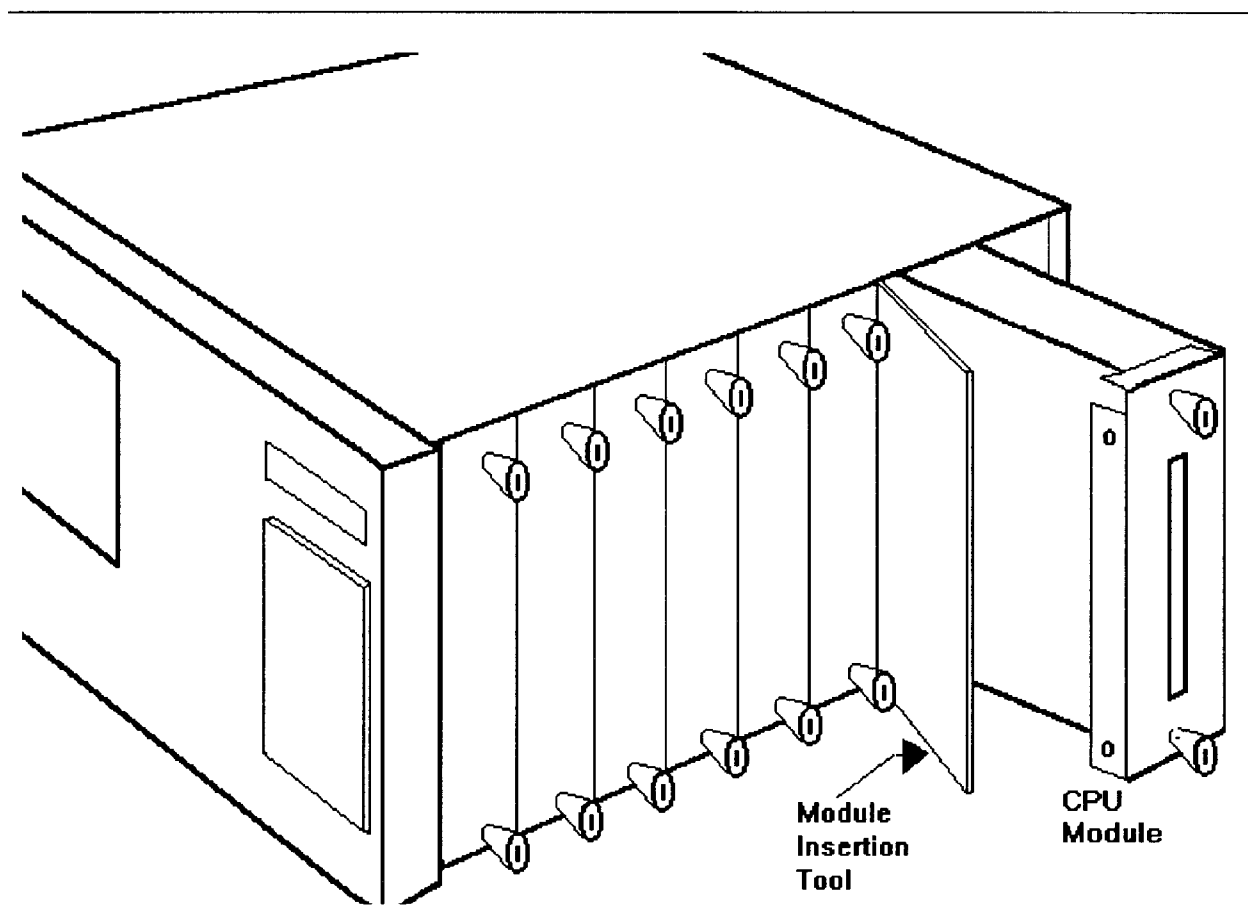When a pass has been obtained on all selftests the instrument is ready for use.

Figure 5. Position of Processor Module and Insertion Tool