FIELD CHANGE ORDER
Number CI780-R00D1

Applicability: Retrofit all Ci750s to Revision level "D1". Minimum acceptable Revision levels in spares stock are: L0101 Etch Revision "A", Part Revision "H1". This FCO Incorporates the following ECO: L0101-TW006

Problem/Symptoms: Functional problems discovered in VAX Cluster Testing:
1. CI780 did not conform to Architectural Specification, producing "Miscellaneous Errors Type 12 & 13 (%X "B & C")", in turn causing VMS CI-port Re-inits. Correction: Release of V4.0 CI Microcode.

Est. Time to Install 1 hour per node

Quick Check
See Page 2.

Compatibility/Prerequisite FCO:
Note: CI780-R00C1 is not a prerequisite.
This FCO includes CI780-R00C1. (20-Feb-85)

Special Tools or Test Equipment
See Page 2.

FCO Parts Information

<table>
<thead>
<tr>
<th>Order by FCO Kit #</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
</tr>
<tr>
<td>For:</td>
<td></td>
</tr>
<tr>
<td>CI780-R00C1</td>
<td></td>
</tr>
<tr>
<td>EQ-01344-01</td>
<td></td>
</tr>
<tr>
<td>EQ-01344-02</td>
<td></td>
</tr>
<tr>
<td>EQ-01344-03</td>
<td></td>
</tr>
<tr>
<td>FA-04625-01</td>
<td>1</td>
</tr>
<tr>
<td>For:</td>
<td></td>
</tr>
<tr>
<td>CI780-R00D1</td>
<td></td>
</tr>
<tr>
<td>EQ-01344-02</td>
<td></td>
</tr>
<tr>
<td>EQ-01344-03</td>
<td></td>
</tr>
<tr>
<td>FA-04625-01</td>
<td>1</td>
</tr>
</tbody>
</table>

EQ Kit Variation/System-Option Applic:

Approvals

<table>
<thead>
<tr>
<th>CSSE Engineer</th>
<th>F.S. Product Safety</th>
<th>F.S. Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andy Padla</td>
<td>John Freudenberg</td>
<td>Ed Duggan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responsible CSSE Mgr</th>
<th>F.S. Microfiche Libraries</th>
<th>Affected Population</th>
</tr>
</thead>
</table>
QUICK CHECK
-----------

This FCO changes the CI780 microcode in ROMs on the L0101 module, in the CI780.BIN file on Console FLOPPY and in SYS$MAINTENANCE. A Revision "D1" CI780 will have the following two (2) changes: (NOTE: A "halted" CPU can be easily verified: See APPENDIX B).

1. L0101 Module at PR-"H1": verify socketed ROM P/N in these IC’s:

<table>
<thead>
<tr>
<th>Location</th>
<th>Part #</th>
<th>Location</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>E76</td>
<td>23-271F3-00</td>
<td>E134</td>
<td>23-274F3-00</td>
</tr>
<tr>
<td>E95</td>
<td>23-270F3-00</td>
<td>E154</td>
<td>23-273F3-00</td>
</tr>
<tr>
<td>E114</td>
<td>23-269F3-00</td>
<td>E174</td>
<td>23-272F3-00</td>
</tr>
</tbody>
</table>

2. The console media must have REV-4 CI780.BIN on it. Under VMS-4.X, use DCL "SHOW CLUSTER/CONTINUOUS; ADD RP_REVIS" command to check for RAM/ROM version of "%X 00040003". APPENDIX A has further information for checking this file.

SPECIAL TOOLS
-------------

Field Service Tool Kit
Loopback Attenuators (12-19907-01)
EVGAA 1.4 AND EVGAB 1.3 (AS-T599E-DE) (Released Nov ’84)
ESCGA 1.1, ESCGB 1.0, ESCGC 1.1 and
ESCGD 1.0 (AS-T195B-DE) (Released Jan ’83)

**************************************************************************
*                                NOTE                                    *
*                                                                        *
*                                                                        *
Self-maintenance customers require a diagnostic license to get the ZE306-CY (which consists of AV-T637*-TE, AS-T644D-DE AS-T695D-DE). Documentation is available through the Maintenance Documentation Service (MDS).

EQ KIT ORDERING FLOW CHART
(see page 3 for Revision History)

(START)

V

+--------------------------+    YES
| IS THE CI780 AT REV. D1? |------------------+
|--------------------------+    YES
| IS THE CI780 AT REV. C1? |------------------+
|--------------------------+    YES
| IS THE CI780 AT REV. 01? |------------------+
|--------------------------+    YES
| IS THE CI780 AT REV. 00? |------------------+

ORDER EQ-01344-02 (11/780)
OR ORDER EQ-01344-03 (11/785)
(AS-T213G-ME CI780.BIN REV. 4)

V

ORDER EQ-01344-01

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 EA)</td>
<td>23-269F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>23-270F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>23-271F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>23-272F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>23-273F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>23-274F3-00</td>
<td>Microcode ROM</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>36-19208-01</td>
<td>Wire Marker &quot;I&quot;</td>
</tr>
<tr>
<td>(1 EA)</td>
<td>36-19209-08</td>
<td>Wire Marker &quot;H&quot;</td>
</tr>
</tbody>
</table>
Due to the rapid introduction of this FCO, the CI780-R-00C1 has not yet been completed. To make life easier, this FCO incorporates both CI780-R-00C1 and CI780-R-00D1. In doing this, the sites that have NOT yet upgraded their CI’s to revision "C1" need only one site visit to implement this FCO.

Reference the flow chart (page 3) to help you decide which EQ kits to order.

SECTION II - Upgrade procedure for Rev. "C1" to "D1" - Console Media only
This section must be applied to CI780’s at Rev "01" or "C1" to upgrade to Rev "D1": it installs the Rev-4 CI ucode on the console media. For CI’s at Rev "01" (CI ucode Rev-2), SECTION III must also be applied to complete the upgrade to Rev "D1". For CI’s at Rev "C1", only SECTION II is necessary.

1. Installation of CI780.BIN (EQ-01344-02 or EQ-01344-03).

   Copy CI780.BIN Revision 4 from the supplied floppy into your default account and then copy to the existing VAX-11/780 or VAX-11/785 system console floppy. Follow section "A" if running VMS 4.X or section "B" if running VMS 3.X.

A. CI780.BIN installation procedure using VMS V4.X

   Install the supplied media, run EXCHANGE and do the following commands.

   EXCHANGE>COPY   CSA1:CI780.BIN   CI780.BIN/TRANS=BLOCK
   EXCHANGE>EXIT

   $COPY  CI780.BIN  SYS$MAINTENANCE:CI780.BIN ;FOR DIAGNOSTICS

   Now, install the original console media. Run EXCHANGE and do the following command.

   EXCHANGE>DELETE   CSA1:CI780.BIN.

   Now copy the new CI780.BIN file out of your default directory onto the console with the following command:

   EXCHANGE>COPY   CI780.BIN/TRANS=BLOCK   CSA1:CI780.BIN

   When this is done, do another directory command to verify that the new CI_Ucode went onto the console. It should be 36 blocks in length.

   EXCHANGE>EXIT

   ******************************************************
   * IF YOU HAVE A REVISION "H1" L0101 AS DETERMINED    *
   ******************************************************
B. CI780.BIN installation procedure using VMS V3.X
-----------------------------------------------
Install the supplied console floppy. Run FLX and copy the
CI780.BIN file off the floppy with the following command:

FLX>/RS/IM=CS1:CI780.BIN/RT
FLX>CTRL <Z>

Install the current console floppy.
Run FLX again and delete the CI780.BIN file off of
the current console floppy with the following command:

FLX>CS1:CI780.BIN/RT/DE

Copy the new CI780.BIN file onto the current console floppy
with the following command:

FLX>CS1:/RT=CI780.BIN/RS/IM
FLX>CTRL <Z>

$COPY  CI780.BIN  SYS$MAINTENANCE:CI780.BIN ;FOR DIAGNOSTICS
2. Shutdown the system by executing the Shutdown Command Procedure.

3. Set the five-position keyswitch on the controller panel to the "OFF" position.

4. Set all Memory Power Supply Switches to the "OFF" position. The memory power supplies can be identified by the label "Memory Power Supply" affixed to the top of the H7100s which are used for that purpose.

5. Set the circuit breaker CB1 on the 869D power controller to the "OFF" position in the CPU cabinet and SBI expander cabinets, if applicable.

6. Disconnect all four BNCIA cables for this VAX-11/780 node at the SC008. Using the loopback attenuators connect:
   - Transmit Path "A" (TA) to Receive Path "A" (RA)
   - Transmit Path "B" (TB) to Receive Path "B" (RB)

****************************************************************
*                                                             *
*                        C A U T I O N                          *
*                                                             *
*       The L0101 module, as all VAX 11/780 modules,           *
*       contains electrostatic discharge sensitive            *
*       devices (ESDS). The use of the VELOSTAT kit           *
*       is essential to prevent damage which may not          *
*       be noticed immediately.                              *
*                                                             *
7. Set up VELOSTAT KIT

   a. Unfold the VELOSTAT mat to full size (24" x 24").
   b. Attach the 15 foot ground cord to the VELOSTAT snap fastener on the mat.
   c. Attach the alligator clip end of the ground cord to a good ground on the 11/780.
   d. Attach the wrist strap to either wrist and the alligator clip to a convenient portion of the mat.

8. Remove the module from the CI option slot 3 and place it on the mat.

9. ROM Change ECO L0101-TW006 upgrades L0101 to Rev - "H1": Unplug ROM P/N 23-218F3-00 at location E114 on L0101. Install new ROM P/N 23-269F3-00 in the same location. (See Figure 1)

10. Unplug ROM P/N 23-219F3-00 at location E95 on L0101. Install new ROM P/N 23-270F3-00 in the same location. (See Figure 1)

11. Unplug ROM P/N 23-220F3-00 at location E76 on L0101. Install new ROM P/N 23-271F3-00 in the same location. (See Figure 1)

12. Unplug ROM P/N 23-221F3-00 at location E174 on L0101. Install new ROM P/N 23-272F3-00 in the same location. (See Figure 2)

13. Unplug ROM P/N 23-222F3-00 at location E154 on L0101. Install new ROM P/N 23-273F3-00 in the same location. (See Figure 2)
14. Unplug ROM P/N 23-223F3-00 at location E134 on L0101. Install new ROM P/N 23-274F3-00 in the same location. (See Figure 2)

15. Install the Wire Marker "H1" on the L0101 module handle.

16. Reinstall the module L0101 in slot 3.

17. Power-up the system.

18. Run the following Macro level diagnostics under the diagnostic supervisor to verify that the CI780 is functional:

<table>
<thead>
<tr>
<th>DIAGNOSTIC</th>
<th>MINIMUM VERSION</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCGA</td>
<td>1.1</td>
<td>CI780 Repair Level I</td>
</tr>
<tr>
<td>ESCGB</td>
<td>1.0</td>
<td>CI780 Repair Level II</td>
</tr>
<tr>
<td>ESCGC</td>
<td>1.1</td>
<td>CI780 Repair Level III</td>
</tr>
<tr>
<td>ESCGD</td>
<td>1.0</td>
<td>CI780 Repair Level IV</td>
</tr>
<tr>
<td>EVGAA</td>
<td>1.4</td>
<td>CI Functional Diag Part I</td>
</tr>
<tr>
<td>EVGAB</td>
<td>1.3</td>
<td>CI Functional Diag Part II</td>
</tr>
</tbody>
</table>

*NOTE*

TO RUN THE CURRENT FUNCTIONAL DIAGNOSTICS ON A CI780 YOU MUST "SET EV FL 1" AT THE DS> PROMPT. ALSO, USE THE PATCHES LISTED BELOW TO PREVENT EVGAA & EVGAB FROM ABORTING (DUE TO THE LEGITIMATE MISMATCH OF RAM 4/ROM 3). NOTE, BEFORE INSTALLING THE PATCHES, THE SUPERVISOR AND DIAGNOSTIC MUST BE LOADED.

<table>
<thead>
<tr>
<th>DIAGNOSTIC</th>
<th>PATCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVGAA 2.3</td>
<td>DEPOSIT 21FD E811</td>
</tr>
<tr>
<td>EVGAB 2.3</td>
<td>DEPOSIT 1FC1 E811</td>
</tr>
<tr>
<td>EVGAA 1.4</td>
<td>DEPOSIT 66FA E811</td>
</tr>
<tr>
<td>EVGAB 1.3</td>
<td>DEPOSIT 64FA E811</td>
</tr>
</tbody>
</table>

WHEN USING "EV FL 1", A COPY OF CI780.BIN MUST BE ON THE MEDIA FROM WHICH YOU LOAD THE DIAGNOSTIC.

19. Remove the loopback attenuators and reconnect the BNCIA
cables to their original SC008 ports.

20. Boot the system.

21. Report the FCO activity on the LARS form in the "module/fail area/FCO" column as "FCO CI780-R-D1" as indicated on pages 13, 14 and 15.

All CI’s in the cluster need to be at Rev. 3 or Rev. 4 of ucode.

For information on booting CI’s with a VENUS, see the VENUS installation manual.

---

APPENDIX A

---

CI780.BIN MICROCODE FILE VERSION # IDENTIFICATION PROCEDURE

1. Copy the CI780.BIN binary file off your console:

   VMS-3.X using FLX>
   $MC FLX /RS/IM=CS1:CI780.BIN/RT/IM<cr>

   VMS-4.X using EXCHANGE>
   $EXCHANGE COPY CSA1:CI780.BIN/TRANS=BLOCK *<cr>

2. Dump the last block of the copied file as follows:

   $DUMP/BYTE/BLOCK=(S:36) CI780.BIN<CR>

This will print out block 36 of the file. On the last line of the printout, the value of the byte at address "%X 1FD" (LOWER LEFT) is the revision of this file. Below is a sample output for a revision V4.0 CI780.BIN file.

Dump of file $1$DBA2:[BRASSARD.CI]CI780.BIN;1 on 7-MAY-1985 16:23:33.85 File ID (341,6,0)   End of file block 36 / Allocated 36
Virtual block number 36 (00000024), 512 (0200) bytes

70 29 5F 00 02 21 F0 00 1C 28 00 C3 F0 00 5A 20 ................. 000000
00 00 00 00 00 00 00 1C F6 00 C1 BB B0 1A 20 4E D9 ................. 000010
00 C1 F0 00 65 16 DC 01 7B B2 5F 00 0A A1 7B AA ................. 000020
00 00 5A E6 00 C1 8B B6 0D 36 67 01 F0 00 1A B6 ................. 000030
This procedure can be used to verify the CI750 RAM & ROM microcode version on a "halted" CPU. The RAM version is only valid if the CI780.BIN microcode file has been loaded: i.e., CI has not been powered off since last "boot" attempt. The procedure is also useful in checking for illegal version combinations when encountering boot problems with the CI750: i.e., VMB.EXE reports "UNABLE TO INITIALIZE DEVICE" or "UNABLE TO LOCATE BOOT BLOCK".

CI780 INSTALLED ON 11/780 OR 11/785 (TR 14)

NOTE: >>> INDICATES COMMANDS ARE TO "CCL" OF HALTED VAX-11/780 (USE CTRL-P).

1. Examining ROM revision:

```
>>>H ; Halt CPU.
>>>U ; Unjam SBI.
>>>I ; Init system.
>>>DEP 2001C014 3FA ;Deposit micro-address in MADR.
>>>EXAM 2001C018 ;Examine MDATR.
```

```
P 2001C018 ##A1D000 ; ## = ROM version.
```

2. Examining RAM revision, if known to be loaded:

```
>>>DEP 2001C014 BFF ;Deposit micro-address in MADR.
>>>EXAM 2001C018 ;Examine MDATR.
```

```
P 2001C018 ##A1D000 ; ## = RAM version.
```

THE ONLY LEGAL COMBINATIONS AS OF THE RELEASE OF THIS FCO ARE:
RAM:  01  02  03  04  
ROM:  01  02  03  03  

\^ CI780
\CI780
\PADLA
\1985
\JUN
\FCO_DOCS