

Firmware Upgrades

Backing up and Restoring MCE/MPE Boards

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Revision History

Revision	Date	Author	Comments
A	Nov 2002	Juliet Wyles	Initial Release
B	Sep 2003	A.Blignaut / G.Brown	Procedures updated, MCE added
C	Nov 2003	G.Brown	Updated the order in which to load the mce firmware components and added new functionality for loading code onto multiple satellite boards of the same type.
D	Dec 2003	G.Brown	MPE NVS backup file format has changed.
E	Feb 2004	G.Brown	Download retry sequence added TFX backup added Board replacement procedure change
F	Apr 2004	G.Brown	LIONEL board procedure added

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1. FIRMWARE MAINTENANCE PROCEDURES FOR SERVICE SHELL

1.1 Terminal Program Setup

For a detailed terminal setup guide, refer to the system documentation under the Help menu in Service Shell.

Service Shell is composed of two parts: Service Host and Service Shell Client. The Service Shell Client is a **client** application that connects to a remote service host **server (**Service Host) to provide access to the Creo devices. Therefore, in order to communicate with the device, Service Host must be running. If Service Host is running, you will have a Service Host icon  in the system tray.

- If you do not have this icon, you must start Service Host. To do so, select Start menu/Program/Creo Service Shell and click on **Service Host**.
- If you do have this icon in the service tray and it is red , right click on it and select **Online**.

When the Service Host is running, connect to it using the Service Shell Client. To start the Service Shell Client, select Start menu/Programs/Creo Service Shell and click on **Service Shell Client**. Enter the name of the server you want to communicate with. The Server name is simply the name of the workstation running Service Host connected to the device you want to talk to. If you are connecting to the host on the same workstation that the client is running on, the server name is “localhost”.

Verify that the service host is setup properly by launching the Host configuration. Right click on the service host icon  and select **Host Configurations**. Use the configuration tool to setup/verify that the host is configured as the proper device and the communication ports are set properly (workstation and diagnostic).

To modify the baud rates for the diagnostic communication com port in service shell client, go to the Tools menu and select **Options**. For com port setting go to the Options window, select **(MPE or MCE) Communication**. Enable the **modify communications settings on the server side** check box to make the required changes.

To modify the monitor/log viewer fonts/colors in service shell client, go to the Tools menu and select **Options**. For monitor/log viewer fonts/colors go to the Options window, select the monitor/log viewer display settings. This info has particular value too when you install a head (head install on) and would like to increase the font size of the monitor output.

Important!

For MPE systems, firmware may prompt you for a "Y/N" reply or more generally, firmware may prompt you for a single character reply, as in the example below:

Example:

```
>> fsave all

Begin download and then press 'Y' to continue ('N' to cancel) (Y/N)
```

You should always follow your answer by the <shift enter> combination rather than only the <enter> key. When Service Shell detects the <shift enter> key, it does not append the carriage return character to your answer.

In cases where the <shift enter> combination is specifically required, the following is an example of the output you would get if you were to use the <enter> key only:

```
>> fsave all

Begin download and then press 'Y' to continue ('N' to cancel) (Y/N)

y

S2258000004E56532056657273696F6E2032000000280000004102200038183040084000302028

Download Aborted!
```

Note: For newer version of firmware (January 2001) both <shift enter> and <enter> keys will be accepted by the firmware.

2. BEST PRACTICES

We recommend that you upgrade the device using the server connected to the device. If you choose to use a laptop, connect to service host through the network. Do not connect the laptop directly to the device via the com port. Using a laptop that is directly connected to the device means that NVS backups files will not be kept on the server that is connected to the device. Using service shell and the upgrade script on the device server (via a network connection) will guarantee that any backup files can be found under the service firmware directory (X:\serviceshell\firmware). Also, having the backup files located on the device server will allow response center or any other service person access to the latest backup files. This is particularly important if the MCE/MPE board needs replacement (dead or no communication) and NVS is required to load onto the new board. If a record of the backup files is needed and a network connection is unavailable use the upgrade script feature that allows copying of the files to a floppy disk which can be loaded onto a different computer at a later date.

Also, note that in the paragraph above and the procedure below, that the Service Shell install drive is noted as X: - this is due to the fact that Service Shell install locations may vary. The default folder is on the system drive (C: or D:) in most workstations.

3. UPGRADE PROCEDURE MPE

To upgrade the MPE firmware:

1. Run the version checker. For more details refer to the *Version Checker Usage* section.

2. If you have the controlled release CD available you can copy 'FileLocationsMPE.txt' (file located in patches directory) into X:\ServiceShell\scripts\device. This file will give the FirmwareUpgrade.spt script the locations of the firmware files on the CD ROM (H DRIVE). If your CD-ROM drive is not H then skip this step. This step is to help the user to avoid browsing to each individual file that needs to be updated on the MPE board/Thermal head.

3. Run the **FirmwareUpgrade.spt** script from within Service Shell and select **Upgrade Firmware**.

   For Head Firmware Versions Pre-1.80

   If the current head version is pre-1.80, you must upgrade the head firmware before upgrading the MPE firmware. Upgrade the head firmware first by itself, then after the head upgrade completes, continue upgrading the other firmware components.

   The script automatically creates backup files for all the NVS parameters on the device and then upgrades the main MPE firmware and head firmware (if necessary). The script allows several firmware components to be loaded in sequence - for example, MPE Main firmware and TH1.X head firmware.

   When the script upgrades both the MPE Main firmware and the head firmware, the MPE Main firmware will be upgraded before the head is upgraded. The MPE NVS backup will created before the MPE main firmware is loaded and a head NVS backup will be created before the head firmware is loaded.

3. After the upgrade is complete, run the Version Checker applet again to make sure all components are correct. If the Version Checker was configured previously in step 1, the Version Checker will automatically start to query the system. For Service Shell version 2.5, the Version Checker prompts the user to test the versions on the system connected to service shell.

4. Run **nvs dump** and save it to a file for comparison of the NVS dump before the upgrade.

5. Use WinDiff supplied on the controlled release CD to compare the NVS dump created by the firmware upgrade script (located under firmware directory in service shell). The firmware upgrade script creates a NVS dump file before loading the main MPE firmware and before loading TH1.X head firmware. Look at *Windiff Program Usage* on directions on how to use WinDiff. Make sure that any differences found

between the NVS parameters before and after the MPE main/TH1.X firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value please correct the value by using either the previous value before the upgrade or the default NVS value.

When both the MPE main firmware and TH1.X firmware are upgraded at the same time, compare the NVS dump file created before the MPE main firmware is created and the NVS dump file created before the TH1.X head firmware is upgraded. This will allow you to verify the MPE main firmware upgrade. To verify the head upgrade compare the NVS dump file created before the TH1.X head firmware upgrade and NVS dump file created in step 4. This will allow you to verify the TH1.X head firmware upgrade.

4. UPGRADE PROCEDURE MCE

To upgrade the MCE firmware:

1. Run the version checker. For more details refer to the *Version Checker Usage* section.
2. If you have the controlled release CD available you can copy 'FileLocationsMCE.txt' (file located in patches directory) into X:\ServiceShell\scripts\device. This file will give the FirmwareUpgrade.spt script the locations of the firmware files on the CD ROM (H DRIVE). If your CD-ROM drive is not H then skip this step. This step is to help the user to avoid browsing to each individual file that needs to be updated on the MCE board/Thermal head/Satellite boards.
3. Run the **FirmwareUpgrade.spt** script from within Service Shell and select **Upgrade Firmware**.

For Head Firmware Versions Pre-1.80

If the current head version is pre-1.80, you must upgrade the head firmware before upgrading the MCE firmware. Upgrade the head firmware first by itself, then after the head upgrade completes, continue upgrading the other firmware components.

The script will automatically create backup files for all the NVS parameters on the device, then upgrade the firmware. The script allows several firmware components to be loaded in sequence – for example, MCE Main firmware and Xilinx.

4. After the upgrade is complete, run the Version Checker applet again to make sure all components are correct. If the version checker was configured previously in step 1, the version checker will automatically start to query the system. For service shell version 2.5, the version checker will prompt the user to test the versions on the system connected to service shell.

5. Run **prm all** (similar to a NVS dump used with a MPE) and save it to a file for comparison of the **prm all** before the upgrade.

6. Use WinDiff supplied on the controlled release CD to compare the NVS dump created by the firmware upgrade script (located under firmware directory in service shell). The firmware upgrade script creates a **prm all** file before loading the main MCE firmware. Look at *Windiff Program Usage* on directions on how to use WinDiff. Make sure that any differences found between the NVS parameters before and after the firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value, correct the value by using either the previous value before the upgrade or the default NVS value.

5. MCE BOARD REPLACEMENT PROCEDURE

1. Select and run the "FirmwareUpgrade" script from the "devices" script list. Select 'Backup NVS' or 'Replace MCE Board' to back up the original board.
   'Backup NVS' will do a backup consisting of 5 files, 3 text and 2 restorable binary files - flash and ram. The files will be on X:\serviceshell\firmware (Optional: You can specify where the backup files can be copied to, a feature in 2.4SP1 or higher).
   'Replace MCE board' asks the user if they have replaced the board yet. Based on that answer two different things can happen. Either they respond no to having replaced the board and the script will create a backup, or if they respond yes then the script will ask for files that need to be downloaded. The backup is the same format as in the 'Backup NVS' option.
   If the MCE board that requires replacement is dead (no communication) either use the most recent backup files from the Service Shell install directory (best source, most recent) X:\ServiceShell\firmware, or get a backup from production. Backups will be stored in X:\ServiceShell\firmware if firmware has been upgraded with the FirmwareUpgrade script in the past.

2. Replace, the MCE board.

3. If you have the controlled release CD available you can copy 'FileLocationsMCE.txt' (file located in patches directory) into X:\ServiceShell\scripts\device. This file will give the FirmwareUpgrade.spt script the locations of the firmware files on the CD ROM (H DRIVE). If your CD-ROM drive is not H then skip this step. This step is to help the user to avoid browsing to each individual file that needs to be updated on the MCE board.

4. Use the Version Checker applet to identify all firmware components that need to be updated. Run the version checker. For more details refer to the *Version Checker Usage* section.
   If you do not have information on what components are required (no controlled release CD available) and you don't use the version checker, use the the 'list version' command to determine what versions are on the board that is being replaced or look at the CR documentation on Techplanet. Load those same versions onto your new MCE board.

5. Make sure you have the controlled release CD in the CDROM (H drive) of the server. Run the "FirmwareUpgrade" script and choose the Replace MCE Board option. You will be prompted on whether you have replaced the board yet. If you have applied the patches referred to in step 3, the script will automatically identify the correct locations of the firmware located on the CD. There is no need to copy the firmware files from the CD manually, as the script will perform this task. The files will be copied to the service shell firmware directory by the script. If the CD-ROM is not specified as the H drive, browse to the files on the CD-ROM via the FirmwareUpgrade script. You can choose which files to update based on the results from the version checker of from using the list version command.
   The script will ask if NVS backup files are available. If you do have NVS parameters available, you can direct the script to their location. To files are required: ram and flash. The script will execute the following steps:

a) Download firmware Boot, Post, Xilinx, and OVWR (OVWR is used only with spectrum).
b) Erase any existing NVS on the replacement board before the main code is loaded. If the NVS is not erased prior to the new main firmware being loaded, the firmware will crash when the new firmware is loaded.
c) Main firmware is loaded.
d) Download NVS.

6. REPLACING A MCE BOARD IN CASE THE SCRIPT DOES NOT WORK

If the boot and post versions are up to date on the new board, the main and xilinx code can be loaded without the script if this is preferred. The script should be used in almost every case to reduce errors. If you are loading firmware besides main firmware, be sure to erase the NVS IMMEDIATELY BEFORE LOADING MAIN FIRMWARE. If you only erase the NVS before loading a firmware component other than main firmware the main firmware will most likely crash after new main firmware is loaded.

New default NVS is created once main firmware has run. If you erase the NVS then load xilinx for example, once the xilinx is loaded the firmware will reset out of boot code and will run main firmware again (Creating default NVS). This process will invalidate the NVS erase you preformed before loading the xilinx firmware. To be successful in not having the main firmware crash after you load the new main firmware erase the NVS immediately before loading the main firmware.

Copy the .bin files to the hard drive e.g. d:\firmware and use the download command directly in service shell
Example:

1) download d:\firmware\mcelca0165.bin Download xilinx and any other MCE firmware components that need to updated on the MCE board.
2) Erase NVS
3) download d:\firmware\3244fmwp11020.bin

Erase the NVS on the replacement board with the following commands IMMEDIATELY BEFORE LOADING MAIN FIRMWARE:

stg erase flash
stg erase ram

Once these are done, restore the backup using the script and the Restore NVS Backup option or refer to the *Manual MCE NVS Restore Procedure.*

Run the Version Checker applet, if available. Use the refresh button to confirm that proper versions were loaded onto the replacement board.

Note: If you did not erase the NVS before loading a different type of firmware onto the board, you will most likely have the following problem.

A typical scenario is when a board on a 3244 needs replacement. Most replacement boards come with QUANTUM>> main firmware, you have to load 3244 main firmware on the replacement board. The main firmware was loaded onto the replacement board via the FirmwareUpgrade script or, just using the download command. If above scenario is carried out the firmware will continue to crash on power up and remain in boot mode after loading the main firmware. A reset does not help)

You have to use the commands above before loading a different type of firmware onto a MCE board. If it is too late and you did not follow the proper procedure you can clear the NVS in boot mode with the following command.
Boot nvramclear

7. MPE BOARD REPLACEMENT PROCEDURE

1. Select and run the **FirmwareUpgrade** script from the devices script list. Select **Backup NVS** or **Replace MPE Board** to back up the original board.

   'Backup NVS' will do a backup consisting of 4 files, 2 text and 1 restorable hex file – a fsaveall file. The files will be on X:\serviceshell\firmware (Optional: User can specify where the backup files can be copied to, a feature in 2.4SP1 or higher.
   'Replace MCE board' asks the user if they have replaced the board yet. Based on that answer two different things can happen. Either they respond no to having replaced the board and the script will create a backup, or if they respond yes then the script will ask for files that need to be downloaded. The backup is the same format as in the 'Backup NVS' option.
   If the MPE board that requires replacement is dead (no communication) either use the most recent backup files from the Service Shell install directory (best source, most recent) X:\ServiceShell\firmware, or get a backup from production. Backups will be stored in X:\ServiceShell\firmware if firmware has been upgraded with the FirmwareUpgrade script in the past.

2. Replace, the MPE board.

3. If you have the controlled release CD available you can copy ‘FileLocationsMCE.txt’ (file located in patches directory) into X:\ServiceShell\scripts\device. This file will give the FirmwareUpgrade.spt script the locations of the firmware files on the CD ROM (H DRIVE). If your CD-ROM drive is not H then skip this step. This step is to help the user to avoid browsing to each individual file that needs to be updated on the MPE board.

4. If you do not have information on what components are required (no controlled release CD available) and you don’t use the version checker, use the the ‘list version’ command to determine what versions are on the board that is being replaced or look at the CR documentation on Techplanet. Load those same versions onto your new MPE board.

5. Make sure you have the controlled release CD in the CDROM (H drive) of the server.

   Run the "FirmwareUpgrade" script and choose the Replace MPE Board option. You will be prompted on whether you have replaced the board yet. If you have applied the patches referred to in step 3, the script will automatically identify the correct locations of the

firmware located on the CD. There is no need to copy the firmware files from the CD manually, as the script will perform this task. The files will be copied to the service shell firmware directory by the script. If the CD-ROM is not specified as the H drive, browse to the files on the CD-ROM via the FirmwareUpgrade script. You can choose which files to update based on the results from the version checker of from using the list version command.
The script will ask if NVS backup files are available. If you do have NVS parameters available, you can direct the script to their location. To files are required: ram and flash.
The script will execute the following steps:

a) Erase any existing NVS on the replacement board. If this is not done the firmware will crash when the new firmware is loaded.
b) Download firmware
c) Download NVS.
d) Script will check version of NVS loaded. If the NVS version is older than the version of firmware the script will issue an **NVS upgrade** command.

8. REPLACING A MPE BOARD IN CASE THE SCRIPT DOES NOT WORK:

The script should be used in almost every case to reduce errors.
Erase the NVS on the replacement board with the following commands.
nvs init all creo

Copy the .bin files to the hard drive e.g. d:\firmware and use the download command directly in service shell
Example:

download d:\firmware\TTSS170.hex

Once these are done, restore the backup using the script and the Restore NVS Backup option or refer to the *Manual MPE NVS Restore Procedure.*

9. MANUAL LOADING AND BACKUP PROCEDURES

9.1 Manual MPE NVS Backup Procedure: cutting and pasting data

We recommend that you minimize the number of diagnostic messages sent to the monitor window when highlighting NVS backup text to copy. To do so, make sure the device is idle and that all verbose fields are set to zero *set verbose xxx 0* (although this is not mandatory, it will greatly facilitate the task).

Steps for Backing up NVS:

- In Windows, open Notepad through start menu/programs/accessories.
- In the Service Shell Device Monitor, press <enter> a few times to ensure you are at the bottom of the monitor screen.

- Set a bookmark by right clicking in the monitor window. Select a bookmark color of your choice. The bookmark will make it easy for you to find the beginning of your NVS backup.
- Type **fsave all**. Once the device has finished outputting the backup data to your monitor screen (approx. 5 min), click on the colored square on the right that matches your color bookmark. This brings you back to the beginning of the NVS backup.
- Start highlighting with the first line that looks similar to this:

```
S2258000004E56532056657273696F6E203200AAAA555555555555555555555555555555AABD
```

Use the **Page Down** key or scroll down with the scroll bar on the left until you reach the end of the back up. The end of the backup will appear in one of following two ways depending how recent the firmware version is (firmware version and compile date will vary depending on the version that you are using).

```
S903000
0FC

END OF NVS MEMORY DUMP - Close log file and hit [Y] (Y/N)
```

OR

```


S9030000FC
```

```
THERMAL VLF TRENDSETTER - MASTER PROCESSOR ELECTRONICS *

    MPE FIRMWARE VERSION 1.50

          Feb 02 2001 11:48:42

END OF NVS MEMORY DUMP - Close log file and hit [Y] (Y/N)
```

- Once you have the entire text highlighted (include version information as well, it will not interfere when loaded back into the device), right click on the highlighted portion and select **Copy to Clipboard**.
- Make your notepad window active, right click on that window and choose **Paste** from the menu. Your notepad should now contain the hex data you copied from Service Shell. Ensure that the file has no blank lines before the hex data starts, otherwise the file will not load properly.

```
NO BLANK LINES AT THE TOP OF THE FILE!

S2258000004E56532056657273696F6E203200AAAA555555555555555555555555555555AABD
```

- Save the notepad file as serial#nvs.txt. Example: B525nvs.txt

9.2 Manual MPE NVS Restore Procedure

Restoring NVS with Service Shell requires that you know the path to the location of your backup file. If you are downloading firmware remotely, the file to be downloaded has to be located on the server that is directly connected to the machine.

In the Service Shell Device Monitor, type **fload memory**. After the message "Begin ASCII transfer now" appears in the device monitor window, type **sendfile pathname\filename**. Be sure to use sendfile <shift enter> for older versions of firmware to execute the command properly, otherwise the sendfile will fail.

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

Sendfile "D:\temp\MPEnvs.txt"

Example:

```
>> fload memory
Loading memory:
      File format     = Motorola S-Record
      Pace character  = `~' (ASCII value 126)
      Begin ASCII transfer now ...
sendfile c:\temp\B525nvs.txt
```

Service Shell then proceeds to upload the NVS backup file. A progress bar will be displayed at the bottom. You may close the download progress window after the download is completed by clicking on the ✕ at the bottom right corner.

Note:

1) If you forget to enter the **fload memory** command before issuing the **sendfile** command, the following will be displayed:

```
sendfile c:\temp\B525nvs.txt
>> S2258000004E56532056657273696F6E2032000000280000004102200038183040084000302028
m                                                    ^m Invalid command
>> S225800021002220000000084000000800040840040048000800280000200030000218800400F1
m                                                    ^m Invalid command
```

```
>> S225800042800020001104282000004024081010006420800420200008105404080020200404 87
m                                                    ^m Invalid command
>> S225800063022020
<MPE> Can't send data chunk at offset=0x00000000
m               ^m Invalid command
```

2) Downloading from a mapped drive may not work depending on the version of Service Shell you are using. If you get the error shown below using a mapped drive and you are

positive you mapped the drive correctly, copy the file to the local server drive. Retype the **sendfile** command with the corrected path name and press enter.

Error you may get using a map drive:

<ERROR> Cannot find firmware file

9.3 Manual MCE NVS Backup Procedure

To backup firmware correctly, you must create two binary backup files. You must create a backup of the MCE ram and flash.

To backup the ram, type:
download NvsRamUpload options=f=pathname\filename

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

download NvsRamUpload options=f=D:\temp\MCEnvsRam.bin

Service Shell then proceeds to upload the backup file. A progress bar will not increment until the entire upload is finished. Close the download progress window after the upload is complete by clicking on the  at the bottom right corner.

Your file will be created under the directory you specified.

To backup the flash, type:
download NvsFlashUpload options=f=pathname\filename

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

download NvsFlashUpload options=f=D:\temp\MCEnvsFlash.bin

Service Shell then proceeds to upload the backup file. The progress bar will not increment until the entire upload is finished. Close the download progress window after the upload is complete by clicking on the  at the bottom right corner.

Your file will be created under the directory you specified.

If you are backing up a second MCE, be sure to make the file have a unique identifier, like MCE2

9.4 Manual MCE NVS Restore Procedure

To restore NVS properly you must load two binary backup files. You must load a backup of the MCE ram and flash.

To download the ram, type:
download pathname protocol=MceNvsDF1Download

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

download D:\temp\MCEnvsRam.bin protocol=MceNvsDF1Download

Service Shell then proceeds to upload the backup file. A progress bar will be displayed at the bottom. Close the download progress window after the download is complete by clicking on the ☒ at the bottom right corner.

Your file will be created under the directory you specified.

To download the flash, type:
download pathname protocol=MceNvsDF1Download options=d=flash

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

download D:\temp\MCEnvsFlash.bin protocol=MceNvsDF1Download options=d=flash

Service Shell then proceeds to upload the backup file. A progress bar will be displayed at the bottom. Close the download progress window after the download is complete by clicking on the ☒ at the bottom right corner.

Your file willbe created under the directory you specified.

If you are backing up a second MCE, be sure to make the file have a unique identifier, like MCE2.

9.5 Manual Firmware Loading

To load firmware with Service Shell you must know the path to the location of your firmware file. If you are downloading firmware remotely, the file to be downloaded must be located on the Server that is connected directly to the machine.

To download firmware, type:
download <pathname\filename>

Note: To enable spaces in your path name, include quotes around your path as shown in the example, otherwise the quotes can be omitted.

Example:

download “D:\temp\tvts_150.hex”

Service Shell then proceeds to download the firmware file. A progress bar will be displayed at the bottom. Close the download progress window after the download is complete by clicking on the ☒ at the bottom right corner.

MCE Specific Details

For complete instructions on how to upgrade a MCE device, refer to the procedure for manual FW loading in case the scripts do not work (MCE specific).

To upgrade satellite board firmware requires more that just the download command. To download satellite board firmware you must first determine the satellite board address via the list version all command. Note the board address in bold.

TSSP>> list version all

Version Information:

FW: TSMCE Jul 15 2003 11:42:58

Version: 1.14.08 Build No: 01430

Built using Baseline #2754 - May 27 2003

HW: Master Control Electronics Hardware Board (MCE)

MCE PCB Version is 04

MCE PCB Population Option Number 01.

Xilinx Version: 1.77

Machine Serial Number: STT Spectrum

MCE Master Control Board PCB Version:4 Population Option:01

Firmware Modules (00h): BBR v1.03, BOOT v1.09, MAIN v1.14.08, POST v1.05, Xilinx v1.77,

GENINE Generic I/O Board @32h Version:1.01

Firmware Modules **(32h**): BBR v1.03, BOOT v1.09, MAIN v1.17,

PDB Power Distribution Board @10h Version:5.00

Firmware Modules (**10h**): BBR v1.03, BOOT v1.09, MAIN v1.17,

LIONEL Generic I/O Board @40h

*** Command Complete

To download firmware, type:
download pathname\filename options =s=XX (XX- corresponds the board address).

Example:

download “D:\temp\PDBFMW117.bin options=s=10”

When upgrading satellite board firmware for a PDB and GENINE, first load the boot code and then the main code.

For upgrading LIONEL board firmware, download the recovery code first before updating the main firmware. The recovery code is a tool required to load the main LIONEL firmware. Only LIONEL boards connected to the MCE can be upgraded through the MCE. A LIONEL board in a UDRC cabinet has to have a cable connected directly to the board to upgrade the firmware. Connecting to a LIONEL board on a UDRC cabinet only requires the download command and you do not have to specify the board address.

MPE Specific Details

If you are upgrading MPE firmware, type **nvs upgrade**. To use the command correctly you must know the version you are upgrading from.

Example:

If someone were to upgrade from version 2.5 to 3.0 he or she would enter:

```
nvs upgrade 2.5
```

After the firmware version 3.0 was loaded.

MCE does not require a firmware upgrade command.

CAUTION: Firmware download filename accepted by Service Shell:

It is important when downloading firmware through Service Shell using the download command to use the official filename. Service Shell detects the kind of download it has to perform based on the filename. If you enter a filename that is not recognized by Service Shell, the download will not proceed.

The name convention is:

MPE Format: UUUU_xxx.hex

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `TTSB_250.hex`

MCE Format: UUUUfmwpxxx.bin

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `3244fwmp101.bin`

MPE Aborted Download

When downloading the current firmware is first erased from the MPE before the new firmware is loaded. If the firmware load is interrupted by a corrupt file or is manually aborted during the loading process, all that will remain is boot code. No prompt will appear because the MPE is now running boot code, which is set at a different baud rate (57600 bps). The normal diagnostic baud rate is set at 9600 bps. Even though no prompt shows up, do not be alarmed. The download command will still work and the firmware download can be

restarted. If this happens, reenter the download command (the up arrow brings back the previously entered command).

Download command:
download <pathname\filename>

Note: Downloading from a mapped drive will not work. If you get the following error using a mapped drive <ERROR> Cannot find firmware file and you are positive you mapped the file correctly, copy the file to the local server drive and retype the download command with the corrected path name and press enter.

MCE Aborted Download

When downloading the current firmware is first erased from the MCE before the new firmware is loaded. If the firmware load is interrupted by a corrupt file or is manually aborted during the loading process, all that will remain is boot code. A BOOT prompt should appear because the MCE is now running boot code. If a POST prompt appears, type **reset boot** to put the MCE into boot mode. If this happens (MCE in boot mode), reenter the **download** command (the up arrow brings back previously entered command).

Download command:
download <pathname\filename>

Note: Downloading from a mapped drive will not work. If you get the following error using a mapped drive <ERROR> Cannot find firmware file and you are positive you mapped the file correctly, copy the file to the local server drive and retype the download command with the corrected path name and press enter.

9.6 Manual firmware loading in case the scripts do not work

Things to be aware of if your script fails:

- Firmware upgrades are tested from the last released CR to the newly released version using the same servers that are connected to the devices.
- If the script fails, it maybe a result of not updating all the proper components, (Service shell, the actual upgrade script or some other configuration problem – service host not being configured to the proper device type (MPE/MCE)).

If you are upgrading the head or MCE main firmware, you should use a script. After upgrading both the head firmware and MCE main firmware, NVS parameter updates are required which are included in the firmware upgrade script. These parameters will vary depending on the release of head/ MCE main firmware. If you chose to upgrade the firmware manually you will have to upgrade these parameters manually. The release notes should contain a section that lists what commands must be entered after upgrading the firmware. MPE parameters are updated via the **nvs upgrade** command. The MCE does not have support for the **nvs upgrade** command. TH1.X head parameters are update via the **nvs upgrade head** command on a MPE system. The MCE does not have support for the **nvs upgrade head** command.

MCE Specific Details

6. Determine what versions have to be upgraded via the version checker applet or using the **list version all** and **head version** commands. Copy the output to a file.

7. Backup first NVS
   A. Before upgrading the MCE main firmware you should backup the device's NVS. To do this, create NVS flash and ram files (see the Manual MCE restore procedure). Also create an additional file for your own for reference - a **prm all** file. Type **prm all** and copy the output to a file.
   B. Before upgrading head firmware you must backup the head NVS – this can only be done by the scripts. Basically all you can do is to create a **prm all** file after upgrading the main firmware if you do not use the script. The script issues commands like set head, set hdm... and will create a script that can be run if the head main firmware has to be downgraded later. For TH2 and TFX, a backup is not required.

8. You must copy the entire firmware directory off the CR CD, to the hard disc of the workstation that is connected to the machine.

9. The order in which you should load firmware is, boot firmware first, followed by post then by whatever you like for the MCE board, via the download command.

Example :

```
download C:\firmware\3244fmwp10923.bin
```

(Downloading boot code first followed by post code is important, for future firmware releases). Remember to issue NVS parameter updates (if any) after upgrading the MCE board.

10. Download the satellite board firmware if required after the MCE firmware has been upgraded (GENINE, PDB, LIONEL). For satellite board downloads you must specify the board address.

Example:

Download C:\firmware\GENFMW117.bin options=s=32)

You can find all the satellite board addresses using the **list version all** command.

```
TSSP>> list version all
Version Information:
-----------------------------------------------------
FW: TSMCE Jul 15 2003 11:42:58
   Version: 1.14.08 Build No: 01430
   Built using Baseline #2754 - May 27 2003
HW: Master Control Electronics Hardware Board (MCE)
   MCE PCB Version is 04
   MCE PCB Population Option Number 01.
Xilinx Version: 1.77
Machine Serial Number: STT Spectrum
MCE Master Control Board PCB Version:4 Population Option:01
Firmware Modules (00h): BBR v1.03, BOOT v1.09, MAIN v1.14.08, POST v1.05,
Xilinx v1.77,
GENINE Generic I/O Board @32h Version:1.01
Firmware Modules (32h): BBR v1.03, BOOT v1.09, MAIN v1.17,
PDB Power Distribution Board @10h Version:5.00
Firmware Modules (10h): BBR v1.03, BOOT v1.09, MAIN v1.17,
*** Command Complete
```

The LIONEL board firmware runs only on the manta device so far. It also runs on PACC UDRC cabinets but you cannot upgrade the firmware on it through the MCE. LIONEL board firmware requires recovery code to be loaded first, before the main LIONEL firmware can be updated.

11. Issue a **prm all** and copy the output to a file. Use WinDiff supplied on the controlled release CD to compare the prm all file created before upgrading the main MCE firmware. Look at *WinDiff Program Usage* on directions on how to use WinDiff. Make sure that any differences found between the NVS parameters before and after the firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value please correct the value by using either the previous value before the upgrade or the default NVS value.

12. Download the head firmware last. Remember to issue NVS parameter updates (if any) after upgrading the head main firmware.

13. Issue a **prm all** and copy the output to a file. Use WinDiff supplied on the controlled release CD to compare the **prm all** file created before upgrading the main head firmware. Look at *WinDiff Program Usage* on directions on how to use WinDiff. Make sure that any differences found between the NVS parameters before and after the firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value please correct the value by using either the previous value before the upgrade or the default NVS value.

    A summary of the order to load firmware:

    1) MCE boot (Example for MCE Boot is: download C:/Firmware/Thermal_MCE/MCE/BOOT/MCEBOOT109.BIN)
    2) MCE post
    3) MCE xilinx/lca
    4) Overwritting file (optional – used on spectrum devices)
    5) MCE main (Remember to backup MCE NVS and update NVS parameters after the firmware is updated (if necessary))
    6) PDB boot (Remember to specify the board address)
    7) PDB main (Remember to specify the board address)
    8) GENINE boot (Remember to specify the board address)
    9) GENINE main (Remember to specify the board address)
    10) LIONEL rec (Remember to specify the board address)
    12) LIONEL main (Remember to specify the board address, for updating LIONEL firmware you have to load the recovery code first)
    13) Head main (For TH1.X remember to issue a prm all command (copy it to a file) before upgrading the head main firmware. Update NVS parameters after the firmware is updated (if necessary))
    14) Head xilinx/lca (TH1.X only)

MPE Specific Details

1. Determine what version have to be upgrade via the version checker applet or using ‘list version all’ and ‘head version’ command. Copy the output to a file.

2. Backup first NVS
   A. Before upgrading the MPE main firmware you should backup the device’s NVS. To do this, you have to create NVS flash and ram files (see the Manual MCE restore procedure). Also create an additional file for your own for reference - a **nvs dump** file. Issue **nvs dump** and copy the output to a file.
   B. Before upgrading head firmware you should backup the head NVS - the procedure TH1.X is the same as above. The head NVS parameters are also stored on the MPE board. For TH2/TFX a backup is not required.

3. Copy the entire firmware directory off the CR CD, to the hard disc of the workstation that is connected to the machine.

4. Issue a **nvs dump** and copy the output to a file. Use WinDiff supplied on the controlled release CD to compare the NVS dump created before upgrading the main MPE firmware. Look at *WinDiff Program Usage* on directions on how to use WinDiff. Make sure that

any differences found between the NVS parameters before and after the firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value please correct the value by using either the previous value before the upgrade or the default NVS value.

5. Load MPE main firmware first. Refer to the *manual firmware loading* section for more details for upgrading the MPE main firmware.

6. Download the head firmware last. Remember to issue NVS parameter updates (if any) after upgrading the head main firmware (read the head release notes). A **head upgrade X.XX** command will be required at the bare minimum for TH1.X heads.

7. For TH1.X heads issue a NVS dump and copy it to a file. Use WinDiff supplied on the controlled release CD to compare the NVS dump created before upgrading the head main firmware. Make sure that any differences found between the NVS parameters before and after the firmware upgrade are documented in these release notes. If any NVS parameters are corrupted with an incorrect value please correct the value by using either the previous value before the upgrade or the default NVS value.

A summary of the order to load firmware:

1) MPE main
2) Head main
3) Head xilinx/lca (TH1.X only)

10. FIRMWARE UPGRADE SCRIPT

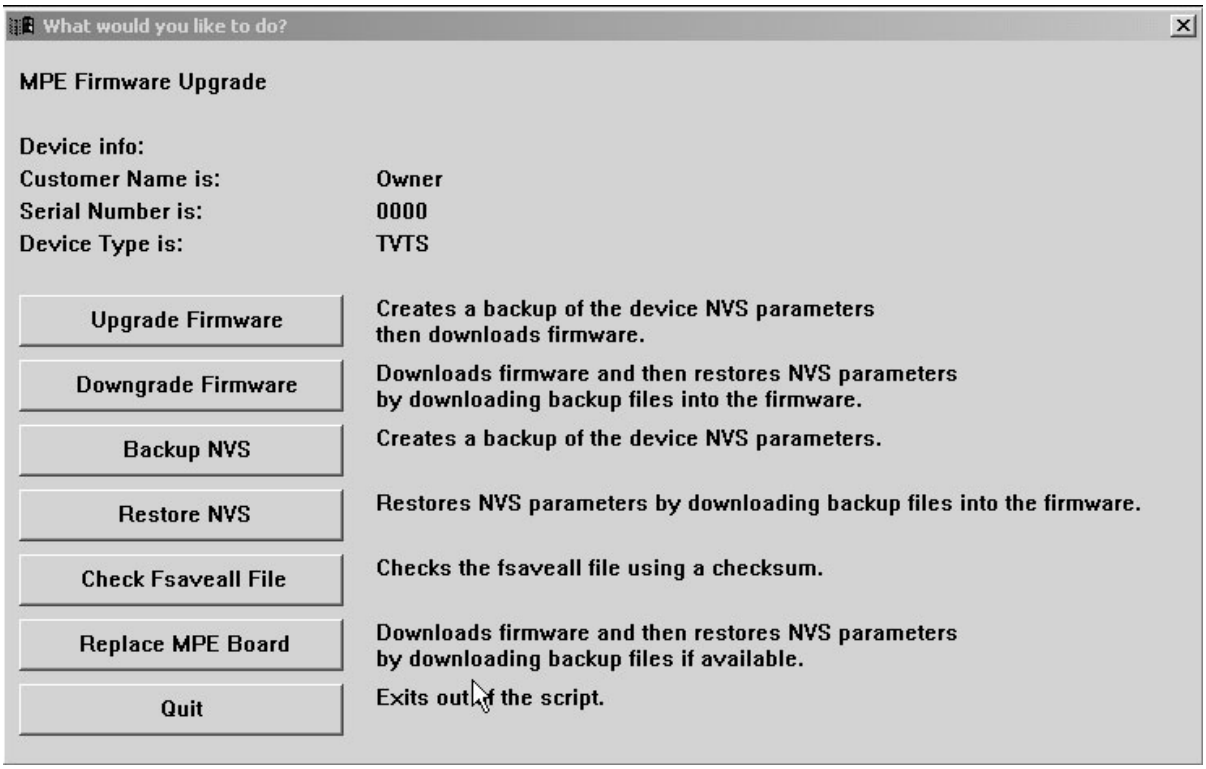
10.1 Running the script and file formats

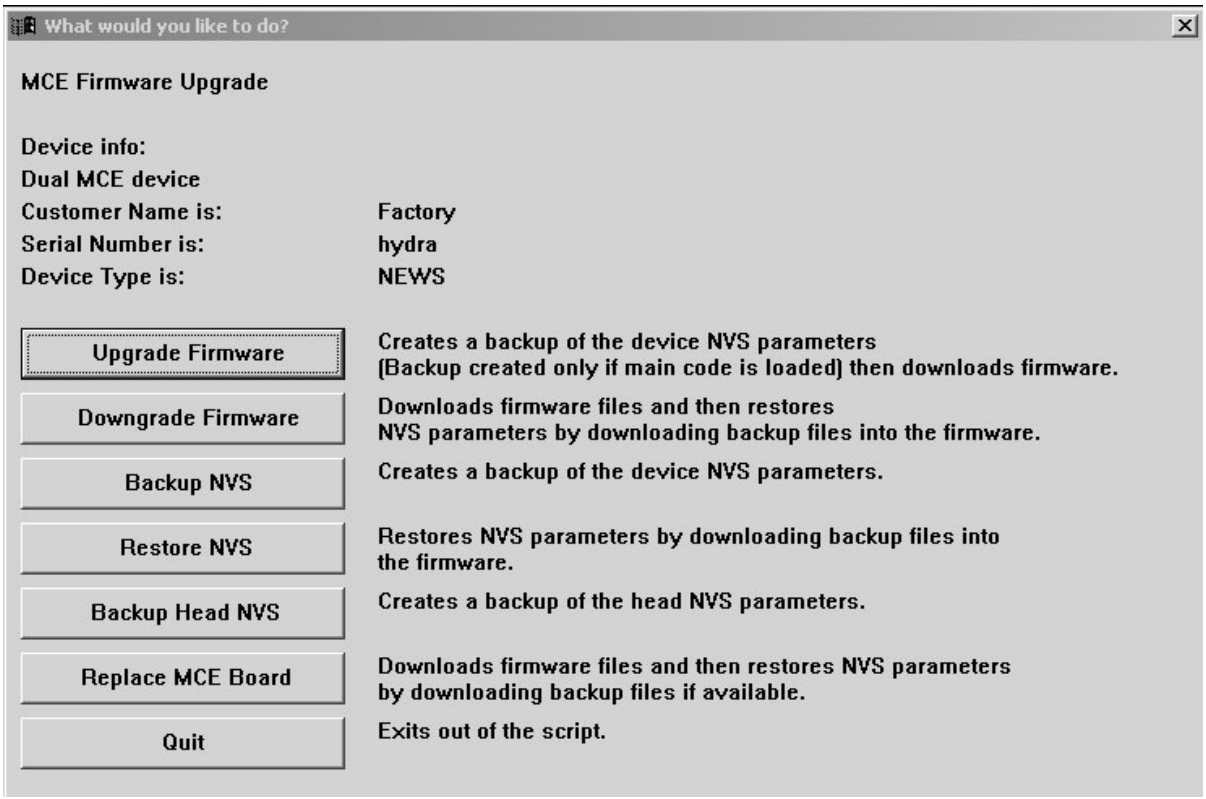
The find the firmware upgrade script (**FirmwareUpgrade.spt)**, left click on the script icon, then left click on the Device group.

To execute the script, select the FirmwareUpgrade script and select **Run selected script**, or highlight the script with a left click, then left click on the run button in the upper right hand corner of the script applet.

The script auto detects the firmware type - MPE or MCE.

The script prompts you with five choices. Those choices vary depending on whether you are connected to a MPE or MCE device.





Here are some details about the files generated by the script:

10.2 The files generated by this script follow the format below:

Format: C_dddd_SSSS_fff_VVV_vvv_tttt.FFFFF

Customer - Customer Name

dddd - Device Type

SSSS - device or head serial number

fff - firmware type (MPE, MCE, TH17, TH2, TFX)

VVV - current firmware version when the file was generated.

vvv - current thermal head firmware version when the file was generated. (used with MPE only)

tttt - file type generated (nvs backup, dump, upgradelog, version info)

FFFFF - type of file created hex, binary, text or splot script.

Example: Creo_TVTS_0123_mpe_250_183_dump.nvstxt

Note: Only the MPE uses the vvv format which includes the thermal head version. With a MPE using a TH1.X head a copy of the head's NVS is stored on the MPE. The TH1.X head version at the time of the MPE backup is then relevant. The NVS backup will vary depending on the head version. A MPE system with either head type TH1.X, TH2 or TFX will include the head version as part of the backup file name. With a MCE device the head parameters are not stored on the MCE board.

All files created by the script are in ServiceShell\Firmware. The script generates the same filenames when executed more than once with the same firmware version. To prevent the overwriting of files, the script keeps up to 10 of the same filenames before it begins to overwrite files. When a duplicate file is found (using the above filename as an example), the extension is changed from .nvstxt to .nvstx0 and will increment .nvstx1, .nvstx2, . nvstx3… until it reaches . nvstx9. After nvstx9 is reached, the script starts back at . nvstx0 again. The most recent file always has no number in the extension.

Firmware file location

Any files to be loaded will be copied to the ServiceShell\Firmware directory. If you browse to file in this folder, the script will still try to copy the file to this location and gives you the choice to overwrite the files or not.

Script path name retention

To aid the user, the script generates a file to keep a copy of the previous paths of the files loaded and generated. The next time the script is executed it will use the same paths and file names that were used the last time the script was run. The paths are kept in a file under ServiceShell\bin.

MPE - Path name format in the device monitor (terminal window)

Path names are reformatted in the device monitor.

Example:

d:\firmware\tvts_150.hex will appear in the log as d:|firmware|tvts_150.hex

The '\' is exchanged with '|' because firmware uses a '\' or '/' to repeat the last command. The semicolon is included in the string so the firmware treats the text as a comment and not a command. This is done for any comment sent from the script to the device.

Running the script remotely

This script can now be run remotely. The files to be loaded and backups created will be transferred between the host and client computer service shell firmware directories.

If the service shell version on the host computer is older than version 2.2, then the script tests to find the service shell install location. If the version is greater than version 2.2, the install location can be found. If the script fails to find the host service shell install location, the script prompts you to specify a location to send files to on the host computer.

Note: If you are connected remotely to a device and a file is not sent properly, you have the option to continue. However, you must copy all the files to be downloaded in the host computers directory (specified by the script) manually or the download will fail. Any backup files that were created will have to be recovered from the host and client computers manually.

MPE specific details

The backup files are sent from the client computer to the host computer. The firmware file will be sent from the client computer to the host computer.

MCE specific details

The backup binary files are sent from the host computer to the client computer. The text backup files are sent from the client computer to the host computer. The firmware files are sent from the client computer to the host computer.

10.3 Backup NVS

The script creates the files in the firmware directory that is under the Service Shell folder. If you would like to specify a location to copy the files, then enable the checkbox as shown in the example.



Note: There is still copies of the backup files in the firmware directory that is under the Service Shell folder.

MPE specific details

The "Backup NVS" option generates a version info file, a NVS backup file and a NVS dump file. The NVS backup file created is scanned for checksum errors after it is created. An error will be reported if this is the case.

Here is an example of the files generated after this option is executed:

Creo_TVTS_1234_mpe_252_183_ver.nvstxt

Creo_TVTS_1234_mpe_252_183_nvs.nvshex

Creo_TVTS_1234_mpe_252_183_dump.nvstxt

The main menu will appear when the script is complete.

MCE specific details

The "Backup NVS" option generates a version info file, two NVS backup files and a NVS dump file.

The NVS is scanned for corruption before a backup is created. If corruptions is found, the script generates an error and you will not be able to continue with the NVS backup or main firmware upgrade, depending on what option you chose. To fix NVS corruption, refer to your firmware release notes. **RecoverCorruptBBRAM.spt,** located in the same folder as this firmware upgrade script, may fix this problem.

Here are examples of the files generated after this option is executed:

Creo_NEWS_1234_mce_106-03_ver.nvstxt

Creo_NEWS_1234_mce_106-03_ram.nvsbin

Creo_NEWS_1234_mce_106-03_flash.nvsbin

Creo_NEWS_1234_mce_106-03_dump.nvstxt

If the MCE device is a dual MCE device a second set of back up files will be created.

Here are example of the files generated:

Creo_NEWS_1234_mce2_102-03_ver.nvstxt

Creo_NEWS_1234_mce2_102-03_ram.nvsbin

Creo_NEWS_1234_mce2_102-03_flash.nvsbin

Creo_NEWS_1234_mce2_102-03_dump.nvstxt

The main menu will appear when the script is complete.

10.4 Restore NVS

The Restore NV" option is used to load NVS.

MPE specific details

Here is an example of the file that may be generated after this option is executed:

Creo_TVTS_1234_mpe_150_upgrade.log

A NVS upgrade may be issued after the NVS is loaded, depending on the version of firmware downgraded to and the version of firmware the NVS fsave all file was created with.

If you downgrade to a version of firmware that does not have the *set config ve*r NVS parameter, the script will complete and the main menu will appear.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter, and you loaded NVS that was created with an older version of firmware that had the *set config ver* NVS parameter. The script will output a dialog box with the following text:

Upgrading NVS in progress…

A NVS upgrade log file is created and the main menu appears when the script is complete.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter, and you loaded NVS that was created with that same version of firmware, the script will output the message:

No need to upgrade NVS. The version of firmware that the NVS file was created with is the same as the current firmware version.

The main menu will appear when the script is complete.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter, and you loaded NVS that was created with a version of firmware that does not contain *set config ve*r. The script will output a dialog box with the following text:

The script could not determine the firmware version to upgrade from. Please upgrade the firmware manually.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter, and you loaded NVS that was created with a version of firmware newer than the one you loaded. The script will output a dialog box with the following text:

You loaded a NVS file that was created from a version of firmware that is more recent than the firmware version you just downgraded to.

This dialog box appears to make it clear to the user that the NVS loaded is not compatible with the version of firmware the user downgraded to. The main menu will appear when the script is complete.

MCE specific details

There is currently no NVS version in MCE. If the device is a dual MCE device then you must specify which NVS you would like to restore (MCE, MCE2 or both MCE and MCE2).

The main menu appears when the script option is complete.

Remote Connection

If you are connected remotely to a device and you wish to restore NVS, you must specify where the backup files are located on the host or client computer.

If you choose the client computer, you have the option to browse to NVS files to load.

If you choose the host computer, you must have the path and filename correct for the location of the backup file or files on the host computer. The script cannot check for files on the host computer. If you get the path incorrect the following error will be displayed in the diagnostic terminal window when the download command is issued:

<ERROR> Cannot find firmware file

10.5 Check fsaveall file

The Check fsaveall file option is used to check the file integrity NVS backup. This utility is only necessary for MPE devices and is only available as an option when you are connected to an MPE device.

If you backup a MPE device with this script, this check is already done. A good clue that the file you are loading has had the checksum done is looking at the file format of the file. Here is an example of a file generated by this script:

Creo_TVTS_1234_mpe_150_nvs.nvshex

If you choose to check a file, the script will check the contents and report any errors found. The main menu will appear if no errors are found.

Remote Connection

If you are connected remotely to a device and you want to check a NVS file, you must get the file to check manually. The option to retrieve the file off the host computer is not given to you.

10.6 Backup Head NVS

The Backup Head NVS option is used primary to backup a TH1.7 head. This utility is only available for MCE devices and is only available as an option when you are connected to an MCE device. For TH2 and TFX heads, a dump file is created but it is a text-based version only. To do a backup, which can be loaded onto a TH2 head, use scripts provided in service shell under the TH2 script library. . To do a backup, which can be loaded onto a TFX head, use procomm and directions specified in the TFX release notes.

Here is an example of the files generated after this option is executed:

Creo_TSSP_1234_mceTH17_150_dump.nvstxt

Creo_TSSP_1234_mceTH17_150_restore.spt

Creo_TSSP_1234_mceTH2_150_dump.nvstxt

Creo_TSSP_1234_mceTH2_150_diff.nvstxt

Creo_TSSP_1234_mceTFX_150_dump.nvstxt

Creo_TSSP_1234_mceTFX_150_diff.nvstxt

To restore a TH1.7 head browse to the script created under ServiceShell\Firmware and execute the script.

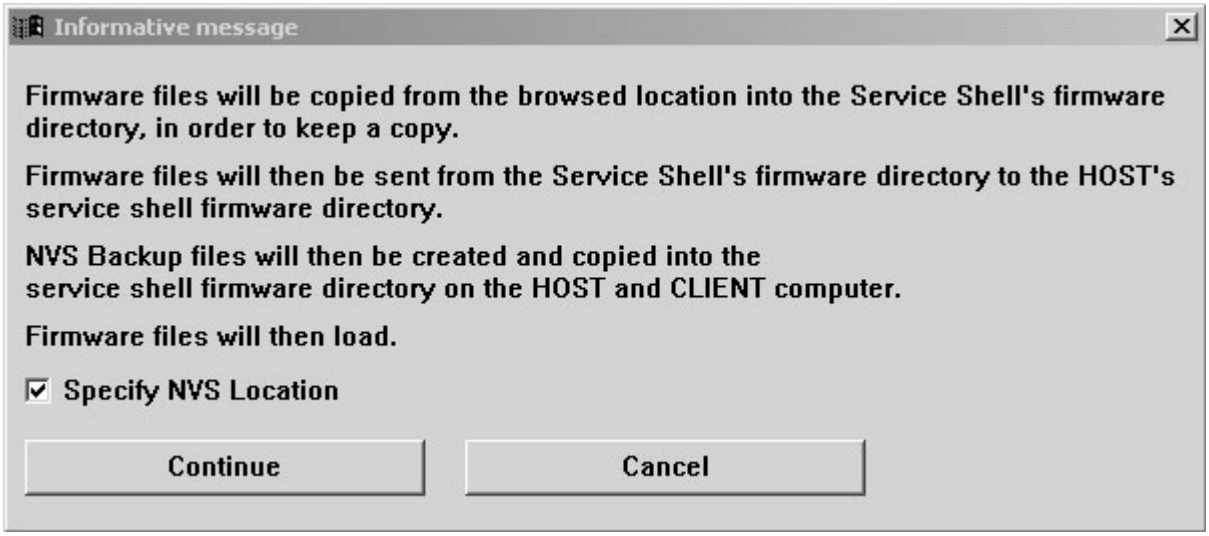
The script to search for would have a format similar to this:

Creo_TSSP_1234_mceTH17_150_restore.spt

10.7 Firmware Upgrade

The Firmware Upgrade option generates a firmware version file, a NVS backup file (or files, depending on the firmware type), and a NVS dump file. It then loads firmware and finally generates a NVS upgrade file (MPE only).

The script will create the backup files in the firmware directory that is under the Service Shell folder. If you would like to specify a location to copy the files, then you can specify a location by enabling the checkbox as shown in the example:



Note: There will still be copies of the backup files in the firmware directory that is under the Service Shell folder.

When downloading firmware through Service Shell, it is important to use the official filename. Service Shell detects the kind of download it has to perform based on the filename. If you enter a filename that is not recognized by Service Shell, the download will not proceed. The name convention is:

MPE Format: UUUU_xxx.hex

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `TTSB_250.hex`

MCE Format: UUUUfmwpxxx.bin

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `3244fwmp101.bin`

The script creates the files in the firmware directory that is under the Service Shell folder. Firmware files or files depending on the firmware type, will be copied from the location specified by the user to the firmware directory that is under the Service Shell folder.

The firmware downloads are monitored and if they fail it is best to go to back to the main menu and choose the **Firmware Upgrade** option again and **Continue** through all the dialog boxes. Only the steps required will be executed by the script.

For a MCE or MPE device that is loading multiple pieces of firmware, the script will keep track of which code was loaded or backups created. The script will only load code which failed to load or create backups that failed to be created.

MPE specific details

Here is an example of the files generated after this option is executed:

Creo_TVTS_1234_mpe_150_ver.nvstxt

Creo_TVTS_1234_mpe_150_nvs.nvshex

Creo_TVTS_1234_mpe_150_dump.nvstxt

Creo_TVTS_1234_mpe_150_upgrade.log

The firmware upgrade script can load all the following files on an MPE device.

MPE main code

TH1.X main code

TH1.X xilinx or lca code

TFX main code

TH2 main code

For TH1.7 heads, a backup of the device's NVS is made since both the device and head share the same NVS.

For TH2/TFX head upgrades, the upgrade is done according to the procedure outlined in the TH2/TFX release notes. The backup is created cannot be used to restore a head. If that functionality is desired, refer to TH2/TFX release notes.

MCE specific details

Examples of the files generated after this option is executed:

Creo_NEWS_1234_mce_150-02_ver.nvstxt

Creo_NEWS_1234_mce_150-02_ram.nvsbin

Creo_NEWS_1234_mce_150-02_flash.nvsbin

Creo_NEWS_1234_mce_150-02_dump.nvstxt

If the MCE device is a dual MCE device a second set of back up files will be created.

Examples of the files generated:

Creo_NEWS_1234_mce2_120-01_ver.nvstxt

Creo_NEWS_1234_mce2_120-01_ram.nvsbin

Creo_NEWS_1234_mce2_120-01_flash.nvsbin

Creo_NEWS_1234_mce2_120-01_dump.nvstxt

With MCE devices, all the code is broken down and loaded separately. Satellite board and head firmware are also supported by the script. Backup files are only created if the MCE

main firmware code is loaded. The firmware upgrade script can load all the following files on a MCE device.

For MCE NVS uploads downloads, the NVS upload for flash and ram will be attempted up to 8 times. If the download fails for the 8th time the script will report an error that the download did not complete on the 8th attempt.

For MCE firmware downloads, the firmware download will be attempted twice if the first attempt fails. If the download fails for the second time the script will report an error that the download did not complete on the second attempt.

MCE board firmware files:

MCE main code
MCE boot code
MCE xilinx code
MCE post code
MCE overwriting patterns ovwr (Currently only used with devices that have the spectrum option)

PDB board firmware files:

PDB main code
PDB boot code

GENINE board firmware files:

GENINE main code
GENINE boot code

LIONEL board firmware files:

LIONEL recovery code
LIONEL main code

TH2 head firmware:

TH2 main code

TFX head firmware:

TFX main code

TH1.7 head firmware:

TH1.7 main code
TH1.7 xilinx code

Satellite board downloads

Satellite boards are the PDB, GENINE, and LIONEL boards. For devices that have multiple satellite boards (ContinuousLoad Spectrum, Spectrum Autoloader) of the same type the script will allow you to choose which board you would like to upgrade/downgrade. The boards are identified in the firmware upgrade script by their board address.

This is example of the board addresses taken from the list version all command.

Firmware Modules **(31h**): BBR v1.03, BOOT v1.09, MAIN v1.17

Firmware Modules **(32h**): BBR v1.03, BOOT v1.09, MAIN v1.17

The 31h & 32h represent the board addresses which will be listed in multiple satellite board download/upload menu.

For satellite board firmware (main, boot or recovery) downloads, the firmware download will be attempted twice if the first attempt fails. If the download fails for the second time the script will report an error that the download did not complete on the second attempt.

Note: Lionel boards in a UDRC cabinet cannot be upgraded via the FirmwareUpgrade script.

Thermal head downloads

This script does support thermal head firmware upgrades for MCE and MPE devices.

For head firmware downloads, the firmware download will be attempted twice if the first attempt fails. If the download fails for the second time the script will report an error that the download did not complete on the second attempt.

For TH2/TFX head upgrades, the upgrade is done according to the procedure outlined in the TH2/TFX release notes. The backup is created cannot be used to restore a head. If that functionality is desired, refer to TH2/TFX release notes.

When upgrading a TH1.7 head on a MCE, a backup script is created that can be used to restore the head at a later time or when downgrading the head. For TH1.7 heads on a MPE device, a backup of the device's NVS is made since both the device and head share the same NVS. A head NVS upgrade log is created after the head's code is upgraded.

TH2 downloads

MPE specific details

Examples of the files generated after this option is executed:

Creo_NEWS_1234_mpeTH2_102_dump.nvstxt

Creo_NEWS_1234_mpeTH2_102_diff.nvstxt

MCE specific details

Examples of the files generated after this option is executed:

Creo_NEWS_1234_mceTH2_102_dump.nvstxt

Creo_NEWS_1234_mceTH2_102_diff.nvstxt

If the MCE device is a dual MCE device a second set of back up files will be created.

Examples of the files generated:

Creo_NEWS_1234_mce2TH2_102_dump.nvstxt

Creo_NEWS_1234_mce2TH2_102_diff.nvstxt

TFX downloads

MPE specific details

Examples of the files generated after this option is executed:

Creo_NEWS_1234_mpeTFX_102_dump.nvstxt

Creo_NEWS_1234_mpeTFX_102_diff.nvstxt

MCE specific details

Examples of the files generated after this option is executed:

Creo_NEWS_1234_mceTFX_102_dump.nvstxt

Creo_NEWS_1234_mceTFX_102_diff.nvstxt

TH1.7 downloads

MPE specific details

The files generated after this option is executed are the same as the files generated by a MPE backup except for an addition file. Backing up an MPE backs up the head as well since they share the same NVS. The addition file created is a log file of the head NVS upgrade.

Examples of the files generated after this option is executed:

Creo_TVTS_1234_mpe_150_ver.nvstxt

Creo_TVTS_1234_mpe_150_nvs.nvshex

Creo_TVTS_1234_mpe_150_dump.nvstxt

Creo_TVTS_2674_TH17_180_upgrade.log

The main menu will appear when the script is complete.

MCE specific details

Examples of the files generated after this option is executed:

Creo_TSSP_1234_mceTH17_180_dump.nvstxt

Creo_TSSP_1234_mceTH17_180_restore.spt

If the MCE device is a dual MCE device a second set of back up files will be created.

Examples of the files generated:

Creo_TSSP_1234_mce2TH17_180_dump.nvstxt

Creo_TSSP_1234_mce2TH17_180_restore.spt

10.8 Downgrade firmware

The Downgrade firmware option is used to revert back to an older version of firmware. The option loads firmware and then loads a NVS backup file (specified by the user).

It is also important when downloading firmware through Service Shell to use the official filename. Service Shell detects the kind of download it has to perform based on the filename. If you enter a filename that is not recognized by Service Shell, the download will not proceed.

The default paths for this option are displayed below:

The name convention is:

MPE Format: UUUU_xxx.hex

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `TTSB_250.hex`

MCE Format: UUUUfmwpxxx.bin

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `3244fwmp10602.bin`

MPE specific details

The NVS upgrade log may or may not happen (more details below).

Examples of the file that may be generated after this option is executed:

Creo_TVTS_1234_mpe_150_upgrade.log

A NVS upgrade may be issued after the NVS is loaded, depending on the version of firmware downgraded to and the version of firmware the NVS fsave all file was created with.

If you downgrade to a version of firmware that does not have the *set config ver* NVS parameter, the script will complete and the main menu will appear.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with an older version of firmware that had the *set config ver* NVS parameter, the script will output a dialog box with the following text:

Upgrading NVS in progress…

A NVS upgrade log file will be created. The main menu will appear when the script is complete.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with that same version of firmware, the script will output the message:

No need to upgrade NVS. The version of firmware that the NVS file was created with is the same as the current firmware version.

The main menu will appear when the script is complete.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with a version of firmware that does not contain *set config ver*., the script will output a dialog box with the following text:

The script could not determine the firmware version to upgrade from. Please upgrade the firmware manually.

If you downgrade to a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with a version of firmware newer than the one you loaded, the script will output a dialog box with the following text:

You loaded a NVS file that was created from a version of firmware that is more recent than the firmware version you just downgraded to.

This dialog box appears, to make it clear to the user that the NVS loaded is not compatible with the version of firmware the user downgraded to.

Downgrading for TH1.7, TFX and TH2 is available for MPE. TH2/TFX downgrade follows the downgrade procedure.

A TH1.7 downgrade follows the same steps as a MPE downgrade. The only differences are that the head code is loaded after the MPE code and after the NVS backup file is loaded and its version is checked, the head values stored in MPE are transferred to the head.

MCE specific details

There is currently no NVS version in MCE. The main menu will appear when the script is complete.

Downgrading for TH1.7, TFX & TH2 is available for MCE. TH2/TFX downgrade follows the downgrade procedure. A TH1.7 downgrade will inform the user to run the TH1.7 restore script that would have been created if the head was upgraded with this script. You should downgrade the head with this script and then browse to the service shell firmware directory and run the TH1.7 restore script.

The script to search for would have a format similar to this:

Creo_TSSP_1234_mceTH17_150_restore.spt

Remote Connection

If you are connected remotely to a device and you wish to restore NVS. You must specify where the backup files are located on the host or client computer. If you choose the client computer, you have the option to browse to NVS files to load. If you choose the host computer, you must have the path and filename correct for the location of the backup file or files on the host computer. The script cannot check for files on the host computer.

If you get the path incorrect the following error will be displayed in the diagnostic terminal window when download command is issued:

<ERROR> Cannot find firmware file

10.9 Replace MCE/MPE Board

The Replace MCE/MPE Board option has two different operations depending where you are in the board replacement sequence. The script will ask the user if the board has been replaced or not. Depending on the response, the script will either create a backup of the old board if the board has not been replaced, or if the new board has been installed it will erase the current NVS on the replacement board, load firmware, and load NVS (if the NVS file is available).

When downloading firmware through Service Shell, it is important to use the official filename. Service Shell detects the kind of download it has to perform based on the filename. If you enter a filename that is not recognized by Service Shell, the download will not proceed. The default paths for this option are displayed below.

The name convention is:

MPE Format: UUUU_xxx.hex

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `TTSB_250.hex`

MCE Format: UUUUfmwpxxx.bin

UUUU - the four letter machine identifier

xxx - the firmware version.

Example: `3244fwmp10602.bin`

MPE specific details

If you choose to load a NVS file then following is applicable.

The NVS upgrade log may or may not happen (more details below).

Here is an example of the file that may be generated after this option is executed:

Creo_TVTS_1234_mpe_150_upgrade.log

A NVS upgrade may be issued after the NVS is loaded, depending on the version of firmware loaded and the version of firmware the NVS fsave all file was created with.

If you loaded to a version of firmware that does not have the *set config ver* NVS parameter, the script will complete and the main menu will appear.

If you loaded to a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with an older version of firmware that had the *set config ver* NVS parameter, the script will output a dialog box with the following text:

Upgrading NVS in progress…

A NVS upgrade log file will be created. The main menu will appear when the script is complete.

If you loaded a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with that same version of firmware, the script will output the message:

No need to upgrade NVS. The version of firmware that the NVS file was created with is the same as the current firmware version.

The main menu will appear when the script option is complete.

If you loaded a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with a version of firmware that does not contain *set config ver*., the script will output a dialog box with the following text:

The script could not determine the firmware version to upgrade from. Please upgrade the firmware manually.

If you loaded a version of firmware that does have the *set config ver* NVS parameter and you loaded NVS that was created with a version of firmware newer than the one you loaded, the script will output a dialog box with the following text:

You loaded a NVS file that was created from a version of firmware that is more recent than the firmware version you just downgraded to.

This dialog box appears, to make it clear that the NVS loaded is not compatible with the version of firmware the user loaded.

MCE specific details

If you choose to load a NVS file then following is applicable.

There is currently no NVS version in MCE.

When dealing with a dual MCE board device, the board replacement option checks for two different things and will act differently depending on what is found.

One check is for the MSFW>> prompt on the MCE port (Com 4). If this prompt is found, the script assumes that you have switched the two MCE boards around and will ask you if this is the case. If your replacement board has slave firmware on it and you are not dealing with a dual MCE device, respond **No** to the question "Is this a dual MCE device?". If you respond Yes, then you will be prompted to load code and NVS (if available) onto both of the MCE boards.

The other check is the detection of the dual head option in the firmware. If the dual head option is enabled, the script will assume that the board you are replacing is the slave board (MCE2). The assumption that is being made is that the replacement board will not have the dual head option enabled. The dual head option is what triggers the script to know if the device is a dual MCE board device. If the script sees that the dual head option is enabled, it will assume that MCE board is already configured with the right version of firmware and is not the board to be replaced. If you do not want to replace the slave board (MCE2) and want to replace the MCE board, disable the option on the replacement board (MCE) and rerun the script.

If you want to replace the slave board (MCE2), be sure to specify the script to only load MCE2 main firmware and MCE2 NVS (if available).

The main menu will appear when the script option is complete.

Remote Connection

If you are connected remotely to a device and you want to restore NVS, you must specify where the backup files are located on the host or client computer.

If you choose the client computer, you have the option to browse to NVS files to load. If you choose the host computer, you must have the path and filename correct for the location of the backup file or files on the host computer. The script cannot check for files on the host computer. If you get the path incorrect, the following error will be displayed in the diagnostic terminal window when download command is issued:

<ERROR> Cannot find firmware file

10.10 Special cases and error reporting

Important!

If the main firmware download is aborted and the script is exited, go back to the Main Menu and retry the download rather than exiting. Or if there is no firmware on your MPE or MCE board when the script is executed, it will not create a proper backup depending on the firmware type (MPE or MCE). For MPE, no backup files will be created before loading firmware. For MCE, a NVS copy of the ram and flash will be created but the dump and version info file will not be created.

MPE specific details

For MPE, older versions of firmware may not recognize commands or may not follow the correct format. In these cases default settings will be used:

ZZZZ - for the four letter machine identifier

0.00 - for the firmware version

0.0 - for the head firmware version

Examples of messages the script will output:

WARNING: Timeout waiting for head version, to display head firmware version number. Assigning 0.00 to the files head version number

MPE – No Firmware Version Available

If no firmware version is found in a firmware upgrade, the script will prompt you to issue a NVS upgrade manually. You must then determine from what firmware version to upgrade from.

Aborting a script

If a user aborts the script or the script has an internal error, it will output a dialog box with the following text:

Script did not complete, or the script was aborted by the user.

No main firmware on the MPE or MCE board

If there is no firmware on the MPE or MCE board, the script will detect this state.

With the MPE, all backup files are not possible to create. Firmware upgrade or Firmware downgrade are the only options available.

With no code on the MCE board, Firmware upgrade, Firmware downgrade, Replace MCE board, or Restore NVS are the only options available. With the MCE, only the ram and flash backup files are possible to create before upgrading main firmware.

With no code on the MCE2 board, the Firmware upgrade, Firmware downgrade, Backup NVS and Restore NVS are the only options available. With the MCE2, only the ram and flash backup files are possible to create. The script will make this clear in the user interface.

Errors generated by the script

With any error that occurs during the script operation, you have the option to go back to the main menu to retry. The only error that is not handled in this manner is the error:

Script did not complete, or the script was aborted by the user.

In this case the script was either aborted by the user, or the script had an internal error.

Download Fails

If a download fails, try the download again. To do this, go back to the Main Menu and choose the same option again (Upgrade Firmware, Backup NVS etc. etc.), and continue through all the dialog boxes.

For a MPE device, the download will proceed again.

For a MCE device that is loading multiple pieces of firmware, the script will keep track of which code was loaded or backups created and will only load code that failed to load or create backups that failed to be created.

Remote connection - File does not transfer properly

If you are connected remotely to a device, and a file is not sent properly, the following error will be reported:

Sending and retrieving files to/from HOST disabled.

You have the option to continue. However, you must manually copy all the files to be downloaded in the host computer's directory (specified by the script) or the download will fail. Any backup files that were created will have to be recovered from the host and client computers manually.
The other option is to exit the script and run it again. At that point the script will enable sending and retrieving files to/from the host.

Commands from script not reaching terminal window

If you get the following error:

Script cannot detect diagnostic prompt! Check device status.

If you are connected to the device and the >> prompt is showing up, but you are still getting this same error, restart Service Shell Client and try running the script again.

11. OVERVIEW OF ALL FIRMWARE COMPONENTS

Board	Component	Downloadable using Script	Extra Notes
	BBR	No	This code is part of the MCE board and should never need to be changed

MCE	BBR	No	This code is part of the MCE board and should never need to be changed
	Boot	Yes	Use script See instructions below if anything goes wrong
	POST	Yes	Use script
	Main	Yes	Use script
	Xilinx	Yes	Use script
	Recovery	No	See instructions below for details
PDB	BBR	No	This code is part of the PDB board and should never need to be changed
	Boot	Yes	Use script
	Main	Yes	Use script
	Recovery	No	See instructions below for details
GENINE	BBR	No	This code is part of the GENINE board and should never need to be changed
	Boot	Yes	Use script
	Main	Yes	Use script
	Recovery	No	See instructions below or details
LIONEL	Boot	No	This code is part of the LIONEL board and should never need to be changed
	Main	Yes	The LIONEL board is part of the UDRC L cabinet, and should not need to be updated on 3244 systems. If it does, contact the product core team for assistance. For Magnus VLF and Flexo Wide II use the script.
	Recovery	Yes	The LIONEL board is part of the UDRC L cabinet, and should not need to be updated on 3244 systems. If it does, contact the product core team for assistance. For Magnus VLF and Flexo Wide II use the script.

11.1 MCE Board

The firmware upgrade script can load Boot code, POST code, Main code and Xilinx. BBR code is part of the board and should not need to be changed in the field.

If any problems are reported during these downloads, do not exit the script or reset the machine. Just go back to the main menu of the script and try the download again.

11.2 Boot Code Download Failures

If there is an error while downloading Boot code and it is not possible to re-start the download, or if the Boot code is not functional, then the machine will be stuck in BBR mode. This mode is detectable if the Heartbeat and Service LEDs are flashing on and off alternatively. To see these LEDs, you will have to open the power box, then use the powerbox disconnect switch service override tool to power the machine back on with the power box door open.

Assuming that the board is stuck in BBR mode, follow these steps to load Boot code back onto the MCE board:

Make sure you have the MCE Recovery code available (MCERECxxx.bin) and that Service Shell is running. If the firmware upgrade script was running, quit the script and go to the Monitor View.

1. Move the serial cable on the MCE board from J38 (DIAG COMM) to J40 (SPR COMM). There will be no prompt on the diagnostic monitor.

2. Download the Recovery code using the download command in Service Shell.

   download d:\firmware\MCERECxxx.bin

   Wait for the download to complete and the progress bar to go green. When the download is successful, the Heartbeat LED will start flashing on its own about twice per second; the Service LED will be out. This indicates that Recovery code is running.

3. Still on J40, download the Boot code using the download command in Service Shell.

   download d:\firmware\MCEBOOTxxx.bin

   Wait for the download to complete and the progress bar to go green.

4. Power down the MCE board – either by pressing the Reset button or by powering down the entire machine.

5. Move the serial cable back to J38.

   - Power up the board. Initially, the Heartbeat and Idle LEDs will flash in unison to indicate the POST code is running. If the Main firmware is okay, the board will power up normally and everything is okay. If the Main firmware is missing, the board will power up in either POST mode or Boot mode. You can determine the mode by checking the prompt.

   - It using the download command in Service Shell. The script will not work because it requires the machine to start in Main firmware:

     download d:\firmware\3244fmwpxxxxx.bin

- Make sure the board is then able to start up normally in Main firmware. Check that all components are present using the fw dir command, or run the Version Checker applet in Service Shell.

11.3 GENINE and PDB Boards

The firmware upgrade script can load Boot code and Main code onto the GENINE and PDB boards. The firmware is downloaded through the MCE board over the CAN bus to the appropriate board. BBR code is part of the board and should not need to be changed in the field.

If any problems are reported during these downloads, don't exit the script or reset the machine. Just go back to the main menu of the script and try the download again.

11.4 Main Code Download Failures

If there is an error while downloading Main code, and it is not possible to re-start the download, check the LEDs on the satellite board. To see these LEDs, you will have to open the power box, then use the powerbox disconnect switch service override tool to power the machine back on with the power box door open. If the Heartbeat LED is flashing on and off once per second but the Service LED is out, the board is in Boot mode. Reset the MCE using the **reset** command and try the download again.

11.5 Boot Code Download Failures

If there is an error while downloading Boot code, and it is not possible to re-start the download, or if the Boot code is not functional, then the machine will be stuck in BBR mode. This mode is detectable if the Heartbeat and Service LEDs are flashing on and off in unison. To see these LEDs, you will have to open the power box, then use the powerbox disconnect switch service override tool to power the machine back on with the power box door open.

Assuming that the board is stuck in BBR mode, follow these steps to load Boot code back onto the GENINE or PDB board:

1. Make sure you have the Satellite board Recovery code available (SATRECxxx.bin) and that Service Shell is running. If the firmware upgrade script was running, quit the script and go to the Monitor View.
2. Move the serial cable from the MCE board to the serial port on the satellite board. This is a little tight, but the cable should reach. Alternatively, use a separate serial cable connected between the computer and the GENINE board.
3. There will be no prompt on the diagnostic monitor.
4. Download the Recovery code using the download command in Service Shell:

   download d:\firmware\SATRECxxx.bin

   Wait for the download to complete and the progress bar to go green. When the download is successful, the Heartbeat LED will start flashing on its own about twice per second; the Service LED will be out. This indicates that Recovery code is running.

Note: if Service Shell reports an error about the protocol not being known, copy the DownloadProtocol.ini file from the product Controlled Release to the d:\ServiceShell\bin directory.

5. Still connected to the serial port on the satellite board, download the Boot code using the download command in Service Shell.

   download d:\firmware\SATBOOTxxx.bin

   Wait for the download to complete and the progress bar to go green.

6. Power down the machine and restart it.

7. Move the serial cable back to the MCE board.

8. If the Main firmware on the satellite board is okay, the board will power up normally and everything will be fine. If the Main firmware is missing, the board will power up in Boot mode. You can determine the mode by checking the LEDs. If the heartbeat LED is flashing on and off once per second, Boot code is running; if the LED is flashing on and off once every two seconds, Main code is running.

   If Main code is not running, run the Firmware Upgrade script to load the Satellite board firmware. If this fails, reset the MCE board with the **reset** command and try again.

9. Reset the machine and make sure everything is then able to start up normally. Check that all components are present using the **list version all** command, or run the Version Checker applet in Service Shell.

11.6 LIONEL Board

The LIONEL board is part of the UDRC L cabinet, and should not need to be updated on a 3244 system.

For Magnus VLF and Flexo Wide II, LIONEL boards are used as part of the CAN bus.

The firmware upgrade script can load Main code onto the LIONEL boards if the board is part of the CAN bus (Magnus VLF and Flexo Wide II only). The firmware is downloaded through the MCE board over the CAN bus to the appropriate board.

If any problems are reported during these downloads, don't exit the script or reset the machine. Just go back to the main menu of the script and try the download again.

The LIONEL board differs from the PDB and GENINE board that no upgradeable boot code resides on the board.

For upgrading LIONEL board firmware, download the recovery code first before updating the main firmware. The recovery code is a tool required to load the main LIONEL firmware. Only LIONEL boards connected to the MCE can be upgraded through the MCE. A LIONEL board in a UDRC L cabinet has to have a cable connected directly to the board to upgrade the firmware.

LIONEL Board Replacement

If you install a LIONEL board and the board does not appear in the **sio nodes** commands' output or there is not functioning properly with the system. You will have to switch the binary communication.

To change the communication for a UDRC L cabinet perform the following steps:

1) Connect a serial cable directly to the com port on the replacement LIONEL board at 9600 baud. The baud rate/port can be modified through the tools options menu in Service Shell.

2) Enter **Creo** (case sensitive) to get the LIONEL>> prompt to appear. If the prompt does appear skip steps 3-5.

3) Reset the board via the blue reset button on the board. (This step requires two people)

4) Enter **y** when the message "Override Binary Mode? (Y/N)" appears. There is no time to reset the board and then get back to the workstation and enter **y**. A laptop would help if you are working alone. "Restarting in Normal Mode" will appear if entered **y** quickly enough. The LIONEL board will now enter normal mode which is required to switch the binary communication mode to remote local.

5) Enter **Creo** (case sensitive) to get the LIONEL>> prompt to appear.

6) Enter **sat remote local**

7) Remove the serial cable connected to the LIONEL board and go back to the MCE monitor window. Enter **sio nodes**, the LIONEL board should now appear in the output of the command.

Example:

Override Binary Mode? (Y/N)

Y

Restarting in Normal Mode

<<Creo password entered here >>

Satellite I/O Board Firmware Version 1.18, Nov 4 2003 14:43:27
Copyright (C) 1999-2003 Creo Inc.
All Rights Reserved.
Type 'Help' for a command list.
CAN Bus Baud rate is 500KHz.
MCU: 68HC12D60A
LIONEL>>

sat remote local

Remote Local Mode

To change the communication for LIONEL board located in a Flexo Wide II or Magnus VLF, perform the following steps:

1) Connect a serial cable directly to the com port on the replacement LIONEL board at 9600 baud. The baud rate/port can be modified through the tools options menu in Service Shell.

2) Reset the board via the blue reset button on the board. (This step requires two people)

3) Enter **y** when the message "Override Binary Mode? (Y/N)" appears. There is no time to reset the board and then get back to the workstation and enter **y**. A laptop would help if you are working alone. "Restarting in Normal Mode" will appear if entered **y** quickly enough. The LIONEL board will now enter normal mode which is required.

4) Remove the serial cable connected to the LIONEL board and go back to the MCE monitor window. Enter s**io nodes**, the LIONEL board should now appear in the output of the command.

Example:

Override Binary Mode? (Y/N)

Y

Restarting in Normal Mode

Magnus VLF AL>> sio nodes

Satellite I/O Board Node List:
GENINE Board #00 Id:030h #Resets: 1 #PowerUps: 0 (CAN)
PDB Board #00 Id:010h #Resets: 1 #PowerUps: 0 (CAN)
PDB Board #01 Id:011h #Resets: 2 #PowerUps: 1 (CAN)
GENINE Board #01 Id:031h #Resets: 1 #PowerUps: 0 (CAN)
GENINE Board #03 Id:033h #Resets: 2 #PowerUps: 1 (CAN)
GENINE Board #02 Id:032h #Resets: 1 #PowerUps: 0 (CAN)
LIONEL Board #00 Id:040h #Resets: 3 #PowerUps: 1 (CAN)
LIONEL Board #01 Id:041h #Resets: 3 #PowerUps: 2 (CAN)

12. VERSION CHECKER USAGE

Use the Version Checker applet to identify all firmware components that need to be upgraded. The version checker applet is part of service shell 2.4 and higher. To execute the version checker click on the version checker icon under 'default views'. If the system you are version checking has not been configured then the "**Device is not configured"** message will appear. Please select one of the following actions to continue.

1. ***If you do NOT have a controlled release CD, use "Detect Versions"*:**
   Detect version will display a menu of supported devices. Once a device is chosen, the version checker will then query all the components for that system. The result of the versions found will be displayed in the version checker window.

2. ***If you have a controlled release CD, use "Configure System":***
   Configure system will ask the user to browse to a version checker file. The controlled release CD will contain a version checker file. This file will be used by version checker to compare versions in the controlled release to versions currently on the device. Click BROWSE and select the version checker file located under the Version Checker folder on the controlled release CD. The file will have a .ini extension. Then in the RELEASES LISTS box, click the down arrow and select the controlled release version that you will be installing.

3. Note: (Service Shell 2.4 specific) You cannot load the version checker file directly off the CR CD. You must copy it to the workstations hard disk first and load form that location for the configuration to be successful. For a system that has already been previously configured with the version checker the behavior of the version checker will change. Once you launch the version checker it will immediately start to test version information. To reconfigure the system, wait for the version checker to complete. Once it has finished querying versions select 'config' in the upper right hand corner of service shell. The next steps will be identical to configure system mentioned above in step 2.

13. WINDIFF PROGRAM USAGE

This appendix seeks to give a quick start guide to using the WinDiff software tool found on the Controlled Release CD.

WinDiff is a program that can be used to compare the contents of two files or two sets of files. It is very useful for checking what has changed because it will highlight every difference between the two files submitted for comparison. In the case of nvs parameter dumps this saves going through the before and after files manually.

To use WinDiff:

4. Start the software

5. To begin a compare, go to the File menu and select **Compare Files …**

6. Use the Explorer style browser to select the first file and then the second file

7. WinDiff now displays an outline view (note that if you compare directories, WinDiff compares all files in the first directory to all the files in the second directory – this will result in many results in the Outline view. When only diff'ing one file with one other there will only be one result in the outline view).

   - If the files compared are identical it will say so and that's it.

   - If the files are different they will be marked as such. Double click on the item – or use the expand button to open a window showing the two files side by side.

8. In the Expanded View:

   - You can scroll down the files and take note of changes OR

9. You can click on yellow/red mark on the summary shown left side to quickly move from change to change (for severely different files there will be a large number of crisscrossing

red and yellow lines). Red highlights are from the first file selected (before) and the Yellow highlights are for the second file selected.

- When you are done, close down the window(s) and that's it.