creo

Trendsetter NEWS_SA
MCE Firmware Version 1.26 Release Notes

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1. SCOPE

This document describes the Trendsetter NEWS_Semi-Automatic (NEWS_SA) MCE firmware that comes with Controlled Release version 1.00. This firmware release consists of MCE Main Firmware Version 1.26. The intended audience is test engineers and service personnel.

Please refer to the TechPlanet firmware documentation pages or the Creo Service CD-ROM for information on commands, error messages, and NVS parameters for the Trendsetter NEWS_SA.

Common acronyms used in this document are defined in Appendix A.

2. FORMATTING CONVENTIONS

The formatting conventions used in this document are as follows:

all NVS parameters are in italics and

commands to be typed into the diagnostic terminal are in bold as well as the diagnostic command responses.

3. PRELIMINARY CHECKLIST (READ BEFORE YOU BEGIN!)

Please ensure the following checklist is performed before the upgrade is started.

- ☐ Use the list version command to display the current MCE version.
- ☐ Ensure you have the entire controlled release package available.
- ☐ Read "readme" notes on the controlled release CD.
- ☐ Run the Version Checker applet[1] with the new controlled release version specified. Identify all components that need to be updated.
  - ☐ Head compatibility (Thermal 1.7x V1.93).
  - ☐ Print Console compatibility (Version 3.15).
  - ☐ MCE POST 1.06
  - ☐ MCE BOOT 1.12
  - ☐ MCE Main firmware (Version 1.26.02).
  - ☐ Xilinx compatibility (Version 1.94).
  - ☐ PDB Power Distribution Board (Version 1.17)
- ☐ Check for any updates to the controlled release – for example, new scripts not included in the official Service Shell release. These updates would be stored in the Patches folder of the controlled release package.
- ☐ **Carriage Amplifier 503C01525B is needed to support carriage acceleration of 150 mm/s^2.**

[1] Available from the Default Views of Service Shell 2.5; ensure the machine is on before running the applet.

☐ Ensure that you allocate at least 4 hours for upgrading and testing the system. After the firmware upgrade, the entire system must be checked to make sure it is operating properly. This includes performing a visual check of plate handling, running a few plots to ensure proper image quality, and instructing the operators on any changes to the system operation. The customer should also be allowed to run a few plates to make sure the machine works to their satisfaction.

4. UPGRADE PROCEDURE

To upgrade the MCE firmware, please perform the following steps:

1. Service Shell 2.5 must already be installed. **This firmware cannot be downloaded without this version of Service Shell!**
2. Use the Version Checker applet to identify all firmware components that need to be upgraded.
3. Run the FirmwareUpgrade.spt script from within Service Shell (see Appendix B for details) and select Upgrade Firmware. The script will automatically create backup files for all the NVS parameters on the device, once this is done 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.
5. Check out the major changes below and make sure to follow ALL the procedures below.

For the Upgrade Procedure, please see the detailed upgrade document *FirmwareUpgrade.pdf*. This document can be opened from the script view in ServiceShell by right-clicking on the Firmware Upgrade script, and clicking Help for selected script. Then click the link to the pdf file:



The *FirmwareUpgrade.pdf* file can also be found in the d:\ServiceShell\Scripts\device folder.

4.1 BOOT and POST Manual Upgrade Procedure

This is a manual alternative to the script upgrade procedure and is included here as a "backup" activity.

Before any attempt to upgrade firmware, any machine is supposed to have old version of firmware running normally.

If this is not the case, the machine needs to be set up properly with the old version of firmware.

When old version of main firmware is running, go through the following steps from the ServiceShell(version 2.5 or newer).

Alternatively, the current version of Bload program can also be used.

1. Download the new version of MCEBOOT.BIN.

   Command:

   download \path\MCEboot.bin, or,

   bload f=\path\MCEboot.bin i=boot p=port#

2. Reset MCE to boot mode.

   Command: **reset boot.**

   When the boot starts up, it will build the FWD firmware directory table and the FWD structure header.

   It displays a message while building the firmware directory table. This is only an operation at the first time the new version of MCE Boot starts up.

   This may take 25 seconds. When it finishes, the "Boot" prompt shows up.

3. Download the new version of MCE POST.

   Command:

   download \path\MCEpost.bin, or,

   bload f=\path\MCEpost.bin i=post p=port#

Reset to boot mode.

4. Download the latest version of Xilinx image.

   Command:

   download \path\MCElca.bin, or,

   bload f=\path\MCElca.bin i=lca p=port#

   Reset to boot mode.

5. Download the new version of the main firmware

   Command:

   download \path\mainfirm.bin, or,

   bload f=\path\xxxfmw.bin i=main p=port#

6. Reset to the new main firmware.

   Command: **reset**

   When the new main firmware starts up, type command '**fwd list'**.

   This command should list all firmware components you have successfully installed.

5. FUNCTIONALITY SUPPORTED

5.1 NVS

NVS System	Param Name	Old Default	New Default	Description	Refer to Section

5.2 Diagnostic Commands

New commands:

Command	Description	Refer to Section

Modified commands:

Command	Description	Refer to Section

Removed commands:

Command	Description	Refer to Section

5.3 Functionality of NEWS Semi-Automatic

The Trendsetter NEWS Semi-Automatic (NEWS_SA) MCE firmware 1.26 is the first version to support NEWS_SA devices. The 1.26 firmware, however, is based on the firmware for Trendsetter NEWS devices CR3.0 without the Autoloader options. All NEWS functionality for manual loading and unloading of media as well as all NEWS CR3.0 functionality and commands for plotting apply to NEWS_SA.

Please note that MCE V1.26 firmware is released for NEWS_SA models only and should not be used on any other device models!

6. FUNCTIONALITY NOT SUPPORTED

All expected functionality is supported.

7. KNOWN PROBLEMS

This section lists the known problems that have not been fixed for this release of the firmware. Where possible, workarounds to the problems are described.

7.1 Image Artifact during Carriage Retrace

There is a known problem when carriage retraces are performed - image artifact. In such a case the image on the plate can contain residue from previous data already imaged. The problem pronounced itself with one or several incomplete vertical lines and other plate defects. Investigation is in progress for this problem. Please note that this problem is not expected to affect NEWS_SA devices in normal operation because carriage retraces are not performed often (due to lower data rate).

The following is a brief summary of what is known about the problem:

Artifact has been discovered on News 150, with each machine running different firmware. Artifact happens with Thermal 1.7 head but not with Thermal 2.0 head. Artifact happens mainly at 1200 dpi. Artifact only happens when retraces are produced. Artifact can be reproduced. Artifact shows up on the TEC side of the plate, and shows up in the same part of the image. Artifact seems to be a result of data being duplicated a few inches from its correct location(in the subscan direction). Plates with dimensions 770x1029 have shown the problem. This problem does not show up on plates with a small mainscan size. Artifact is generally about half a swath width wide and two to six inches long.

7.2 PRS 6325: Unable to read LIONEL board info with list version all command.

```
NEWS>> list version all
Version Information:
-----------------------------------------------------
FW: TSMCE Mar 30 2004 12:16:02
Version: 1.26.02 Build No: 02056
Built using Baseline #3010 - Feb 17 2004
HW: Master Control Electronics Hardware Board (MCE)
MCE PCB Version is 06
MCE PCB Population Option Number 02.
Xilinx Version: 1.94
Machine Serial Number: None
Exposure Head Type = Thermal 1.7x, Model = Standard, Firmware Version = 1.93
MCE Master Control Board PCB Version:6 Population Option:02
Firmware Modules (00h): BBR v1.03, BOOT v1.12, MAIN v1.26.02, POST v1.06, Xilinx
v1.94,
PDB Power Distribution Board @10h Version:5.00BBR v1.03, BOOT v1.09, MAIN v1.17,
LIONEL Generic I/O Board @40h
Error: Cannot read Satellite Board's HW Version Register
Failure obtaining fw version number
*** Command Complete
```

7.3 PRS 7340: Stuck in suspend after safety loop opened during imaging

Press Emergency stop while device is imaging at ~ 70%.
- suspend: [Product:Emergency stop switch is on] with Eject button
Hit Eject.
- next suspend came up: [Product:Emergency stop switch is on] with Resume and Release buttons.
If one follows the ‘Resume’ path device gets in undefined state.

Workaround:Select the Resume button on the second 'Emergency stop switch is on' or 'top panel opened' suspend then plate is unloaded properly.

7.4 PRS 7262: Firmware crashed after cancelled the active job before imaging

This is a timing issue. The problem occurs when cancelling a job right after focus learn completed.

No problem found if the job is cancelled before or after this instance.

8. DEVICE CONFIGURATION PROCEDURES

8.1 Setting Up the NEWS_SA Model

Ideally, all required NVS parameters would be configured automatically when the model is configured. This has not yet been done, in part because a single model can have different options that change its characteristics. The following list defines what settings must be verified when a model or feature is changed (do access dev first to gain access to commands):

- option autoloader disable — disabled for NEWS_SA
- option dual-plate enable — dual-plate functionality is always required
- mode n — ensure resolutions are set correctly

Set both mode 1 and mode 2 as 1200dpi.

Example: set mode 1 displays resolution parameters. Should be as follows:

NEWS_SA: 1200
1200
1
2

set mode 2 Repeat the mode 1 parameters.

Example of NEWS_SA option setup:

```
NEWS>> option
Available Options
-----------------
      Dual-plate option is enabled
       No-buzzer option is enabled
    Debris UDRCB option is disabled
    Debris UDRCL option is enabled
*** Command Complete

NEWS>> product
Product Specific Constants
==========================
```

```
Device Model
--------------
Trendsetter II NEWS SemiAuto [NEWS_SA]
Media Constants
--------------
Minimum plate subscan length              : 285 mm
Minimum plate mainscan length             : 304 mm
Maximum plate subscan length              : 1118 mm
Maximum plate mainscan length             : 813 mm
Minimum plate thickness                   : undefined
Maximum plate thickness                   : undefined
Minimum plate density                     : undefined
Maximum plate density                     : undefined
Leading edge margin                       : 6.096 mm
Trailing edge margin                      : 7.000 mm
Leading edge clamp shadow                 : 9096 um
Trailing edge clamp shadow                : 9000 um
Maximum number of cassette bays           : 0
Maximum number of punch configurations    : 0 (undefined)
Maximum number of media stacks            : 2
Maximum number of machine exits           : 0
Other Constants
--------------
Maximum drum velocity                     : 400 RPM
Maximum imaging speed (plates)            : 30500 microns/s
Maximum number of image tasks             : 2
Target SCSI ID                            : 1
Drum diameter                             : 286000 microns
Plot clamp direction                      : LEC to TEC
*** Command Complete
```

9. DEVICE CALIBRATION PROCEDURES

If the firmware is being loaded into a new machine or the NVS parameters have been erased without making a backup, then the following NVS parameters must be calibrated:

9.1 Setting the Plate Measuring Sensor Offset

The mh DistSensorToLEC parameter specifies the nominal distance between the Leading Edge Clamps (LEC) and the optical plate measuring sensor on the load ramp. This parameter is used by the firmware to measure the main-scan size of plates as they are being wound onto the drum. To calibrate this parameter, place a plate of a known size on the load ramp, load the correct plate size information from the workstation, and verify that the media mainscan size is correct by entering the ‘load args’ command from the diagnostic terminal.

Type ‘load calibrate’ through diagnostics and press the ‘Load’ button. This will cause a plate to be loaded onto the drum. The plate size will be measured and the mh DistSensorToLEC parameter will be calibrated as the plate is wound onto the drum. The new value is automatically saved.

9.1.1 TEMargin Parameter

This NVS parameter affects the mainscan (around the drum) distance from trailing edge of the plate to the last imaged pixel. To view or modify the value of this parameter use ‘set prd’ command.

9.1.2 LEMargin Parameter

This NVS parameter affects the mainscan distance from leading edge of the plate to the first imaged pixel. To view or modify the value of this parameter use ‘set prd’ command.

9.1.3 TEAdjust Parameter

This NVS parameter adjusts the amount that the trailing edge magnetic clamp covers the plate. Any changes in the parameter will affect the length of plate being clamped by the TEC. To view or modify the value of this parameter use ‘set mh’ command.

Before adjusting this parameter, make sure the LoadPos and TECParkPos parameters are properly calibrated.

To verify or adjust the TE clamp cover:
1. Load a plate and using the TEC as guide, draw a line on the plate.
2. After unloading the plate, measure the distance between the edge of the plate and the line.
3. Calculate "desired TE clamp cover distance minus value from step 2"
4. For positive values in step 3, add the amount to the current TECAdjust parameter to increase the cover.
For negative values in step 3, subtract the amount from the current TECAdjust parameter to decrease the cover. Please note that the value stored in mm in NVS does not directly correspond to what the device will actually clamp. For example, if the value stored in NVS is 7 mm the device could only be clamping 5 mm.

9.2 Debris Cable Support on J37

Please note that firmware 1.26 supports debris cable connected to J37.

9.3 RAM vs. FLASH Parameters in MCE Machines

There are two separate types of NVS parameters that are accessed by the MCE firmware. Most parameters are stored in RAM. A few parameters that are not expected to be changed frequently are stored in Flash. Both sets of parameters must be backed up to fully capture the state of the machine; and both sets of parameters must be loaded onto a new board to restore the machine to its previous state. The FirmwareUpgrade.spt script automatically creates two separate files, one for each type of NVS, and expects both files when restoring parameters.

NVS parameters in general provide the following:

- Storage for machine-dependent parameters that must remain intact between power cycles.
- Storage for "state variables" that allow a machine to resume where it left off if power is cycled during loading or imaging.

All parameters are saved immediately as soon as they are changed.

When firmware is upgraded on a device, any new parameters will automatically be set to their default value. If a more complicated upgrade procedure is required, a script will be created to perform this upgrade, and this script will be released with the firmware.

APPENDIX A: COMMON ACHRONYMS

MCE	Master Control Electronics
CTP	Computer to Plate (this includes Trendsetters and Platesetters)
NVS	Non-Volatile-Storage
PDB	Power Distribution Board
GENINE	Generic I/O Node Electronics Board
LIONEL	Little I/O Node Electronics Board
POST	Power-On Self Test
BBR	Boot-block Recovery
PC	Print Console
TH2	Thermal 2 Head
TH1.7x	Thermal 1.7x Head
WS	Workstation
TSAL	Trendsetter Autoloader
TS	Trendsetter – base model
TSSP	Trendsetter Spectrum
NEWS_SA	Trendsetter NEWS_SA
NEWS	Trendsetter NEWS

APPENDIX B: NVS BACKUP/RESTORE AND LOADING FIRMWARE

Service Shell is required to load new firmware, and to backup or restore NVS parameters. A script has been written to simplify these tasks.

As part of the Service Shell install, a script named FirmwareUpgrade.spt is copied to the Device scripts folder. A document describing how to configure Service Shell and how to use the script is also included in the d:\ServiceShell\scripts\device folder. Service Shell is installed on every workstation before it leaves the factory, so this document will be present on every workstation. An updated copy with more MCE-specific information is available in the Trendsetter NEWS MCE Controlled Release V2.0.

Inside Service Shell, left-click on the Scripts icon, then left-click on the Device group. Double-click on FirmwareUpgrade.spt to start the script. It is very important to use this script for the upgrade to make sure a full NVS backup is performed.

IMPORTANT: BEFORE UPGRADING THE FIRMWARE OF ANY RECORDER MACHINE YOU MUST BACKUP THE CONTENTS OF THE CURRENT NVS MEMORY IN CASE IT BECOMES NECESSARY TO REVERT TO THE PREVIOUSLY INSTALLED VERSION OF FIRMWARE!

APPENDIX C: BBRAM CORRUPTION ON MCE DEVICES

BBRAM corruption has been seen so far on NEWS 200 (both MCE boards) and NEWS 70. There is a Service Shell script RecoverCorruptBBRAM.spt, to be run on a MCE device which should be able to recover the BBRAM from the corruption that we have been seeing. The problem is still under investigation. The corruption occurs in an unused portion of BBRAM, so the actual real data in BBRAM is not affected. If corruption occurs in a real portion of the BBRAM, the firmware will automatically recover. One can upload corrupted BBRAM from one MCE boards, and corrupt a new MCE by downloading the corrupted file. BBRAM corruption will normally be noticed when a service engineer attempts to change a NVS parameter which results in the firmware crashing.
The symptoms will be the following:

1) Using the "set" command to change specific NVS parameters will cause the firmware to crash. This will seem inconsistent to the user, some parameters will always work while others will always result in a crash. Also this will also not be consistent from device to device. Some parameters that may work on one device, will not work on another.

2) One would see the following errors on device startup:

```
MCE Power On Self-Test (POST) v1.05, Dec 10 2001 03:45:06
```

```
Copyright (C) 2000-2001 Creo Products Inc. All Rights Reserved.
MCE Board Revision:02 Configuration:00 Boot Cycles:3
9010: 1M SRAM Test ..............................PASSED
9011: 32K NonVolatile SRAM Test .................PASSED
9012: Quad Uart Test A+B+C+D+....................PASSED
9013: 68376 Uart Test A..........................PASSED
9014: NVS SRAM Verification FAILED
9015: NVS Flash Verification ....................PASSED
*** Initializing Firmware Subsystems ***
NUC 376 MCE ERR URT MON MOP PRD MSG UTL NVS STG PRM PST LCA
376s MCEs ERRs URTs NUCs PRDs PSTs CAN SIF SIO DF1 IOS NET SST STA HLT
DPC HIF CEH EHI DTL CRG RIF WMD GIM MIC MPC DRS SMC MDH MPI MDS OWB KEY IBM
DEB CTP VBS
*** Firmware Subsystems Init Complete ***
TSMCE Firmware Diagnostic Monitor
Version: 1.01.06 Build No: 00761 Date: Feb 13 2003 15:37:41
Built using Baseline #2650 - Feb 13 2003
Engineering Version - Not for Production Use
Machine Serial Number:  **Not Available**
BBRAM Nvs Found: Addr:00C90000h Size:16384 bytes IS CORRUPT!
Flash Nvs Found: P1:00020000h P2:00040000h Size:131072 bytes VERIFIED OK
CAN Bus Baud Rate is 500KHz.
C ---: Using PPP Client Protocol
C ---: Starting Telnet Server
Access level is: developer
```