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1. SCOPE

This document describes the important changes to the Trendsetter NEWS MCE firmware that come with MCE Main Firmware Version 1.30.60. Please note that MCE Slave Firmware Version is the same as in CR4.1 namely 1.16.09.

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.

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 or higher; Thermal 2 V1.04d or higher).
  - ☐ Print Console compatibility (Version 3.17, RCON protocol version 6.4 or later).
  - ☐ MCE POST 1.06
  - ☐ MCE BOOT 1.16

[1] Available from the Default Views of Service Shell 2.4; ensure the machine is on before running the applet.

- ☐ Carriage compatibility (Version 1.69 or higher).
- ☐ Xilinx compatibility (Version 2.23 or higher).

☐ 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.

☐ **GENINE board Part Number 10-4227D-A**

☐ Carriage amplifier board: 503C01525B (needed to support carriage acceleration of 150 mm/s^2): FCO CA00752 (http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/fcos.htm#CA00752)

☐ Unload table 16-tooth pulley: FCO CA02183 (http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/fcos.htm#CA02183)

☐ 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.

☐ **Please note that firmware 1.30 supports debris cable connected to J37.**

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 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. CHANGES SINCE NEWS CR4.1

5.1 NVS Changes

NVS System	Param Name	Old Default	New Default	Description	Refer to Section
N/A					

5.2 Diagnostic Command Changes

New commands:

Command	Description	Refer to Section
N/A		

Modified commands:

Command	Description	Refer to Section
scan	Additions to "scan" command for Dual Bay option sensors status. Note: Applicable with Dual Bay only.	
Scan	DB_StopBlockOUT 1 DI_DualBay_0100 00000010h	Dual Bay option only.

Removed commands:

Command	Description	Refer to Section
N/A		

5.3 Bug Fixes

5.3.1 Reduce the unload table hold current when moving the unload traveller home

The hold current is now set to half current (instead of full current) when the unload table traveller is moved home. This will reduce the heat generated by the unload traveller stepper motor when it is resting at the home position.

5.3.2 Large Dual Plate option fix

Fixed a firmware bug in load command when checking for a maximum broadsheet plate or a minimum panorama plate and Large Dual Plate option is enabled.

IMPORTANT:

Please note that Large Dual Plate option requires a hardware change (engine).

Please perform 'gc init' command if you switch between options 'dual-plate' and 'large-dual-plate' and verify that pin assignment is correct!

5.4 New Functionality for NEWS 200 Models

5.4.1 Changes to Dual Bay Option

5.4.1.1 Stacker push after each pick from Bay 2

Stacker pushes plates back in after each pick from Bay 2 to prevent a potential plates stack separation when vacuum is applied during picking.

5.4.1.2 Speedup SwitchoverBay2

Speedup SwitchoverBay2 by removing redundant delay of 5 seconds.

5.4.1.3 Added DB_StopBlockOUT sensor

Added DB_StopBlockOUT sensor support for Dual Bay feature to assure that the StopBlock is out before any request to a Preloader is issued.

Please use 'scan db' ServiceShell command to examine the value of DB_StopBlockOUT sensor.

DB_StopBlockOUT 1 indicates the StopBlock is OUT.

DB_StopBlockOUT 0 indicates the StopBlock is IN.

The following is the updated sensor monitoring for Dual Bay option:

NEWS>> scan db

Bit Name	State	Group	Bit Mask
DB_StopBlockOUT	1	DI_DualBay_0100	00000010h
DB_ArmHomeIN	~0	DI_DualBay_0100	00000020h
DB_PlateStackHeight	~1 b	DI_DualBay_0100	00000080h

DB_ArmAwayIN ~0 DI_DualBay_0100 00000800h

DB_&PlateStackHeight 1 b DI_DualBay_0100 00800000h

DB_ClampCylinderDrive 1 b DO_DualBay_0000 00000001h

DB_StackerDrive 0 b DO_DualBay_0000 00000002h

DB_ArmDrive 1 b DO_DualBay_0000 00000004h

*** Command Complete

All other functionality as before.

5.5 Various Settings Reference

The following are settings for options introduced with CR4.0 and are included here for reference purposes only.

5.5.1 Option “Large Dual-plate” with Modified Registration Pin location for NEWS Models (ECO CA06137)

A new option “Large Dual-Plate” has been added with CR4.0. This option is an alternative to “Dual-plate” option. When “Large Dual-plate” option is enabled the device can process broadsheet plates with maximum subscan size of 536 mm provided the drum has modified registration pin locations (ECO CA06137) as described below.

This option requires hardware modifications to the engine and will not function without these modifications.

Please perform 'gc init' command if you switch between options 'dual-plate' and 'large-dual-plate' and verify that pin assignment is correct!

A modification of the positions of the registration pins has been made to allow for a maximum subscan of 536 mm for a broadsheet plate and a minimum of 620 mm for a panorama plate.

The registration pins on the modified drum are spaced as follows:

pins: 1 2 3 4

pinloc: 153 427 733 1007 mm

Pins 1-3 can have from 620mm subscan size plates to 888 mm subscan size plates

Pins 1-4 can have form 889mm subscan size plates to 1118 mm subscan size plates

The new limits on broadsheet and panorama plates are as follows:

Minimum subscan size panorama plate - 620 mm

Maximum subscan size broadsheet plate - 536 mm

The following is the gc setup for a NEWS device with the new registration pins.

```
NEWS>> gc
Current GC NVS parameter settings:
pins:         1-2      1-3      1-4      3-4
              ---      ---      ---      ---
mscale:       -361     "        "        -361     ppm
mshift:       4686     "        "        4509     microns
sscale:       -18      "        "        "        ppm
sshift:       4604     "        "        "        microns
orthoadjust:  -22      "        "        "        uradians
rotation:     -428     -209     79       675      uradians
sscansizemax: 536      888              536      mm
pins:         1        2        3        4
              ---      ---      ---      ---
pinloc:       153      427      733      1007     mm
Track profile (zone size = 0.50 ):
  01:         -4       -3       -2       -1       0          microns
  06:         1        3        5        6        5          microns
  11:         5        4        3        1        -1         microns
  16:         -3       -5       -5       -6       -6         microns
  21:         -6       -6       0        0        0          microns
  26:         0        0        0        0        0          microns
Rotation mapping (index [pins]): 1 [1-2]; 2 [1-3]; 3 [1-4]; 5 [3-4].
*** Command Complete
```

5.5.2 Debris Removal Parameter Setup on NEWS200

The following outlines debris removal options and necessary setup for NEWS200 devices. Please note specific cases supported and make sure the recommended setup is entered on the device.

- **NEWS200 with TH2 uses UDRCB-H cabinet only. UDRCL option will not work on NEWS200 because there is not appropriate UDRCL cabinet to provide an adequate flow for a dual-head device currently.**
- **Please note that from the 3 debris removal UDRCB options available NEWS200 with TH2 is recommended to specify option 1 and 3 only – i.e. the air-jet needs to be always enabled so that adequate readings can be obtained from the nozzle sensors for TH2.**

5.5.2.1 Example for UDRCB option enabled on a dual-head device (NEWS200)

debris options

NEWS>> debris options

Debris Removal Option(s):

(debris option 1) Air Jet Debris Removal

(debris option 2) POC Debris Removal -- Note: NOT recommended for TH2

(debris option 3) Air jet and POC Debris Removal

*** Command Complete

5.5.2.2 Example for option 3 enabled on NEWS200

NEWS>> debris

Debris Removal Status

Air Jet is running

POC is running

Air jet: enabled

Lid closed/filter present : present

Blower : on

Nozzle Pressure : 1.922 kPa (7.723 "H20)

Nozzle Flow : 75.500 SCMH (44.437 SCFM)

Nozzle2 Pressure : 2.137 kPa (8.587 "H20)

Nozzle2 Flow : 80.024 SCMH (47.100 SCFM)

The following is the required setup for NEWS200 ; Modify the following parameters after typing the command for enabling media access changes in Service Shell:

```
NEWS>> set debris
PRM debris parameters:
Group       Parameter       Active          Default         Units
-------------------------------------------------------------------------
debris      BlowerOffDelay  300             300             seconds
debris      PartFilterLatch False           False
debris      NozzleFlowConst 7280.000        2226.510        E-07
debris      NozzleFlowExp   1822.000        2053.038        E-03
debris      BellmouthFlowConst 2789.703     2789.703        E-07
debris      BellmouthFlowExp 1839.091       1839.091        E-03
debris      PressZero       0.125           0.125           kPa
debris      PressMaxNozzle  6.500           4.977           kPa
debris      PressMaxBellmouth 24.880        24.880          kPa
debris      PressMaxDiffBell 2.490          2.490           kPa
debris      FlowZero        17.000          30.000          SCMH
debris      FlowLow         59.000          65.000          SCMH
debris      FlowMin         65.000          71.000          SCMH
debris      FlowMarginal    68.000          76.000          SCMH
debris      FlowMaxDiff     8.500           8.500           SCMH
debris      FlowChangeRate  3.000           3.000           SCMH
debris      SiteElevation   0               0               m
debris      PressureCorrectionExp 1125.000  1125.000
debris      NozzleSensorType 0              0
debris      Nozzle2SensorType 0             0
debris      BlowerOnPostDelay 3.000         3.000           seconds
*** Command Complete
```

Summary of setup for NEWS:

5.5.2.2.1 Type of Debris Nozzle	nfc	nfe	fmin (SCMH)	fmar (SCMH)	fl (SCMH)	fz (SCMH)	pnmax (kPa)	fmaxdiff (SCMH)
Thermal 1.x (50-2117B or 50-2117C) (3)	2227	2053	71	76	65	17	5.0	8.5

Thermal 2.x (50-2331A) Lotem Quantum	7280	1822	71	76	65	17	6.5	8.5
Thermal 2.x (50-2331A) Trendsetter News	7280	1822	65	68	59	17	6.5	8.5
Thermal 2.x (50-2331A) NEC (Fugu) Engine	3033	2013	65	68	59	17	6.5	8.5
Thermal 2.x (50-2331A) on any VLF engine	(3033) (2)	(2013)	71	76	65	17	(8.5) (2)	8.5

6. KNOWN PROBLEMS

6.1 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 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 Atifact is generally about half a swath width wide and two to six inches long.

7. DEVICE CONFIGURATION PROCEDURES

7.1 Setting Up a 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 enable — enabled for all models
- option dual-plate enable — if dual-plate functionality required
- option rotator enable — if rotator installed

- option dual-head enable for NEWS 200
- mode n ensure resolutions are set correctly

For Commercial options, set mode 1 as 2400dpi and mode 2 as 1200dpi; otherwise, set both mode 1 and mode 2 as 1200dpi.

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

News50 & 70:	1200
	1200
	1
	2
News50C & 70C	2400
	2400
	1
	1
News100 & 150	1200
	1200
	1
	1

set mode 2 displays parameters. For single resolution, repeat the mode 1 parameters. For dual resolution:

News50C & 70C	1200
	1200
	1
	2

7.2 Thermal 2 Firmware Installation Notes

Please note that if a pre-release version of Thermal 2 firmware version 1.02 is running and a new head firmware version is installed, the following procedure is required before installing the new head firmware:
- th2 "eng"

- th2 "set sys firmwareversion 1.01"
- reset

If you have replaced the 1.7x head on the device and the head fails to initialize, run the service shell script "InitHDM9to16" in the "devices" script list. This script is included in Service Shell 2.4 SP1 (Service Pack 1).
Please read the " readme" notes on the controlled release CD for more information.

7.3 Thermal Head 2 Basethickness Parameter Setup

This parameter is provided to allow the firmware to detect when double-picking occurs, that is, two or more plates sandwiched together. It is recommended that this parameter be chosen as the largest media thickness that will be used at the target site. It does not necessarily have to be the thickness of the media used to install the head. However, the following constraint must be satisfied:

(Base thickness) - (Install thickness) = (Error head is installed to)

For example, if the thickest media will be 305 microns, then set the base thickness parameter to this value. If the plate used to install the head is 215 microns thick, then you must ensure that the head is installed to an error of +90 microns. Using this method will ensure that all media thickness required for the site will be supported by the head, in addition to ensuring that adequate bump tracking can be performed by the head.

8. 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:

8.1 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 stack of plates of a known size into the bay, load the correct plate size information from the workstation, and verify that the media mainscan size is correct by entering the bay 1 command from the diagnostic terminal.

Type load bay 1 calibrate through diagnostics. This will cause a plate to be picked and 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.

8.1.1 TEMargin Parameter

This NVS parameter affects the mainscan (around the drum) distance from trailing edge of the plate to the last imaged pixel.

8.1.2 LEMargin Parameter

This NVS parameter affects the mainscan distance from leading edge of the plate to the first imaged pixel.

8.1.3 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.
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.

8.2 Calibrating the Unload Table Cup Rotate Position

The mhauto UtRotatorPos parameter specifies the nominal position for the unload table traveler to move to before rotating the unload vacuum cups. The firmware moves the traveler to this position and checks the rotate position sensor before attempting to rotate the cups. If the sensor is not tripped, then the traveler is moved slowly towards the away end of the table until the sensor is tripped or the firmware gives up and suspends.

Calibrate this parameter with the unload table in the down position (use the table down command). Move the traveler home by typing table home. Then type table move rotate. This command will move the traveler to the position specified by mhauto UtRotatorPos. The center of the optical interrupter tab on the traveler should be 1-2 millimeters towards the home side of the rotate position sensor, and the sensor should be tripped (check the sensor using the table command). Adjust the position by changing the mhauto UtRotatorPos parameter and re-typing table move rotate. The new value is automatically saved when it is changed.

On machines with short unload tables (most Trendsetter 400 and NEWS machines), the mhauto UtRotatorPos parameter should be set to 500 to make sure the traveler stops in the correct place when it is dragging a plate along the unload table.

8.3 Enabling Plate Rotation

The rotator is enabled in firmware by typing access expert then option rotator enable. Plate rotation is controlled from Print Console. If the rotator option is enabled, then a “Rotate Plate” checkbox will show up in the Media Size settings in Print Console. If this box is checked, Print Console will tell the Trendsetter to rotate the plate during unload.

Without Print Console, rotation can be tested by typing:

- load bay 1 r 1 to load a plate from the bay and tell it to rotate on unload, or
- unload r 1 to unload the plate on the drum and tell it to rotate.

8.4 Adjusting Eject Speed and Distance

8.4.1 Eject distance

The plate will be pushed towards the processor at fast speed, then slowed down to match the processor intake speed.

The exit FastDistance parameter determines when the traveler slows down. This parameter should be set to the distance (in mm) from the traveler home position to the position of the far end of plate when the speed changes. To adjust this distance, enter set exit fastdistance <nn> where <nn> is the new value in millimeters.

To adjust the distance that the plate moves at slow speed, enter set exit slowpush <nn> where <nn> is the new distance value in millimeters.

The new values will be saved automatically when they are changed.

8.4.2 Eject speed

Enter set exit velocity to see the current slow speed setting.

Use the table move <position> <velocity> command to test different speeds and determine the best speed. Enter set exit velocity <nn> where <nn> is the new speed setting. The new value will automatically be saved.

8.5 Enabling Manual or Automatic Unloading

Plates loaded through manual-bypass will be unloaded through manual-bypass or automatically based on a configuration setup in Print Console. Automatic loading should be configured to automatic unloading only. Currently the device does not support automatic loading with manual unloading.

8.6 UDRC-L location change

Please note that firmware 1.30 supports debris cable connected to J37.

There was a problem where communication with UDRC-L cabinets was failing. This is fixed by moving the UDRC-L cabinet from port J40 (an un-buffered port) on the MCE board to port J37 (a buffered port). The un-buffered J40 port in some cases introduced enough transmission errors to cause communication with UDRC-L cabinets to fail.

This version of firmware uses port J37 for UDRC-L cabinets, and J40 is now unused.

For ALL devices (even those without a debris cabinet):

a) Power off the device

b) Remove the dongle at J37 (if present)

c) Move the serial cable on the MCE board at J40 to J37

d) Apply the new J37 label to the serial cable

e) Power the device back on

For devices with UDRC-L cabinets:

a) Check that the MCE is communicating properly with the debris cabinet through J37 by using the command **sif rd 50 40 7f0** (where sport=50 and bid=40). You should see a response similar to the following:

```
TSSP>> sif rd 50 40 7f0
Board 0040h VRegister 07F0h: 01 10 01 00 *** Command Complete
```

b) If a filter is installed in the cabinet, you can also test that the device is communicating with the cabinet by using the **debris pacc on** command. The debris cabinet should turn on.

Modify the following parameters after typing “prm hazardous media enable” in Service Shell.
set debris NozzleFlowConst (from 2226.510 as default to 7280.0)
set debris NozzleFlowExp (from 2053.038 as default to 1822.0)
set debris PressMaxNozzle (from 4.977 as default to 6.0)

Check if modifications for UDRC are done properly by performing the following:
>>set debris nozzlesensortype 0

a) On the sensor change: make sure the 6 conductor cable has been used when connecting from GENINE J1 to the lower Pressure Sensor Daughter Card.

b) After downloading firmware, one can check the connections using these commands and expect these readings:

DVAC

```
NEWS>> dvac
Drum Vacuum Status
Drum Vacuum:
      Drum Vaccum Reading:        0.00 kPa (-1 adjusted counts)
      Drum Vacuum ADC Offset:     38
      Drum Vaccum Drive:          Off

      Drum Vaccum Generator Drive:  Off

*** Command Complete
NEWS>> dvac on
Turn on drum vacuum pump
*** Command Complete
C NET: PPP link is Down.
NEWS>> dvac
Drum Vacuum Status
Drum Vacuum:
      Drum Vaccum Reading:        2.83 kPa (29 adjusted counts)
      Drum Vacuum ADC Offset:     38
      Drum Vaccum Drive:          On

      Drum Vaccum Generator Drive:  Off

*** Command Complete
```

UDRC

```
NEWS>> scan ai_udrc
Group Name          Status Value
AI_UDRC_POCNozzPress      b 0000099Ah
AI_UDRC_POCNozzPressNF    b 00000000h
AI_UDRC_PACCNozzPress     ** 00000000h
AI_UDRC_DiffPress         ** 00000000h
AI_UDRC_BellPress         ** 00000000h
*** Command Complete
debris blower on
```

```
NEWS>> debris blower on
*** Command Complete
scan ai_udrc
NEWS>> scan ai_udrc
Group Name          Status Value
AI_UDRC_POCNozzPress       b 00000E4Dh
AI_UDRC_POCNozzPressNF     b 00000000h
AI_UDRC_PACCNozzPress     ** 00000000h
AI_UDRC_DiffPress         ** 00000000h
AI_UDRC_BellPress         ** 00000000h
*** Command Complete
```

8.7 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 ACRONYMS

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	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
```