creo

Trendsetter NEWS
MCE Firmware Version 1.06 Release Notes

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1. SCOPE

This document describes the important changes to the Trendsetter NEWS MCE firmware that comes with version 1.06.

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.
- ☐ 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 V1.80 or higher; Thermal 2 V1.01 or higher).
  - ☐ Print Console compatibility (Version 3.2 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.
- ☐ 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

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

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. Use the Version Checker applet to identify all firmware components that need to be upgraded. Note that both 1.7x head firmware and Thermal 2 firmware are included in the controlled release, but only one needs to be present. So ignore the warning for the head type not installed.
2. 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, then upgrade the firmware. The script allows several firmware components to be loaded in sequence – for example, MCE Main firmware and Xilinx.
3. Reset the machine with the **reset** command. Service Shell V2.4 build 377 automatically resets the machine after the download completes.
4. After the upgrade is complete, run the Version Checker applet again to make sure all components are correct.

5. CHANGES SINCE V1.00

5.1 NVS Changes

The following table details new NVS parameters in this release.

NVS System	Param Name	Old Default	New Default	Description	Refer to Section
drum	**MaxPacc**	--	**20**	Sets the maximum acceleration possible during position moves. The *drum MaxAcc* parameter now controls the maximum acceleration for velocity moves only.	
drum	**Tsettle**	**0.55**	**2**	Increased time to allow the drum more time to settle after a move.	
carriage	**accel**	**40**	**45**	Increased acceleration so that retraces during a high-speed plot will be handled properly.	
media	**Flags**	--	**0**	Bit 0: media retrace aversive If this bit is set (i.e., **set media flags 1**), the plot will suspend after plotting if a retrace has occurred.	
focus	**LearnSkip**	--	**False**	Used to skip the focus learn procedure, if focus profile already known. This parameter should only be set to True with a Thermal 2 head.	5.4.6

prd	**DrumSpeedSafety**	--	**100**	Sets the maximum drum speed when the key switch is in the safety over-ride position	5.4.9
prd	**SimulationState**	--	**0**	Stores the simulation state of all the device components. This should always be 0 for machines in the field.	5.5.3
prd	**Rescheduling**	--	**False**	Enables or disables media rescheduling (i.e., re-using media from a previous cancelled job). Note: this should always be set to False.	5.4.14
bay	**UsePreloader**	--	**0**	If set to 1, the loading sequence will request plates from the Preloader.	5.4.11
mh	**TECDelay**	--	**0**	Time delay between the trailing edge clamp up/down and lock/unlock.	
mh	**BuzzerDelay**	**10**	**20**	Time delay before starting persistent beeping when waiting for the operator – to push button during manual load, or remove plate after manual unload.	
mhauto	**ClampUnloadOffset**	**0**	**-1**	Indicates how much to over-rotate the drum during an automatic unload. This parameter is only used if the Unload-Offset option is enabled.	
mhauto	**LECToUnloadHome**	**350**	**380**	Default changed to support new unload table cups with longer push tabs.	
debris	misc	--	--	Several debris parameters were added. They should not need to be adjusted in the field.	5.4.13
hmgr	**type**	--	**1**	Specifies the head type (i.e., Thermal 1, Thermal 2, etc.). This replaces *head type*.	5.4.1
ehi	**tstk**	--	**540**	Number of minutes between beam balances. This replaces *sys tstk*.	5.4.1
ehi	**baud**	--	**11520**	Baud rate for MCE-head communication	5.4.1
ehi	**protocol**	--	**True**	Enable/disable the MCE-head application protocol negotiation. This should always be left as True.	5.4.1
net	misc	--	--	Several parameters were added to support TCP/IP communication between the MCE board and Print Console.	5.4.8

5.2 Diagnostic Command Changes

New commands:

Command	Description	Refer to Section
abort clear	Used after the **abort** command to clear the error condition.	
list pattern	Displays a list of all available TPG test patterns. Replaces **plot list**.	
list pattern <n>	Displays detailed information about a given TPG test pattern.	
config	Used to configure the model type	5.4.2
feature	Used to modify the min/max limits of a machine – for example the maximum media size allowed	5.4.2
verbose alpha	Display subsystems in alphabetical order	
reset head	Resets the Thermal head	
ceh	CEH (Creo Exposure Head) is the new head interface subsystem. Several commands were created for testing purposes only.	5.4.1
debris	New commands for debris removal support	5.4.13

option udrcb enable|disable	Enable/disable the UDRC base model (POC)	5.4.13
option udrcl enable|disable	Enable/disable the UDRC LIONEL model (PACC)	5.4.13
picker wrist in fast	Fires the appropriate solenoid (rotator if no rotator installed; otherwise the plate-pusher) while the wrist is moving in to move it in faster	
picker service	Moves the picker up and unlocks the plate cover	5.4.19
picker time	Moves picker actuators and displays the time for each motion	5.4.20
table time	Moves unload table actuators and displays the time for each motion	5.4.20
sim saveall	Save the current simulation state to NVS. This should never be done on a machine in the field.	5.5.3
gim bypassprompt ignore	Don't post prompts to Print Console if I/O is bypassed.	5.4.17
mh awayplateload	Use the away sensor on the load ramp for checking/measuring plate size for the next media load. This allows a single plate to be loaded on the away side for testing purposes. Available only on dual-plate machines.	
net status	Display the status of the TCP/IP communication link to workstation	5.4.8
net newaccount 1 <account>	Set or change the user account name	5.4.8
net newpassword 1 <password>	Set or change the user account password	5.4.8

Modified commands:

Command	Description	Refer to Section
loaded force	Now uses the arguments from the last media on the drum instead of the last media loaded.	
loaded	Now indicates if media is partially loaded.	
load	[auto] is no longer an option – for automatic loads, specifying a bay number automatically forces an automatic load.	
plot edge <position>	Now uses microns instead of millimeters.	
plot shift <shift>	Now allows fractional values – so **plot shift 25.4** is now valid.	
plot scale	Can now take parameters – to alter the mainscan or subscan scaling factor.	
list version all	Displays the main firmware version in three parts – major, minor, revision	
fw dir	Displays the main firmware version in three parts – major, minor, revision	
engine time	Fixed up to move all actuators, and to display the time more clearly	5.4.20
gc	Now only shows applicable pin configurations	
table	Use Blocked and Unblocked terminology for table/rotate/away sensors	

Removed commands:

Command	Description	Refer to Section
verbose list	Equivalent to **verbose**	
verbose help	Equivalent to **help verbose**	
mask range on|off	It is not possible to bypass range checking with MCE firmware.	
dr	Functionality replaced by **debris** commands	

5.3 Bug Fixes

5.3.1 Check Table Entry Sensors More Thoroughly

During unload, the unload table entry sensor is watched to determine when the plate has been pulled fully out of the machine onto the table. If this sensor is not working, it will indicate that

the plate is already on the table when it is in fact still in the engine. We now check the sensor prior to pulling the plate onto the table. If it already low, we suspend with the error:

```
40812 MDHULTB: Media not detected at unload table entry [sensor_name]
```

This error was already present in some previous versions of firmware.

5.3.2 Multiple Plate Detection Allowed for Thermal 1.7x

Multiple plate detection by the head during focus learn is now supported for Thermal 1.7x heads and Thermal 2 heads. If focus learn is successful, a value indicating the thickness of the plate(s) on the drum is returned. If this thickness is more than 60% greater than expected, we suspend with the error:

```
38134 MPC: Multiple plates detected on drum
```

With Thermal 2 heads, focus learn generally fails if two plates are loaded onto the drum, so the error message simply indicates that focus learn failed.

5.3.3 Changes to Verbose Command

The **verbose** command is used to increase/decrease the relative amount of information displayed by different subsystems in the firmware. The subsystem verbose levels displayed in **verbose** command now incorporate the global verbose level. So if the global setting is Service, all subsystems will have a level of at least Service unless they are turned off.

5.3.4 Support Invert Flag from Workstation

Inverting the image data was not done properly for the case where the Invert flag was sent from the workstation. This is now fixed so that the data is inverted correctly.

5.3.5 Set Device Suspended Flag Properly

There is a general device status flag tracked in the firmware. When any part of the device is suspended, this flag is set to Suspended. Previously, if multiple parts of the device suspended at the same time, the general status would get set to Suspended and would not be cleared when the error was cleared, causing the Print Console status bar to remain in the Suspended state. This has been fixed so that the general status is reported properly.

5.3.6 Fixed “Double-Unload” Problem

There was a problem before where, if the unload did not complete successfully (i.e., if Release was required), then a second unload would be attempted for that job. This caused several different errors, depending on what else was active when the unload completed.

Some errors caused by this bug:

- `37706 DRS: The current command has been preempted`
- `38329 MDS: Scheduler has already scheduled an unload command for the media on the drum`
- `40634 MDHENG: Media is expected on the drum, but no media was found`

This has now been fixed so that the job is complete when the unload is finished, regardless of whether the unload completed successfully or not.

5.3.7 Turn off Write Laser at End of Series Plot

When doing a series plot, turn the write laser off at the end of each strip. This ensures that the laser is turned on with the correct settings for the next strip. For normal plots, the laser is left on after plotting to reduce the setup time for the next plate.

5.3.8 Turn off Write Laser for 1.7x Heads

For TH1.7x heads, turn off write laser at start of plot and also at end of plot to ensure that it is off during focus learn. With a Thermal 2 head, the laser is left after plotting to reduce the setup time for the next plate.

5.3.9 Rotator Improvements

The algorithm used to search for the rotate position has been modified:

- Move to expected rotator position (*mhauto UtRotatorPos* in NVS).
- Move the cups up and grab the plate (this ensures that the cups grab the plate in the centre)
- If sensor not blocked, search forward until sensor is found
- If sensor is not found, then move back to expected position and search backwards.

If the sensor is found while searching, it is verified again once the traveller stops moving. This ensures that the firmware will not later suspend with the error:

```
40807 MDHULTB: Unload stepper motor not in safe position to rotate cups
```

5.3.10 Improved Recovery for Wrong-Sized Media Error

If the wrong sized plate is detected during loading, it is unwound back up the front of the machine if possible. For a manual-bypass load, the options are to Resume and put the correct plate size in, or Release and cancel the job.

Previously, Resume did not work, and that has been fixed. If Resume is selected, the operator must confirm that the media has been removed before re-starting the load.

5.3.11 Changes to Push-Button Operation

When waiting for the operator to push the button during a manual-bypass load, the machine will now beep repeatedly every five seconds or so to get the operator’s attention.

5.3.12 Dongles Are No Longer Required on the MCE Board

Changes have been made to the MCE firmware so that a dongle is no longer required on the MCE board. Once this firmware is loaded onto the machine, the dongle can be removed.

5.4 New Functionality

5.4.1 New Thermal Head Interface

The firmware interface to the thermal heads has been modified significantly. There is a new interface now called CEH (Creo Exposure Head). The most visible changes associated with the new interface are as follows:

- with Thermal 2 heads starting with head firmware V1.02, head parameters can only be accessed through redirection. **set head**, **set hdm 1**, etc. will no longer be supported.
- with a 1.7x head, the **set head**, etc. commands will still work, but the format of the output has changed to match the standard MCE parameter output
- with a 1.7x head, as soon as a head parameter is changed, it is automatically saved
- the plot controller no longer knows anything about the hdm index. This means that messages referencing hdm 1 are displayed even though a different media is being used.
- new NVS subsystems – ehi (Exposure Head Interface) and hmgr (Head Manager)
- messages about "laser initializing, xx seconds remaining" no longer show up on startup
- several messages will be displayed on startup showing the head interface being initialized
- MCE-head communication is displayed by setting the verbose level of the DTL subsystem to Debug (i.e., **verbose debug dtl**). Previously, this was done by setting the *sys dhi* and *sys dho* parameters.
- if the head is not installed, use the **sim head enable** command instead of setting an NVS parameter.

5.4.2 Feature Limiting

In the initial Beta MCE firmware versions, there were no restrictions on media size, throughput, resolution, etc. This has been fixed, and we now support the multitude of different products in the Trendsetter 400/800, Spectrum and Newspaper product lines.

For Newspaper, there are 5 different models:

- Trendsetter NEWS 50
- Trendsetter NEWS 70
- Trendsetter NEWS 100
- Trendsetter NEWS 150
- Trendsetter NEWS 200

The following table shows the model name to use for each product, plus the maximum allowable imaging speed and typical settings:

Full Model Name	Internal Name	Maximum Imaging Speed	Typical Head Swath Width	Typical Drum Speed
Trendsetter NEWS 50	NEWS50	7.6 mm/s	192 pixels	205rpm
Trendsetter NEWS 70	NEWS70	14.2 mm/s	224 pixels	320rpm
Trendsetter NEWS 100	NEWS100	22 mm/s	224 pixels	255rpm (1200dpi head)

				360rpm (2400dpi head)
Trendsetter NEWS 150	NEWS150	30.5 mm/s	224 pixels	345rpm
Trendsetter NEWS 200	NEWS200	30.5 mm/s	224 pixels	345rpm

The model is configured using the **config** command, for example (command is case-sensitive):

config <password> NEWS70

After using this command, reset the machine then use the **config** command on its own to verify that the model was set correctly.

The default configuration of each model when first configured is a maximum resolution of 1200dpi, and a maximum media size of 660mm x 960mm. These settings can be viewed using the **feature** command.

```
NEWSENG>> feature
Current Model
-------------
Trendsetter NEWS 70 [NEWS70]

Licensable Limits
-----------------
============================================
Tag Description
============================================
1   Maximum plate size in mainscan          :    660 mm        [Optional]
3   Maximum plate size in subscan           :    960 mm        [Optional]
25  Maximum resolution in mainscan          :   1200 DPI       [Optional]
26  Maximum resolution in subscan           :   1200 DPI       [Optional]

*** Command Complete
```

Only those features that can be changed are displayed. For a full list, use the **feature list** command.

The tag number on the left identifies the feature – and is used when modifying the settings:

feature <password> 1 839 to set the maximum mainscan size to 839mm

To meet the specifications, a delay must be added for broadsheet plates only for the NEWS50, NEWS70 and NEWS100 models (except the NEWS 100 commercial option). The delay is specified in the **feature list** command under:

```
33  Maximum delay for broadsheet plates         :      4 seconds   [Standard]
```

and varies from three seconds/plate for a NEWS50 up to five seconds/plate for a NEWS100. This delay occurs just prior to spinning the drum.

5.4.3 Drum is Idled When LEC is Down

When the drum is in position mode and the LEC is down, the two fight each other and drum vibrations can occur. This has been resolved by idling the drum when the LEC is down.

Just before moving the LEC actuator up to clamp the plate, the drum is put back into position hold mode by telling it to move to its current location. Because of this extra step, there is a noticeable delay on manual-bypass loads between pressing the load button and the LEC moving up.

Note: when running automatic jobs at full speed, the drum is not idled because the LEC is only down for a few seconds between the time the unload completes and the next plate is loaded on.

5.4.4 Drum Moves To Unload Position After Plotting

After plotting, the drum will be moved to the unload position in one smooth motion. Previously, the drum was stopped completely, then moved to the unload position. Doing the entire thing in one step saves about 0.5s per plate. The command **drum stopat** replicates this functionality of stopping a spinning drum at a specific location.

5.4.5 Image/GUI Status Reporting

The firmware reports back status messages to Print Console so it can keep track of what the device is doing. The status reporting has been greatly improved so that correct information is now sent back to Print Console.

5.4.6 Added Ability to Skip Focus Learn

To achieve faster throughput, we required the ability to disable focus learn once the profile has been learned. This feature is only supported when a Thermal 2 1200dpi head is installed, as this head has a greater depth of focus. For this purpose, a new NVS parameter was created – *focus LearnSkip*. The focus learn will not be done if the following conditions are met:

- media type is the same as the last time
- a successful focus learn has already been done
- the plate cover has not been opened, and the bay has not been re-loaded since the last plate
- the laser is still on from the last plot (i.e., less than 30s has elapsed since last plot)

Note: this functionality is only supported with Thermal 2 head code V1.02 and higher.

We normally use the focus learn to determine if multiple plates have been loaded on the drum. If focus learn is not done, we read the focus lens position from the head during plotting. If the lens position indicates that the thickness of the media is 100 microns larger than expected, then an error is reported at the end of the plot:

```
38134 MPC: Multiple plates detected on drum
```

The media thickness detected is displayed at the end of the plot, but only if focus learn was skipped:

```
S MPC:   Measured thickness = 391 microns
```

5.4.7 Changed how Abort Command is Handled

If the **abort** command is used, everything will be stopped, just like if the emergency-stop button is pressed. No commands are allowed to be started. The machine will remain in this aborted state until the **abort clear** command is entered. If a command is entered while the machine is in this aborted state, the following error will be reported:

```
35779 PRD: User issued an abort, use 'abort clear' to clear the abort
```

5.4.8 TCP/IP connection

The serial connection between the firmware and the Print Console workstation has been modified to use TCP/IP.

The effects of this change in the firmware include:

- a new *set net* subsystem was created to store parameters associated with the connection
- new **net** commands were created to show the status of the connection, and to modify certain NVS parameters
- an account must be created using the **net newaccount 1 <account_name>** and **net newpassword 1 <password>** commands. This account must match the one created on the workstation. For details, please refer to the PPP_Server_Setup.pdf document (on TechPlanet, under Print Console, 3.2, Procedures)

Note: the connection to the workstation is done differently in the simulator, so the *net* NVS subsystem and **net** commands do not show up in the simulator.

5.4.9 Limit the Drum Speed When Safety Over-ride On

When the key-switch is in the safety over-ride position, the maximum drum speed is 100rpm. This can be over-ridden by setting the parameter *prd DrumSpeedSafety* to the speed at which you want to spin the drum. This setting can not be saved.

5.4.10 Extra Padding on Positive Plates

For positive media, the entire plate must be cleared in order to avoid lines showing up on the edges. For media that is not square, this presents a problem. To ensure that the entire background is cleared, an extra two mm of blank data is inserted into the image on either side. This means that imaging starts before the edge of the media.

This extra padding means that an extra one or two drum revolutions are required for the image, which will slow down the machine slightly.

This extra padding is not done if the Invert flag is sent from the workstation – only if the media invert flag is set.

5.4.11 Full Preloader Support

The NELA Preloader is now fully supported. A flowchart showing how the Trendsetter intrefaces with the Preloader during a load command will be posted in TechPlanet. The important things to note:

- use the **option preloader enable** command to enable support for the Preloader
- use the **preloader** command to display the current status of the Preloader
- there is a new "Use Preloader" checkbox in the Load Bay window of Print Console. If this box is selected, the *bay UsePreloader* NVS parameter will be set to True, and the Preloader will be used to load plates into the bay.
- if plates are in the bay when a load is started, and the Preloader was requested, the device will suspend with the error:

  ```
  40427 MDHPICK: Please remove all plates from the Trendsetter bay
  ```
- when using the Preloader, the air jets are not used during the pick to reduce noise.
- it is possible to test the electronic interface using two new commands:
  - **preloader test requestplate <enable|disable>**
  - **preloader test pickerclear <enable|disable>**

For more information about the Preloader, please refer to ECO E862 under FCOs on the Trendsetter NEWS TechPlanet page:
http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/fcos.htm - E862

5.4.12 Full Processor Interface Support

A processor interface board is now supported. The functionality is as follows:

- use the **option processorinterface enable** command to enable the interface
- use the **processor** command to display the current status of the processor
- before starting the unload, the firmware checks the processor interface
  - if the processor is not ready or faulted, the firmware reports an error
- before pushing the plate into the processor, the firmware checks the processor interface again
  - if the processor is not ready or faulted, the firmware reports an error
  - if the processor is busy, the firmware will wait for up to 30 seconds. If the processor is still busy after that time, an error will be reported.

5.4.13 Debris Removal (UDRC) Support

The firmware now supports the UDRC (Universal Debris Removal Cabinet). A new NVS group, *debris,* was created to hold parameters associated with debris removal, and a new command, **debris,** was created to display the status of the debris cabinet and associated hardware. Also, two new options were added: UDRCB and UDRCL. The options refer to the type of UDRC cabinet being used (UDRC Base and UDRC LIONEL). To enable the options, use the commands: **option debris UDRCB enable,** or **option debris UDRCL enable**.

There are currently five types of debris removal available:

- Debris option 1- Air jet only. This is available by default regardless of the other options installed. The air jet is also known as the whisker jet.
- Debris option 2- POC (particulate only collection). This requires that either one of the options **debris UDRCB** or **debris UDRCL** be enabled.
- Debris option 3- POC and air jet. This is a combination of the POC and air jet options. This requires that either one of the options **debris UDRCB** or **debris UDRCL** be enabled.
- Debris option 4 - PACC (particulate and chemical collection). This is only available if the option **debris UDRCL** has been enabled.
- Debris option 5 - PACC and air jet. This is a combination of the PACC and air jet options. This is only available if the option **debris UDRCL** has been enabled.

To enable the appropriate debris removal option for a selected media, set the *media n debrisoptions* NVS parameter to be one of the debris options above. For example the command **set media 2 debrisoptions 3** would enable the debris option "POC and the air jet" for media #2.

Note: before changing the media setting, enter the command **prm hazardous media enable** to gain access.

For POC debris removal, there is a pressure sensor board mounted in the power box to measure the pressure. With this configuration, the *debris NozzleSensorType* must be set to 5.

For any type of PACC debris removal, the parameter *media n EmissionsIntensity* is also REQUIRED to be setup. This is setup using the command **set media 2 emissionsintensity <value>**. Refer to media documentation to see what value this should be set to for a particular media.

The **debris** command can be used to see which debris options are available on a particular device. Also options can be tested using the commands **debris <debris_option> on** to enable, and **debris <debris_option> off** to disable. Use the **help debris** command to show the option names.

5.4.14 Media Rescheduling

If a job is cancelled during loading, or before plotting begins, that media is generally still okay and can be used for the next job. Allowing that media to be re-used requires what we call "media rescheduling".

This feature has been implemented, but is not fully functional. There is an NVS parameter *prd rescheduling* that should be set to False until the feature is fully functional.

5.4.15 Load and Imaging Lamps Working as Defined in the Manual

The functionality of the load lamp and the imaging lamp on the user interface panel has been updated. The functionality is as follows:

- error lamp flashing when suspended; off at all other times (never on solid)

- imaging lamp — flashing from the time the plot starts (during the load) until the plot completes (start of unload); off at all other times (never on solid)
- load lamp — flashing when operator action is required (when waiting for a plate to be loaded or unloaded); on solid while there are jobs active in the machine; off when machine is idle.

5.4.16 TECDelay Parameter Added

If the sensors for the trailing edge backbone are not aligned properly, there could potentially be problems picking up or putting down the clamps. The new sensors in the MCE-based Trendsetters should be better, but a delay parameter has been added to the firmware just in case – *mh TECDelay*. If this delay is non-zero, the firmware will pause for this amount of time after moving the trailing edge backbone up or down, and after locking or unlocking the clamps. This parameter will affect the throughput of the machine, so should be left at zero unless mechanical problems start occurring.

5.4.17 "I/O Bypassed" Prompt Modifications

If any sensors or cable detects in the machine are bypassed, a prompt will show up on Print Console stating this fact. This is done so the operator knows the machine is broken, and demands that it be fixed. It used to be that this prompt would be replaced at the start of each image. But for machines such as the NEWS 200, where a new image is started every 15s or so, this constant replacing of the prompt made it nearly impossible to use Print Console.

Now, the prompt is only replaced every ten minutes. The prompt will stay up the whole time, but will only pop to the foreground every ten minutes. In addition, a new command **gim bypassprompt ignore** was created to temporarily disable the prompt. This is for use at tradeshows, etc. where we don't want to draw attention to a broken machine.

5.4.18 Plate Cover Door Now Locked During Pick

Previously, the plate cover door was left unlocked during a pick. Now, the door is locked at the start of the pick, and is left locked until the plate is wound onto the drum, or until the device suspends.

5.4.19 Picker Service Mode Implemented

The picker occasionally requires some maintenance that can be done by operators. Examples are replacing a damaged cup, or replacing the mylar film. There is a new mode where the operator can push the load button, and the device will move the picker up and unlock the plate cover.

Before entering this mode, the Trendsetter must be in an idle state (i.e., no jobs active from the workstation). The operator can then put the device into this "picker maintenance" mode by pressing and holding the load button. The sequence is as follows:

1. Operator presses and holds load button for roughly 6s.
2. Machine beeps once to indicate request acknowledged.
3. Picker moves up, plate cover is unlocked.

4. Machine beeps once to indicate plate cover can now be opened. Prompt posted to Print Console indicating the device is ready.
5. Operator can open cover and work on picker.
6. As soon as door is closed again, picker will move back down.
7. Machine beeps three times to indicate end of command.

Notes:

- if the door is open when the mode is requested, a prompt is posted in Print Console indicating that the door must be closed. If the door is not closed within two minutes, the command will be cancelled.
- if, after moving the picker up, the plate cover is not opened after two minutes, the command will be cancelled and the picker will be moved back down.
- if the plate cover is left open for more than 30 minutes, the command will be cancelled so the Trendsetter can accept new jobs. The firmware will later suspend if the plate cover needs to be closed.
- if the plate cover sensor is disabled, then the firmware can't tell when the door is opened/closed. So, after moving the picker up, it cancels the command, leaving the picker up. This is very awkward – **please make sure that the plate cover sensor is enabled**.

This sequence is also available through the **picker service** command.

5.4.20 Improved Timing Commands

The **engine time** command has been improved, and **picker time** / **table time** commands added. These commands will activate each solenoid in sequence and time how long it takes for each motion to complete. The actuators involved in each sequence are listed below.

In each case, the time for the motion to complete is displayed, together with the post-delay and the timeout value. The post-delay is the length of time the firmware waits after seeing the sensors change state to when the motion is declared as complete.

Engine:

- Move drum to load position
- LEC down
- LEC up
- Roller down
- Roller up
- Load ramp in
- Load ramp out
- Move drum to park position
- TEC down
- TEC unlock
- TEC lock
- TEC up

Picker:

- Picker up
- Picker in
- Picker wrist in (times how long it takes for wrist out sensor to go low)
- Picker wrist out
- Picker out
- Picker down

Table:
- Table down
- Table cups up
- Move to rotate position (if rotator installed)
- Rotate cups (if rotator installed)
- Unrotate cups (if rotator installed)
- Table cups down
- Table up

5.5 Details and/or Changes That Shouldn't Affect Field Service

5.5.1 Added statistics event tracking

The following statistics are now tracked for workstation plots:

- Time required for edge detection
- Time required to start data transfer
- Time required for focus learn
- Time required for plotting the image
- Time required for plot shutdown
- Each time a PLL warning is generated
- Each time a false edge is detected during edge detect
- Each time edge detection fails, for any reason
- Each time a double edge is detected – this is when the head "sees" two transitions of the edge signal and we accept the first as the true edge
- Each time the picker wrist times out moving out
- Each time the picker drops a plate while wristing out
- Each time a wrist cylinder leak is detected
- Each time the picker detects plates sticking together
- Timing of each actuator – time for each sensor to change state
- Analog sensor readings – reported every five minutes:
    - temperature of MCE board, leadscrew, frame
    - system pressure

This information is sent back to the workstation, and is logged together with the time of the event. This log file can later be analyzed to extract information about the device.

Note: This logging is only available with Print Console V3.3 or higher.

5.5.2 Method of Forcing Failures in Plot Sequence (for testing only)

A new command **plot fail** has been created. This command allows you to force a plot to fail at a specific step. It is similar to the forced failure command implemented in the media handler subsystem.

Usage:

- use the **plot events** command to display a list of valid events that you can force failure on
- specify the failure step using the **plot fail <step>** command. For example, use **plot fail "Plot: Spinning drum"** to force a failure after starting the drum spinning
- use the **plot fail** command to confirm what you just set up
- after the event specified has been processed, the plot will shut down and suspend with the error:
  `38146: MPC: Forced failure`
- use **cancel**, **eject**, or **leave on** to recover from the suspend (**resume** is not an option for plotting errors) (note: for diagnostic plots, the plot will simply shutdown – there will be no suspend)
- use the **plot fail clear** command to clear the failure mode and allow plotting to continue normally

Failures can be forced this way for diagnostic and workstation plots.

5.5.3 Store the simulation state

Various components of the device can be simulated – this means they will work even without the hardware attached. This should never be done on a real machine in the field, but it is done frequently during internal testing. Workstations can be tested by connecting them to an MCE board in simulation instead of requiring an entire machine.

The simulation state can now be stored to NVS so it will survive a power cycle. This makes setting up and using boards in simulation much easier. The existing **sim** commands work as they always did. A new command **sim saveall** must be entered to store the simulation state to NVS. If a saved simulation state is detected, then a warning will be displayed to Print Console:

```
45204 Product: WARNING: The device is currently running in simulation mode -
for testing purposes only!
```

This prompt cannot be removed, and will remain posted until the simulation state is cleared. This prompt is to make sure that a machine in the field is not accidentally left in a simulated state.

For existing "card-cage" setups, you can do the following to re-configure your systems:

- **sim all enable**, then **sim saveall**.
- on the slave board (for NEWS 200 boards), do the same – **sim all enable** and **sim saveall**.
- if the PDB board is present, do **sim all enable**, **sim pdb disable**, then **sim saveall**.
- there is no longer any need to run a script, or any function keys in Service Shell. The boards will automatically start up in the correct mode

- the imaging speed is determined by the machine model (see Section 5.4.2 for details). On the NEWS150 and NEWS200 models, it is possible to modify the throughput speed for testing purposes only, but other models cannot be modified.

6. KNOWN DEFICIENCIES

6.1 Media Index Not Changed With Media n Command

The **media *n*** command does not affect the media used during a plot. The plot always uses the media index currently loaded on the drum (use the **loaded** command to check it).

If you want to change the media index of the plate on the drum, use the **loaded force mi *n*** where n is the media index. For example **loaded force mi 3** for media 3.

Note also that the load arguments are not changed by the **loaded force** command, so the next load you do will be with the original media index. To specify the media index during the load command, use the **load ... mi 2** command to specify media index 2. You can also load that media index into the bay and just do **load bay 1**.

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.

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.

8.2 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 Unloading

Plates loaded through manual-bypass will be unloaded through manual-bypass. Plates loaded automatically from the bay will be unloaded automatically out the back of the machine. There is not currently any way to over-ride this rule when running workstation jobs.

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 V1.0.

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.

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.

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!