Creo Products Inc.

Thermal 3244 Trendsetter
MPE Firmware Version 2.51x Release Notes

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1. Scope

This document describes changes to the Thermal Trendsetter firmware in version 2.51x. Starting at version 2.05x, a lower-case alpha character (either 'a' or 'b') is appended to the firmware version number. The 'a' and 'b' versions of Trendsetter firmware are always released together. The reasons for this were outlined in the "Scope" section of the release notes for version 2.05x. The essence of this information has been retained and moved near the end of this and all future release notes. If you are unsure of the meaning of the letters appended to the release version numbers please read section 8 "Trendsetter Firmware Version Numbers". In this document, the version number is referred to with an 'x' appended when describing functionality that applies to both version types. When descriptions relate to a specific firmware type, the unique version number is used.

2. Preliminary Checklist (read before you begin!)

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

1. ☐ Using the **list version** command, record the following:

   current MPE version: _____

   current head version: _____

2. ☐ Ensure you have the TTSA_251.HEX (for version 2.51a) or TTSB_251.HEX (for version 2.51b) file available.

3. ☐ Thermal Trendsetter Firmware Version 2.51x is compatible only with Thermal Head Firmware Version 1.62 and higher. If the current thermal head firmware version is less than 1.62, you will need to upgrade the head after the MPE firmware has been upgraded. The current thermal head firmware version at the time of this MPE release is 1.62.

4. ☐ Check that you have an E-version MPE (part no. 10-3692A) and not an older A-version (part no. 10-0733A). It is not absolutely necessary, but **strongly recommended** that the E-version MPE is used with this firmware.

3. Upgrade Procedure

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

1. Save all current NVS (see Appendix C).
2. Load new firmware (see Appendix D).
3. Issue the **nvs upgrade <previous version>** command (for example: **nvs upgrade** 2.10).
4. Reset the machine with the **reset** command.

4. Bug Fixes

4.1 Drum Errors Correctly Reported

An error in the error list for drum errors in 2.50 caused incorrect errors to be reported when the error number is 6025 or greater (i.e. 6025-6041). This has been corrected.

4.2 Updated MPE Xilinx

In 2.50b, the MPE Xilinx file (version 0.10) appears to cause problems with Creo encoders (9000 line) resulting in either incorrectly reported Hall Velocity errors (code 6025) or correctly as a missing tick error (6041). This version uses version 0.17 of the MPE Xilinx which does generate this error erroneously on the Creo encoder. Note that 2.50b does not exhibit this problem when the machine is equipped with a Heidenhein encoder (5000 line).

4.3 Load/Unload Light Flashes During Diagnostic Loads

The load light in 2.50 did not flash during load/unload. This is corrected with this version.

4.4 Drum Speed Series Plot

In 2.50, the drum speed series plot causes output of staggered strips due to missing modifications required to accommodate the newer E-series Xilinx. These modifications have been added to this release and the drum speed series plot now has the correct output.

4.5 Default Drum Position Acceleration Changed (2.51b Only)

In 2.50, the drum position acceleration (*drum pacc*) default value was erroneously set to 15. The default value is now correct at 10.

5. New Functionality

5.1 Drum Tick Command Supported

For diagnosing encoder problems, the **drum tick** command is now supported in this release. Please see the intranet or service CD for more information on the **drum tick** command.

6. Known Deficiencies

6.1 Bench Mode Requires “drum tpr” to be 9000

When running in bench mode (*sys bench* set to 1), the *drum tpr* parameter must be 9000. Otherwise, some registers are not setup properly and plots will fail.

6.2 1600dpi Plots May Fail During a Retrace

A 1600dpi plot will often fail with a carriage state error (error #07017) if a retrace is needed. If this occurs, check the *carriage psteps* value. Reducing the *psteps* value to 29 should temporarily fix the problem. However, reducing the value could cause the carriage to stall at higher drum speeds. Refer to the firmware error page at ErrorNumber07017.html.

6.3 Unexpected Message Dump 0104

When a plot is cancelled during a edge detect and he subsequent completion of edge detect fails, an unexpected message error is displayed similar to the following:

```
    Dumping message information:
        Message type = state
        Message ID: 9
        Message state = reserved
        Task ID: Image 0
        Message command group: 1
        Message command code: 4
        Message flags:
            Preempt:    No
            Reserve:    No
            Release:    No
        Message state = 99
Image 0 : [Unload] received resp_msg, cmd = 051D, type = 1
MPE -> Host: [ U 2 32701 14 0 MPE Software: Unexpected message    ]
        [ in mailbox mbx_image0, message code 0104h        ] (7865)
```

This is not a cause for concern and the plate will be unloaded as expected. Note that this does not happen if the edge detect succeeds after the cancellation of the plot during edge detect.

6.4 PLOT Command Problems

The **plot on** command will not work reliably above 300rpm to check PLL tracking. Note that in order for the **plot on** command to work, the drum speed in the currently active media (*hdm <n> ds*) should be equivalent to the drum speed that is being tested. The firmware uses the currently active media's drum speed setting to determine how to setup the PLL (i.e. to use SCLK64, SCLK32, or SCLK16) not the current drum speed.

The **plot <pattern> synch** command is unable to plot correctly on S-model machines.

6.5 New MPE Boards Crash When Loading FDPE Xilinx

Brand new MPE boards connected to machines without a head installed will crash upon startup of the firmware due to inability to load FDPE Xilinx. This does not normally affect field service but is more of an issue for those in startup and production. Until a fix is found, ensure that the **nvs init state creo** command is used prior to loading current firmware.

7. Trendsetter Firmware Version Numbers

Trendsetter 'a' firmware releases (Part No. 19-3049x-x)

Trendsetter firmware version numbers with an 'a' appended denote support for machines using the original plate loading electronics. These systems use two electronic boards commonly known as the **L**oad-**U**nload **E**lectronics (LUE) board and the **T**rendsetter **I**nter**F**ace (TIF) board.

All Trendsetters sold before July 1, 1997 are considered "base" models without the potential to be fitted with the new "autoloader" or "proofing" options. Such machines still require ongoing support for bug fixes and any other new functionality common to all types of trendsetter regardless of its plate loading electronics.

Until further notice, all firmware that supports base model Trendsetters using LUE and TIF boards will have a version number with the suffix 'a'. The Creo part number for these firmware releases is 19-3049x-x. This is the original part number for all previous Trendsetter firmware releases up to and including 2.04.

Trendsetter 'b' firmware releases (Part No. 19-3143x-x)

Trendsetter firmware version numbers with a 'b' appended denote firmware that supports the new plate loading electronics. This system uses a single electronic board that incorporates the functionality of the original LUE and TIF boards. The new board is known as the **T**rendsetter **E**ngine **E**lectronics (TEE) board. The TEE board is more than just a physical condensation of two earlier boards. It also contains the necessary electronics to support the optional "Autoloader" and "Proofing" options for the "base-model" Trendsetter machine.

Until further notice, all firmware that supports base model Trendsetters using TEE boards will have a version number with the suffix 'b'. The Creo part number for these firmware releases is 19-3143x-x.

Appendix A: 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.

Appendix B: Common Acronyms

MPE	Main Processor Electronics
CTP	Computer to Plate (this includes Trendsetters and Platesetters)
NVS	Non-Volatile-Storage
TTS	Thermal 3244 Trendsetter
T324	Thermal 3244 Platesetter
GVLF	Green VLF Platesetter
TVLF	Thermal VLF Platesetter
GVTS	Green VLF Trendsetter
TVTS	Thermal VLF Trendsetter

Appendix C: Backing UP and Restoring NVS RAM

The NVS RAM in recorder machines provides the following:

- Storage for machine-dependent "configuration and calibration 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.

At power-up, the contents of NVS RAM are copied to regular volatile RAM in the recorder and that is where they are used by the firmware. If any of these parameters are changed for any reason they must be copied back to NVS RAM or the changes will not be preserved after the next power-up. Changing individual NVS parameters is therefore a two-step process:

1. A parameter is first changed in a volatile RAM copy of the parameter
2. The changed value is saved (i.e. copied) to the NVS memory

Generally, there is no need to change "state" variables in NVS RAM since they simply contain a record of where the machine is (or was) during various tasks.

Whenever firmware is upgraded in a recorder machine, some of the NVS calibration and configuration parameters will typically need to be upgraded as well. Simply loading new firmware into a machine will not upgrade the NVS. Steps must be taken to ensure that the NVS is properly configured for the new firmware. This process may be partly or wholly accomplished with the **nvs upgrade** command available from the recorder monitor. In some cases, however it will be necessary for the installer to make certain upgrade configurations depending on the hardware that is present in the particular machine. Instructions on how and when to use **nvs upgrade** as well as any special machine-dependent upgrade procedures will be included near the beginning of this release note.

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!

Procedure to Backup and Restore NVS

Previous release notes specified two separate procedures for backing up and restoring NVS memory. There is now only one simplified procedure to follow. This procedure is used to save the entire 32k of NVS RAM. The "**fsave all**" monitor command is used to download the NVS memory to a file and the "**fload memory**" command is used to upload the NVS memory from a file. An overview of the general procedure is shown below

Backing up NVS:

1. Open a log file to collect data that is displayed on the monitor screen
2. Issue a monitor command to allow the desired data to be displayed (and therefore also collected in the log file).
3. Close the log file

Restoring NVS:

1. Issue a command at the monitor that readies the recorder to read a log file.
2. Send the log file to the recorder

Detailed instructions for accomplishing these general steps using various terminal configurations are given in further on in this appendix. An NVS dump file made according to the procedure that follows will be exactly 79508 bytes long. If your file is exactly this long there is a very high probability that it is not corrupt. If you require more assurance concerning the integrity of the file you may examine it with a text editor or listing utility and check for the following:

- The file must consist of exactly 995 lines.
- The first 992 lines will be 78 characters long and look similar to the following

```
S2258000004E56532056657273696F6E203200AAAA55555555555555555555555555555555AABD
```

- Line 993 will be 76 characters long and look similar to the following:

```
S224807FE05555555D5555755575D55DD775555555AA6EAAABBAAAAAAE998E823A4A9FFED671
```

- Lines 994 and 995 (the last two lines) will look exactly like this:

```
S9030000FC
END OF NVS MEMORY DUMP - Close log file and hit [Y] (Y/N)
```

Terminal Program Setup

The PCPLUS terminal utility is usually used for NVS backup and restore. This utility may be run from either DOS (or a DOS window) or it may be used with a "Windows" style interface. It is assumed that the terminal program will be run on the system workstation. If it is run on another PC it may be necessary to change all the hard drive reference letters in this appendix from E: to C:. Any files created on the C: drive of a separate PC (i.e. terminal) should be copied over to the workstation on drive E: for archival purposes The following subsections show the necessary changes to the default configurations of the PCPLUS programs.

Setting up PROCOMM Plus for DOS (version 2.0)

Hit "Alt-S" and select "Protocol Options" and "General Options"
Set "Abort transfer if CD lost" to "No"

Hit "Esc" to return to "Protocol Options" menu and choose "Ascii"
Set "Character Pacing (milliseconds)" to "0"
Set "Line Pacing (1/10 sec)" to "0"
Set" Pace Character" to "126"
Save and exit

Setting up PROCOMM Plus for Windows 95 (version 4.0)

Under "Setup" - "System" - "System Options…"
Select "Data" Tab
Select "Path" Tab
On the "Capture Path" entry line, set a path for the capture file. For example, E:\NVS (This specifies only the capture file path, not the filename itself). The filename will be prompted for at the time a download is begun.
Select "OK"

Under "Setup" - "Data" - "Transfer Protocol…"
Under "CR options - upload" select "Don't translate CR"
Under "LF options - upload" select "Don't translate LF"
Under "CR options - download" select "Don't translate CR"
Under "LF options - download" select "Don't translate LF"
Be sure to uncheck the "Use" box and specify "~" for the line pace character
Select "OK"

Under "Setup" - "Data" - "Setup Files…"
Under "Meta Keys" select "None"
Under "Translate Table" select "None"
Under "Capture" select "None"
Select "Setup" (brings up "Capture File Options" window).

In "Capture File Options" window"
Disable "Write text as it appears on screen"
Disable "Write filtered text with no emulation escapes"
Enable "Write raw text including all escapes"
Enable "Overwrite existing capture file"
Enable "Query for file name when capture is started"

Detailed NVS Backup Procedure

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface
Prepare recorder to dump all NVS	**fsave all** Y/N prompt appears, ignore for now	**fsave all** Y/N prompt appears, ignore for now
Open log file	**Alt-F1** Pop-up window prompts for a filename	**Alt-F1** Pop-up window prompts for a filename
Name log file	Enter a path plus a name that includes the firmware version before upgrade e.g. **E:\NVS\xxx.MEM** (where xxx is the version number).	Enter filename (without path or extension) that includes the firmware version before upgrade. e.g. **xxx**. (where xxx is the version number). Pcplus adds a ".CAP" extension to this name and uses the previously defined path. Click "OK".
Dump entire NVS to log file	**Y** Data is displayed as it is dumped. The dump will take a few minutes. Eventually the following message is displayed: END OF NVS MEMORY DUMP - Close log file and hit [Y] (Y/N)	**Y** Data is displayed as it is dumped. The dump will take a few minutes. Eventually the following message is displayed: END OF NVS MEMORY DUMP - Close log file and hit [Y] (Y/N)
Close log file	**Alt-F1**	**Alt-F1**
Confirm end of download	**Y**	**Y**
Rename file	Not necessary	Rename the file: **E:\NVS\xxx.CAP** To: **E:NVS\xxx.MEM**

Detailed NVS Restore Procedures

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface
Initialize NVS	**nvs init all creo** All NVS firmware defaults written to NVS	**nvs init all creo** All NVS firmware defaults are written to NVS
Reset the recorder	**reset** Ensures NVS is copied to active RAM	**reset** Ensures NVS is copied to active RAM
Prepare recorder to receive all NVS	**fload memory** "Begin upload…" message appears	**fload memory** "Begin upload…" message appears
Prepare to upload	**PgUp** Pop-up window prompts for protocol	Select "Data" - "Send File"
Select ASCII	**A** Filename prompt appears	ASCII protocol was already selected when PCPLUS was set up.
Enter NVS filename	Enter the path and name of the previously saved configuration file e.g. **E:\FW\xxx.MEM** after hitting ENTER the upload will begin. Pace characters are displayed as the upload progresses. This stops when the upload completes. This will be followed by a "Transfer Successful" message.	Navigate to **E:\FW\xxx.MEM** and Select "Open" Button. The load begins and a "progress" window appears that tracks the progress of the load. When transfer is 100% done a "Transfer Successful" message will appear. Close the progress window.
Reset the recorder	**reset** Ensures NVS is copied to active RAM	**reset** Ensures NVS is copied to active RAM

Appendix D: Loading Firmware

Before loading firmware it is assumed that the installer is running either "Procomm Plus" for DOS or "Procomm Plus" for Windows 95 at the system workstation. It is further assumed that all of the necessary program options have been set up as described in Appendix C "Backing Up And Restoring NVS" and that the "Allegro" software is not running on the workstation.

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface
Copy firmware to workstation hard drive:	Create a directory on the WS hard drive to hold the new firmware. Give it a meaningful name that includes the version number for example: **E:\FW\xxx**	Create a directory on the WS hard drive to hold the new firmware. Give it a meaningful name that includes the version number for example: **E:\FW\xxx**
Jump to the bootstrap loader	**reset boot** (Bootstrap loader will sign on and display messages)	**reset boot** (Bootstrap loader will sign on and display messages)
Change baud rate to 38400	hit **Alt-P**, select menu item **7**, hit **Esc**	Click baud rate button and select 38400
ready to load	**fload bank 0**	**fload bank 0**
Prepare to upload	**PgUp** (A pop-up window prompts for protocol)	Select "Data" - "Send File"
Select ASCII	**A** (Filename prompt appears)	(ASCII protocol is already selected)
Enter firmware filename	Enter the path and name of the firmware. Hitting ENTER starts upload Pace characters displayed during load and stop when complete	Navigate to the path and firmware file name. Select the "Open" The load begins. Progress is graphically displayed.
Reset	**reset**	**reset**
Change baud rate to 9600	hit **Alt-P**, select menu item **5**, hit **Esc**	Click baud rate button and select 9600