Creo Products Inc.

Thermal 3244 Platesetter
MPE Firmware Version 2.25 Release Notes

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1. SCOPE

This document describes the important changes to the Thermal 3244 Platesetter firmware that come with version 2.25.

Common acronyms used in this document are defined in Appendix A and the formatting conventions are outlined in Appendix B.

2. PURPOSE OF RELEASE

The main motivation for this release is:

a) Changes to plate handling to accommodate plates with extreemly delicate emulsion.

b) Few rare bugs in error recovery in 2.24

3. 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 firmware version: _____

   current head firmware version: _____

2. ☐ Ensure you have the T324_225.HEX file available.

3. ☐ Version 2.25 is only compatible with Head Version 1.32 and above. If the current head version is less than 1.32, then you will need to upgrade the head after the MPE has been upgraded. It is very important that you obtain the release notes for the Thermal Head before doing any MPE or Head firmware upgrades. Please note that this head upgrade operation is quite complex and should be treated carefully.

4. UPGRADE PROCEDURE

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

1. save all current NVS both in hex format (fsave all) and text format (nvs dump) (see Appendix C) Do an inch grid plot (like plot 100 or grid.ps) for reference.
2. load new firmware (see Appendix D).
3. issue the **nvs upgrade <previous version>** command (for example: **nvs upgrade 2.21**).
4. reset the machine with the **reset** command.

5. upload the new head firmware if required.
6. When upgrading from 2.24 or 2.23 the ‘hdp sssa’ may have been altered by 500 to compensate for an incorrectly set ‘mode # image_side’ If this is the case adjust ‘hpd sssa’ by 500 (it’s usually normally around 50 but is head dependant). You should ensure that you do a GC plot that has an inch grid (ie. test plot 100) and ensure that the sub scan shift is properly aligned.
7. It will most likely be necessary to calibrate the vacuum thresholds. See procedure below.
8. It is recommended that the bay positions be checked. The ‘cal bay’ command can be used. See below.
9. After the upgrade you should run ‘drum cal’ and save the drum nvs.
10. If delicate media is to be used it is essential to follow the delicate media upgrade procedure, 72-3394A-A-PR01

5. BUGS FIXED IN THIS RELEASE (2.25)

5.1.1 Simulator

Simulator did not work for testing purposes with workstation software.

5.1.2

6. NEW FUNCTIONALITY IN THIS RELEASE (2.25)

6.1.1 Delicate Plate Handling Improved

A fixed extra jog of 7mm is made prior to plate wipe to expose ajet2 (upper/front ones) while airjet is pulsed. This is compensated for before the wiper fingers are extended.

For delicate media (mcode 5) when the picker is positioned for the slip sheet wipe, it is positioned *delicate_wipe_y* further back from the plate.

When mcode is set to delicate media (5) then the initial plate seek is stopped when the proximity sensor detects a metal plate. Consequently because the proxsen will stop the picker before the cups touch the plate, the final plate seek is done by small jogs until vacuum is detected.

For the final plate grab the picker is positioned to *pgy* for normal plates (as before this puts the cups in contact with the plate at the microswitch position).
For delicate media the final plate grab is jogged to *pgy* + *delicate_wipe_y* which compensates for the softer wipe and places the suction cups close to the plate but not in hard contact with the plate. The final plate seek is done by small jogs until vacuum is detected.

A new nvs parameter is used plate_pick_offset_z which is the distance from the top edge of plate to the top surface of the bay (shutter). This is used for delicate media to prevent the bay shutter from closing on the plate but still have it close on any dangling slipsheets.

6.1.2 Monitor commands:

6.1.2.1 CB <#> SHUTTER OPEN|CLOSE

This command will open or close the cassette bay shutter, but it will only do so if the picker Z is known to be out of the way, that is; only if the pz position is < nvs.cal.alpos.cassette_clear_z and the PZ is initialized, or if the PZ is home. It also requires the cassette drawer to be closed before opening the shutter. The back door commands BAY <#> SHTRCL ON|OFF and BAY <#> SHTROP ON|OFF (double acting bi-stabe valve) still have no safety checking.

6.1.2.2 ENGINE <INIT>

Init now forces a re-initialization of the engine (even if the engine_initialized flag was set)

"`Engine`" with no parameters will now list the engine sensor status. (The same as "`sat stat ldr`")

6.1.2.3 PICKER

"`Picker`" (with no parameter will list the picker sensor status. (The same as "`sat stat pkr`")

6.1.2.4 PROCESSOR

This command only gives the status of the 3 inputs from either processor interface on the processor board.

Entering *processor* with no argument will return the status of the active processor set in the last media used. Entering *processor select* <number> will select the processor specified, but this will be over written during the next plate process cycle by the value set in the media being processed.

Syntax: *processor <1|2> , select<1|2>*

Returns:

Processor #1
Processor Fault = 0
Processor Busy = 0
Processor Ready = 0

6.1.2.5 CONVEYER

This command without any argument will return the status of the Plate in Conveyer sensor, the Conveyer Lid sensor, the Bridge Down sensor, the 5V power on the conveyer interface board, and the Exit Door Closed sensor.

The following arguments are valid;
RLR ON, RLR OFF, RLR ON <number between –255 and +255 representing the speed>
RLR UP, RLR DOWN, RLR DN, Conveyer rollers up/ down or on/off with optional speed. If no speed is specified then
CBELT ON, CBELT OFF Conveyer belts on / off. (only full speed available)
FENCE UP, FENCE DOWN, FENCE DN For S conveyers raises/lowers fence (same actuator but opposite sense as rlr up/dn
REJECT ON, REJECT OFF. Reject stamp extend (on) or retract (off)

6.1.2.6 CAL BAY

"`Cal bay`" is a startup command that will send the picker searching for the bays and set up the bay locations in *`bay <#> location`* and also set the *`aldrv y limit`* (PY away limit),

and it will set *al bays* , but the nvs for these are not saved. The picker z must be clear of the bays before the command is attempted.

6.1.2.7 CAL UVAC

"Cal uvac" is a semi automated way of setting up unload vacuum thresholds. The command requires the user to open the front of the machine and place a plate over the cups as directed. First the no plate threshold is measured, then the user is asked to cover one cup with a plate and press "Y" (never use a porous material like paper). Then the user is asked to seal both cups and press "Y". The vacuum will be released 7 seconds later and the plate will drop. The nvs, *sat uvt* and *sat uvrt* will be calculated and set and saved. The algorithm takes repeated readings until none of the last 5 readings differs from the average of the last five readings by more than 4.

6.1.2.8 CAL PVAC

"Cal pvac" is a semi automated way of setting up picker vacuum thresholds. The command requires the user to open the front of the machine and place a plate over the picker cups as directed. First the no plate threshold is measured, then the user is asked to cover 2 cups with a plate and press "Y" (never use a porous material like paper). Then the user is asked to seal all three cups and press "Y". The vacuum will be released 7 seconds later and the plate will drop. The nvs, *sat pvt* and *sat pvrt* will be calculated and set and saved. The algorithm takes repeated readings until none of the last 5 readings differs from the average of the last five readings by more than 4.

6.1.2.9 NVS UPGRADE <current version>

If you run nvs upgrade <version> where version is the same as the installed version, then the aldrv parameters will be initialized to default, but only if *aldrv y sr* = 0 or *aldrv z sr* = 0. This is basically intended for startup. It will also initialize *mode* <#> *mis* and *sys maxis*. All these should remain at default anyway.

6.1.3 Drum Tick

Not working.

6.1.4 Fault Finding Aid

A new nvs parameter *sys abort_on_error* is used to "freeze" the autoloader when an error is detected. Normally the firmware will continue to move stuff after an error is detected in order to make a safe and sensible recovery and give access to the bays etc. If sys *aoe* is set to 254 all error will abort on an error, if only one error group is of interest (example the autoloader errors 15xxx) then sys *aoe* may be set to the error group number. Set *aoe* to 0 to disable. (255 selects the default which is 0)

6.1.5 Special consideration

In the unlikely event of problems with the monitor accepting commands or locking out the keyboard. Contact product development for possible work around involving a temp nvs parameter.

NVS Changes in this 2.25 release

NVS Parameter	Comment	See Section
Cup_clear_y	changed name to delicate_wipe_y	Alpos
delicate_wipe_jog_y dwy	Default changed to 5. *dwy* is the amount added to *try* when the picker is backed away from the plate before the slipsheet wipe is done with mcode =5.	Alpos
Queue_jog3_z	No longer used. Memory location renamed to: plate_pick_offset_z	Alpos
plate_pick_offset_z ppoz	PPOZ is the distance from where the picker cups grab a plate and the top of the plate.	Alpos
Pvac_release_threshold Pvrt	This is the threshold which ale_init uses to determine that there is no plate on the picker. It should be above the no cup vacuum and below the 1 cup vacuum.	Sat
Uvac_release_threshold uvrt	This is the threshold which ale_init uses to determine that there is no plate on the unload table. It should be above the no cup vacuum and below the 1 cup vacuum.	Sat
no_slip_sheet_roller nssr	Setting this to 1 will prevent the bay slipsheet roller from being activated, as some customers want to reuse slip sheets.	Al
Abort_on_error	Setting this to 254 will cause the machine to suspend / abort upon any error. aoe may be set to a specific task number and only errors generated by that task will suspend. aoe 0 disables this feature. (note 255 selects the default which is 0)	sys

6.2 Thermal Module 2.36

This supports head firmware 1.56 and previous versions.

7. KNOWN BUGS IN THIS RELEASE

8. BUG FIXES PREVIOUS RELEASE (2.24)

8.1.1 Workstation hangs and crashed recorder with process synch error 32493

The load and unload commands were returning “command complete” even when there was an error. This caused the Allegro software to issue the next command (“unload” or “process”) when there was no plate on the drum (or unload table) resulting in a Process error that would crash the recorder. This has been fixed.

8.1.2 Poor recovery from plate removed from drum when nms = 1

If a plate was manually removed from the drum by manually operating the valves to get the clamps, and the tec mag sensor (set al nms 1) was disabled, it was possible that the firmware would drop the clamps when tyring to recover. This is caused by a conflict between the flag “*state al te”* and the magnet sensors on the tec backbone.

This has been fixed by first doing a put_clamp then get_clamp to re-establish the “*state al te”* flag.

8.1.3 NVS Changes in the previous (2.24) release

None

9. BUG FIXES 2.23

9.1.1 NVS Changes in the previous (2.23) release

The following table details which NVS parameters have changed in release 2.23.

NVS Parameter	Comment	See Section
drum dfrict	Default changed to 20	9.6.1
aldly tuntilt	Default changed to 5	9.7.1
aldly ttilt	Default changed to 5	9.7.1

media cspd	Rescaled by “nvs upgrade” if value too large for LUE version	
alpos ppz	ppz not allowed to exceed aldrv z limit when used	
media mcode	New value no_wipe (for soft emulsion aluminum) changes to delicate_media and value changes from 2 (nw) to 5 (delicate)	
media <x> carrier_thickness	new unused nvs for thermal module compatibility	
media <x> ablative	new unused nvs for thermal module compatibility	
media <x> media_load_clean	new unused nvs for thermal module compatibility	
cup_clear_y	no longer used.	
tissue_release_y	incrimented by 1 to compensate for cup_clear_y	
Reject_method	0 is now no reject marking 1 is emboss 2 is reverse rollers 3 is old green led	

9.2 Image task fixes

A number of fixes to the image task have been made. Previous versions would crash when resuming after certain types of image errors. Also, previous versions would hang when images were aborted under certain conditions too many times.

9.3 Thermal head module upgraded to 2.34

This version supports head code 1.32, 1.32.6 and 1.36. and 1.38

NVS CHANGES

The following table details which NVS parameters have changed in this release. All of these changes are automatically implemented by the upgrade procedure and no special action is required by the user during field upgrades.

NVS Parameter	Comment	Description
set head fshift	default changed	The default value is modified from 127 to 55.
set head bmpwrcal	deleted	The NVS parameter is no longer needed.
set head fheadcal	default changed	The default value is modified from 0.025 to 5.0
set head hpslope	range changed	The range is increased from 200 - 400 to 100 - 400.
set head hpoffset	range changed	The range is increased from 500 500 to -500 600.
set head nomlsrcur	range changed	The range is increased from 0 - 35A to 0 - 70A.
set head bpgain	default changed	The default value is modified from 0 to 40.
set head casehigh	new	Active chiller feature. Sets the case temperature
required to enable the active chiller.		
set head caselow	new	Active chiller feature. Sets the case temperature required to disable the active chiller.
set head humidity	new	Humidity sensor.
set hdp fcp	deleted	Eliminate a focus initialization procedure that would move the carriage and drum to the appropriate location and initialize the focus using the clamp.\tab
set hdp fdp	deleted	Eliminate a focus initialization procedure that would move the carriage and drum to the appopriate location and initialize the focus using the clamp.\tab
set hdp lci	deleted	The NVS parameter is no longer needed.
set hdm x fmode	range changed	The range is increased from 0 4 to 0 6.
set hdm x ds	range changed	The range is increased from 10 250 RPM to 1 250 RPM.

set hdm x dsn	range changed	The range is increased from 10 250 RPM to 1 250 RPM.
set hdm x wpowers	new	Laser standby feature.

9.4 Carriage module upgraded to 2.12

Changes were relating to general firmware structure and clean up.

9.5 New TPG module 1.01

Changes for version 1.00

9.5.1 New Horizontal Microband Test Pattern: Plot 19

All devices now support a new version of the test **plot 1**. Plot 1 consists of vertical bands of different bit patterns to implement varying degrees of darkness. The new test **plot 19** looks exactly the same but is oriented horizontally instead of vertically. Plot 19 allows one to plot multiple screens in the main scan direction, therefore it is not necessary to expose the whole plate to see all the available screens. This allows testers to perform the same checks while only imaging part of a plate, permitting quicker tests or more plots on the same plate.

Changes for version 1.01

9.5.2 New Checkerboard Test Patterns

New 2, 3, 4, 5, 6, 7, and 8-pixel checkerboard patterns have been added, in addition to the existing 1-pixel checkerboard pattern. The new pattern numbers are 22, 33, 44, 55, 66, 77, and 88, respectively. (Note that the 1-pixel checkerboard pattern is still pattern number 15.)

9.5.3 New GC Pattern: Plot 100

This new pattern is the good old plot 0 stripped down to just the crosshairs. T's have been added in the blank space to give reference to the leading edge of the plate (this is important for registration purposes). The crossbar on the T corresponds to the leading edge of the plate (ie. LE is on the top when you can read to T). This pattern has been created to help alleviate some problems with the GC table in integration.

9.5.4 New Screen Pattern for Flexo: Plot 110

This new pattern is a 10% screen at 45 degrees. This adds to the current selection of screen plots. Plot 110 was added to aid plot quality inspection for the ThermoFlex product. Being able to examine low and high screens is necessary to gauge the effectiveness of the debris removal.

9.5.5 New Vertical 1 Pixel Bars Pattern: Plot 111

All devices now support this pattern which is as it says 1 pixel wide vertical (around the drum) bars. The bars are spaced with 1 pixel wide non-imaged areas. This pattern is added to support testing for tinted film testing on the ThermoFlex project but is made available to all products should it be useful.

9.6 Drum code upgraded to version 1.14

9.6.1 Changes To Drum Calibration Procedure (*drum cal*)

When *drum cal* determined that the dead-band was less than the *dfrict* value it used to report "deadband too narrow". Some people thought that this meant that the drum amp had to be replaced, while infact it could still be used even though the drum cal routine could not compensate for the deadband of that drum amp.

The firmware now reports:

- "deadband too narrow to compensate, ...but should function." and "Drum Cal: Deadband offset value (doff) set to zero" - if the deadband is less than *dfrict* but greater than zero.
- ".....deadband too narrow, replace or adjust drum amp." and "Drum Cal: Deadband offset value (doff) set to zero" - if the drum won't settle (deadband zero or no deadband at all).
- "Drum Cal: complete, new deadband offset = <#> " if a new doff was determined.

Drum amps have been revised (ECO C890 15-3114B) so that the deadband is set at the factory to be wider than normal so that the *drum cal* is required to do the compensation in order for the system to work. This gives the added advantage the deadband can now drift in either direction and the drum cal routine will still be able to compensate for the drift.

- The *dfric* value should not be changed from default. Changing it will merely cause the calculation of the *doff* value to be wrong, even though it will mask the error message.

9.6.2 Drum init

Drum init now includes a check of the drum drive system to be able to settle, that is if the drum moves with no signal applied to the drum amp, then drum init will fail. In this case a drum cal may aleviate the problem, if not then the drum amp must be replaced. This is to prevent extreme run away.

9.6.3 Other Drum module bugs

In previous versions of the drum code it was not possible to issue a torque commant unless the software had detected at least one index. (This was actually incorrect, what the software required was that the Hall mode routine be initialised and the encoder be working or else "Hall mode velocity does not match encoder mode velicity" errors would be reported.) The torque command will now drive current to the motor even if the encoder is not connected.

When a drum amp fault occurred, the only way to clear it used to be by recycling the power on the machine. Now issuing a "drum init" will toggle the drum amp enable line which will reset it.

9.6.4 Index

The drum init process used to rotate the drum untill it had detected 3 indexes and then declare "index detected". This was based on MPE index interrupts. It was however possible that the drum position counter inside the MPE LCA was not being reset. For A series Xilinx MPE LCE 0.10 this would show up later as "index not detected" due to the counter over run, and on E series Xilinx MPE LCA 0.03 (which has a modulus 36000 counter) it would not give any error but would put the drum in the wrong position for loading.

Drum init now does the following checks: For A series Xilinx it checks that the counter does not exceded TACH_TICKS_PER_ROT = 36000 during drum init and for E series Xilinx, it checks the LCA bit that are dedicated to latching a sucessful index.

9.7 Autoloader Bug Fixes

9.7.1 timeout moving stow/tilt

In the previous release, if the table sensors were disabled with no_table_sensor, then it would still report an error "timeout moving stow/tilt cylinder". This bug has been addressed.

9.7.2 MCODE "Delecate media"

Release 2.21 introduced an MCODE for metal plates with slipsheets that had a delicate emulsion, this was called No_Wipe and had the value 2, it prevented the shutter from closing while the plate is being lifted out of the bay. (This introduces a certain amount of risk of slipsheet problems but some customers prefered that to damaged plates.)

This release changes the name and value of this MCODE to "Delicate Media" and the code to 5, this will now be available in other products too.

Pick sequence changed for "Delicate Media" (specially done for Fuji positive and KPG N95).

This mcode is intended for aluminum plates with soft emulsion. Setting "media <N> mcode 5" instructs the autoloader to treat the media as it would with mcode 0, except for the following:

1. The emulsion side of the plate is not wiped against the shutter seal as it is pulled from the cassette bay,
2. The wiper fingers are retracted before the plate is pulled from the box (wipers were scuffing Fuji positive plates).
3. After the Velcro cycle the plate is backed away from the Velcro tabs before it is lifted out of the bay.

- Make sure the Velcro nvs positions are adjusted correctly.
  alpos vpz (velcro_pos_z) should be set so that the top edge of the plate is at the same height as the Velcro tabs when it comes to do the Velcro cycle.

alpos vjy (velcro_jog_y) should be set so that the top edge of the plate is about 3/8" (10mm) into the Velcro tab, the Velcro tab therefore "T"s onto the top edge of the plate to hook the edge of stubborn slip sheets.
Failure to set these correctly may mean that the Velcro ends up wiping against the emulsion and scratching it.

9.7.3 Check of Proximity Sensor during Plate Grab

If the vacuum threshold SAT PVT is set too low (below the level generated with the vacuum on, but with no plate covering the cups) then the plate grab process will assume that it has a plate even when the plate has fallen off or the box was empty. This is fixed by also checking the plate proximity sensor after a successful plate grab.

9.7.4 Check of Vacuum thresholds during ALE INIT

Because so many problems were occurring due to incorrectly set vacuum threshold levels (SAT PVT and SAT UVT), it was decided to check that the vacuum read with no plate on the picker (unload table) was below the SAT PVT (SAT UVT) set in NVS. It is not possible to disable vacuum checking, therefore if these levels are wrong during ale init then the machine suspends until the threshold levels are corrected.

9.7.5 Premature Picker Vacuum during Plate Grab

In some previous releases the picker vacuum was turned on during the plate grab, before the picker microswithces were in contact with the plate. (some releases this only happened with film). The result of this was that the plate got sucked away from the plate stack a fraction of a second before the picker microswitch depressed, the momentum of the plate was enough to prematurely activate the picker microswithch which stopped the py before the pms were properly depressed. This gave rise to intermittent pms errors. The vacuum is now turned on at the proper time.

9.7.6 Ptilt denting plates

The sequence of operations during a plate grab has been changes slightly to prevent the small dents that appear on the back of some plates of the picker is not setup perfectly. Once that picker has found the plate (picker microswitch detected) then it starts to back off (to let the slip sheet drop) slightly before the cups are tilted away from the plate. (This required Pick10 to be combined into pick7)

When the picker moves forward again to grab the plate, turns on the vacuum, and (new action) it backs off ALE_GRAB_BACKOFF = 4mm , before it tilts the picker head back. This is to prevent the tilt from bending the plate over the Ptilt hinge and causing dents/scratches.

9.7.7 Pick speed enhancement

After plate grab, ale_get_plate() now pre-positions the PY close to the back edge of the bay tab at the medium speed, so that the search for the edge of the bay tab (at slow speed for accuracy) takes less time. *ALDRV Y MR* can now be set to 5. Type "set aldrv y 5"

A side effect of this change was that during an unload the table moved forward too fast before the edge of the plate was on the table causing the edge of the plate to crash into the edge of the table during the unwrap from the drum. This was fixed by a 1 second delay before advancing the table.

cup_clear_y is no longer use as it served no useful function. To compensate tissue_release_y has been incrimented by 1. The default for tissue_release_y and plate_get_y have been increased to 9mm.

9.7.8 Reject Marker

The reject marking system was not working at all, significant rearraning of alconv.c was required but the intended functionality should be the same. *set al prm* sets the plate reject method where 1 is embossed, 2 is reverse conveyer rollers and 3 is for the green fog led. *al prm* 0 disables reject marking. *set aldly tbs* sets time between stamps and *set aldly tps* sets time per stamp. For the green fog led the 'on' time is set by *media <x> rexp* (reject_exp_time). The act command for turning the marker on or off is *act fog <on>/<off>*.

9.7.9 PY Idle effect of ALE initialized state.

If PY is idles then the ale_initialized flag is now reset incase the picker was moved.

9.8 Change to Download Setup

This is not a firmware change. However, if you are using Procomm for Windows note the changes to the Procomm setup in "Terminal Program Setup" in Appendix A.

9.9 Error number changes

All the error numbers have been revised to coincide with those used on other similar products and the intranet descriptions.

10. NEW FUNCTIONALITY- 2.24

None

11. NEW FUNCTIONALITY- 2.23

11.1 "pvac" , "uvac" & "table" Monitor Commands Added

To make removing a plate from the picker or unload easier, two commands were added:

Syntax: *pvac on|off* <*delay*> where delay is an integer in seconds before the vacuum turns off or on.

uvac on|off|grab <*delay*> where grab will first extend the ucups and wait the delay then turn on the vacuum.

uvac (*pvac*) without any parameter will report the current vacuum reading.

A command has been added to move the table more easily.

Syntax: *table up | dn | half*
Example: *table up* or *table load* will move the table to the fully up or load position,
table dn or *table down* will move the table to the fully tilted position or unload position, and
table half or *table unload* will move the table to the unload position.

Typing *table* alone will return the current table status.

11.2 "getclamp" modified.

Getclamp now requires a parameter, either *getclamp park* or *getclamp last* . This corresponds to the command as used on VLF. *getclamp park* retrieves the TEC's from the parked position, while *getclamp last* retrieves the clamps from the last known position as determined by the plate size on the drum, (in *set state plate_loc d*).

The places where ale_get_clamp() are used have also been modified to allow *clear* to make remote and manual manipulation easier.

- The following were all added in 2.21 but it is good to review them here.

11.3 "cb <bay> open" Monitor Command Added

A new monitor command has been added to "open" a cassette bay. This command is identical to pushing the open bay button on the workstation. The bay will be automatically locked when closed

11.4 Sensor Dump Upon Suspend

Note: these changes were first introduced in version 2.05

A new service feature has been added. When enabled, this feature displays the state of recorder sensors on the diagnostic monitor. The new “set verbose suspend” parameter determines the amount of sensor information displayed.

This command works by executing regular monitor status commands. Following is a list of the status commands executed with each verbose level:

0 - sensor dump disabled

1 - "ale", "sat stat pkr", "sat stat ldr", "sat convert pkr", "carriage", "drum"

2 - same as 1 plus: "mask", "sat stat cnvyr", "sat stat flt", "sat convert ldr", "laser"

3 - same as 1 & 2 plus: "head", "scsi flags", "scsi state", "scsi config", "scsi cdb"

The sensor dump can also be displayed with the new “list all [<level>]“ command, where <level> is 0, 1, 2, ... as described above.

11.5 “Pick”, “Load”, etc. Check For Plates

Note: these changes were first introduced in version 2.05

When a pick, load, or unload command is issued from the monitor, a quick check is performed to see if there are any plates in the way (i.e. a plate on the picker already when a pick command is issued). If there are, an error message is printed and the command is aborted. Previous versions of firmware would suspend and make recovery difficult.

11.6 Direct read of the flyoff signal added

The unfiltered, un-reset status of the flyoff sensor can now be read with the “sat stat flt” command (macro ‘o’).

11.7 New “ale step [off|on [<timeout>]]” command added

A new autoloader command, “ale step on [<timeout>]”, has been added which forces the autoloader into step mode. This causes the autoloader to pause after each step of a pick, load, unload, or process. The next step will be executed when “ale step” is entered on the diagnostic monitor.

Step mode is disabled by entering “ale step off”.

There is also an auto-step mode, entered by specifying a timeout: “ale step on <timeout>”. The autoloader will pause for between steps, but if “ale step” is not typed before the specified <timeout>, the next step will be automatically executed.

11.8 WS Version and Product Queries supported

Newer versions of workstation software use two new commands that query the recorder for its product identity and firmware version number. These commands are now supported.

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

Before upgrading the firmware of any recorder machine it is important to backup the current NVS memory in case it becomes necessary to revert to the previously installed version of firmware.

What is 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.

Saving individual NVS configuration parameters is a two-step process. A parameter is first changed in a volatile RAM copy of the NVS map and then saved (i.e. copied) to the NVS map

itself. State variables are always accessed directly from NVS. Generally, there is no need to change state variables manually 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. This appendix deals only with the following:

- Backing up and restoring the NVS configuration parameters.
- Backing up and restoring the entire NVS map (i.e. calibration and configuration parameters plus state variables).

Two Procedures to Fully Backup and Restore NVS

There two procedures ("A" and "B") that must be followed to do a reliable backup (as well as a possible restore) of NVS memory. Each procedure contains instructions for both saving and restoring NVS memory. BOTH procedures must be followed when saving NVS memory but ONLY PROCEDURE "B" SHOULD BE USED WHEN RESTORING NVS. It is possible to restore NVS memory using procedure "A" but this restore method is NOT recommended. The following provides a general outline of both procedures.

Overview of Procedure "A":

Procedure "A" involves the back up and restoration of NVS "configuration and calibration parameters" but not "NVS "state variables". The file created during this procedure is readable ASCII and it may be screen-listed or printed. It will conveniently show the installer a "snapshot" of the NVS configuration before the firmware upgrade was begun. Although it is possible to restore the original NVS configuration from this file (and instructions are provided to do this), it is not the recommended method. While it is not absolutely necessary to save and restore state variables when reverting back to an earlier version of firmware it should be done for the sake of completeness. For this reason, if it ever becomes necessary to restore NVS memory, the procedure "B" restoration method should be used. Procedure "A" uses the **nvs dump diff** monitor command. This command creates a file that contains only those configurations that are different from their firmware default values. This file is fairly short since it does not list unchanged default parameters already embedded in the firmware. The **nvs dump** command (i.e. without **diff**) may optionally be used to create an ASCII file containing all of the NVS configuration and calibration parameters. This file is rather long but contains complete configuration information. Only **nvs dump diff** is necessary to perform procedure "A".

Overview of Procedure B:

This involves backing up both configuration parameters and state variables (i.e. the entire NVS RAM map is backed up and restored). This procedure is completely thorough and in some cases faster than procedure "A". The **fsave all** monitor command is used to extract the NVS map from the recorder device. The file created in this case is not humanly readable. It is a "Motorola S record" file which is very cryptic but contains a record of all the data in the NVS map.

General Procedure

Both procedure "A" and "B" have similar steps and can generally be summarized as follows:

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 previously saved log file.
2. Send the log file to the recorder

Detailed instructions for accomplishing these general steps for both procedures using various terminal configurations are given in subsequent sections of this appendix.

Because the monitor is used for many display functions it is possible that undesired data may be accidentally inserted into a log file. If any extra data is inserted it will always be at the beginning or end of the file. In most cases, extra data is not a problem since during reloading the recorder will parse this undesired data, recognize it as superfluous and ignore it.

Occasionally, extra data may cause the recorder to become confused and issue some error messages at the beginning of an attempt to restore NVS. In this case it will be necessary to edit the log file. In a DOS environment the "Edit" program or any other text editor may be used for this purpose. In a Windows environment "Notepad" or "Wordpad" are usually available.

When problems of this nature occur it will usually be when loading the "Motorola S record" file created using procedure "B. The first line (i.e. record) of a typical file looks like this:

S225448EEE2F3C0045514C4EB900446BA82F3C004551194EB900446BA82F3C004551084EB900E7

The first line may be shorter than this example but it will always start with the letter "S". The usual problem will be that a line (or lines) of monitor message text will have crept into the beginning of the file. Simply use a text editor to remove any extra lines ahead of the first "S" record to make it useable.

Any superfluous lines of monitor message that creep into the end of a log file are usually harmless. There may be a warning that bad data was encountered but by the time this warning is displayed the load process is already complete.

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
Set "Character Pacing (milliseconds)" to "0"
Set "Line Pacing (1/10 sec)" to "0"
Set" Pace Character" to "126"

Setting up PROCOMM Plus for Windows 95 (version 4.0)

Note: There's been a change to the setup information – DON'T use the pace character and disable "Write text as it appears on screen"

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 (we used to check this box)
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"
Disable "Write raw text including all escapes"
Enable "Overwrite existing capture file"
Enable "Query for file name when capture is started"

Specific NVS Backup and Restore Procedures

Procedure "A" Backup

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface	Using Windows "Terminal" Program
Open log file	**Alt-F1** (A pop-up window prompts for a filename)	**Alt-F1** (A 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.DIF** (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 will adds ".CAP" extension to this name and uses the previously defined path.	
Dump configuration parameters to log file	**nvs dump diff** (Data is displayed as it is dumped. When the dump completes this display stops).	**Nvs dump diff** (Data is displayed as it is dumped. When the dump completes this display stops).	
Close log file	**Alt-F1** (Dump file complete)	**Alt-F1** (Dump file complete)	
Rename file	(not necessary)	Rename the file: **E:\NVS\xxx.CAP** To: **E:NVS\xxx.DIF**	

Procedure "A" Restore

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface	Using Windows "Terminal" Program
Initialize NVS	**nvs init all creo** (All NVS firmware defaults are 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 NVS configuration	**nvs dump load** (A prompt to "begin ASCII transfer now…" appears)	**nvs dump load** (A prompt to "begin ASCII transfer now…" appears)	
Prepare to upload	**PgUp** (A pop-up window prompts for protocol)	Select "Data" - "Send File"	
Select ASCII	**A** (a filename prompt appears)	(ASCII protocol is already selected)	
Enter NVS configuration filename	Enter the path and name of the previously saved configuration file **E:\NVS\xxx.DIF** and the upload will begin. Data is displayed as the load progresses and stops when complete. After a few more seconds "NVS load of dump file complete" message appears. Restore is complete.	Navigate to **E:\NVS\xxx.DIF** Select "Open" Button. A window appears that tracks the progress of the load. After a few more seconds "NVS load of dump file complete" message appears. Restore is complete.	
Reset the recorder	**reset** (ensures NVS is copied to active RAM)	**reset** (ensures NVS is copied to active RAM)	

Procedure “B” Backup

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface	Using Windows “Terminal” Program
Prepare recorder to dump all NVS	**fsave all** (a Y/N prompt appears, ignore just for now…)	**fsave all** (a Y/N prompt appears, ignore just for now…)	
Open log file	**Alt-F1** (A pop-up window prompts for a filename)	**Alt-F1** (A 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.	
Dump entire NVS to log file	**Y** (Data is displayed as it is dumped. When the dump completes this display stops).	**Y** (Data is displayed as it is dumped. When the dump completes this display stops).	
Close log file	**Alt-F1** (Dump file is complete)	**Alt-F1** (Dump file is complete)	
Rename file	(not necessary)	Rename the file: **E:\NVS\xxx.CAP** To: **E:NVS\xxx.MEM**	

Procedure “B” Restore

Steps	Using PCPLUS in a DOS window	Using PCPLUS with windows interface	Using Windows “Terminal” Program
Initialize NVS	**nvs init all creo** (All NVS firmware defaults are 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** (A pop-up window prompts for protocol)	Select “Data” - “Send File”	
Select ASCII	**A** (Filename prompt appears)	(ASCII protocol is already selected)	
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** Select “Open” Button. The load begins and a window appears that tracks the progress of the load. When transfer is 100% done a “Transfer Successful” message will appear.	
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	Using Windows "Terminal" Program
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	