Kodak

Thermal 2 Imaging Head

Installation Procedure for Trendsetter Platesetters

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Revision History

Revision	Date	Author	Comments
A	November 2005	Ken Johnston	New document, based on 725-00104A-C, TH2 Installation Procedure for *Trendsetter* NEWS. (NEWS devices are no longer the only *Trendsetter* devices with TH2 imaging heads, now that the *Trendsetter* Autoloader X-Speed option is available.)
B	12 Dec 2007	Maureen Munroe	Updated the template; updated the trademarks; updated actions related to FCO E040. removed the detailed tilt procedure and added a reference to procedure 719-00424A (Adjusting Tilt on a Thermal Head).

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1. PROCEDURE OVERVIEW

This procedure describes how to install a thermal 2 imaging head (TH2) in one of the following *Trendsetter* output devices:

- Kodak® Trendsetter® News™ 100 and News 150 (MPE or MCE) thermal platesetters
- Trendsetter News 200 (MCE) platesetter
- Kodak Trendsetter® 800 II platesetter with X-speed option (MCE)

Important:
This document is intended for field service engineers who have attended a thermal head introductory course, and are therefore familiar with the safety precautions when working with a Trendsetter platesetter and a thermal head. Do not begin this procedure until you read "Required Reading: Laser Safety Practices," below.

This procedure assumes that the head has been pre-configured for the media type and imaging time with the correct media parameters (such as write laser power and drum speed). See the appropriate media technical note (for details, see "Related Documents") if the media parameters have not been correctly configured.

2. REQUIRED READING: LASER SAFETY PRACTICES

- When any safety-interlocked access panel is opened, power is automatically removed from both the write laser and the focus laser.
- You cannot enable the focus or write laser with the Safety Interlock Override (SIO) key switch.
- Service personnel are issued with their own key (if you lose this key, you must order a replacement).
- *For devices that have not had FCO E040 applied:* There is a spare key under the key switch, fixed to the panel by a bolt, which can be removed using a 3-mm hex key tool. Remove this key. Do not replace it. For details see FCO E040.



Danger:
Never operate a Trendsetter with its enclosure open and the write laser on. The write laser *must* be disabled when the enclosure is open. Failure to do so may result in permanent eye damage.

The write laser must be disabled in the firmware. To do so, use the commands:

```
redirect enable
```
(to display the TH2 prompt)
```
set sys laserenable false
```



Danger:
The TH2 focus laser is a hazard for up to 1.2 meters (4 feet) from the aperture of the head. For this reason, you cannot enable the TH2 focus laser with the safety interlock override key switch. This means that service procedures requiring the focus laser to be on, such as head positioning, must be performed

with all doors closed and panels on.

Danger:
The rear panels on all MCE output devices that contain TH2 heads should have access holes through which a long hex key can be inserted for safe adjustment of the TH2 head positioning.

However, there are some Trendsetter News 200 MCE platesetters in the field that do not have this kind of rear panel. In addition, Trendsetter News MPE platesetters that have had their thermal 1.7 heads upgraded to thermal 2.0 may not have this rear panel.

On these devices, you must install the new style rear panel (FCO E608, kit part number 512-00248A) before installing a new TH2 head.

Danger:
Do not tamper with the safety interlock override (SIO) key switch. The key can only be removed from the key switch while in the Normal Operation position.

3. RELATED DOCUMENTS

- Adjusting Tilt on a Thermal Head: **TechPlanet > Output > Heads > Thermal 2 > Procedures**
- FCO E040: **TechPlanet > Output >Computer to Plate > Trendsetter 800 > FCOs** (http://techplanet.creo.com/output/computer_to_plate/vlf_trendsetter/content/ecos/fco_E040.htm)
- Find Debris Removal information at: **TechPlanet > Output > Heads > Debris Removal** (http://techplanet.creo.com/output/heads/debris_removal/nav/index.htm).
- Find Media Technical Notes at: **TechPlanet > Consumables > Media** (http://techplanet.creo.com/consumables/media/nav/index.htm).
- Find thermal 2 Troubleshooting information at: **TechPlanet > Output > Heads > Thermal 2 > Troubleshooting** (http://techplanet.creo.com/output/heads/thermal_2/nav/troubles.htm).
- [Trendsetter News 200 platesetter only] Find the procedure for adjusting geometric correction parameters of the stitch line on a Trendsetter News 200 platesetter at: **TechPlanet > Output > Computer_to_Plate > Trendsetter News > Installation** (http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/install.htm#install_procs).

4. PARTS REQUIRED

- Adjustment screw service tool (part number 90-1211)
- Loctite® 242 adhesive (for whisker jet installation)
- [If output device does not have rear panel with head positioning adjustment holes] FCO E608, kit part number 512-00248A

5. INSTALLING THE THERMAL 2 HEAD

This section describes how to mount a thermal 2 head on the adapter plate, connect the cables, and position the head.



Caution:

- Always lift the head by the two retractable handles that slide out from each end.
- Always wear an antistatic wrist strap to prevent static discharge from damaging the head.

5.1 Preparing the Head For Mounting

To prepare the head for mounting:

1. Attach the mounting plates to the sides of the head if they aren't already in place:
    a. On the home side of the head, slide the plate inside the black outer casing of the head.
    b. On the away side of the head, mount the plate on the outside of the head casing.
    c. Secure both plates in place using four M4 x 8 screws and Belleville washers.
2. If necessary, install the whisker-jet block (57-7501).
    a. Install the o-ring (59-3079) and mount the whisker-jet block. Plug the two threaded holes with the two setscrews (52-4062).
    b. Sparingly apply loctite 242 adhesive to the two setscrews. The tops of the setscrews should be flush with the surface of the block.
    c. Allow the adhesive to dry for at least 30 minutes.
    d. Purge the whisker-jet cavity with compressed air.

WARNING: Applying too much Loctite adhesive will contaminate the TH2 final window. Dry the adhesive for a minimum of 30 minutes prior to installing the whisker-jet block.

    e. Fasten the whisker-jet block to the lower edge of the nosepiece with two screws (52-4988).

5.2 Mounting the Head On The Adapter Plate

Note: Wear an antistatic wrist strap plugged into the grounding socket on the Trendsetter.

1. On the adapter plate, unscrew the precision screw to give clearance for the rod on the bottom of the head.
2. Loosen the six M6 screws in the sides of the adapter plate and open up a gap between the clamping bars and the plate.
3. Gently place the head on the adapter plate mounted on the carriage. The slots on the mounting blades will slide over the six loose screws, between the adapter plate and the steel clamping bars, at the ends of the adapter plate.

Caution:
Do not to bump the lens, shutter, or autofocus actuator. Do not allow the head to drop down on the carriage. The sudden impact could shift the components inside the head and cause misalignment.

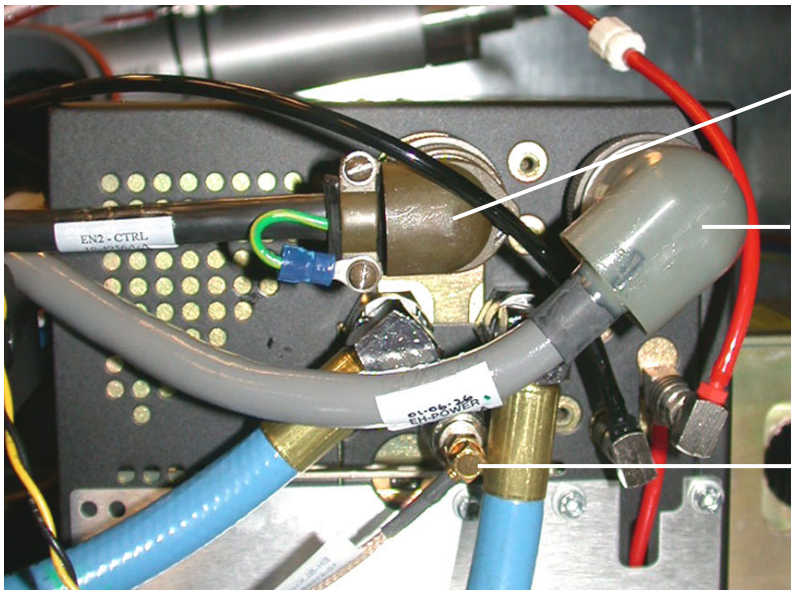
4. Tighten the precision screw just until you begin to apply force to the rod. The other end of the rod will compress a spring-loaded ball bearing.
5. Slowly turn the drum by hand to check that the head has clearance from both the leading edge and trailing edge clamps.

Caution:
Failure to check the clamp clearance could result in severe damage to the head and clamps.

6. Leave the clamping bar screws loose enough so the adjustment screw can still move the head easily. If you try to adjust the positioning screw when the head is not free to move, you could strip the threads on the screw.

5.3 Connecting the Cables and Hoses

5.3.1 Attaching the Electrical Connectors



Connect the following cables to the head as shown:

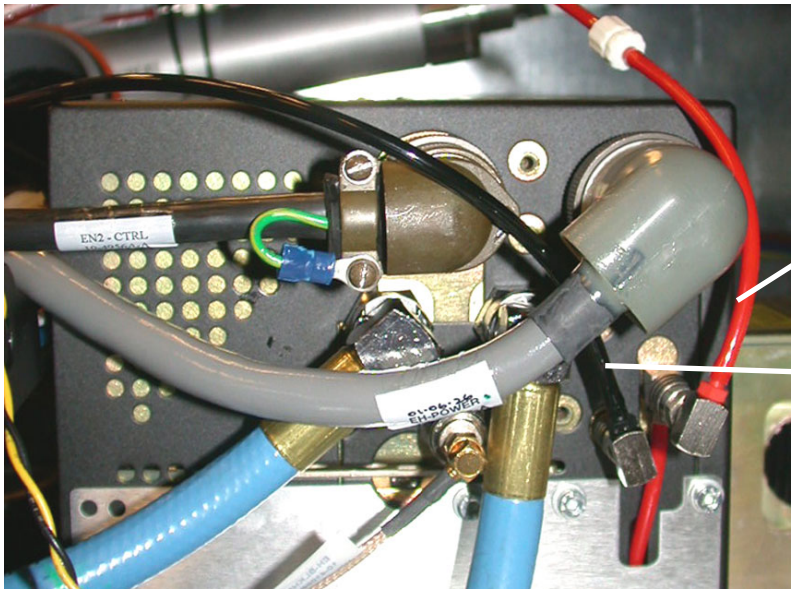
1. Control signal cable
2. Power and laser safety cable
3. Hot link cable

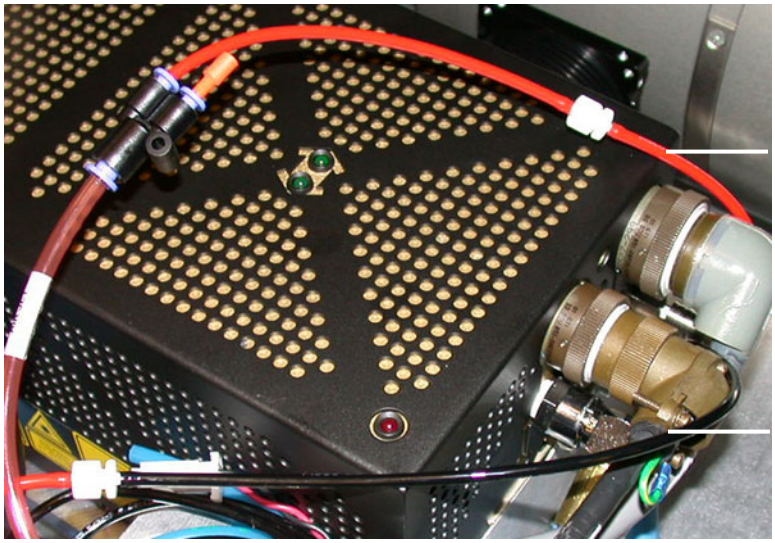
5.3.2 Attaching the Air Connectors

The thermal 2 head uses an internal dehumidifier system, consisting of a sleeve of semi-permeable DuPont Nafion® plastic membrane.

- Connect the dehumidifier and the whisker jet air lines (if applicable).

Note: The connections for the dehumidifier and the whisker jet are located next to each other on the side of the head. They have similar quick-release fittings but are different sizes, so they cannot be incorrectly connected.





Tip: When you connect the lines and turn on the air, the dehumidifier makes a noise similar to air escaping. This is normal—the sleeve is semi-permeable and releases moist air.

5.3.3 Attaching the Coolant Connectors

1. Inspect the O-rings (part number 59-3766) on the two cooling hose fittings.

   If there are any nicks or other damage, replace the O-rings to prevent leaking.

2. To avoid damage to the O-ring, check that the latches on the thermal 2 head cooling connectors are in the released position.

3. Insert the two cooling hoses. The direction of coolant flow through the head is not important.

4. Check that all connectors are fully inserted and latched.
5. Check the coolant level in the reservoir, and if required, add coolant.
6. Close all access panels.

   Note: Check the coolant level after you turn on the output device.

5.4 Initializing the Trendsetter

To get the thermal 2 head ready for positioning, you need to turn on and initialize the output device:

1. Turn on the output device and monitor the startup sequence on the diagnostic terminal.

   The following two messages should appear:

   ```
   >> Datalink: exposure head coming online

   >> Head initialized successfully
   ```

   If these messages do not appear, turn off the output device, open the access panels, and inspect the serial communications cable (EH-BP).

   If the following message appears…

   ```
   >> incompatible head firmware detected
   ```

   …enter the command **`list version`** and identify the cause of the incompatibility.

2. To identify the head as thermal 2, use the following commands:

   - MPE:
     `set head type 3`
     `nvs save head type`
   - MCE:
     `set hmgr type 3`

3. To check the serial data communications, use the head command:

   `head status`

4. To disable the write laser, enter commands:

   `redirect enable`
   (to display the TH2 prompt)
   `set sys laserenable false`

5.5 Positioning the Head

Positioning the head requires the following conditions:

1. Media parameters set
2. Write laser turned off
3. Plate loaded on the drum
4. Autofocus active

5. All doors and panels closed



Danger:
The TH2 focus laser is a hazard for up to 1.2 meters (4 feet) from the aperture of the head. This means that service procedures requiring the focus laser to be on, such as head positioning, must be performed with all doors closed and panels on.

For this reason, TH2 heads must not be installed on output devices that do not have a back panel with access holes through which a long hex key can be inserted for safe adjustment of the TH2 head positioning.

If the output device does not have the correct back panel, you must install FCO E608 (kit part number 512-00248A) before proceeding.

5.5.1 Setting the Media Parameters

For details on setting up the media and head parameters, see the media technical note for the specific media (for details, see "Related Documents" on page 2).

5.5.2 Replacing All Safety-Interlocked Panels

Note: The write and focus lasers are disabled if any of the safety-interlocked panels are open. You cannot re-enable either laser with the safety interlock override key switch.

To complete the head positioning, the panels must be closed and the focus laser on.

1. Replace all panels.
2. Re-enable the write laser. Enter the command:

```
set sys laserenable true
```

5.5.3 Preparing for Head Positioning

To prepare the output device for setting the head position:

1. Use command **`load <y> <x>`** to load a plate on the drum. Set the two parameters to the plate dimensions, in mm. For example, use command **`load 660 762`** for a 660 x 762 mm (26 x 30 inch) plate.
2. For MCE , set the `focus basethickness` parameter to the maximum plate thickness supported by the device (for example, 305 microns for Trendsetter News). Use the command:

```
set focus BaseThickness 305
```

3. Move the drum and carriage so that the focus laser is focused on the central area of the plate. Use the following commands:

For MPE	For MCE

`carriage moveto 20000`
`drum move 8000 h`
`drum soft`
	`carriage moveto 500`
	`drum move 70`

4. Activate the media type:

- MPE:
  `mode media <n>`
- MCE:
  `media <n>`

Note: <n> is the number for the media type that will be loaded on the drum.

5. Display the media parameters:
   - MPE:
     `set state plate_loc d`
   - MCE:
     `loaded`

   Note: This checks that the plate description is correct, particularly the media index/type and thickness.

6. Check the thickness and media type to ensure they are correct for the plate being loaded.

   `thk` (plate_thickness in microns) (for MPE only)

   `type` (media_type, a number from 1 to 8)

   Note: *For MPE only,* setting the `state plate loc d thk` parameter equal to the actual plate thickness on the drum before positioning the head ensures that the head will work well for the entire range of qualified plate thickness (.008 in. to .020 in., or 203.2 to 508 microns), regardless of the thickness used for positioning. Performance is optimized for a mid-sized plate, for example, 0.012 in. (304.8 microns), and is acceptable for the extremes of .008 in. (203.2 microns) and .020 in. (508 microns).

7. To measure and set the surface reflectivity parameter (on a fresh plate), type the following commands:

   `redirect enable`
   (displays the TH2> prompt; you may have to press the ENTER key more than once)
   `eng`
   `foc cal reflect`
   `redirect disable`

8. Use the value displayed by the command **`foc cal reflect`** for the `sr` parameter:

MPE	MCE
`set hdm <n> sr <value>` **`nvs save hdm <n>`**	**`redirect enable`** **`set med <n> sr <value>`** **`redirect disable`**

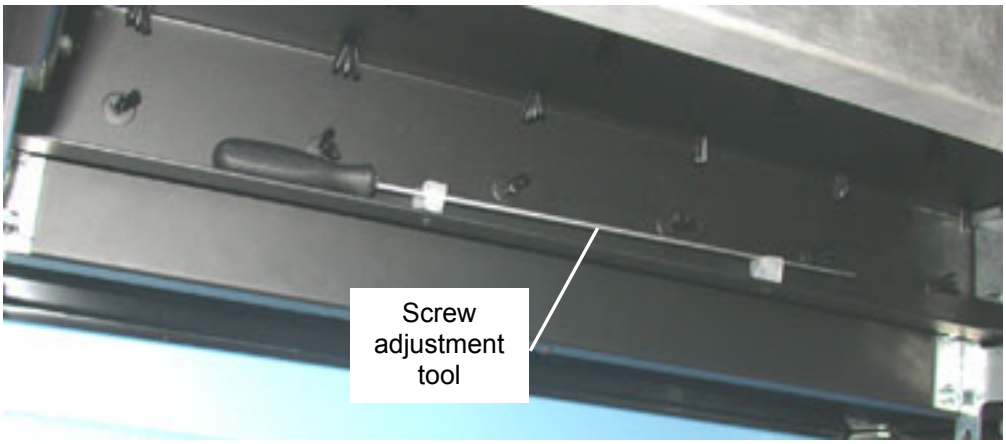
Note: <n> = the media number. In MPE firmware, the `hdm` (head-dependent media) parameters are numbered 1 through 16, and are stored in the device nonvolatile storage (NVS). However, on MCE devices, the hdm parameters have been renamed to `med`, and are numbered 0 through 15. These parameters are stored in the head NVS, not the device NVS, which is why it is necessary to use the redirect enable command to bring up the `TH2>` prompt and communicate directly with the TH2 head.

5.5.4 Setting the Head Position

To set the head position:

1. Enter the command **`head install on`**. The monitor will display the focus sensor sum, difference, and error values.

2. Insert the screw adjustment tool (part number 57-9589A, shown in the photo) through the adjustment hole on the back panel and into the adjustment screw on the adapter plate. If the carriage and head have been properly positioned (as described in "Preparing for Head Positioning"), then the tool will be guided directly into the precision adjustment screw.



3. Use the precision adjustment screw to position the head until the sum is somewhere between 500 and 2000. Continue adjusting until the target error value is reached (± 5 microns).

   To determine the correct target error value, use the following equation:

   $305 - P = E$

   …where 305 is the focus basethickness value, *P* is the thickness of the media being used to position the head, and *E* is the target error value.

   For example, if you are positioning the head using a plate 205 microns thick, the target error value is:
   305 – 205 = **100** (± 5 microns)

   Note: The head is not positioned correctly unless both the sum and error values are in the acceptable range.

4. To turn off the data streaming, use command:

   `head install off`

5. Open the panel and lock the head in position by tightening the six screws that hold the blades to the adapter plate. Start by tightening the middle screw on each side, then alternate from side to side.

6. Close all the safety-interlocked panels.

7. Verify that the sum and error numbers are still acceptable by typing the command `head install on`. If the numbers are not acceptable, open the panels, loosen the six screws, and repeat steps 2 through 6.

Note: Other locations on the plate will likely produce an error outside the acceptable range. This is acceptable, as long as the ± 5 micron range is met at a central location on the plate.

5.6 [News 200 only] Geometric Correction for Dual-Head Stitch Line

The Trendsetter News 200 platesetter uses two TH2 thermal imaging heads to increase its maximum plate throughput compared to that of single-head devices. When the two heads are writing one large image on a panorama plate, it is important that the following geometric correction parameters be set correctly, so that not stitch line can be seen between the section imaged by the master head and that imaged by the slave head:

`mshift` (mainscan shift)

`headspacing` (distance between master and slave heads)

The procedure for adjusting both of these parameters, along with `sshift` (subscan shift, which ensures that the image written by each thermal head is correctly set up for individual plates), is posted on the TechPlanet Trendsetter News site's Installation page: Adjusting Parameters for Geometric Correction on a Trendsetter News 200 http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/install.htm#install_procs.

5.7 Complete the Head Installation

1. To check the edge detect position, use the command:

   - MPE:
     `plot edge`
   - MCE:
     `edge test`

   Troubleshooting: If the head switches to a wide search or the error message `false edge detected (`or any other error message) appears, you should investigate to find and fix the problem:

2. Check that the edge detect groove is correct. Run the script:

   - MPE: `edgegroove3244.spt`
   - MCE/GMCE: `edgegroovehydra.spt`

   Expected values:

	MPE	MCE
Parameter	**`set drum epos`**	**`set edge drumpos`**
Typical value	170–230 tachometer ticks	3 degrees

3. Unload the plate from the drum.

4. Close all doors or access panels.

   Note: If the plate has been on the drum for more than 15 minutes, replace it with a fresh one.

5. Set up the following media-dependent settings (for the customer's media). See the appropriate media technical note for the specific media for more details (for details, see "Related Documents" on page 2).

   - **`escan`**
     (extra_scanlines, MPE); *ExtraScanLines* (MCE)
   - **`sr`**
     (surface_reflectivity)
   - **`sd`**
     (surface_depth)

6. MEDIA SETUP

For details on checking image quality and media setup, see the appropriate Media Technical Note (for details, see "Related Documents" on page 2).

6.1 Processor

Check the processing line. For more details, see the appropriate Media Technical Note (for details, see "Related Documents" on page 2).

6.2 Focus

6.2.1 Determining the Focus Offset Value

To determine the focus offset value:

1. Plot a focus series to determine the best focus offset value. Enter command:

   ```
   redirect enable

   set foc offset
   ```

   The result for focus offset should be exactly the same as that previously determined by integration (find the value on the thermal head's serial number label). Because of the subjective nature of determining the maximum power density, a slight change of approximately 25 units is possible. However, if the focus varies by more than this amount, double-check to ensure that you have picked the strip with the maximum power density, rather than the best-looking swath. If all else fails, call the Response Center for help.

   f. Inspect the plate to make sure that head is square to the drum.

   If the density profile of the swaths changes slope dramatically as the head steps through the best focal position, the head is not square to the drum. For example, the head is skewed if the swath appears darker at the pixel #0 end on one side of the best focus offset setting, but darker at the pixel #239 end on the other side of the best focus offset setting.

If the head is skewed, you must:

a. Loosen the head.

b. Reposition it.

c. Check it again.

Note: Remember to push down on the head above the V-groove to help align the head properly in the groove.



This illustration shows the results of a focus series plot when the head is skewed on the carriage, and assumes 0 is the ideal focus offset. A focus offset value of 0 will not be the case for every head.

6.3 Laser Power

Check for the correct exposure. For more details, see the appropriate Media Technical Note (for details, see “Related Documents” on page 2).

6.4 Tilt

Check the tilt by plotting a **plot 1**. Inspect the 3-on-3 off-horizontal lines section of the plate under a powerful loupe to make sure the pixels line up. For the full procedure, see “Adjusting Tilt on a Thermal Head”.

6.5 Geometric Correction

To conduct a geometric correction:

1. Check the registration by plotting an **inchgrid.ps** file from the workstation (for download information, see “Related Documents” on page 2). Then, using the inchgrid alignment tool, check that the plot is 1 inch (25.4 mm) from the leading edge clamp (LEC) edge of the plate.

2. If not, adjust the parameter `mssa`, making note of the original setting:
   - MPE:
     set gc mssa xxx
   - MCE:
     set gc Mshift xxx
3. Repeat steps 1 and 2 until the registration is accurate.
4. Save the `mssa` (MPE) or `Mshift` (MCE) parameter using the command:
   - MPE:
     nvs save mssa
   - MCE:
     set gc Mshift

     After this step, you should not see any focus errors near the LEC edge of the plate.

6.6 Banding

For details on checking banding, see the appropriate Media Technical Note (for details, see “Related Documents” on page 2).

6.7 Air Flow

Check the ATP 1A test plot for signs of tick or whisker marks. For further details, see the media-specific Media Technical Note (see “Related Documents” on page 2 for details).

6.8 Backing up NVS Parameters

Save the NVS parameters when the head installation is complete and you are satisfied with the image quality.

1. Back up the NVS parameters using the command:
   - MPE:
     nvs dump diff
   - MCE:
     prm diff
2. Save the backup file on the workstation in a service directory.
3. Name the file **TH<nnn>.NDD** where **<nnn>** is the head serial number.

7. REPLACING A THERMAL 2 HEAD

To replace a thermal 2 head, you must remove the existing head, and then follow the installation procedures in section 5, “Installing the Thermal 2 Head,” and the setup procedures in section 6, “Media Setup.”