CreoScitex

Trendsetter NEWS 70/100/150
Functional Description

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1. SCOPE

This document describes the normal operation of the Trendsetter NEWS 70/100/150 on the MCE platform. It will be a guide to help understand how the machine should operate. It does not go into any detail about implementation.

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. PRODUCT DEFINITIONS

The Trendsetter NEWS 70/100/150 is a product line targeted specifically for the Newspaper market. It can load, image, and unload two plates side-by-side. This configuration cuts in half the load-unload time per plate. The two plates are imaged in sequence with a single head.

Some definitions below:

- **dual-plate loading**: the act of loading two plates at a time.
- **broadsheet plate**: a single newspaper page. Typical sizes are 500-600mm (mainscan) by 315-400mm (subscan).
- **panorama plate**: a double newspaper page. Roughly the size of two broadsheet plates.
- **right-hand** or **home plate**: plate nearest the carriage home position.
- **left-hand** or **away plate**: plate farthest from the carriage home position.

4. DEVICE FUNCTIONALITY

The Trendsetter NEWS 70/100/150 is based on the current Trendsetter NEWS products, but runs on an MCE platform. The basic functionality is described here, with most attention given to the changes implemented as a result of the conversion to MCE electronics.

4.1 Maximum Resolution is 1200dpi

For the basic machine, the maximum resolution is 1200dpi. Upgrading the machine to plot at 2400dpi is a very expensive upgrade, so that functionality must be protected.

For diagnostic plots, 2400dpi can be used by setting the mode *parameters for 2400dpi. However, that mode will be treated as invalid when the workstation queries the device. This means that TIFF files cannot be imaged at 2400dpi.*

Also, when the machine is reset, all modes are checked for invalid resolutions. For any mode with a resolution greater than 1200dpi, the resolution is set to 0dpi, thus disabling that mode.

The above only applies to the Trendsetter NEWS 70. The Trendsetter NEWS 100 and 150 require a 1200dpi head, so do not support 2400dpi plotting.

4.2 Maximum and Minimum Plate Sizes

The following table shows the absolute maximum and minimum plate sizes supported by the device:

	Minimum Broadsheet	Minimum Panorama	Maximum Broadsheet	Maximum Panorama
Around the drum (msz)	18” (457mm)	18” (457mm)	26” (660mm)	26” (660mm)
Along the drum (ssz)	11.4” (290mm)	17.8” (451mm)	17.8” (450mm)	37.2” (960mm)

Wide option: the maximum panorama size along the drum is 45” (1143mm).

B1 option: the maximum panorama size along the drum is 45” (1143mm), and the maximum size around the drum is 32” (813mm) for broadsheet and panorama plates.

Note: a plate as small as 14.5” (370mm) around the drum can be supported, but only if loaded and unloaded through manual-bypass.

4.3 Plate Positioning

In the default configuration, there are four registration pins in a Trendsetter NEWS 70/100/150 drum, installed so that the two outer pins are higher than the two inner pins. If the pins are numbered one through four, starting with the one closest to the carriage home position, a broadsheet plate will sit on pins one and two, or pins three and four. Small panorama plates will sit on pins one and three, while larger panorama plates will sit on pins one and four.

The pin locations are stored in NVS (*gc pinloc*). The default locations are roughly as follows:

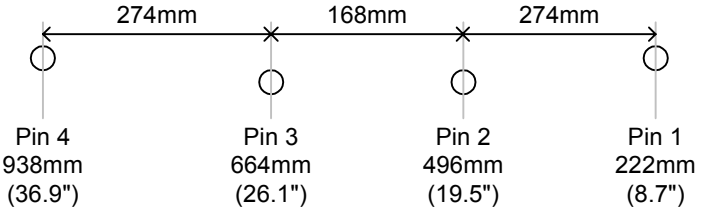


Figure 1: Default pin locations

In general, plates should be centered on these pins. However, there are some exceptions to this rule as described in the following sections.

4.3.1 Broadsheet Plates

For positioning plates in the bay, broadsheet plates should be positioned so that they are centered on pins 1 and 2; or pins 3 and 4. This means that the centre-most edges are (221mm – 1/2ssz) from the centre of the device. The centre of the device can be identified by the round hole in the load table. The following diagram shows the configuration:

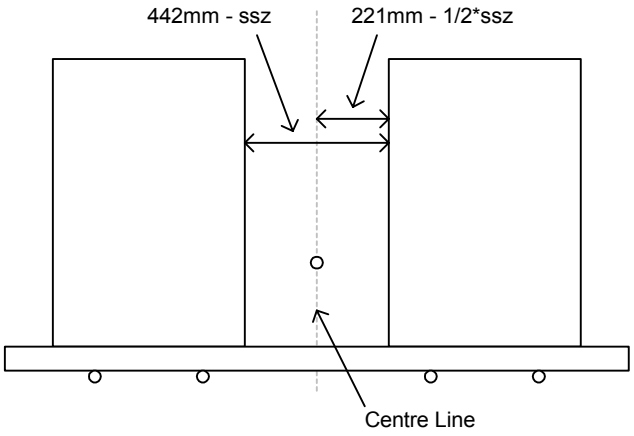


Figure 2: Plate positioning for broadsheet plates

Plate positioning stickers can then be put on the load table for reference.

Plates positioned this way will be centered on the pins. The exceptions are broadsheet plates greater than about 420mm. Broadsheet plates greater than 420mm should be positioned so that there is about 20mm between the two plates.

4.3.2 Panorama Plates

Panorama plates smaller than 750mm should be loaded so that they are centered on pins 1 and 3. This means that they are off-centre by 137mm relative to the machine, so the right-most edge should be (137mm + 1/2 ssz) from the centre position.

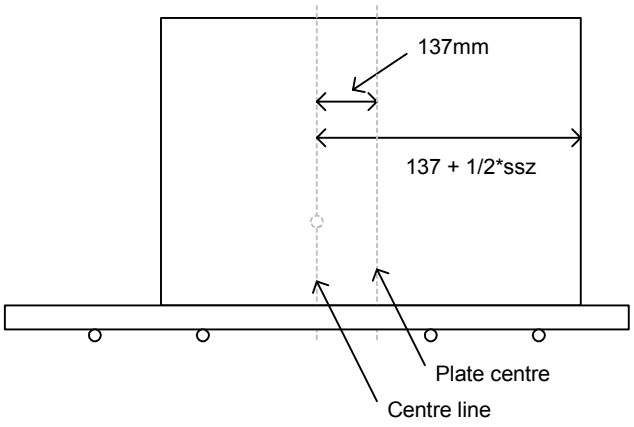


Figure 3: Plate positioning for small panorama plates

Panorama plates larger than 750mm should be loaded centered in the machine, sitting on pins 1 and 4.

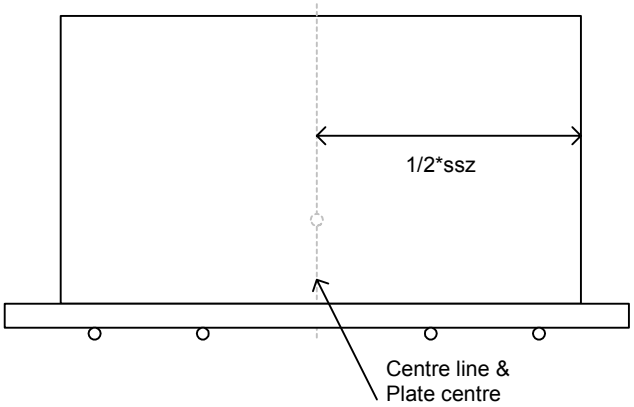


Figure 4: Plate positioning for large panorama plates

Plate positioning stickers can then be put on the load table for reference.

Note: the 750mm threshold is a programmable value – *set gc sscansizemax 2*.

4.3.3 Edge Detection

The firmware stores the most recent edge position. If the next media loaded is the same size, it will use that last edge as the starting point. Use the **plot edge** command to view the last edge.

When searching for the edge of the second broadsheet plate, the carriage will not search past the middle line of the device. This limit is imposed to avoid having the focus laser see the first plate while searching for the second.

If, after finding the edge of the plate, the firmware determines that the plate was sitting on the wrong set of pins, the following error will be reported:

[38132: Media not on <home/away> registration pin]

4.3.3.1 Edge detect only when needed

The Trendsetter NEWS machine can load plates repeatable within about 2mm side-to-side error. If the customer has an optical punch, then edge detection is not required if the edge has been previously detected. If the bay is opened, or the media size changes, then edge detection is required on the first set of plates, but can be remembered after that.

The operator can select the mode of operation – to do edge detection always, or only when needed. They can change the mode using a menu option on the Device menu in Print Console.

Skipping edge detect saves several seconds off the cycle time. When running broadsheet plates, it means the drum can be left spinning between the two plates. The total time savings is roughly 10% of the total cycle time.

4.3.4 Focus Learn

On the Trendsetter NEWS, there is always a margin of at least 6mm around the image. We don't care too much about the focus of this part of the image, so we do only a single focus learn at least 5mm from the edge. After the first set of plates, the focus profile is remembered, and that is used as the starting focus for the next set of plates.

We may need a way to enable two focus learns vs. just one. This machine may be used for other than newspaper work, in which case we may image right to the edge of the plate.

Theoretically, once the focus profile has been learned once, it can be remembered until the media type changes. But work still needs to be done to determine when and if it is feasible to simply remember the last profile and start imaging.

Skipping focus learn saves several seconds off the cycle time – roughly 3s per plate, or 10% for faster machines running broadsheet plates.

Are we learning at an actual swath?

4.4 Imaging

4.4.1 Plate Rotation

As described earlier (Section 4.3, Plate Positioning), a single panorama plate will sit on either pins one and three or pins one and four, depending on its size. The two broadsheet plates will sit on the two right-hand pins or the two left-hand pins, and will be rotated towards each other.

During Integration, the following gc rotation parameters will be configured:

- *rotation 1* media sitting on pins 1 & 2 (i.e., media < 450mm; home side)
- *rotation 2* media sitting on pins 1 & 3 (i.e., media < 750mm)
- *rotation 3* media sitting on pins 1 & 4 (i.e., media > 750mm)

- *rotation 5* media sitting on pins 3 & 4 (i.e., media < 450mm; away side)

Note: the 450mm and 750mm thresholds are NVS parameters – *gc sscansizemax*

Use the **gc** command to display the current gc settings for each set of pin combinations.

Note: need to fix gc command to display pin 3-4 combination for single-head

4.4.2 Imaging Speeds

The maximum drum speed of the Trendsetter NEWS 70/100/150 is 360rpm. For currently available media, the drum speed will be 345rpm.

Assuming a swath width of 224 pixels, this works out to roughly 27mm/s plotting speed for the Trendsetter NEWS. For the Trendsetter NEWS 70, the imaging speed is roughly 14mm/s.

4.5 Diagnostic Commands

- **plot** – essentially the same as MPE, but if the length is specified it must be in mm.

  plot 50 10 plate 1 – means plot pattern 50 on plate 1 for 10mm

  plot 1 20 plate 2 – means plot pattern 1 on plate 2 for 20mm

- **edge test** – finds the edge of the home plate.
- **edge test away** – finds the edge of both the home and away plates.
- **plot edge** – displays the most recent edge position(s)
- ***mh loadawayside*** *– the next load will assume a plate on the away side only. This is useful when loading a single broadsheet onto the left side during Integration.*
- **option** – configure various options on the machine, specifically the Autoloader option, the Dual-head option, and the Dual-plate option.

4.6 Miscellaneous

- Picking of a single broadsheet is not supported. A single broadsheet can only be loaded through manual-bypass.

4.7 Normal Operation from the Workstation

On startup, the workstation queries the device to find out what it supports. The queries include: how many heads and/or plates the device supports; the minimum/ maximum plate sizes for a single stack and double stack of plates loaded from the bay; and the minimum/maximum plate sizes for a manual-bypass load.

4.7.1 External Connections

There will be one serial cable running between the workstation and the Trendsetter NEWS 70/100/150 and SCSI cables. There can be one diagnostic serial cables also connected to the workstation.

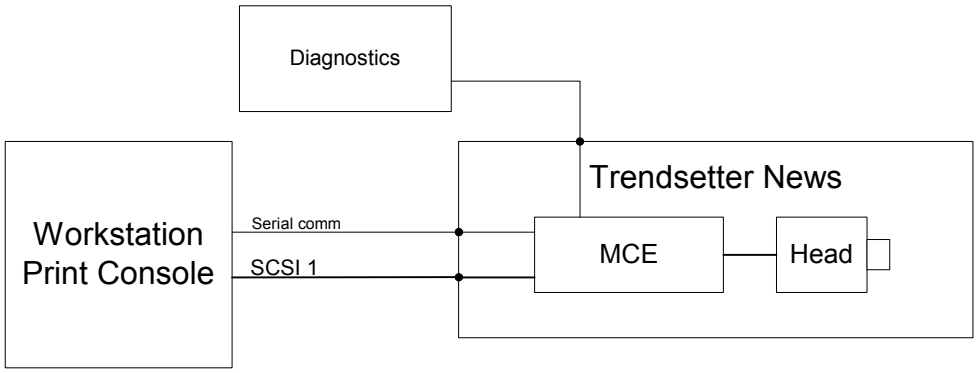


Figure 5: System block diagram

4.7.2 Loading the Bay

The operator will select a plate type (plate size, media type, etc. defined within that plate type) and the number of stacks to load. If two stacks are selected, the workstation will display two plates side-by-side in the load-bay window. Otherwise, a single plate will be shown. Print Console will verify the selection based on plate size information returned from the device (i.e., won't allow two stacks of 800mm plates, or one stack of 300mm plates), then sends down the new parameters to the Trendsetter.

When specifying the number of plates to load in the bay, the number of plates in each stack should be used. That number is decremented by one for each pick sequence completed.

4.7.3 Submitting Jobs

For any machine that supports more than one plate or head, images will be sent in groups from Print Console to the device. The workstation will send down a "Group Start" command, including the head number and plate number for each image in the group, followed by "Image Start" commands for each image in the group. Loading can start at the point, but imaging will not begin until all the required parameters are received for each image in the group.

The workstation tells the device which image will go to which head, and sends the SCSI data appropriately.

Terminology

Separation: a single image

Group: one or more separations tied together, either manually or automatically

Job: one unit sent from the workstation

For the Trendsetter NEWS 70/100/150, one separation in a group will generally go onto one plate. If there is only one separation in a group, only the plate specified for that separation will be imaged.

4.7.4 Express Mode vs. Economy Mode

Note: this has not yet been implemented

There are two modes of operation of the device: express mode and economy mode. Express mode is the default. The mode determines what to do when one of two plates is complete but the other plate is still un-imaged. This will only happen if only one separation is included in the group, or if one separation fails but the plate it was assigned to is still usable (eg., invalid resolution).

Economy mode: *If there is no rush to get the plates done, then both plates should be left on the drum. The operator can later submit a job to go on the free plate, or request that both plates be unloaded. This is economy mode – no plates are wasted without the operator requesting it.*

Express mode: *If plates are needed as quickly as possible, then both plates should be unloaded. This is express mode – plates will be wasted if jobs are not grouped together into twos before being sent to the device.*

Economy mode may be useful if jobs are trickling in slowly. If the plates are already loaded on the drum, the imaging cycle for the next plate is faster because loading is not required.

The mode is defined as part of the Print Setup in Print Console. This Print Setup can be tied to a specific hot folder, or it can be selected as a system-wide default.

4.7.4.1 Manual Unload / Flush Drum command

If a job is set up for economy mode and one plate is left un-imaged, the two plates could be left on the drum indefinitely. There is a special command from Print Console that allows the operator to request that the plates be unloaded. This command will be rejected if the device is busy.

4.7.5 Manual-bypass Jobs

Single-plate or dual-plate jobs can be loaded through manual-bypass. There is a check-box in Print Console that can be used to specify manual-bypass loading. Beside this is a spot to indicate if a single plate or two should be loaded.

Also, if the bay is not loaded with the requested media when the job is approved, Print Console will bring up a prompt asking if the plates should be loaded through manual-bypass.

Currently, if plates are loaded through manual-bypass, they must also be unloaded through manual-bypass.

4.7.6 Possible groups

All possible groupings are listed below. For completeness, groupings allowed for a single-headed machine are also included even though they don't apply for the Trendsetter News 200.

4.7.6.1 If two broadsheet plates are loaded:

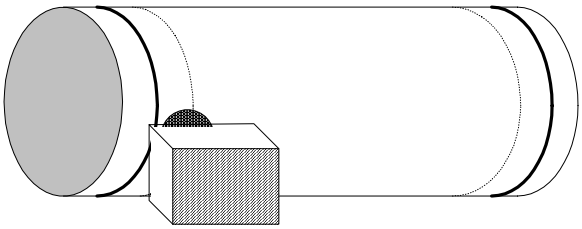
- (plate 1 head 1) imaging home plate only
- (plate 1 head 1) & (plate 2 head 1) normal single-head operation
- (plate 2 head 1) imaging away plate only

4.7.6.2 If a single panorama plate is loaded:

- (plate 1 head 1) single image
- (plate 1 head 1) & (plate 1 head 1 (shifted)) not fully supported – see Figure 8
- (plate 1 head 1 (shifted)) not fully supported

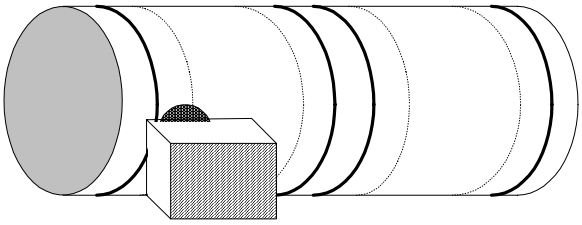
The (shifted) comment indicates that the image must be shifted relative to the edge of the plate. That shift is sent from the workstation, and specifies the absolute shift from the edge of the plate.

The following diagrams shows the possible configurations of plates on the drum:



NEWS 70/100/150:
1 Head
1 Plate
1 Image

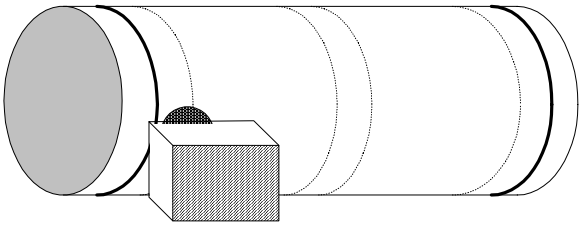
Figure 6: One head one plate one image



NEWS 70/100/150:
1 Head
2 Plates
2 Images

Figure 7: One head two plates two images

The configuration shown below is supported but is inefficient because the device looses time between plots. It is more efficient for the workstation to gang the two images together into one large image. In addition, it is only supported through GDAPI. The position of the second image relative to the edge of the plate must be sent from the workstation with the image command.



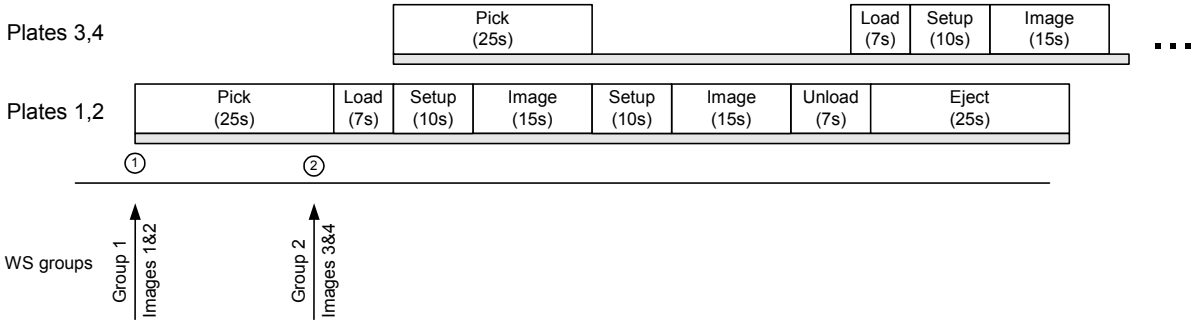
NEWS 70/100/150:
1 Head
1 Plate
2 Images

Figure 8: One head one plate two images

4.7.7 Examples

Following is an example of the imaging sequence:

Example 1: Groups of two images are submitted



Decision Points:

1. Group #1 is submitted to the device, the device starts picking two plates.
2. Group #2 is submitted. Picking cannot begin because the picker is busy.

Note: I will need to add more examples to explain express vs. economy mode, but that operation is not yet defined or supported.

4.8 Error Handling for Workstation Jobs

4.8.1 Suspends

During loading, the first separation in the group will suspend. If the response to the suspend is anything but Resume, both separations in the group will be recorded as having failed.

During plot setup and imaging, either separation in the group can suspend. If one separation suspends during plot setup or imaging and is cancelled, the other separation can still continue.

During unload, only the second separation is still active in the device, so it will suspend. If the plates are removed, the separation that suspended will fail, and the entire group will be recorded as having failed.

4.8.2 Canceling jobs

A group can be cancelled at any time. It is not possible to cancel individual separations in a group.

If cancelled during loading, the load will continue unless it is possible to back out. *The plate(s) will be left on the drum as free plates, and can be reassigned if possible.*

If cancelled during plot setup or imaging, the plot will stop. Currently, the plates will be unloaded immediately. *Eventually - any plate left un-imaged will be left on the drum if Economy mode was selected. If express mode was selected, the plate(s) will be unloaded.*

During unload, a cancel has no effect.

5. DEVICE CONFIGURATION PROCEDURE

The system defaults to only support 1200dpi imaging. The system can be upgraded to support 2400dpi imaging, but this requires an expensive upgrade. To enable the feature though firmware, use the following command.

option commercial enable <password>

This is not a common upgrade – please contact the Trendsetter News Core Team to get the password.

6. 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:

6.1 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 this has been entered by typing **bay 1** from the diagnostic terminal. The MainScan length parameter should be equal to the plate mainscan size measured in millimeters.

Type **load cal** through diagnostics. This will cause a plate to be picked and loaded. The plate size will be measured and the *DistSensorToLEC* parameter will be calibrated as the plate is wound onto the drum. This parameter can only be set using this command – it cannot be changed using the **set** command. This parameter will be saved automatically.

6.2 Adjusting Eject Speed and Distance

6.2.1 Eject distance

The plate will be pushed towards the processor at fast speed, then slowed down to match the processor intake speed. (If a stacker is installed, the slow speed portion will be skipped.)

1. 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.

2. 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.

These parameters will be saved automatically as soon as they are changed.

6.2.2 Eject speed

1. Enter **set exit velocity** to see the current speed setting.
2. Enter **table move <pos> <nn>** to move the traveler to a specified location at <nn> mm/s. The travel limit is roughly 600mm, so we can't move beyond that distance.
3. Enter **set exit velocity <nn>** to set the desired speed setting.

6.3 Enabling Manual Unloading

Note: this is not yet implemented.

You can enable manual unloading for a media type by setting the media type parameter manual_unload *to a value other than zero: any plate of this particular media type will then unload back up the load table and will have to be removed from the machine manually. Set the value to zero when you manually load a plate of the same media type but of a different size than those stacked on the machine and you want to unload that plate automatically to send it to the processor. Set* manual_unload *to a non-zero value when you want to manually unload plates and process them on a different processor than that attached to the Trendsetter.*

In theory, any plate can be manually unloaded whether it has been loaded manually or automatically. However, manual unloading should be reserved for plates that have been manually loaded. There will be no workstation prompt to remove the plate at the end of a manual unload if the plate was loaded automatically.

Steps to enable manual unloading for plates of media type <n>

*Enter **set media <n> mu 1** where <n> is the media type.*

*Enter **nvs save media <n> mu** to save the new setting.*