

Trendsetter NEWS

MCE Firmware Commands, Parameters, and Sensor States

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Revision History

Revision	Date	Author	Comments
1.0	Jun 2005	Ken Johnston	This document is adapted from a Trendsetter® NEWS training handout created by Stewart Taylor.

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1. INTRODUCTION

This document provides and introduction to firmware commands and parameters used on the Trendsetter® NEWS output device. It also describes how the output device uses low-level firmware commands and parameters to perform operations such as picking, loading, imaging, and unloading thermal plates. In addition, it explains how to use firmware commands to check the status of the analog and digital sensors and digital drives used throughout the output device.

2. FIRMWARE BASICS

2.1 What are firmware commands?

Firmware commands are text strings containing action words (verbs) that:

- Return information about a module if used alone
- Perform an action on a subsytem if combined with a valid argument

The argument may also contain a value which sometimes has a sign (+ or –).

```
<module> <verb> > <value>
```

Examples:

`drum`
Returns drum status.

`drum spin 100`
Spins drum at 100 rpm, normal direction.

Note: If the safety interlock override (SIO) key switch is engaged, drum speed will be limited to 100. For more information on the SIO key switch, see the *SIO Key Switch* page on TechPlanet: http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/sio_keyswitch.htm

`system`
Returns system pressure and threshold.

`init`
Causes autoloader to initialize.

`carriage`
Returns carriage status.

`carriage moveto 150`
Moves carriage to 150 mm (from home).

`picker`
Returns status of picker.

`picker up`
Moves picker up

`set`
Returns a list of NVS subsystems.

`set mh`
Returns list of media handler parameters.

`set mh LoadPos 165.500`
Changes LEC position.

```
engine time
picker time
table time
```
Use these commands to exercise the engine, picker, and table actuators (pneumatic cylinders) and receive a report of how long each actuator takes to perform its job. For more information, see *Measuring engine, picker, and table actuator times and adjusting actuators on Trendsetter NEWS devices* on TechPlanet:
http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/content/docs/engine_picker_table_time_adj.htm

`safety`
Returns important safety-related information about the door interlock safety loop. For more information, see “Door loop sensors” on page 27.

2.1.1 How do I find a command?

To find information about specific commands, use the `help` command, followed by the command name:

```
help <command>
```

To find list of all available commands (number available depends on access level), use the `help` command by itself.

```
NEWS>> help
Available commands:
        a               abort           access          ale
        autocalibrate   bay             board           cancel
        carriage        config          debris          dongle
        door            drum            edge            eject
        engine          event           fans            feature
        fload           flush           flyoff          focus
        fw              gc              group           head
        help            hlt             hotlink         ibm
        image           init            laser           leave
        lec             list            load            loaded
        macro           mask            mce             media
        memory          mh              mload           mode
        msg             munload         net             pick
        picker          plot            post            prm
        product         ramp            redirect        release
        reset           resume          rlr             roller
        safety          scan            scheduler       scorr
        shutter         sif             sio             smc
        spot            status          stg             stroke
        suspend         system          table           tec
        temp            th2             u               ui
        unload          vbs             verbose
```

2.2 What are firmware parameters?

Parameters are firmware values (numbers) to which the system refers in order to operate properly. When the Trendsetter NEWS autoloader needs to load a plate, it needs to know (among many other things) where to position the drum to activate the leading edge clamp. This information is stored in the parameter `LoadPos`, and in the example shown below, this value is 165.500°. When the output device retrieves the clamps from the park position, it refers to the parameter `TECParkPos` and rotates the drum to that position to pick up the magnets. In the example below, the value of the `TECParkPos` parameter is 118.850°.

```
NEWS>> set mh
PRM mh parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
mh           LoadPos         165.500            165.500            degrees
mh           TECClampPos     0.000              0.000              degrees
mh           TECAdjust       5.000              5.000              mm
mh           DistSensorToLEC 197.000            197.000            mm
mh           TECParkPos      118.850            118.850            degrees
mh           SensorAcc       3.000              3.000              mm
mh           MediaInEngine   0                  0
mh           BuzzerDelay     20                 20                 seconds
mh           TEClampsOnDrum  False              False
mh           TECDelay        0.000              0.000              seconds
mh           NormalLoadVel   20.000             20.000             RPM
mh           NormalUnloadVel -30.000            -30.000            RPM
mh           SlowLoadVel     10.000             10.000             RPM
mh           SlowUnloadVel   -10.000            -10.000            RPM
*** Command Complete
```

Parameters values can be changed via the `set` command. The general form is:

```
set <group> <parameter name> <new value>
```

Example:

```
set mh TECParkPos 119.600
"mh TECParkPos" changed from 119.100 to 119.600 degrees
*** Comand Complete
```

Warning: When you change the value of a parameter, the new value goes directly into the Active column, and unless you wrote down or saved a backup, there is no indication of what the number used to be.

Note: Values shown in the Default column cannot be changed.

2.2.1 How do I find a parameter?

Parameters can be found on line through the use of the `set` command:

```
NEWS>> set
Group
-----
drum
mode
mh
prd
gc
media
edge
mds
bay
exit
debris
carriage
net
focus
mhauto
hmgr
ehi
```

Note: There are some parameters built into the firmware which cannot be accessed or changed. These include parameters for timeouts and other delays.

Some of the more frequently accessed groups and parameters are highlighted for your identification.

2.2.2 Examples of `set <group>` parameters

```
NEWS>> set mhauto
PRM mhauto parameters:
Group        Parameter           Active           Default           Units
-------------------------------------------------------------------------
mhauto       UnloaderGain        3.000            3.000
mhauto       UnloaderSPM         2.550            2.550             steps/mm
mhauto       UnloaderMSR         2                2                 uteps/step
mhauto       UnloaderVelocity    800              800               mm/s
mhauto       UvacThresh          140              140
mhauto       UvacThreshDual      400              400
mhauto       PvacThresh          288              300
mhauto       PickerDropPause     0.400            0.400             seconds
mhauto       MediaOnPicker       0                0
mhauto       MediaOnUnloadTable  0                0
mhauto       AutoLoadVel         20.000           60.000            RPM
mhauto       AutoUnloadVel      -100.000         -100.000           RPM
mhauto       LECToUnloadHome     380.000          380.000           mm
mhauto       UtRotatorPos        628.000          628.000           mm
mhauto       ClampUnloadOffset  -1.000           -1.000             degrees
mhauto       KeepTableDown       0                0
mhauto       PlateGonePostDelay  0.000            0.000             seconds
mhauto       ProcessorBusyWait   90.000           90.000            seconds
*** Command Complete
```

Note: The Active and Default values shown above for `mhauto UnloaderSPM` and `mhauto UnloaderMSR` are for the 16-tooth unload table stepper motor pulley used on current production machines (serial number NM126 or later). If the NEWS output device uses the old 24-tooth pulley, the correct Active values are as follows:

```
mhauto       UnloaderSPM         1.700
mhauto       UnloaderMSR         4
```

```
NEWS>> set drum
PRM drum parameters:
Group        Parameter       Active              Default             Units
-------------------------------------------------------------------------
drum         MaxJerk         500.000             500.000             Radians/s^3
drum         MaxAcc          25.000              25.000              Radians/s^2
drum         MaxPacc         20.000              20.000              Radians/s^2
drum         MaxVel          360.000             360.000             RPM
drum         TSamp           5.000               5.000               ms
drum         BwVel           7.500               7.500               Hz
drum         Ifs             10.000              10.000              Amps
drum         Ufs             511                 511
drum         Kt              0.560               0.560               N-m/Amp
drum         Np              6.000               6.000
drum         Jl              0.860               0.860               Kg-m^2
drum         Ipk             10.000              10.000              Amps
drum         Icts            1.500               1.500               Amps
drum         BwPos           3.000               3.000               Hz
drum         TSettle         2.000               2.000               seconds
drum         DrvDir          0                   0
drum         MaxVerr         20                  20                  RPM
drum         MaxPerr         2.000               2.000               degrees
*** Command Complete

NEWS>> set mode
PRM mode parameters:
Group        Parameter       Active              Default             Units
-------------------------------------------------------------------------
mode         MscanResolution 1200                2400                DPI
mode         SscanResolution 1200                2400                DPI
mode         MscanDuplicate  1                   1
mode         SscanDuplicate  1                   1
*** Command Complete

NEWS>> set mh
PRM mh parameters:
Group        Parameter       Active              Default             Units
-------------------------------------------------------------------------
mh           LoadPos         165.500             165.500             degrees
mh           TECClampPos     0.000               0.000               degrees
mh           TECAdjust       5.000               5.000               mm
mh           DistSensorToLEC 197.000             197.000             mm
mh           TECParkPos      118.850             118.850             degrees
mh           SensorAcc       3.000               3.000               mm
mh           MediaInEngine   0                   0
mh           BuzzerDelay     20                  20                  seconds
mh           TEClampsOnDrum  False               False
mh           TECDelay        0.000               0.000               seconds
mh           NormalLoadVel   20.000              20.000              RPM
mh           NormalUnloadVel -30.000             -30.000             RPM
mh           SlowLoadVel     10.000              10.000              RPM
mh           SlowUnloadVel   -10.000             -10.000             RPM
*** Command Complete
```

```
NEWS>> set prd
PRM prd parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
prd          FwVersMajor     0                  0
prd          FwVersMinor     0                  0
prd          PRDOPT1         3309632            0
prd          PRDOPT2         0                  0
prd          SerialNumber    ""                 ""
prd          CustomerName    ""                 ""
prd          Flyoff          False              False
prd          CanBaud         500                500                KHz
prd          SysThresh       487                487                kPa
prd          DrumSpeedSafety 100                100                RPM
prd          SimulationState 0                  0
prd          Rescheduling    False              False
prd          TEMargin        7.000              7.000              mm
prd          LEMargin        6.096              6.096              mm
prd          DefaultCarrierThk 305                305                microns
*** Command Complete
```

Note: The following example is taken from a Trendsetter NEWS 200 dual-head output device:

```
NEWS>> set gc
PRM gc parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
gc           Mscale[1-2]                                           ppm
gc           Mshift[1-2]                                           microns
gc           MshiftSlave     40                 0                  microns
gc           Sscale          -91                0                  ppm
gc           Sshift[1-2]                                           microns
gc           OrthoAdjust     19                 0                  uradians
gc           Rotation[1-5]                                         uradians
gc           TrackProfile[1-30]                                    microns
gc           PinLoc[1-4]                                           mm
gc           HeadSpacing     442000             400000             microns
gc           SscanSizeMax[1-2]                                     mm
gc           DrumMidpoint    575                575                mm
*** Command Complete
```

```
NEWS>> set media 1
PRM media parameters:
Group        Parameter              Active             Default         Units
-------------------------------------------------------------------------------
media        Name[1]                "KPG Thermal Gold" ""
media        Invert[1]              0                  0
media        ExtraScanlines[1]      1                  1
media        TempCoeff[1]           0                  0                ppm/C
media        Type[1]                9                  9
media        Colour[1]              ""                 ""
media        DebrisOptions[1]       1                  1
media        Density[1]             2750               2750             kg/m^3
media        EmissionsIntensity[1]  1.000              1.000
media        PatternId[1]           0                  0
media        Flags[1]               0                  0
media        Mscale[1]              0                  0                ppm
media        Sscale[1]              0                  0                ppm
media        AirjetMarginHome[1]    0                  0                microns
media        AirjetMarginAway[1]    0                  0                microns
media        MIMID[1]               1                  0
media        ImageMode[1]           0                  0
*** Command Complete
```

Note: Your machine may be set up for more than 1 media. The form of the `set media` command is:

```
set media <number>
```

```
NEWS>> set edge
PRM edge parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------------
edge         DrumPos         3.000              0.000              degrees
*** Command Complete
```

```
NEWS>> set mds
PRM mds parameters:
Group        Parameter          Active             Default            Units
-------------------------------------------------------------------------
mds          LastMediaType      9                  9
mds          LastLoadMethod     1                  1
mds          LastMainScan       660                660                mm
mds          LastSubScan        762                762                mm
mds          LastMainScanUm     660.400            660.000            mm
mds          LastSubScanUm      762.000            762.000            mm
mds          LastThickness      305                305                microns
mds          LastBay            0                  0
mds          LastMediaStacks    1                  1
mds          LastMediaIndex     1                  1
mds          LastProofIndex     1                  1
mds          LastPunch          0                  0
mds          LastExit           1                  1
mds          LastRotate         0                  0
mds          LastImageSide      0                  0
mds          LastMediaInstance  32770              32768
mds          LastRepeatLength   660400             0                  microns
mds          LastStackLocations 0                  0
mds          LastUnloadMethod   1                  0
mds          LastPortrait       0                  0
*** Command Complete

NEWS>> set bay
PRM bay parameters:
Group        Parameter          Active             Default            Units
-------------------------------------------------------------------------
bay          MediaIndex         1                  1
bay          MediaQuantity      0                  0
bay          MediaThickness     300                0                  microns
bay          MediaMainScan      490                0                  mm
bay          MediaSubScan       673                0                  mm
bay          MediaStacks        1                  1
bay          UsePreloader       0                  0
*** Command Complete

NEWS>> set exit
PRM exit parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
exit         Name            ""                 ""
exit         Location        1                  1
exit         Velocity        20.000             19.000             mm/s
exit         TravelLimit     590.000            600.000            mm
exit         FastDistance    1000.000           1000.000           mm
exit         SlowPush        20.000             20.000             mm
*** Command Complete
```

```
NEWS>> set debris
PRM debris parameters:
Group        Parameter             Active           Default         Units
-------------------------------------------------------------------------
debris       BlowerOffDelay        100              300                seconds
debris       PartFilterLatch        False            False
debris       NozzleFlowConst        7280.000         2226.510          E-07
debris       NozzleFlowExp          1822.000         2053.038          E-03
debris       BellmouthFlowConst     2789.703         2789.703          E-07
debris       BellmouthFlowExp       1839.091         1839.091          E-03
debris       PressZero              0.125            0.125             kPa
debris       PressMaxNozzle         6.500            4.977             kPa
debris       PressMaxBellmouth      24.880           24.880            kPa
debris       PressMaxDiffBell       2.490            2.490             kPa
debris       FlowZero               17.000           30.000            SCMH
debris       FlowLow                59.000           65.000            SCMH
debris       FlowMin                65.000           71.000            SCMH
debris       FlowMarginal           68.000           76.000            SCMH
debris       FlowMaxDiff            8.500            8.500             SCMH
debris       FlowChangeRate         3.000            3.000             SCMH
debris       SiteElevation          0                0                 m
debris       PressureCorrectionExp  1125.000         1125.000
debris       NozzleSensorType       0                0
debris       Nozzle2SensorType      0                0
debris       BlowerOnPostDelay      3.000            3.000             seconds
*** Command Complete
```

```
NEWS>> set carriage
PRM carriage parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
carriage     Mspeed          85                 45                 mm/s
carriage     Accel           150                45                 mm/s^2
carriage     Gearing         3.000              3.000
carriage     Pitch           5.080              5.080              mm
carriage     Steps           200                200
carriage     Kamp            2.000              2.000              Amps/Volt
carriage     Imove           7.000              7.000              Amps
carriage     Iplot           7.000              7.000              Amps
carriage     Ihold           1.200              1.200              Amps
carriage     Mtravel         720                1162               mm
carriage     Espeed          10                 10                 mm/s
carriage     Ispeed          20                 20                 mm/s
*** Command Complete
```

```
NEWS>> set net
PRM net parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
net          IpAddress       "169.254.255.110"  ""
net          NetMask         ""                 ""
net          Gateway         ""                 ""
net          AccountName     "MCEDevice"        ""
*** Command Complete
```

```
NEWS>> set focus
PRM focus parameters:
Group        Parameter         Active             Default            Units
-------------------------------------------------------------------------
focus        BaseThickness     305                0                  microns
focus        LearnSkip         True               False
focus        LearnMarginAdjust 0                  0                  microns
*** Command Complete


NEWS>> set hmgr
PRM hmgr parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
hmgr         Type            3                  3
hmgr         BlpOffset       10.000             10.000             mm
hmgr         BlpRange        10.000             10.000             mm
*** Command Complete


NEWS>> set ehi
PRM ehi parameters:
Group        Parameter       Active             Default            Units
-------------------------------------------------------------------------
ehi          tstk            540                540                minutes
ehi          baud            115200             115200
ehi          protocol        True               True
*** Command Complete
```

2.2.3 Is there a way to see all parameters at once?

There is a way to see all parameters at once, but be prepared to watch a lot of parameters roll up your screen. This command shows all the parameters, and is also used in backing up parameters:

```
prm all
```

This command shows only parameters that are different from the default values:

```
prm diff
```

See also:

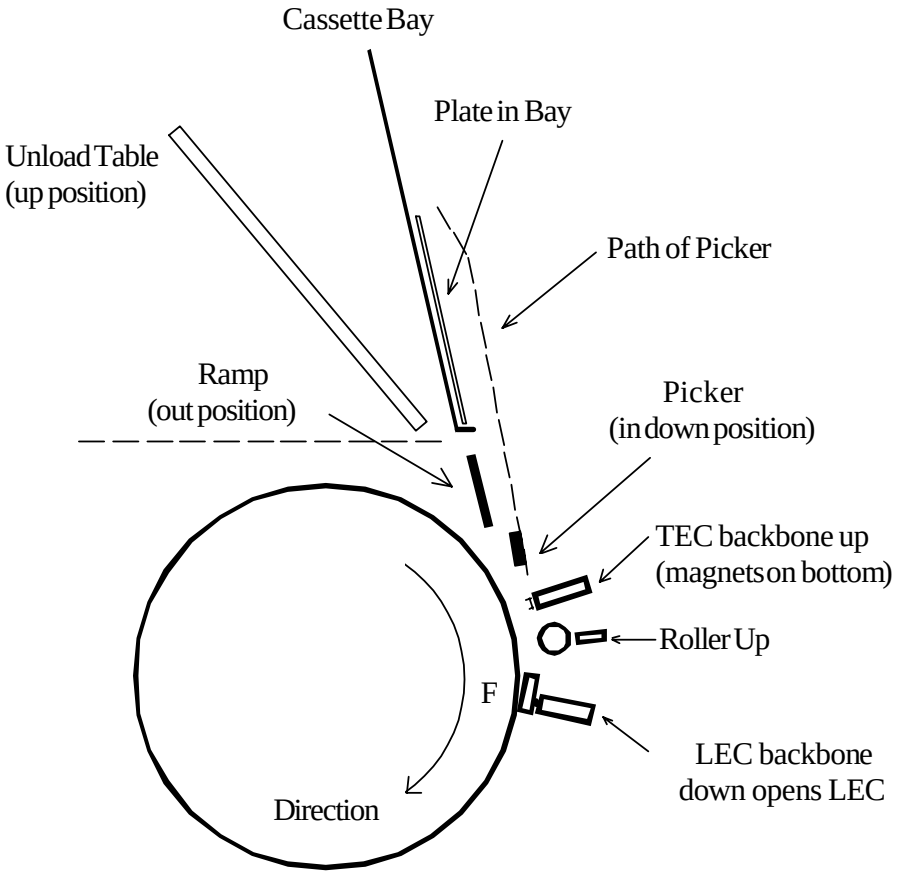
- Trendsetter NEWS MCE parameters page on TechPlanet: http://techplanet.creo.com/output/computer_to_plate/trendsetter_2637/nav/nvs_mce.htm
- MCE firmware search on TechPlanet: http://techplanet.creo.com/firmware/fw1ctpxml/search.htm

3. HOW FIRMWARE CONTROLS THE PICKING, LOADING, AND UNLOADING PROCESS

This section describes how low-level firmware commands control the operation of the various autloader and engine components during the picking, loading and unloading process.

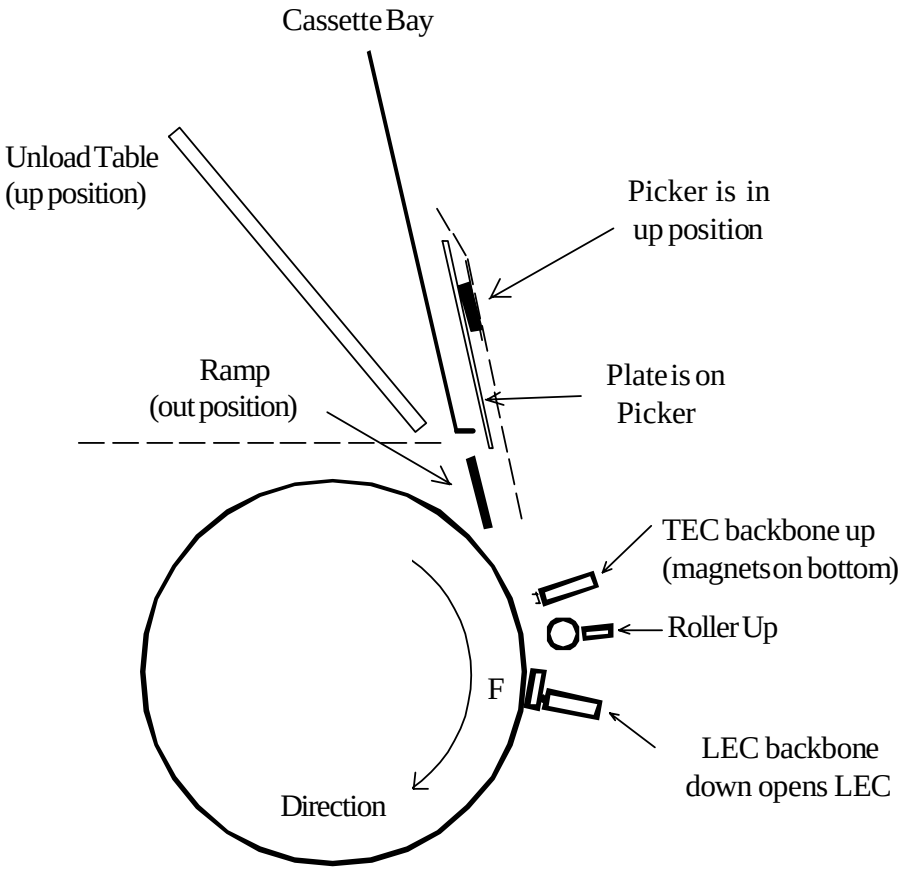
3.1 Step-by-step overview of the loading and unloading process

3.1.1 Starting position



- Starting position is with picker down
- Plates in the bay
- Drum in leading edge position (`mh LoadPos`)
- LEC backbone down
- LEC clamps open
- Ramp in out position
- Table is up
- Table cups down
- Table in home position
- System has been initialized

3.1.2 Plate is picked



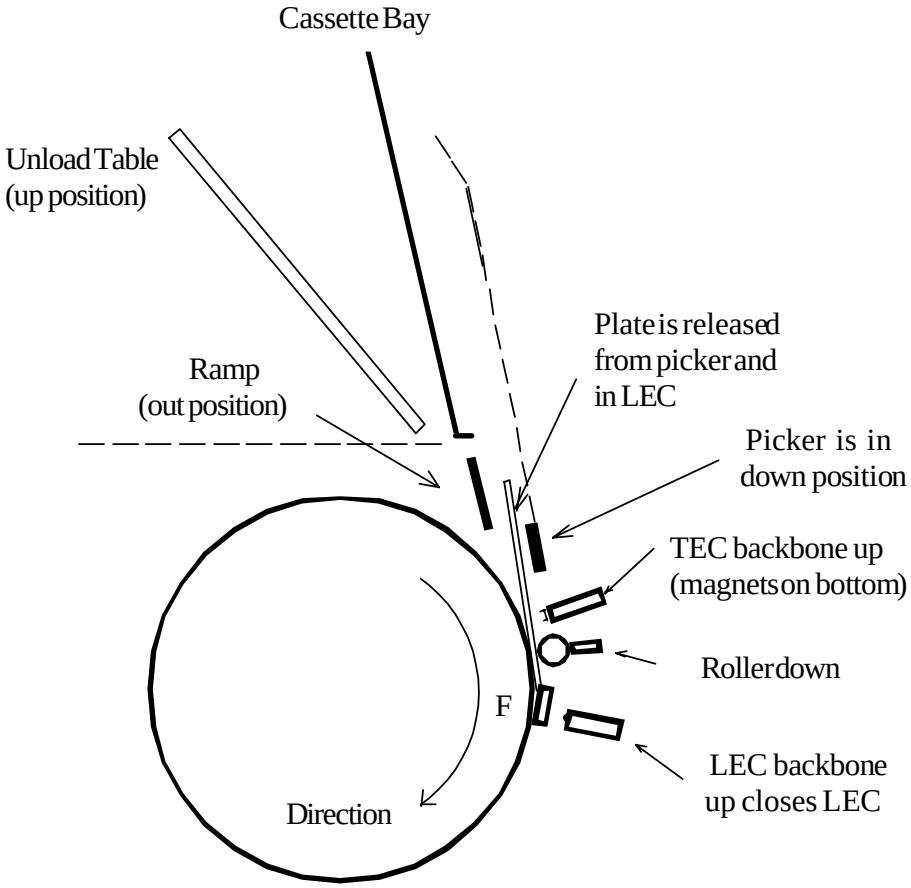
`Load` command causes a plate to be picked, lowered and loaded on to the drum. The size of the plate being loaded is specified in:

```
set bay 1 <MediaMainScan | MediaSubScan | MediaThickness>
```

The TEC position is calculated depending on plate size.

- Picker to rises to up position
- Picker moves in
- V3 wrist move in
- Picker vacuum on
- Air knife on
- V3 wrist out (if vacuum threshold met)
- Picker out
- Separators in (only applicable to Trendsetter NEWS output devices with the Full Format option)
- Air knife off

3.1.3 Plate is loaded and clamped in LEC



Continuing `Load` command results in:

- Picker moves to down position
- Picker vacuum off (plate drops into LEC)
- LEC backbone retracted (LEC clamps plate)
- Roller on
- Rotates plate to TEC position[1]
- Places TEC backbone on drum
- Unlock magnets
- TEC retracted
- Roller off[1]

[1] When issuing low level commands to rotate drum with roller down, it is necessary to disable the roller sensors and the roller drive. When finished, re-enable sensors and drive. (See "What sensors do I need to disable before issuing certain firmware commands?" on page 27 for more information.) There is no parameter associated with the TEC position, as it is calculated by the system.

3.1.4 Plate is rotated and clamped at trailing edge by magnets

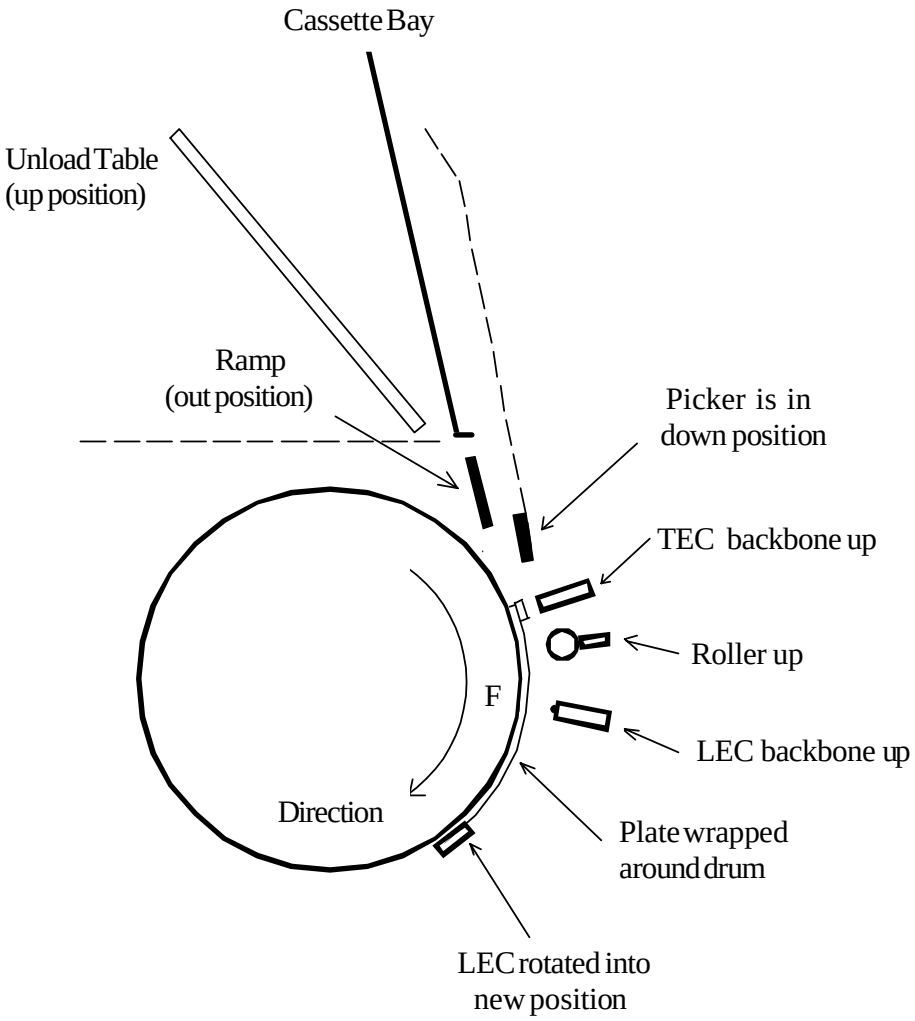
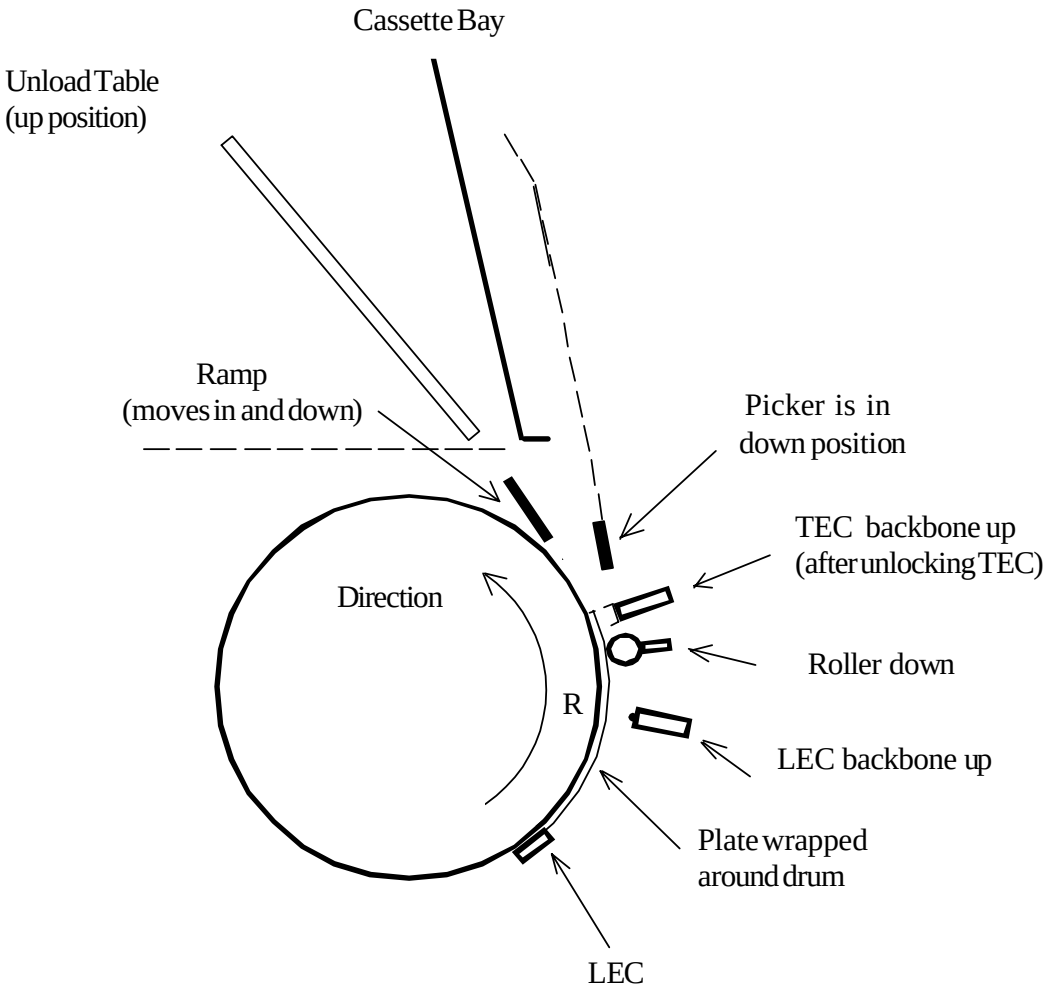


Plate is ready to image.

3.1.5 Plate is unclamped at TEC position



Unload command results in plate being unloaded onto the unload table and sent to the processor.

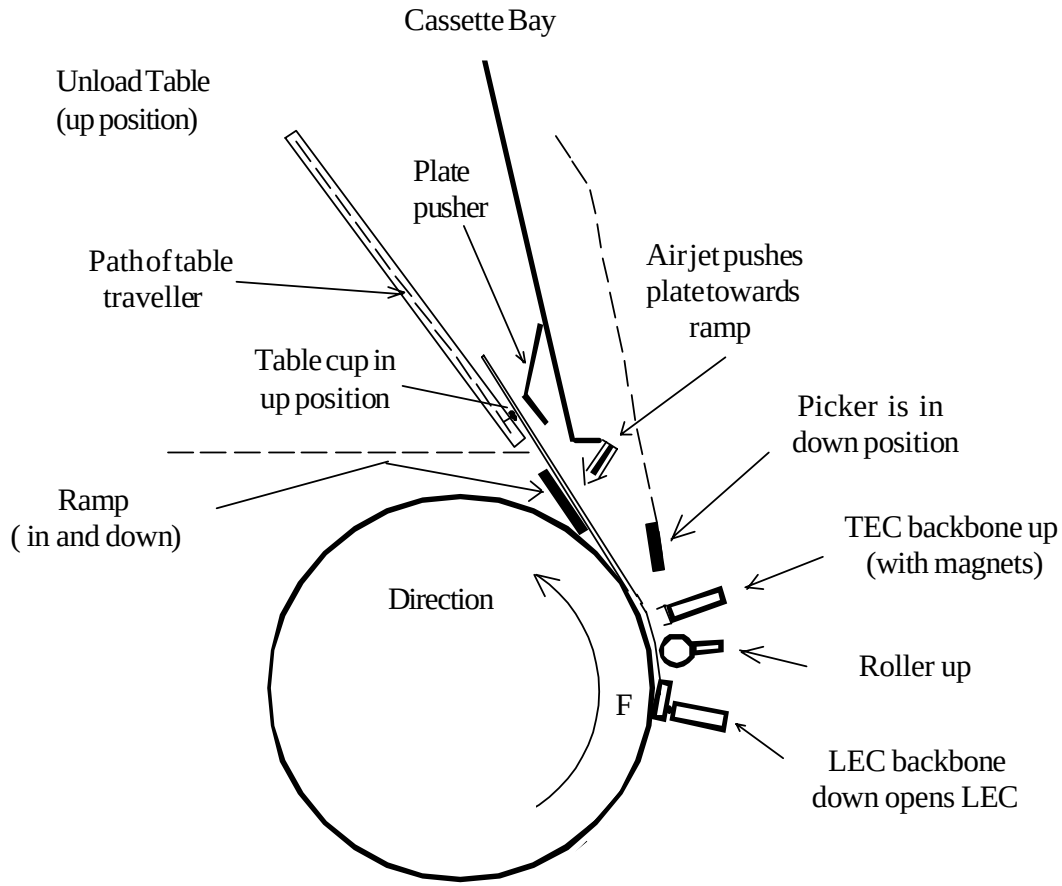
- Ramp moves in and down to be in line with the unload table[2]
- Air jet comes on to push plate on to ramp
- Drum moves to TEC position
- Roller on
- TEC backbone on
- TEC lock (see footnote 1 on page 14)
- TEC off

…continued on next page

[2] You must disable the ramp sensors and ramp drive when issuing firmware commands to rotate drum with ramp in. Remember to re-enable. (See "What sensors do I need to disable before issuing certain firmware commands?" on page 27 for more information.)

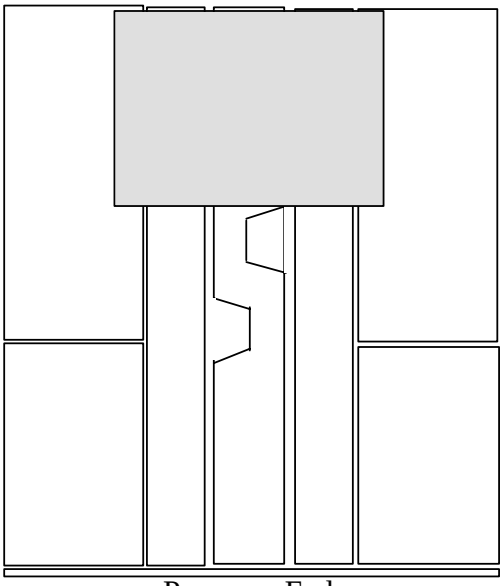
3.1.6 Plate unloads onto unload table

…unload process continued from previous page



- Drum unwinds to LEC position and pushes plate up the unload table
- Table traveler move to position cups under plate
- Table cups up, table vacuum on
- Plate pusher momentarily on. Ensures cups make contact with plate and holds vacuum.
- Roller up
- LEC backbone on opens LEC and releases plate
- Table traveler moves to pull plate clear of load ramp
- Ramp moves out and air jets turn off

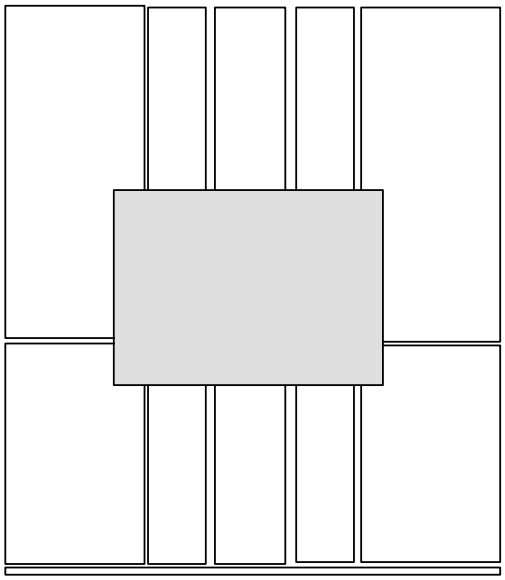
3.1.7 Traveler moves plate to processor



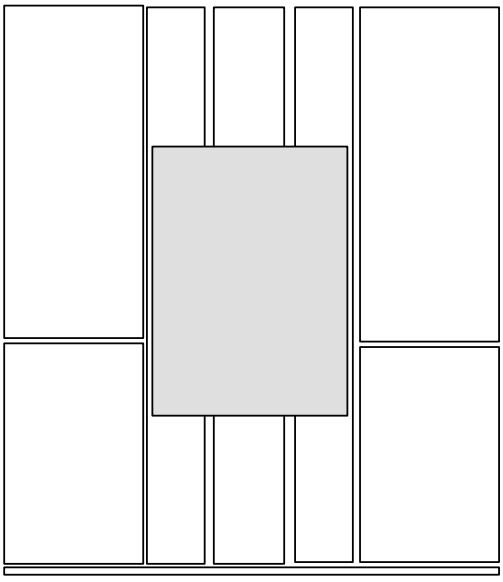
Processor End

Plate has been pulled clear of the load ramp and is fully on table

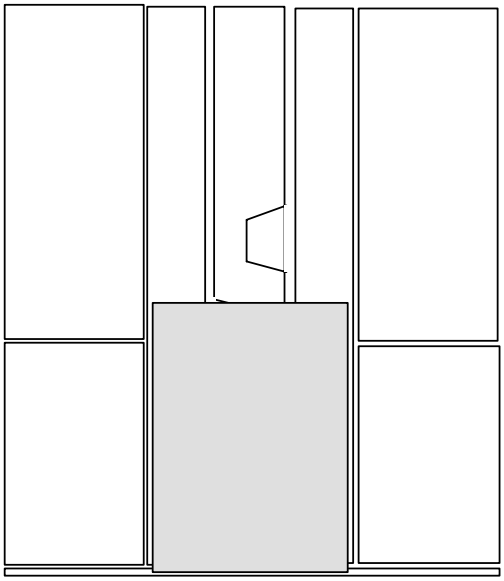
Table is lowered



Traveller moves ***plate*** to optional rotate position
Table vacuum off, cups down
Cups move to rotate position

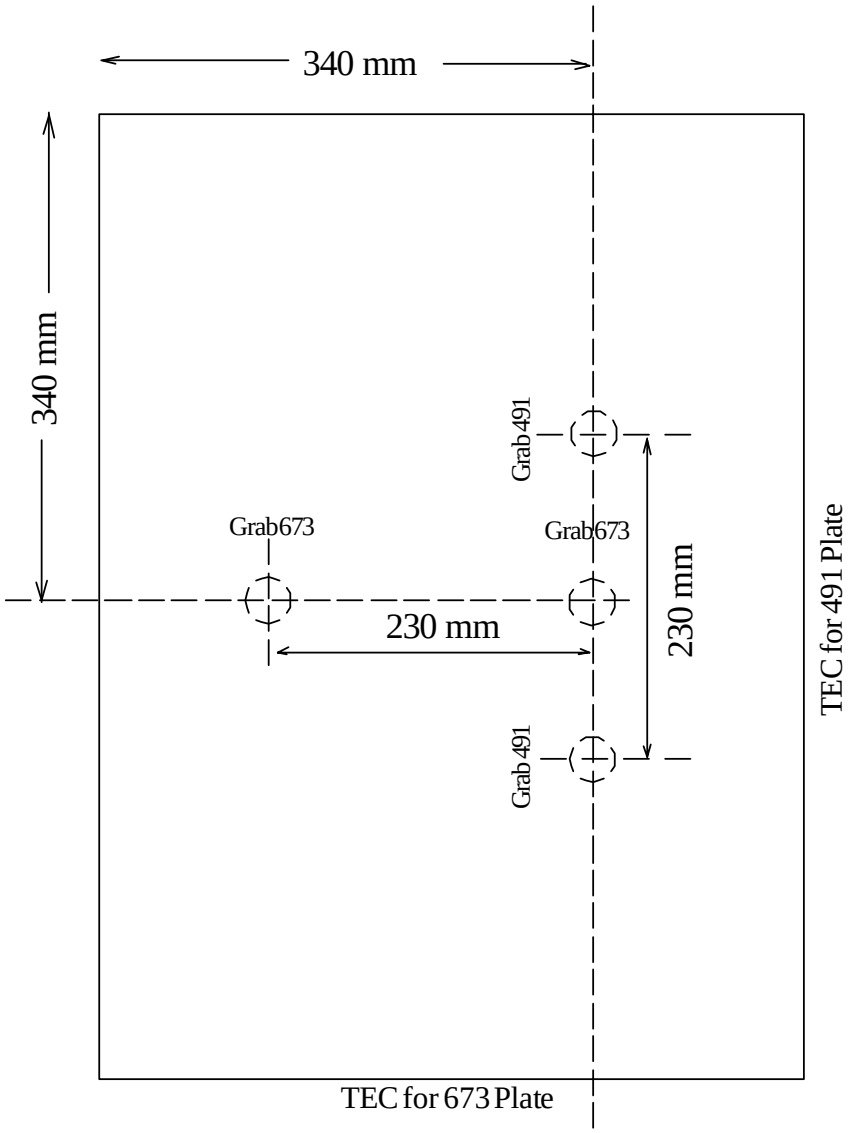


Cups up, table vacuum on
Rotate plate (if fitted with rotator option)
Vacuum off, cups down



Traveller moves to behind plate
Cups (and fingers) up
Pushes plate to edge at fast speed
Changes to slow speed to match processor

Typical grab points for 673 x 491 & 491 x 673 plates



In the case of a 673 x 491 mm plate, the table vacuum cups grab the plate in approximately the center. When the plate is in the landscape mode, the grab position is much closer to the edge that was held by the TEC. In both cases, the traveler moves 350 mm to pull the plates clear of the leading edge and fully on to the table. For plates that are large in the mainscan direction, the traveler moves up before grabbing the plates.

3.2 Annotated load/unload process via low level firmware commands

Firmware command	Description
`init`	Causes the TS News to initialize picker, engine and unload table. Visualy verify that the drum is at the
`drum`	load position (xxx.xxx deg) and the LEC is down.
`picker up` `picker in`	Brings the picker up. Using the command >>picker will indicate that Picker up sensor is blocked (true). When the picker is in, the status of Picker is no longer true, thus showing that the Picker Up sensor is ony true for Up and Out.
`picker wrist in` `picker vac on`	Check the status of the picker wrist sensor prior to moving it in. Verify blocked (***head in wrist out***) Picker wrist move slowly in to put the cups (mylar) in contact with the plate(s) in the bay. Picker cup vacuum is turned on. In automatic mode, the system monitors the vacuum level until it is above the threshold thus showing that the cups have picked the plate. Check that Picker vacuum is above the threshold using >picker command.

`picker ajet on`
`picker wrist out`
`picker ajet off`
`picker out`
	The air jet turns on and blows up between the plates. At the same time, the wrist pulls the plate over the ledge teeth which separates plates (aided by the air jets). When the plate is clear of the ledge teeth, the air jets turn off and the picker head move out. The plate is now grabbed and ready for the loading sequence.

`picker down`	The picker moves down and positions the plate ready to enter the open LEC clamps. Verify that the status of the picker with the `picker` command. Note that the picker down sensor shows blocked (true). Note also that the definition of the picker being “down” is that the picker is down and out.
`picker vac off`	The picker vacuum is turned off and the plate drops a few millimeters into the open LEC clamps.
`lec off`	The LEC backbone is retracted and the leading edge of the plate is clamped.
`roller on`	The roller comes down to hold the plate against the drum during load and unload operations.

`scan RLR_SensorHomesideDown bon`
`scan RLR_SensorAwaysideDown bon`
`scan RLR_Drive bon`
	There are specific safegards in the firmware to not allow drum rotation when the roller is down. This is to stop the roller running over the LEC and TEC clamps and destroying the roller material. In order for you to rotate the drum (even partially) during load or unload, the roller sensor and drive indication must be disabled. We will cover the sensor disables later in the course. It is only necessary to disable the down sensors and drive.

Firmware command	Description
`drum move yyy.yyy`	The drum is rotated so that the plate is wound on to the drum and the trailing edge of the plate is under-neath the trailing edge clamp magnets. This position is plate size dependant and is calculated on the fly. Use the number that you recorded during automatic operation.
`tec` `tec on`	Check the status of the TEC prior to bring down the TEC (>>tec) and note that the magnets are detected and that their location is on the backbone .
`tec unlock` `tec off`	The tec magnets are unlocked on to the drum and the TEC backbone is raised
`roller off`	The roller is raised. The plate is now be loaded for imaging.

`scan RLR_SensorHomesideDown boff`
`scan RLR_SensorAwaysideDown boff`
`scan RLR_Drive boff`
	Re-enable the roller sensors. If you are perfectly sure that these are the only sensors disabled you may issue the command >>scan bclear

`drum spin 60`	Spin the drum to simulate imaging
`drum stop`	Stops the drum
`drum move yyy.yyy`	Moves the drum to the place where the TEC clamps were put down in the load sequence.
`tec unlock`	TEC should have already been unlocked but check it out because if it is locked and you bring it down, you may damage the TEC clamps.
`tec on` `tec lock`	Brings down the TEC. Locks the TEC magnets.
`roller on` `tec off`	Must put roller on before lifting the TEC magnets or else the plate will come off the drum and cause a flyoff.

`scan RLR_SensorHomesideDown bon`
`scan RLR_SensorAwaysideDown bon`
`scan RLR_Drive bon`
	Disable the roller down sensors and drive so that the drum can be rotated with roller down.

`ramp in`	Tilt ramp in to unload the imaged plate on to the unload table. Noisy air jets direct pate downward.
`scan LR_SensorOutTop bon`	The ramp has safegards similar to the roller to
`scan LR_SensorOutBottom bon` `scan LR_Drive bon`	prohibit drum rotation with the ramp in. Must disable the sensors and the drive indication. At CR
`scan PS_LoadRamp bon` `scan PS_LoadRampAway bon`	2.0, firmware checks for plate on ramp when drum spinning. Now necessary to disable plate sensors.
`drum move xxx.xxx -10`	Moves the drum in the ***reverse direction***to the LEC clamp position. Do not forget the “-10” Unwinding the drum causes the plate to eject onto the unload table.
`lec on` `drum idle`	LEC backbone comes down and opens the LEC clamps. Then idle drum
`roller off`	Roller comes off and the plate is free to be moved out of the LEC clamps and along the table surface.

Firmware command	Description
`scan bclear`	This command will turn off all the bypasses that have been set. i.e. Roller, Load Ramp & Plate Sensors (in ramp). If you have other items disabled they will be cleared as well. Alternatively, use individual sensor names with “boff”
`table cups up`	Brings the cups up on the unload table into contact with the plate.
`table vac on`	Turns table vacuum on. Cups may, or may not be in good contact with the plate.

`table`
`table push on`
`table push off`
	Check the table vacuum and see if it is above threshold. Causes the plate pusher (slapper/beaver tail) to momentarily contact the plate and push it into good contact with the table cups.

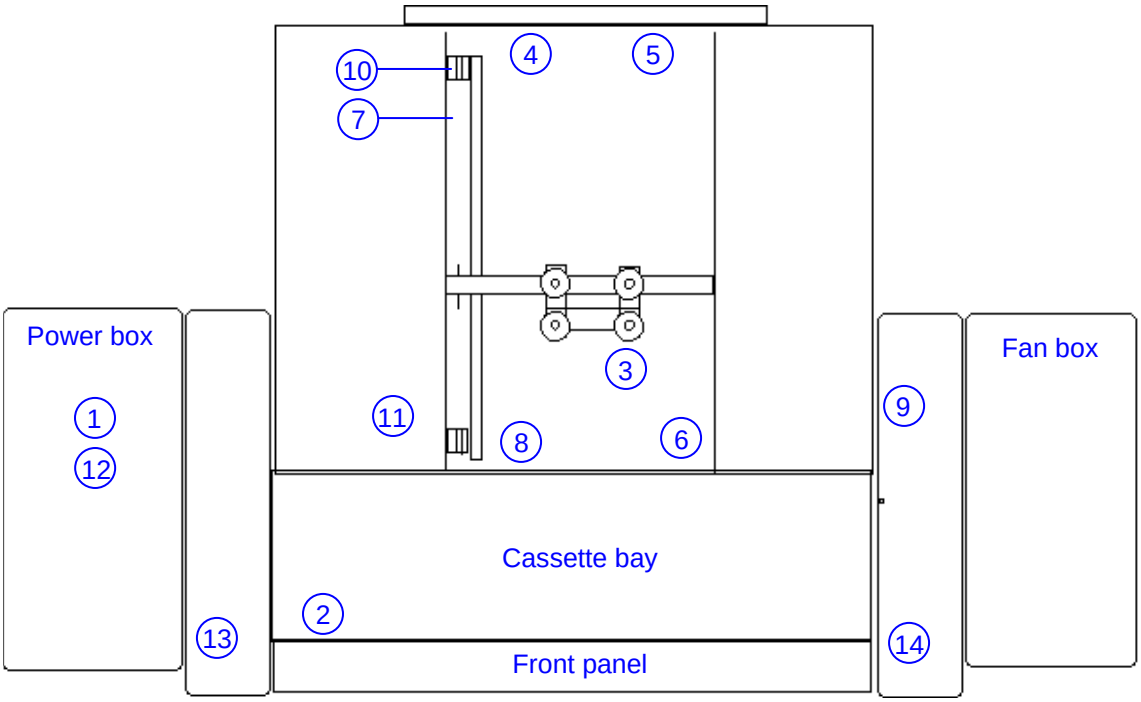
`table`	Check the table vacuum on the cups to see if it is above threshold. If not table push om/off again.
`table move zzz`	Table axis motor pulls the plate clear of the load ramp and on table. Typical value is 500 mm
`ramp out`	Ramp returns to out position to load another plate and noisy air jets turn off.
`table down`	Table moves down with beeping noise to warn of movement.
`table vac off` `table cups down`	Vacuum releases plate and table cups drop below table level.
`table move 0` `table cups up`	Table traveler moves to home and the table cups come up so that the fingers can push the plate.
`table move 180` `table move 200 1`	Typical numbers that will bring a 491 plate MediaMainScan to edge of table at high speed and move slowly off into processor

`table move home`
`table cups down`
`table up`
	Table traveler moves to the home position, cups move down and table moves up.

4. TRENDSETTER NEWS SENSORS

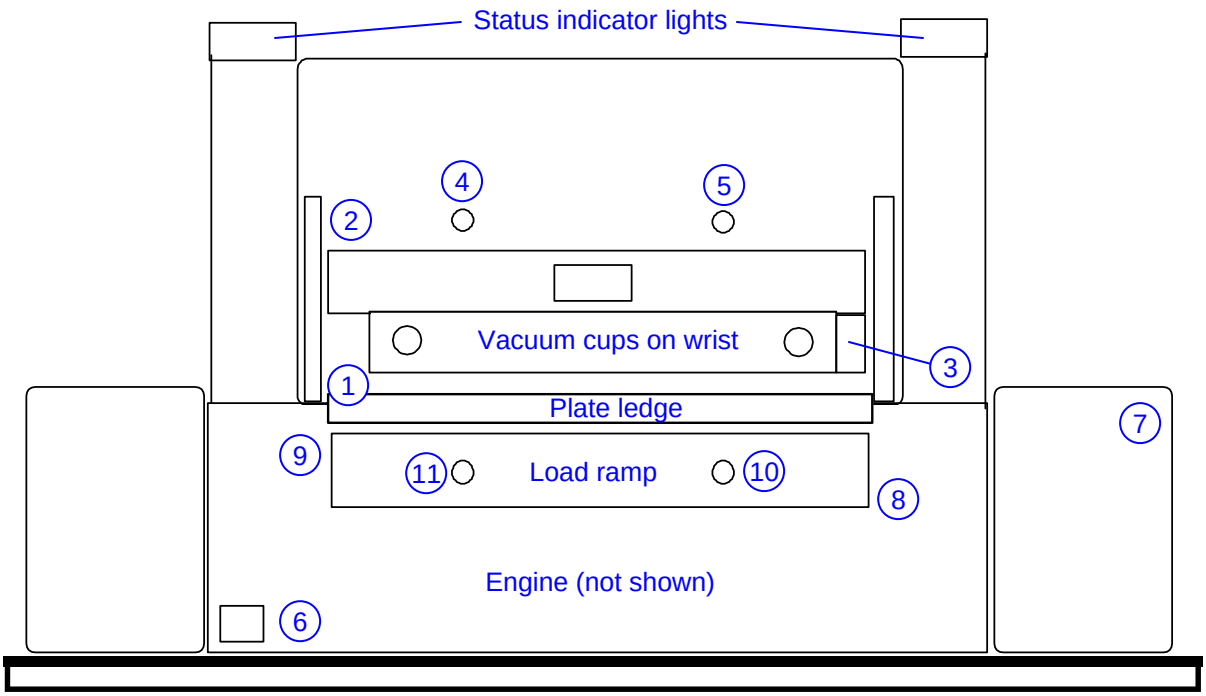
4.1 Digital and analog sensor locations

4.1.1 Autoloader sensor locations—top view



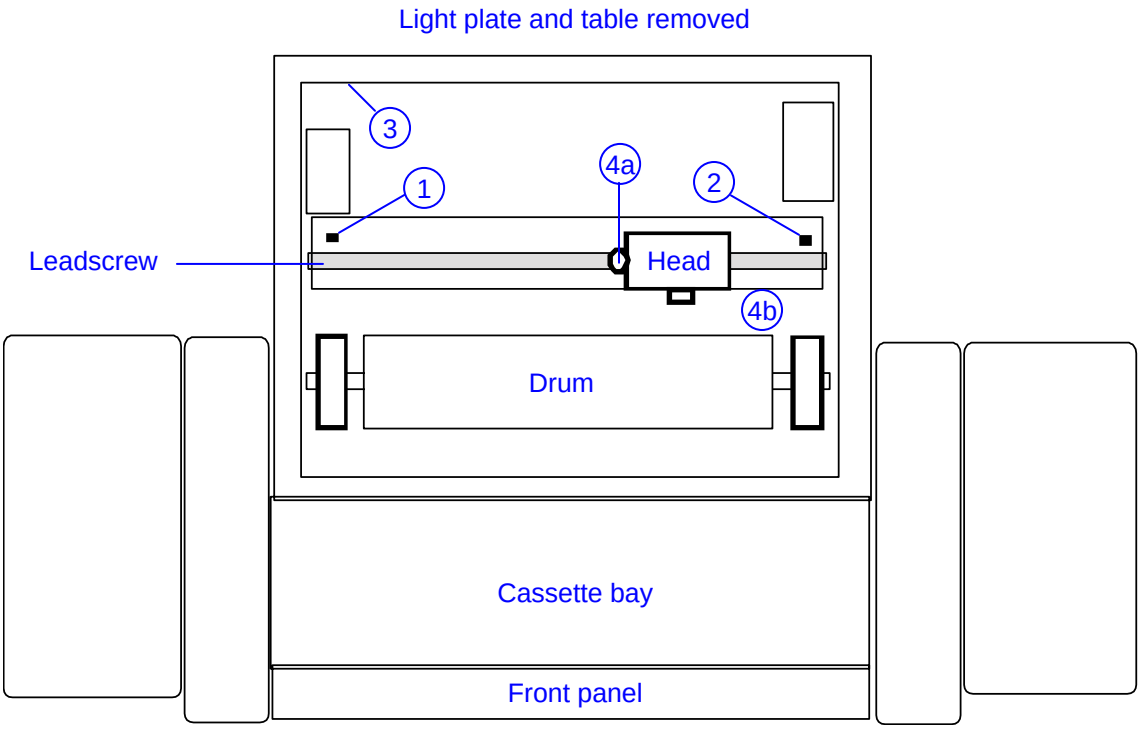
1 AL_PickerVacuum
2 AL_SensorCoverClosed
AL_SensorRotatorRetract (rotator option not shown)
AL_SensorRotatorRotate (rotator option not shown)
AL_SensorSeparatorRetract (may not be installed)
3 AL_SensorTableCupsDown
4 AL_SensorTableDown
5 AL_SensorTableEntryAway
6 AL_SensorTableEntryHome
7 AL_SensorTableExitAway
8 AL_SensorTableExitHome
9 AL_SensorTableUp
10 AL_SensorTravellerAway
11 AL_SensorTravellerHome
12 AL_UnloadVacuum
13 DOOR_Loop3Sense (See “Door loop sensors” on page 27.)
14 DOOR_Loop4Sense (See “Door loop sensors” on page 27.)

4.1.2 Autoloader sensor locations—front view



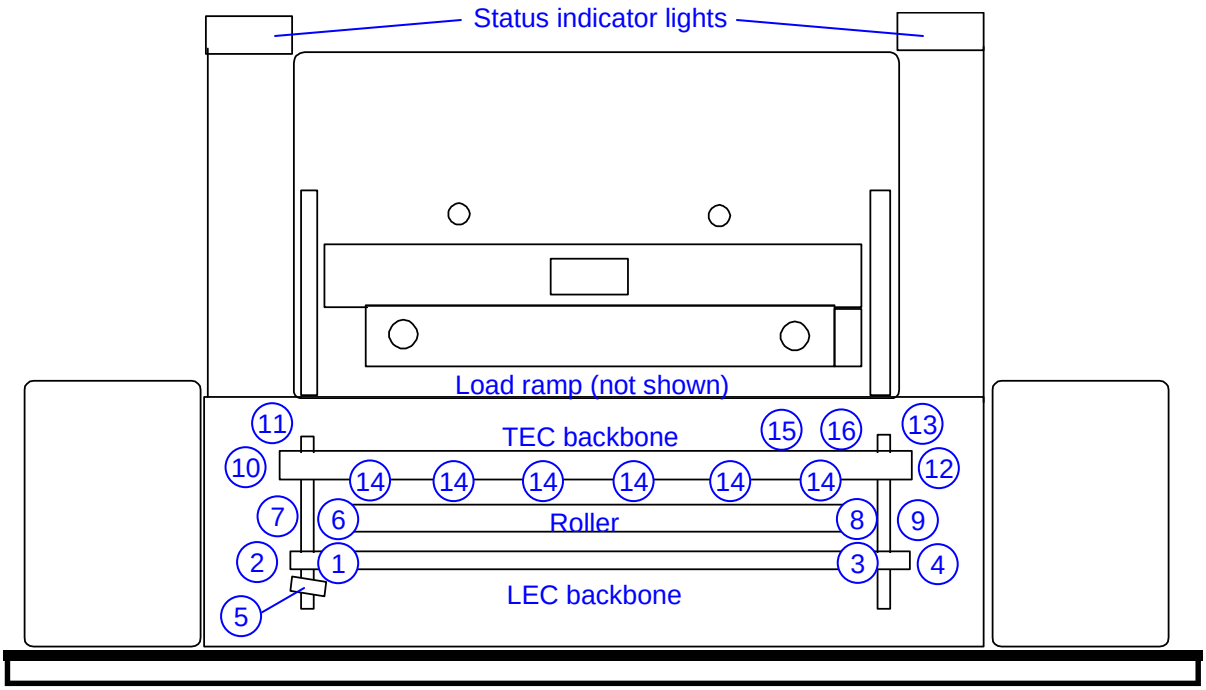
1 AL_SensorPickerOutDown
2 AL_SensorPickerOutUp
3 AL_SensorPickerWristOut
4 AL_SensorPlateStackAway
5 AL_SensorPlateStackHome
6 DOOR_Loop1Sense (See “Door loop sensors” on page 27.)
7 DOOR_Loop6Sense (See “Door loop sensors” on page 27.)
8 LR_SensorOutBottom
9 LR_SensorOutTop
10 PS_LoadRamp
11 PS_LoadRampAway

4.1.3 Engine sensor locations—top view



1 CAR_SensorAwaySide
2 CAR_SensorHomeSide
3 DOOR_Loop5Sense (See “Door loop sensors” on page 27.)
4a TMP_&BallScrew
4b TMP_&Engine

4.1.4 Engine sensor locations—front view



1 LEC_SensorAwaySideDown (On drum)
2 LEC_SensorAwaySideUp Off drum (inverted)
3 LEC_SensorHomeSideDown (On drum)
4 LEC_SensorHomeSideUp (Off drum) (inverted)
5 PS_Flyoff ~0 b DI_Group3
6 RLR_SensorAwaySideDown (On drum)
7 RLR_SensorAwaySideUp (Off drum)
8 RLR_SensorHomeSideDown (On drum)
9 RLR_SensorHomeSideUp (Off drum)
10 TEC_SensorAwaySideDown (on drum)
11 TEC_SensorAwaySideUp (off drum)
12 TEC_SensorHomeSideDown (on drum)
13 TEC_SensorHomeSideUp (off drum)
14 TEC_SensorClamp (6 sensors in series)
15 TEC_SensorLock
16 TEC_SensorUnlock

4.2 Disabling sensors

4.2.1 How do I disable sensors in general?

The I/O system is accessed by the `scan` command. To see the possible variations of this command, use the `help scan` command.

```
NEWS>> help scan
scan groups             Show all I/O groups
scan bits               Show all I/O bits
scan presence           Show all 'presence' bits
scan bclear             Clear all I/O bypasses
scan bstatus            Show all I/O bypasses
scan time               Show scanner update time
scan events             Show I/O bits with events
scan <ioname>           I/O scanner commands
  <ioname>              Show bit/group status
scan <ioname> [options]
  <ioname>              Show bit/group status
  [addr]                Show remote bit/group address
  [<on|off>]            Set bit on/off
  [<bon|boff>]          Set bit bypass on/off
  [<son|soff>]          Set group scanning on/off
*** Command Complete
```

The general form of a sensor disable or enable command is:

`scan sensorname bon | boff`
bon = bypass on (disable)
boff = bypass off (enable)

Example:

```
NEWS>> scan AL_sensortabledown bon
IO bit [AL_SensorTableDown] Bypass Set
*** Command Complete
```

4.2.2 What sensors do I need to disable before issuing certain firmware commands?

Before rotating the drum, the firmware checks sensors to ensure that the roller is not down, where is would be destroyed by running of the LECs and TECs, and the load ramp is not tilted inwards, where it would come in contact with the LECs. During the loading and unloading process, however, it is necessary that the roller be down and the load ramp be tilted inward while the drum rotates.

For this reason, during automatic loading and unloading, the firmware temporarily disables these sensors, allowing the drum to move. You will not see this reported by the system when automatically loading and unloading.

When you are using firmware commands to load and unload plates, you must disable and re-enable the roller and ramp sensors yourself, using the commands below.

Disable Roller Sensors

`scan rlr` (to see the sensor names)
`scan RLR_SensorAwaysideDown bon`
`scan RLR_SensorHomesideDown bon`
`scan RLR_Drive bon`

Enable Roller Sensors

`scan RLR_SensorAwaysideDown boff`
`scan RLR_SensorHomesideDown boff`
`scan LR_Drive boff`

Disable Ramp Sensors

`scan lr` (to see sensor names)
`scan LR_SensorOutTop bon`
`scan LR_SensorOutBottom bon`
`scan LR_Drive bon`

Enable Ramp Sensors

`scan LR_SensorOutTop boff`
`scan LR_SensorOutBottom boff`
`scan LR_Drive boff`

Notes:
`bon` = bypass on
`boff` = bypass off

There is a quick way to clear the bypasses if (and only if) they are the only bypasses set:

`scan bstatus`
(check to see if the only bypasses set are yours)

`scan bclear`
(clears all bypasses)

4.3 Door loop sensors

Understanding the results of the `door` command can be somewhat challenging.

- If the front panel is *open*, the door command shows only that "The front door is open" even if other doors are open.
- If the front panel is *unlocked but closed*, the door command shows only that "The front door is unlocked" even if other doors are open.
- If the front door is *closed and locked*, the results of the `door` command correctly identify any single open door. However, if there are multiple doors open, only one of them is identified.

Note: Door sensors are not bypassable for obvious safety reasons.

Also potentially confusing is the `safety` command, which returns the safety loop status.

If the front panel is open, the results of the `safety` command will be similar to Example A where all door are shown open. If the front panel is closed and locked, the results of the `safety` command will correctly identify any single open door. More than one fault will result in more doors reported as being open. In such cases, an inaccurate number of doors may be reported as being open, with one or more still reported as being closed.

Example B shows the results of the `safety` command when the front panel is closed and locked, and all other doors are closed.

Example A:

```
NEWS>> safety
Safety Loop Status
------------------
Emergency stop switch:          Off
Front door lock:                Unlocked
Front door (1):                 Open
Top panel - away side (3):      Open
Top panel - home side (4):      Open
Back door (5):                  Open
Fanbox panel (6):               Open
Safety override (key switch):   Normal
Safety loop status              Not Okay
Safety write laser              Not Okay
Door Status
-----------
The front door is open.
*** Command Complete
```

Example B:

```
NEWS>> safety
Safety Loop Status
------------------
Emergency stop switch:          Off
Front door lock: :              Locked
Front door (1): :               Closed
Top panel - away side (3):      Closed
Top panel - home side (4):      Closed
Back door (5):                  Closed
Fanbox panel (6):               Closed
Safety override (key switch):   Normal
Safety loop status :            Okay
Safety write laser :            Okay
Door Status
-----------
All doors are closed.
*** Command Complete
```

4.4 Cables as sensors

Many cable have extra pairs of wires acting as a loop sensor. These cable loops can be scanned and their presence detected (or not) with the command:

`scan presence`

The I/O names for all of these sensors have an ampersand (&) character at the beginning of the name.

`AL_&PickerWristOut`
This is the cable loop to the picker sensor.

`AL_SensorPickerWristOut`
This is the sensor itself.

4.4.1 List of "&" cable loops in alphabetical order

Note: These presence I/O names are not displayed in alphabetical order when you issue the `scan presence` command.

```
AL_&PickerHeadSensors        1 b DI_ALE_0100
AL_&PickerVacuum             1 b DI_ALE_0103
AL_&PlateStackSensors        1 b DI_ALE_0100
AL_&Processor                1 b DI_ALE_0103
AL_&SensorPickerOutDown      1 b DI_ALE_0100
AL_&SensorPickerOutUp        1 b DI_ALE_0100
AL_&SensorPickerWristOut     1 b DI_ALE_0100
AL_&StatusLamps              1 b DI_ALE_0103
AL_&TravelerHomeAway        ~1 b DI_ALE_0103
AL_&TravelerSensors          1 b DI_ALE_0100
AL_&UnloadMotor              1 b DI_ALE_0103
```

These presence "sensors" pertain to the AL or autoloader portion of the machine.

0 = False (unblocked) (off)

1 = True (blocked) (on)

~ = Inverted signal

b = bypassable

& =A "presence" item

```
CAB_&EngineGroup0Sensors     1 b DI_Group0
CAB_&EngineGroup1Sensors     1 b DI_Group1
CAB_&SpareSensors            1 b DI_Group0
CAB_&TECBackboneSensors      1 b DI_Group2
CAR_&SensorAwaySide          1 b DI_Group0
CAR_&SensorHomeSide          1 b DI_Group1
CM_&Motor                   ~1 b DI_Group4

DA_&Amplifier                1 b DI_Group4
DA_&Power                    1 DI_PDE_0103
DV_&PumpBreaker             ~1 DI_PDE_0103
EH_&Cable                    1 b DI_Group4
EH_&LogicPower              ~0 b DI_Group4
EH_&PowerCable              ~1 b DI_PDE_0100

PS_&Flyoff                   1 b DI_Group2
PS_&LoadRampAway             1 b DI_Group2

SAF_&24V+                   ~1 DI_PDE_0103
SAF_&48V+                   ~1 DI_PDE_0103
SAT_&24V+                   ~1 DI_PDE_0103

SP_&CassLatchAway           **** DI_SPE_0100
SP_&CassLatchHome           **** DI_SPE_0100
SP_&CRAtDrumAway            **** DI_SPE_0100
SP_&CRAtDrumHome            **** DI_SPE_0100
SP_&CRAtNeutralAway         **** DI_SPE_0100
SP_&CRAtNeutralHome         **** DI_SPE_0100
SP_&CRAtVRAway              **** DI_SPE_0100
SP_&CRAtVRHome              **** DI_SPE_0100
SP_&StepperHomeAway         **** DI_SPE_0103
SP_&TRAtDownAway            **** DI_SPE_0100
SP_&TRAtDownHome            **** DI_SPE_0100
SP_&VRAtDownAway            **** DI_SPE_0100
SP_&VRAtDownHome            **** DI_SPE_0100
SP_&VRAtIndex               **** DI_SPE_0100
SP_&VRAtNeutralAway         **** DI_SPE_0100
SP_&VRAtNeutralHome         **** DI_SPE_0100
SP_&VRAtUpAway              **** DI_SPE_0100
SP_&VRAtUpHome              **** DI_SPE_0100
SP_&VRVacuum8Up             **** DI_SPE_0103
```

Presence I/Os shown with **** are not installed on the system.

In this particular case these sensors would be for a Spectrum unit.

```
SY_&12V-                    1 b DI_Group2
SY_&12V+                    1 b DI_Group2
SY_&24V+                    1 b DI_Group2
SY_&24VFuse                ~1 DI_PDE_0103
SY_&5V+                     1 b DI_Group2
SY_&AbortFuse              ~1 DI_PDE_0103
SY_&CoolantPumpFuse        ~1 DI_PDE_0103
SY_&MainPower               1 DI_PDE_0103
SY_&RelayHeader             1 b DI_Group2
SY_&SolenoidHeader          1 b DI_Group2

TE_&Tach                    1 b DI_Group4
TEC_&SensorLock             1 b DI_Group1
TEC_&SensorUnlock           1 b DI_Group2

TMP_&Engine                 1 b DI_Group2
TMP_&BallScrew              1 b DI_Group2

UI_&Board                   1 b DI_Group2
WL_&Power                   1 DI_PDE_0103
```

For more information, see *Interpreting MCE Sensor I/O Bit States* on TechPlanet: http://techplanet.creo.com/output/computer_to_plate/trendsetter_3244/content/docs/interpreting_i-o_bit_states.htm

4.5 Digital drives

The `scan` command is issued, the I/O scanner reports the state of not only the sensor inputs, but also the states of the digital outputs used to control actuators. For example, the RLR digital outputs tell the plate roller to go up or down by setting the digital output to 0 (off) or 1 (on). When the scan RLR command is issued, the states of the digital outputs are displayed along with the states of the sensor inputs

List of drives:

```
AL_AirKnifeOnDrive          0 DO_ALE_0000 00100000h
AL_CoverUnlockDrive         1 DO_ALE_0003 00000002h
AL_PickerDownDrive          0 DO_ALE_0000 00080000h
AL_PickerOutDrive           0 DO_ALE_0000 00000800h
AL_PickerInDrive            0 DO_ALE_0000 00000400h
AL_PickerUpDrive            0 DO_ALE_0000 00040000h
AL_PickerVacuumOffDrive     0 DO_ALE_0000 00000200h
AL_PickerVacuumOnDrive      0 DO_ALE_0000 00000100h
AL_PickerWristInDrive       0 DO_ALE_0000 04000000h
AL_PusherDrive              0 DO_ALE_0000 00010000h
AL_RotatorRotateDrive       0 DO_ALE_0000 01000000h
AL_RotatorUnrotateDrive     0 DO_ALE_0000 02000000h
AL_SeparatorInDrive         0 DO_ALE_0000 00008000h
AL_StatusLampsDrive         0 DO_ALE_0003 00000001h
AL_TableCupsUpDrive         0 DO_ALE_0000 10000000h
AL_UnloadTableDownDrive     0 DO_ALE_0000 00002000h
```

```
AL_UnloadTableUpDrive        0 DO_ALE_0000 00001000h
AL_UnloadVacuumOffDrive      0 DO_ALE_0000 00800000h
AL_UnloadVacuumOnDrive       0 DO_ALE_0000 00400000h
EDR_Drive                    0 b DO_Group0 00000400h
LR_Drive                     0 b DO_Group0 00000001h
RLR_Drive                    0 b DO_Group0 00000040h
TEC_Drive                    0 b DO_Group0 00000010h
TEC_LockDrive                0 DO_Group0 00000004h
```

4.6 Analog inputs

To find the analog inputs (AI), use the `scan AI` command.

```
NEWS>> scan AI
Group Name          Status Value
AI_BallScrewTemp         b 0000021Ch
AI_EngineTemp            b 0000021Ch
AI_MainBoardTemp         b 000001B4h
AI_SystemPressure        b 00000348h
AI_DrumVacuum           ** 00000000h
AI_CarriageAmpTemp         000001E6h
AI_PickerVacuum          b 000000ECh
AI_StatusLamps           b 00000001h
AI_UnloadVacuum          b 00000025h
AI_VRVacuum4Up          ** 00000000h
AI_VRVacuum8Up          ** 00000000h
AI_UDRC_POCNozzPressNF   b 00000000h
AI_UDRC_POCNozzPress     b 00000000h
AI_UDRC_PACCNozzPress   ** 00000000h
AI_UDRC_DiffPress       ** 00000000h
AI_UDRC_BellPress       ** 00000000h
*** Command Complete
```

Bypassing analog inputs works the same way as the digital inputs. For example:

```
scan AI_UnloadVacuum bon
```

Note: Bypassing any sensor automatically invokes the timeout for that sensor which is in firmware, is not a parameter, and is not subject to change. The philosophy is that if a machine has bypassed sensors, it should not act at normal speed and consequently is downgraded in performance. If multiple sensors are bypassed, there will be multiple timeouts.

4.7 Status command responses

This section describes the results of commands on commonly used to interrogate sensor I/Os on the Trendsetter NEWS MCE output device.

Many of the sensors used on the autoloader are of the reflective optical type. When there is nothing to reflect the beam the sensor is said to be `Unblocked` or `False` or `Logical 0`.

When there is something in a position to reflect back to the sensor, the sensor is said to be `Blocked` or `True` or `Logical 1`. The sensors on Trendsetter NEWS are identified as `home` side or `away` side to make troubleshooting easier.

Drive refers to the electrical signal causing solenoid actuation of the pneumatic cylinder(s). The firmware checks that the sensor readings agree with what they should be under the given drive conditions. Drive should always match sensors unless there is a fault in the system.

In the example below, the LEC is off the drum.

```
NEWS>> lec
Leading Edge Clamp Actuator status:
     Up (off drum) sensor (home/away)   =   Blocked     Blocked
     Down (on drum) sensor (home/away)  =   Unblocked   Unblocked
     Drive                              =   Off
     Drive matches Sensors              =   True
*** Command Complete
```

In the next example, the LEC is on the drum (`lec on`). Note that the the subsequent status command shows the changeover of the blocked and unblocked sensors.

```
NEWS>> lec
Leading Edge Clamp Actuator status:
Up (off drum)     sensor (home/away)    =   Unblocked    Unblocked
Down (on drum) sensor (home/away)       =   Blocked      Blocked
Drive                                   =   On
Drive matches Sensors                   =   True
*** Command Complete
```

Note that in both examples, above, the status of `Drive` "matches sensors" whether it is on or off.

4.7.1 Examples of status responses from roller, TEC, and ramp

```
NEWS>> roller
Drum Roller Actuator status:
     Up (off drum)  sensor (home/away)  =     Blocked      Blocked
     Down (on drum) sensor (home/away)  =     Unblocked    Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True
*** Command Complete


NEWS>> tec
Trailing Edge Clamp Actuator status:
     Up (off drum)  sensor (home/away)  =     Blocked      Blocked
     Down (on drum) sensor (home/away)  =     Unblocked    Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

     Lock sensor                        =     Blocked
     Unlock sensor                      =     Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

     TEC Magnetic Clamps                =     Detected
     TEC Magnetic Clamps location       =     on the backbone

*** Command Complete
```

```
NEWSENG>> ramp
Ramp Top:                 (Drive: Off)  Out:Blocked
Ramp Bottom:              (Drive: Off)  Out:Blocked
Load ramp plate sensor (home):   Media NOT detected
Load ramp plate sensor (away):   Media NOT detected
*** Command Complete
```

4.7.2 Examples of status responses from picker and load table

```
NEWS>> picker
Task     Initialized Sim mode State        Abort Fault   Step mode Aborted
-------------------------------------------------------------------------
picker   False       Disabled Idle         0             Disabled  False

Picker Up Sensor:           Unblocked
Picker Down Sensor:         Blocked
Wrist Out Sensor:           Unblocked
Separator Out Sensor        Blocked

Plate Cover Closed Sensor:  Unblocked
Plate Stack Sensor (home):  Blocked
Plate Stack Sensor (away):  Unblocked

Vacuum:          Off

Vacuum Pressure:    237 counts
Vacuum threshold: low
*** Command Complete


NEWS>> table
Task     Initialized Sim mode State        Abort Fault   Step mode Aborted
-------------------------------------------------------------------------
table    False       Disabled Idle         0             Disabled  False

Table Up Sensor:                    Blocked
Table Down  Sensor:                 Unblocked
Cups Down Sensor:                   Blocked
Home Position Sensor:               Blocked
Away Position Sensor:               Unblocked
Table Entry Plate Sensor (home):    Unblocked
Table Entry Plate Sensor (away):    Unblocked
Table Exit Plate Sensor (home):     Unblocked
Table Exit Plate Sensor (away):     Unblocked

Vacuum:          Off

Vacuum Pressure:    377 counts
Vacuum threshold (single): low
Vacuum threshold (dual): low

Motor Position:   0.000
*** Command Complete
```

4.7.3 Example of combination status responses from engine

```
NEWS>> engine
Task     Initialized Sim mode State        Abort Fault   Step mode Aborted
-------------------------------------------------------------------------
engine   False       Disabled Idle         0             Disabled  False

Engine Status:

Drum Roller Actuator status:
     Up (off drum)  sensor (home/away)  =     Blocked      Blocked
     Down (on drum) sensor (home/away)  =     Unblocked    Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

Leading Edge Clamp Actuator status:
     Up (off drum)  sensor (home/away)  =     Blocked      Blocked
     Down (on drum) sensor (home/away)  =     Unblocked    Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

Trailing Edge Clamp Actuator status:
     Up (off drum)  sensor (home/away)  =     Blocked      Blocked
     Down (on drum) sensor (home/away)  =     Unblocked    Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

     Lock sensor                        =     Blocked
     Unlock sensor                      =     Unblocked
     Drive                              =     Off
     Drive matches Sensors              =     True

     TEC Magnetic Clamps                =     Detected
     TEC Magnetic Clamps location       =     on the backbone


User Interface:
        Cable Detected
        Button Off
        Buzzer Off
        Imaging Lamp Off
        ErrorLamp Off
        LoadLamp On
*** Command Complete
```

Note: The response to the `engine` status command are similar to those for LEC, TEC, and roller, but displays additional information about the user interface.

4.7.4 Examples of status responses from drum and carriage

Not initialized

```
NEWS>> drum
DRS status:
==========
Hardware version: 1.16
Hardware  all present
NOT Initialized
Watchdog normal
State = 0
Position = 0.000 degrees
Velocity = 0.000 RPM
Rotation Count = 0 (invalid)
Spinning Flag = FALSE
NOT Busy
Idle
*** Command Complete
```

Inititalized

```
NEWS>> drum
DRS status:
==========
Hardware version: 1.16
Hardware  all present
Initialized
Watchdog normal
State = 6
Position = 65.628 degrees
Velocity = 59.997 RPM
Rotation Count = 8
Spinning Flag = TRUE
NOT Busy
Idle
*** Command Complete
```

Not initialized

```
NEWS>> carriage
Current carriage status:
------------------------
Hdwr ver = 1.10
State    = 0
Position = invalid (not initialized)
Velocity = 0.000 (mm/sec)
Edge pos = 0.000 (mm)
Home lim = FALSE
Away lim = FALSE
NOT Initialized
No valid carriage plot params
*** Command Complete
```

Inititalized

```
NEWS>> carriage
Current carriage status:
------------------------
Hdwr ver = 1.10
State    = 6
Position = 77.706 (mm)
Velocity = 10.000 (mm/sec)
Edge pos = 0.000 (mm)
Home lim = FALSE
Away lim = FALSE
Initialized
No valid carriage plot params
*** Command Complete
```

Note: There are different responses from an initialized drum versus an uninitionalized drum. Specifically, the response for the former displays a `NOT Initialized` warning, and the `Position` and `Velocity` are shown as 0. Similarly, the response for the uninitialized carriage displays the `Position = invalid (not initialized)` warning and indicates a velocity of 0.000 mm/sec. You are unlikely to see the `Home lim` flag displayed as `True`, as the carriage immediately moves to make it false and label this position as 0.000 mm.