

Xitron Raster Blaster Linotype-Hell Speedway Device Driver Manual

*For use in configuring and using the Xitron
Speedway Device Driver for the Xitron Raster Blaster*

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Overview

Xitron's Raster Blaster uses interface cards consist of a two board set. The first board is a PCI interface. The PCI board provides an interface from the Raster Blaster software to the second board. This second board is an ISA interface which can be customized for a particular recorder family, in this case, the Linotype-Hell Speedway interface recorders. This card is called the Personality Board or PB2. These two cards are cabled together using an internal ribbon connector. Up to two PB2 cards can be attached to a single PCI card.

Xitron's Speedway Device Driver, together with the Raster Blaster, custom Windows device drivers and the 2 interface cards, provides a robust imaging solution to drive Linotype's Herkules, Quasar, and 30x3 family of recorders.

Device Drivers

Device Drivers for the Xitron Raster Blaster are Win32 dynamic link libraries. Device Drivers completely control all actions of an output device for the Raster Blaster. This includes checking status's, device setup, imaging of data and advancing and cutting material. The Device Driver relays to the Raster Blaster all the physical characteristics of an engine such as supported resolutions and imageable area.

When the Raster Blaster has a page to image on an output device it loads the Speedway Device Driver and begins a series of steps to begin output. The Raster Blaster first gives the Device Driver a chance to initialize the engine and check that it is ready. Assuming it is, it begins to read bitmap data off disk into the Printer Buffer, telling the Device Driver where the data is in memory. When the Raster Blaster has filled the printer buffer, the Device Driver starts the output device. As the output device consumes the data, the Device Driver relays this information to the Raster Blaster, which then refills the memory. This continues until all of the data has been output. The Raster Blaster then tells the Device Driver that the job is over and waits for the Device Driver to indicate that the recorder has finished. This process happens for each page output to an engine.

Configuring Devices

Xitron distributes the Speedway Device Driver with a set of pre-configured devices, one for each supported recorder. Supported devices currently include: Herkules, Herkules M, Herkules NP, Quasar, 3020 and 3030 (3020 and 3030 via the optional speedway interface). The Device Driver and interface make no distinction between the standard Herkules and Herkules PRO models.

Additional configuration available through “Driver Conf”

The push button labeled “Driver Conf” in the Device Configuration dialog is used to access parameters that are specific to the Speedway Device Driver. Clicking on this button will produce the following dialog:

Configure Speedway Plugin

Max Page Width (points)

Max Page Depth (points)

Mux String

PB2 Interface Card

Film Saving Mode

Enable Additional margins below (in mm)

Slow scan Fast scan

Punch Control

Control the punch from the Rip

1st Side Punch Foot Punch

2nd Side Punch Head Punch

3rd Side Punch Center image to punch

Minimum Film Feed (millimeters)

Fast Scan Punch Position (micro-m)

Slow Scan Punch Position (micro-m)

Herkules Exposure Control

Filter (0-5)

Focus (0-700)

Bias (0-255)

NOTE: Values not used unless "exposure" is non-zero

OK Cancel

From this dialog box you may configure the following options:

- **Max Page Width:** This value is used to override the built in width clipping in the Device Driver. When this value is set to 0, the Device Driver will always clip images at the maximum width of the recorder. In the case of Speedway devices, the maximum width will vary with the selected recorder. If this value is non-zero, it will be used as the clip width. This value is entered in points.
- **Max Page Depth:** This value is used to set the maximum length of an imaged job. If this value is set to 0 on a Speedway recorder, the Device Driver will clip the job length at the maximum dictated by the selected recorder (media width). Non-zero values will cause the Device Driver to clip, or cut off, images over the set length. This value is entered in points.
- **Mux String:** This is used in an environment with a multiplexor to select one or more output devices to scan for a connection. This may be left blank except in installations using Xitron’s Spinnaker multiplexing or Xitron’s IPU multiplexing.

- **PB2 Interface Card:** If a second PB2 card is in the PC, you may select from this box which card to use.
- *Film Saving Mode:* These features enable an option similar to the Linotype Raster Blaster's "Collect Mode". In this mode, the media remains stationary on the drum while multiple exposures are packed on the film, enabling more efficient media usage. When an exposure is started and there is not enough room left on the film to fit it, the film advances and the process starts over at the top (side) of the film. Please refer to the section below on "Speedway Drum Packing" for more information.

NOTE: Film Saving Mode **CANNOT BE USED WITH PUNCHES.**

- ♦ **Enable:** Check this box to turn the feature ON
- ♦ **Additional margin - Slow Scan:** This is an additional margin that will be added to the top and bottom of the image. The value entered in millimeters is split in half, half added to the top of the image, half added to the bottom.
- ♦ **Additional margin - Fast Scan:** This is an additional margin that will be added to the left and right side of the image. The value entered in millimeters is split in half, half added to the left side and the other half added to the right side.
- *Punch Control Features:* The different recorders in the Speedway interface family have different punch configurations. This group of settings is used to control them. **NOTE:** enabling any punch will cause the Film Save Mode setting to be ignored. The 2 features are mutually exclusive.
 - ♦ **Control the Punch from the Raster Blaster:** This checkbox is used to enable the punch control. If this box is not checked, the punch settings are not sent to the recorder during imaging. This has the effect of leaving the punch controls at their last setting or default. If this box is checked, the controls in the remainder of this group dictate what the punch action will be.
 - ♦ **1st Side Punch:** This check box will engage or disengage one of the 3 punched located around the circumference of a Herkules drum.
 - ♦ **2nd Side Punch:** This check box will engage or disengage one of the 3 punched located around the circumference of a Herkules drum.
 - ♦ **3rd Side Punch:** This check box will engage or disengage one of the 3 punched located around the circumference of a Herkules drum.
 - ♦ **Foot Punch:** This checkbox will engage the foot (supply side) bar punch.
 - ♦ **Head Punch:** This checkbox will engage the head (take-up side) bar punch.
 - ♦ **Center image to punch:** This checkbox will cause the image to be aligned according to the punch location defined in the controls labeled "Fast Scan Punch Position (micro-m)" and "Slow Scan Punch Position (micro-m)". Depending on the punch selected, head, side or foot, the image will be exposed on the recorder's drum aligned to the punch location. Using this feature can be complicated. Please refer to the section below on "Punch Centering" for more complete instructions and examples on using this feature.
 - ♦ **Minimum Film Feed:** This value, specified in millimeters, overrides the normal film advance at the end of the job. If set to 0, it has no effect, and the amount of film advanced is determined by the width of the job. If this value is non-0, and any punch is selected (ON), this value will be used as the amount of film to advance after exposure. This value is most often needed with foot and side punches when "Center image to punch" is selected. It should be set so that enough film is flushed to the output so that the punches are moved completely off the drum. If the selected punch is a "Head" punch, this value will be used as an **ADDITIONAL** feed amount, added to the width of the exposure.
 - ♦ **Fast Scan Punch Position:** This value, specified in micrometers, is the fast scan position that will be used for punch centering. This value is specified in the recorder's internal coordinate system which may vary for each recorder model (Herk, Herk M, Quasar) and may even vary from software revision to revision in recorders of the same model. For more information, please refer to the section below on "Punch Centering".

- ♦ **Slow Scan Punch Position:** This value, specified in micrometers, is the slow scan position that will be used for punch centering. This value is specified in the recorder's internal coordinate system which may vary for each recorder model (Herk, Herk M, Quasar) and may even vary from software revision to revision in recorders of the same model. For more information, please refer to the section below on "Punch Centering".
- *Herkules Exposure Control:* This group of 3 settings supplements the "exposure" setting on the page setup dialog to provide all necessary laser intensity control of the Herkules recorders. Please refer to the section below on "Laser Intensity Controls" for more information. These values are only used on the Herkules recorders.
 - ♦ **Filter :** This setting selects which filter to engage at this resolution.
 - ♦ **Focus:** This setting selects the focus lens position.
 - ♦ **Bias:** This setting sets the current supplied to the laser when in the "off" state (dark). It is sometimes referred to as "Bias light current" on Linotype equipment and software.

Speedway Laser Intensity controls ("Exposure" values)

All members of the Speedway family of recorders allow for some type of control over laser intensity. On the Quasar, 3020 and 3030, this intensity control is a single value, implemented as the "exposure" control on the page setup dialog. On the Herkules recorders, a total of 4 values are needed to control the laser, intensity (called exposure in Harlequin land), filter, focus and bias. For the Herkules recorders, the "intensity" value is entered as "exposure" on the page setup dialog and the remaining 3 values are available in the "Configure Device" dialog under page setup. These 4 values are derived from a lengthy calibration procedure documented in the recorder's operations manual. For installations where the Xitron Raster Blaster is replacing an existing Linotype Raster Blaster, these sets of values (one for each resolution) can be collected from configuration software of the existing Raster Blaster.

In the case of installations where initial values for intensity, filter, focus and bias are not available, the following table may prove helpful with initial values. Linotype-Hell documentation should be consulted on the actual laser intensity calibration technique.

Resolution	Exposure	Filter	Focus	Bias
5080 dpi	225	3	240	100
3386 dpi	195	2	240	100
2540 dpi	145	1	240	100
1693 dpi	145	1	300	100
1270 dpi	195	1	300	100

Speedway Drum Packing

There are 2 different methods for optimizing film usage on the Speedway recorders. One involves using the "pack Drum" page feature supplied by Harlequin to do imposition of postscript jobs containing multiple pages. The second scenario uses the "Film Save Mode" feature on the Device Driver to instruct the recorder to hold the film stationary while imaging different sections. Selecting this feature is documented above in the section on "Configure Device". This feature effectively mimics the "Collect Mode" implemented on the Linotype-Hell Raster Blasters.

When "Film Save Mode" is enabled, it is strongly suggested that cut operations be done from the Raster Blaster instead of the recorder's from panel. If images have been output to the recorder, but the film has not advanced, use the "cut and collect" option from the device menu to force immediate output of the film. Failure to do so will result in wasted fill because the Device Driver and interface will not know to reset the packing back to the top of the film if the cut and collect is initiated at the recorder's front panel.

Caution should be used when running 2 Raster Blasters on a Herkules and using “Film Save Mode”. There is no way for one Raster Blaster to know that the other Raster Blaster has partially exposed the drum. In this case, images would more than likely be written on top of one another.

“Film Save Mode” is not available on the 3020 and 3030.

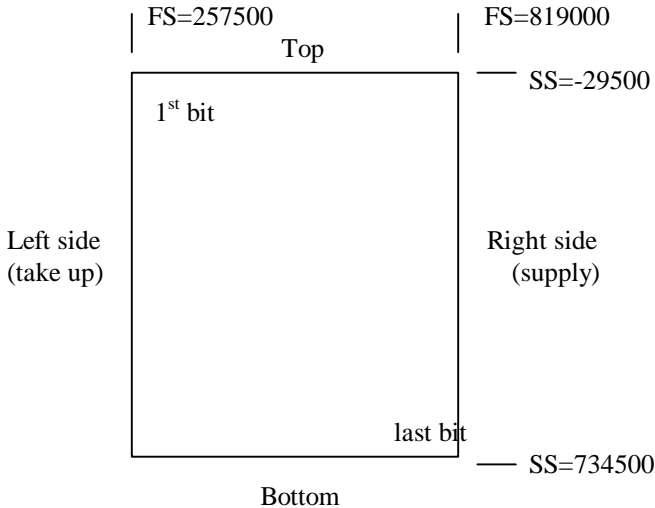
“Film Save Mode” **CANNOT BE USED WITH PUNCHES**. Selecting a punch (turning it on) will effectively disable film saving mode.

Punch Centering

The Speedway Device Driver provides for the centering of the exposure to a point in the exposure window defined as a punch pivot. This point, specified by the Configure Device Dialog settings “Fast Scan Punch Position” and “Slow Scan Punch Position” is defined in the coordinate system of the recorder’s exposure window. For the purposes of the following example, values from the Herkules imagesetter will be used. To locate the values of the coordinate system on any particular recorder, it is necessary to examine the following parameters in the “Measure Data” parameter set:

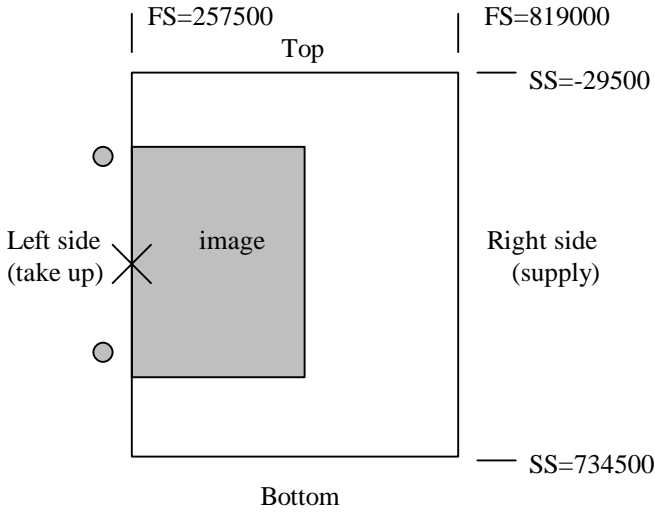
Parameter #	Parameter name	Value on Herkules (um)
32	SS2BOMA	-29500
33	FS2BOMA	257500
34	SS2EOMA	734500
35	FS2EOMA	819000

BOMA stands for Begin Of Max Area and EOMA stands for End Of Max Area. For this example, 32 and 33 define the upper left corner of the exposing window and 34 and 35 define the lower right corner. Keep in mind that SS (slow scan) is the height of the job (across the media from edge to edge) and FS (fast scan) is the width of the job (circumference of the drum). The exposing window looks like this:



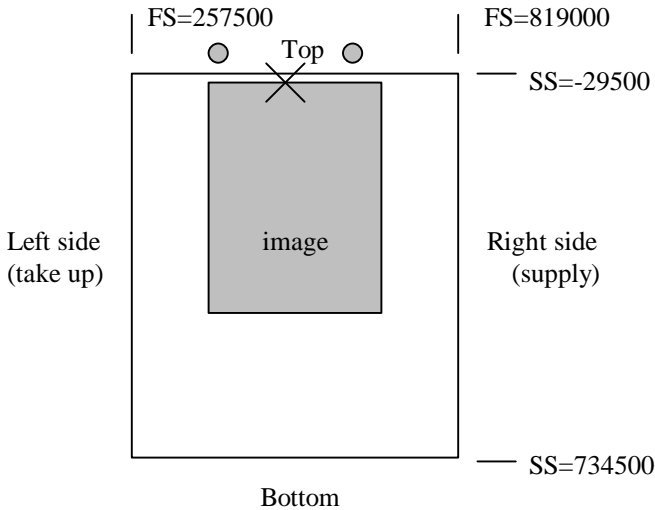
Once this is clear, the type of punch needs to be considered. A head punch would be located along the left side of the image (or take up side of the drum). Side punches are assumed to be across the top of the image (one end of the drum). A foot (or feed) punch is along the right side of the image (or supply side of the drum).

Example: Head Punch



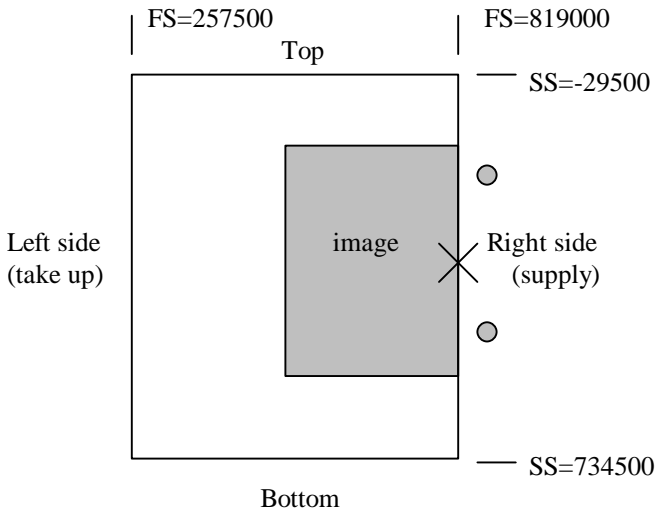
The “X” marks the spot defined as the Punch Pivot point. For a Head punch, this point will define the left side of the image with half the image above the point and half below. For this example, “Fast Scan Punch Position” would be 257500 and “Slow Scan Punch Position” would be 352500.

Example: Side Punch



The “X” marks the spot defined as the Punch Pivot point. For a Side punch, this point will define the top edge of the image with half the image to the left of the point and half to the right. For this example, “Fast Scan Punch Position” would be 538250 and “Slow Scan Punch Position” would be approximately 25000 (notice that the image is not EXACTLY at the edge of the drum). In the case of a side punch, it may be desirable to specify a “minimum film feed”. If none is specified in this case, the film would only advance an amount equal to the width of the image, leaving some of the image still on the drum.

Example: Foot (feed) Punch



The “X” marks the spot defined as the Punch Pivot point. For a Foot punch, this point will define the right edge of the image with half the image above the point and half below. For this example, “Fast Scan Punch Position” would be 819000 and “Slow Scan Punch Position” would be approximately 352500. In the case of a foot punch, it is important that a “minimum film feed” be specified equal to if not larger than the entire drum circumference. If none is specified in this case, the film would only advance an amount equal to the width of the image, leaving the punch holes still on the drum.

Initial film load on Herkules

The Speedway Device Driver will not issue the “film load” command to the Herkules on the first job after a power-up/reset. This means that before the Herkules can image, the user must manually instruct the recorder to load film from the Herkules’ front panel.

Attaching the Speedway recorder to the Raster Blaster

The Xitron PB2 interface for the Speedway family of recorders uses a single cable attached to the recorders’ “Speedway” port (9-pin D-Shell type connectors).

Use the Xitron supplied interface cable (part no. 20-0446-030) to connect the 9-Pin D-Shell connector on the back of the Xitron PB2 interface card to the Speedway port on the back of the Quasar or Herkules recorder (also 9-pin, D-Shell Type). There is a single point of attachment on the Quasar but, the Herkules has 2 speedway points, either should work.

NOTE: In the initial production run of the 2228 Speedway PB2 card, there were 10 boards released and shipped that required an additional device in line in order for the interface to work. This small aluminum box was supplied with a short (8 inch) cable, allowing it to be placed off the back of the PB2 card and the 20-0446-030 cable was then attached to it. This was only required on the first 10 units. The current version of the 2228 card, revision B, does not require this device.

Device Driver Errors

When a Device Driver encounters an error on an output device, it will print an appropriate error message. The short form of this message will appear in the Throughput Controller. The long form will appear in the Raster Blaster System Monitor window. Refer to figure 1 on the last page of this document for a sample screen of the running Raster Blaster. If the error encountered is one that can be easily remedied, i.e. recorder off-line, then the Device Driver will continue to periodically test the engine until the error has been cleared. During this time the user may disable output by checking the “Disable output” check box in the Throughput Controller and dragging the page to either the Active or Held queues. If the error is serious, the Device Driver will request that the Raster Blaster disable output and the page will be placed back in the Active Queue automatically.

Error messages common to all Device Drivers

The following table list the error messages that are common to all the Device Drivers developed by Xitron.

<i>Short Message</i>	<i>Long Message</i>	<i>DescRaster Blastertion</i>
Invalid error code	An unidentified error condition has occurred	The error codes returned by the external device/devices are unintelligible.
PB2 read error	The Device Driver is having trouble reading the PB2 ISA board	The PB2 interface card has failed.
PB2 write error	The Device Driver is having trouble writing to the PB2 card	The PB2 interface card has failed.
PB2 unsupported	An attempt was made to run an unsupported command on the PB2	The most likely source of this problem is trying to run a specific Device Driver against the wrong PB2 card.
Wrong PB2 ver	This Device Driver does not support the installed PB2 card	The incorrect type or version of PB2 card is installed.
Version problem	The PB2 firmware is too old to run with this Device Driver	The Device Driver requires a version of firmware newer than that installed on the PB2 card.
No eng. response	The imaging engine is not responding	Check that the cable from the PB2 to the recorder is plugged in and the recorder is powered on.
Data buffer not full	During image startup, PB2 data buffers were not full	When the page is being prepared for output, all buffers must be full before the recorder is activated. One of these buffers, on the PB2, failed to go-full in preparation for output imaging. Most likely, the 26-pin ribbon cable is installed incorrectly. Run PB2diag.
Bad eng. response	The recorder gave in invalid response for the previous operation	A correctly formatted response was received but was completely out of context for the command issued.
Invalid PB2 state	The PB2 has entered an invalid state	An internal error occurred in the PB2 interface software.
Invalid PB2 context	The PB2 has run in an invalid context	An internal error occurred in the PB2 interface software.
Pagebus U error	An UNSUPPORTED indication was received on the Pagebus interface	A Pagebus “U” error code was received on the Pagebus interface.
Pagebus Invalid	An invalid frame was received on	A Pagebus “I” error code was received on the

<i>Short Message</i>	<i>Long Message</i>	<i>DescRaster Blastertion</i>
Missed EOJ	the Pagebus interface. While polling the buffers for empty (eoj), timed out	Pagebus interface. While waiting for output imaging to complete, a timeout occurred.
No driver	Could not access the hardware drivers for PCI and/or PB2	The drivers for the Raster Blaster are either not installed correctly or have not been started
No Xitron DLL	Couldn't find or load Xitron DLL	There is a problem with the Raster Blaster installation. The Raster Blaster cannot locate the file XDLL32.DLL, which should be located in the sw\devices directory.
No PB2 card	Can't find the PB2 card	There does not appear to be a PB2 card installed in the computer at the address specified in the XITRON33.INI file. Run the PB2Diag program, which will attempt to re-locate the PB2 card and update the XITRON33.INI file.
Data underrun	There was an underrun in the driver while imaging	An underrun, and corresponding loss of image integrity, occurred on the PCI card.
Start failed 1	Imaging start failed because of memory/driver problems	A driver error or memory allocation problem caused imaging startup to fail.
Bad DMA channel	Bad or invalid DMA channel	Attempt to use an old-style (non-PB2) ISA card with the 32-bit Device Driver. Not allowed.
Left marg. too wide	Left margin too wide	The requested left margin is so wide, it causes the image to be shifted outside the imaging area of the recorder.
Top marg. too long	Top margin too long	The top margin is set such that it will be the only thing on the page.
Neg. margin error	A negative margin is set larger than the image	A negative margin cannot be set larger than the image being set.
too much margin	Memory needed to expand right/left margins exceeds Printer Buffer	Memory, a vital system resource, is needed to expand margins when imaging. The amount of memory needed to expand the margins on this job exceeds the memory used for the Raster Blaster's print buffer.
PB2 already open	The driver to access the PB2 is already open	An internal error caused the PB2 driver to be opened more than once.
Can't alloc mem	Couldn't allocate dynamic memory	Additional memory needed while imaging was not available. Check system resource.
PB2 unsupported	The previous command is not supported by the PB2	A command was run on a PB2 card in an IPU that is unsupported.
PB2 failure	One of the PB2 boards in the PBRI has failed	PB2 cards in the IPU are in failure mode.
No GO signal	The video GO signal was not received from the remote	The IPU failed to get a Video "GO" signal on the Pagebus interface, timeout.
Devices busy	There are no available output devices on the PBRI	When attempting to mux/select in the IPU, all requested devices were busy.
Illegal error	Illegal error	An unintelligible error code was received.

Speedway Interface specific errors

The following is a list of error messages that the Speedway family of recorders can generate. Listed first is the error message as it is displayed in the Throughput controller of the Raster Blaster. The long messages are output to the Raster Blaster's monitor window. There is a brief description of each.

<i>Short Message</i>	<i>Long Message</i>	<i>DescRaster Blaster</i>
Offline	The Speedway recorder is off-line or busy	This error is in response to an uninterpretable message or an unidentified or unsupported command.
Change takeup	The take-up cassette needs to be emptied/changed	A cut operation was performed but no one has emptied the take-up cassette.
--- BUSY ---	Another Raster Blaster is using the recorder (lock is asserted on the other port)	On the Herkules, where 2 Raster Blasters can be attached to the recorder at the same time, this error indicates that the recorder is busy running an exposure on from the other Raster Blaster. This is a retry condition, meaning that the exposure will be re-tried after waiting a few seconds.