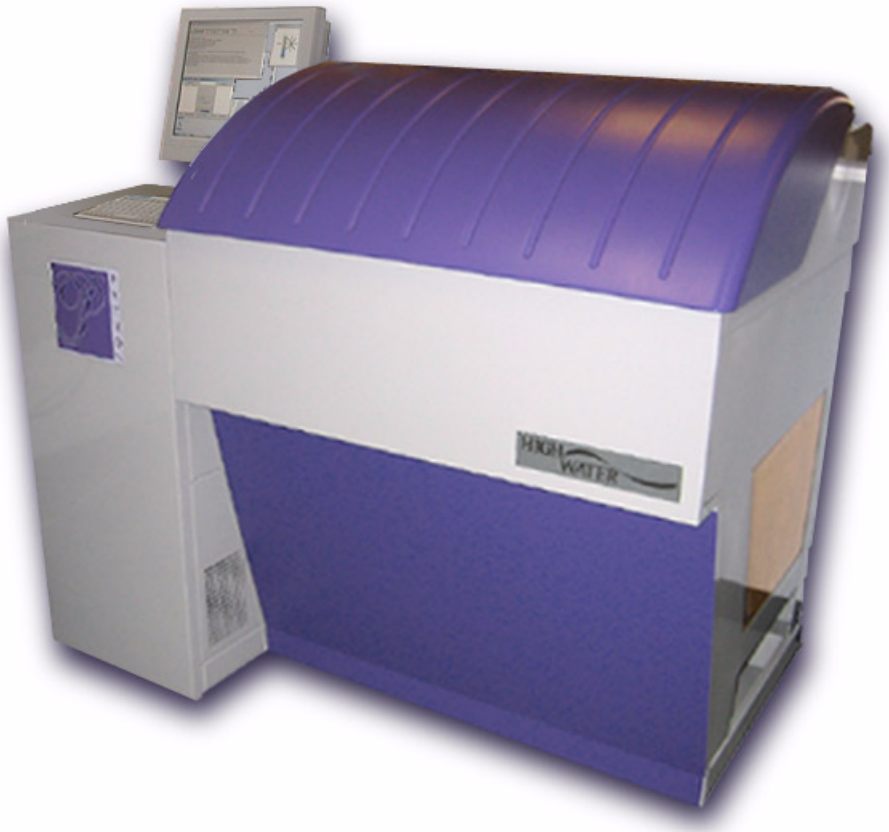
Python Essentials



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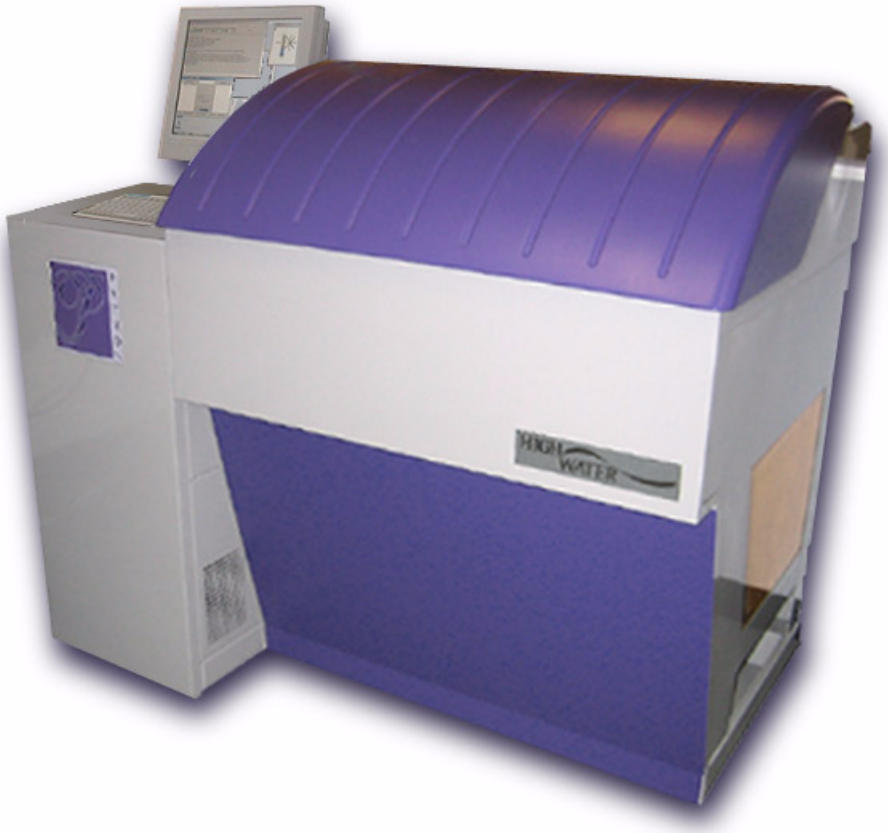
1. AN INTRODUCTION TO PYTHON

The production of metal plates for printing presses has been considerably simplified with the advent of computer-to-plate technology. In the past, a job was output to film from which a plate was produced. Now, current technology removes the intermediate film stage, so that jobs are output directly from computer to printing plate.

HighWater's Python platemaker is designed to meet the needs of a wide range of the pre-press and printing industry. It produces high quality, aluminium plates which have the cleanness, accuracy and repeatability characteristics that are only achievable with digital imaging. Furthermore, Python's modular design makes it easy to install, set up and maintain.

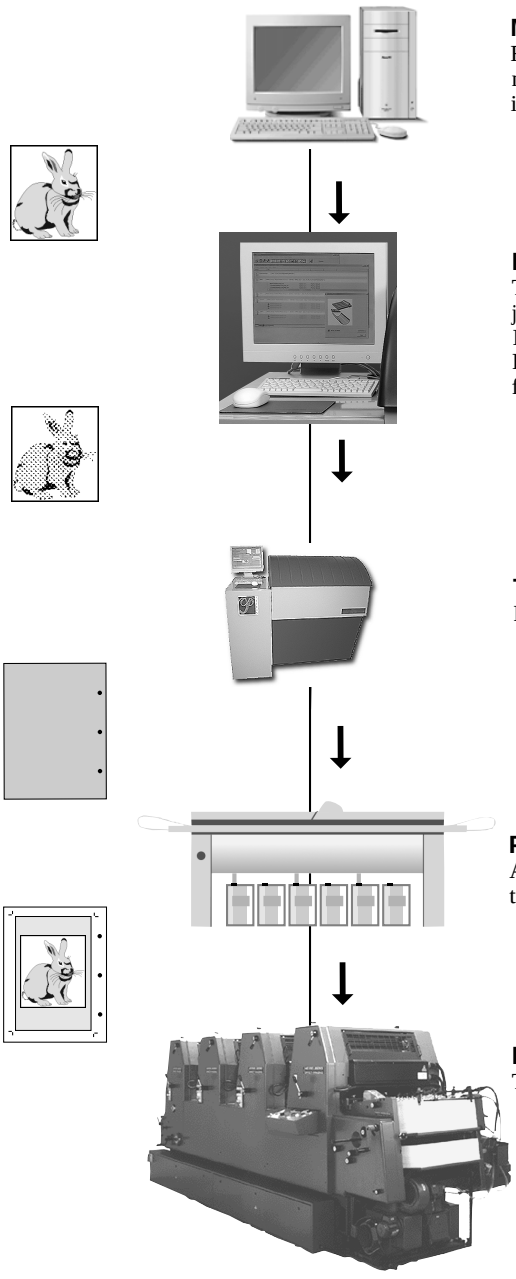
The full Python system includes:

- The **Python engine**, which images the plate.
- The **Python workstation**, which runs all the software required to process jobs and output them to the Python engine.



1.1 Typical job flow through the Python system

The following diagram illustrates the key stages in the Python system job flow, from job creation to output on the press.



Macintosh / PC
First, create a PostScript / PDF job in your page make-up or imposition application. Then print it to one of the Torrent RIP's input queues.

Python workstation
The Torrent RIP interprets and screens your job, producing TIFF bitmap files.
Next, use the Q2 Output Controller or the Python Layout Tool to output the bitmap files to the Python engine.

The Python engine
Python exposes the plate.

Plate processor
After the plate has been exposed, put it through the plate processor.

Printing press
The plate is now ready for the printing press.

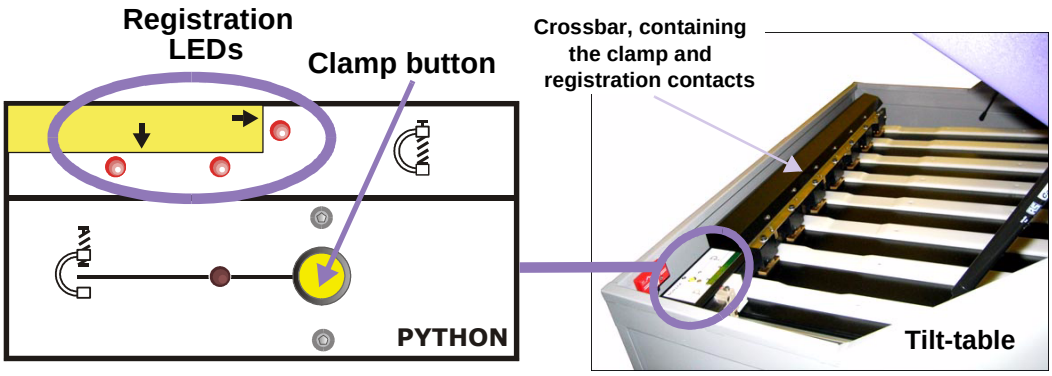
1.2 The Python engine

The Python engine, which images your plates, has three main parts: the tilt-table, the drum and the carriage. Each of these is described below.

The tilt-table

The tilt-table is where you load the plate. On or near to the tilt-table you will find the following:

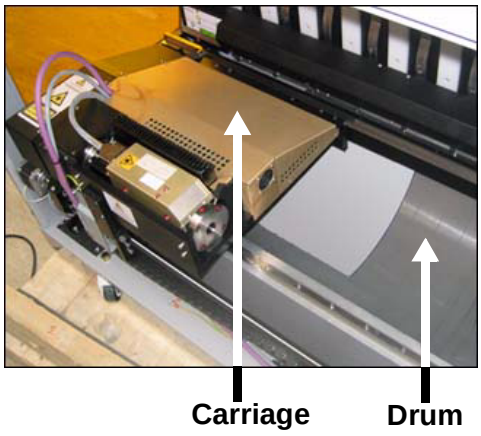
- The **registration contacts** – these are located in the crossbar and help you to position the plate correctly on the table.
- The **registration LEDs** and **clamp button** – the 3 registration LEDs tell you when the plate is positioned correctly. You use the clamp button to unclamp the plate after imaging.
- The **clamp** – this is in the crossbar and automatically clamps the plate once it is in the correct position on the tilt-table.
- The **crossbar** – this sits at the end of the tilt-table. When the imaging cycle begins, the crossbar moves down the tilt-table to insert the plate into the drum.



The drum

The metal drum is located underneath the tilt-table and is where the plate imaging takes place. The drum contains:

- The **vacuum** – this holds the plate securely in the drum during imaging.
- The **lead screw**, also called the **ball screw** – the carriage moves along this as the plate is imaged.
- The **plate width system** (only present on early models) – this measures the width of the plate to help position the pressure roller (see below).



The carriage

The carriage sits over the drum and contains:

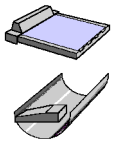
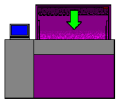
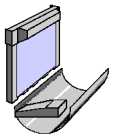
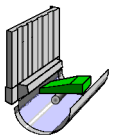
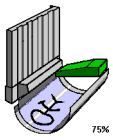
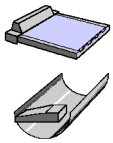
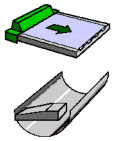
- The **pressure roller** – this rolls the plate, prior to imaging, to ensure that it sits tightly in the drum.
- The **laser** – this images the plate.
- The **spinner** – this directs the laser beam around the drum.

1.3 Plate auto-unload

A plate auto-unload option is available with the Python system. The use of this option means that users don't need to manually remove each imaged plate from Python's tilt-table: instead, the plate is automatically pushed out of the back of the Python engine onto a bridge to a processor.

1.4 How the Python engine images the plate

The Python engine images a plate in the following way:

	You set up a job for output using either Q2 or the Python Layout Tool software (these software applications are described in chapters 3 and 4).
	You load the plate onto Python's tilt-table (as described in section 5.1). When the plate is in the correct position it is automatically clamped, and remains clamped throughout the entire plate load/ image/unload sequence.
	Close Python's lid.
	The horizontal tilt-table tilts downwards to a vertical position.
	The crossbar moves down the tilt-table, inserting the plate into the drum.
	Once the plate is fully in the drum, the pressure roller and vacuum are applied to the plate to ensure that it fits tightly against the drum.
	The carriage moves across the drum and the laser images the job onto the plate.
	Once the job is imaged, the vacuum is released, and the crossbar moves back up the tilt-table, removing the plate from the drum.
	The tilt-table moves back to its horizontal position.
	You can now open the lid, remove the plate and process it (alternatively, the plate will be automatically unloaded through the rear cover, if the auto-unload feature is available with your system).

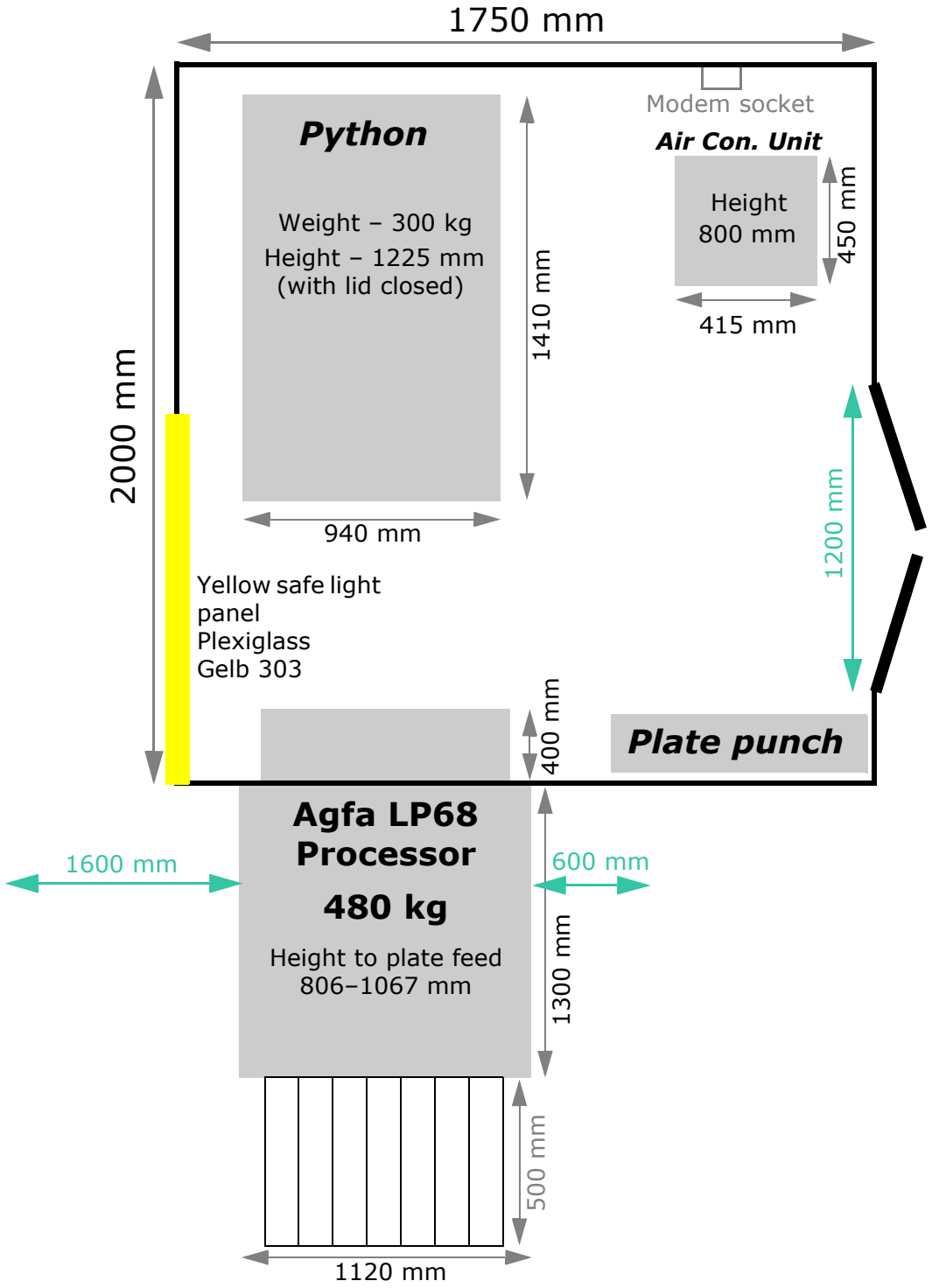
1.5 The Python workstation

The Python workstation is a high performance computer, which is supplied with all the software required to process jobs and output them to the Python engine. The workstation runs Windows 2000 and the following HighWater software applications:

Torrent RIP	HighWater's Torrent RIP (based on the Harlequin RIP) accepts incoming PostScript/PDF files from a page make-up workstation on the network and interprets them into bitmap TIFF files suitable for output to Python. Note: If you purchased a two-computer Python system, the Torrent RIP runs on the second computer, which can be connected anywhere on the network.
Q2 Output Controller	This queue management application automatically outputs TIFF files (from the Torrent RIP) to the Python engine.
Python Layout Tool	This lets you manually output TIFF files (from the Torrent RIP) to the Python engine.
Status Monitor	This shows the current status of the Python engine, for example, when it is idle, when the tilt-table is moving, during image processing, when an error occurs, etc.
Python Test Tool	This runs facilities to help test, and diagnose problems with the Python system. It also lets you check the laser power for your plates.
Low Res Generator (LRG)	This creates the low-res 'view' files used by Q2 and the Python Layout Tool.
Blackscreen	You can use this to darken the computer monitor when you are handling plates.
InkMonitor (optional)	This optional software application calculates the amount of ink required on the press.

1.6 Typical brightroom layout

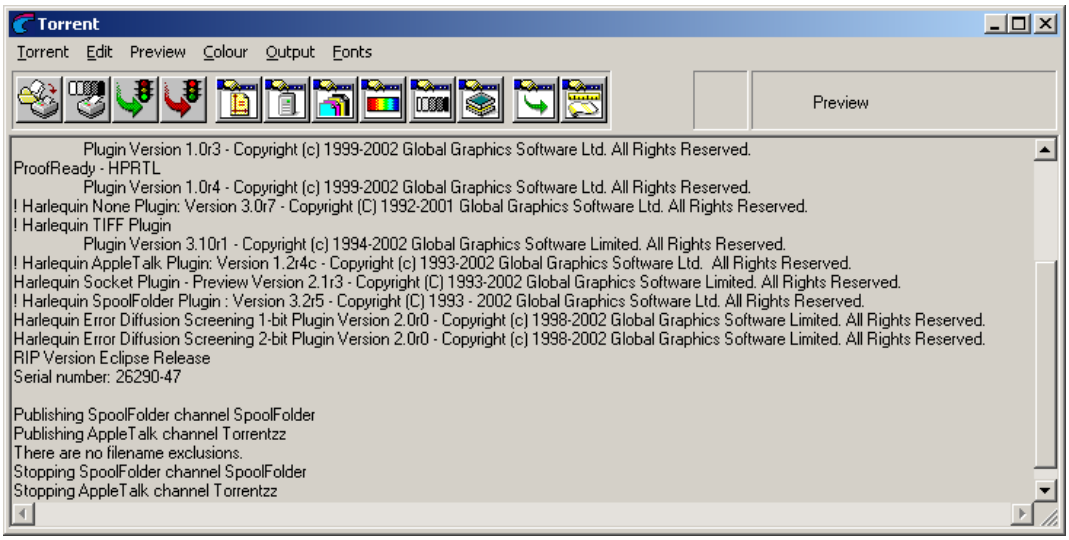
The plates used with the Python system are sensitive to the violet light of the laser diode, so they must be protected from this component of light. Therefore, you should operate the Python system in a brightroom with a yellow safe light. The typical brightroom layout below shows the operating and service access dimensions for Python:



2. USING THE TORRENT RIP

The Torrent RIP, which runs on the Python workstation, converts your PostScript and PDF files to bitmap TIFF files. Later, you output these TIFF files to the Python engine using either Q2 or the Python Layout Tool software.

Torrent's main window looks like this:



2.1 Setting up and printing to the Torrent RIP

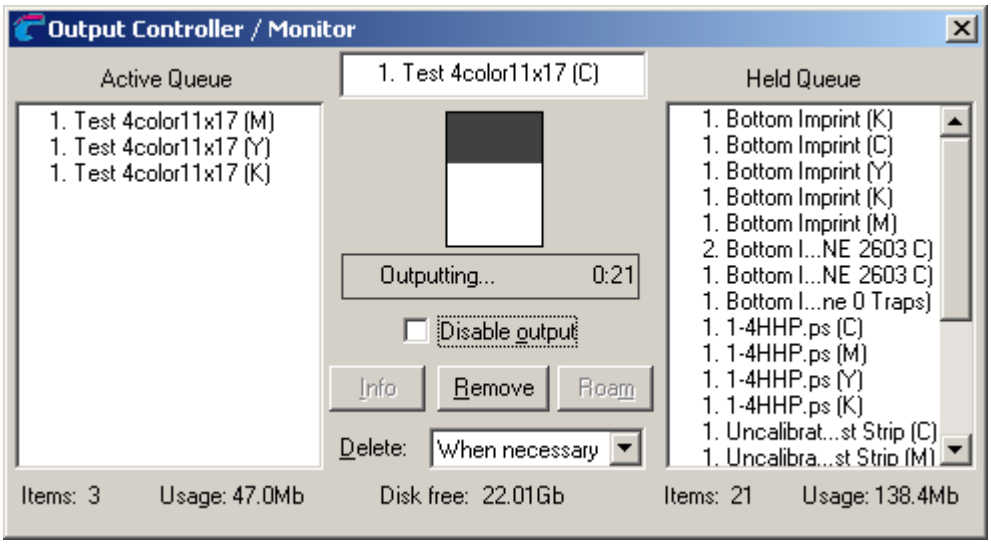
Before you can print to the Torrent RIP you need to create one or more 'Page Setups'. The Page Setup specifies the settings to be applied to a job (for example, the resolution, page size, orientation, scaling, screening, dot shape, and the device a job is to be printed to). Every different combination of settings requires a separate Page Setup.

Once you have created your Page Setups, you associate each one with an 'input queue'. The input queues let you send jobs across the network to the Torrent RIP. Once your input queues have been 'broadcast', they appear as virtual printers on your page make-up workstations on the network. You can then print jobs directly to these printers, and Torrent RIPs the job with the settings specified in the appropriate Page Setup. The job is then output as bitmap TIFF files ready for output to the Python engine.

2.2 Torrent's Output Controller

When you print a job to Torrent you can use its Output Controller to monitor and control the progress of jobs through the RIP.

Select **Output Controller** from Torrent's **Output** menu to display the Output Controller:



The Output Controller's **Active Queue** contains pages that are waiting to be printed. Pages listed at the top of the Active Queue are printed first.

The **Held Queue** contains pages that have already been printed, or you can move them there from the Active Queue to suspend them.

When a page is being printed, it is shown in the box at the top of the Output Controller between the Active Queue and the Held Queue.

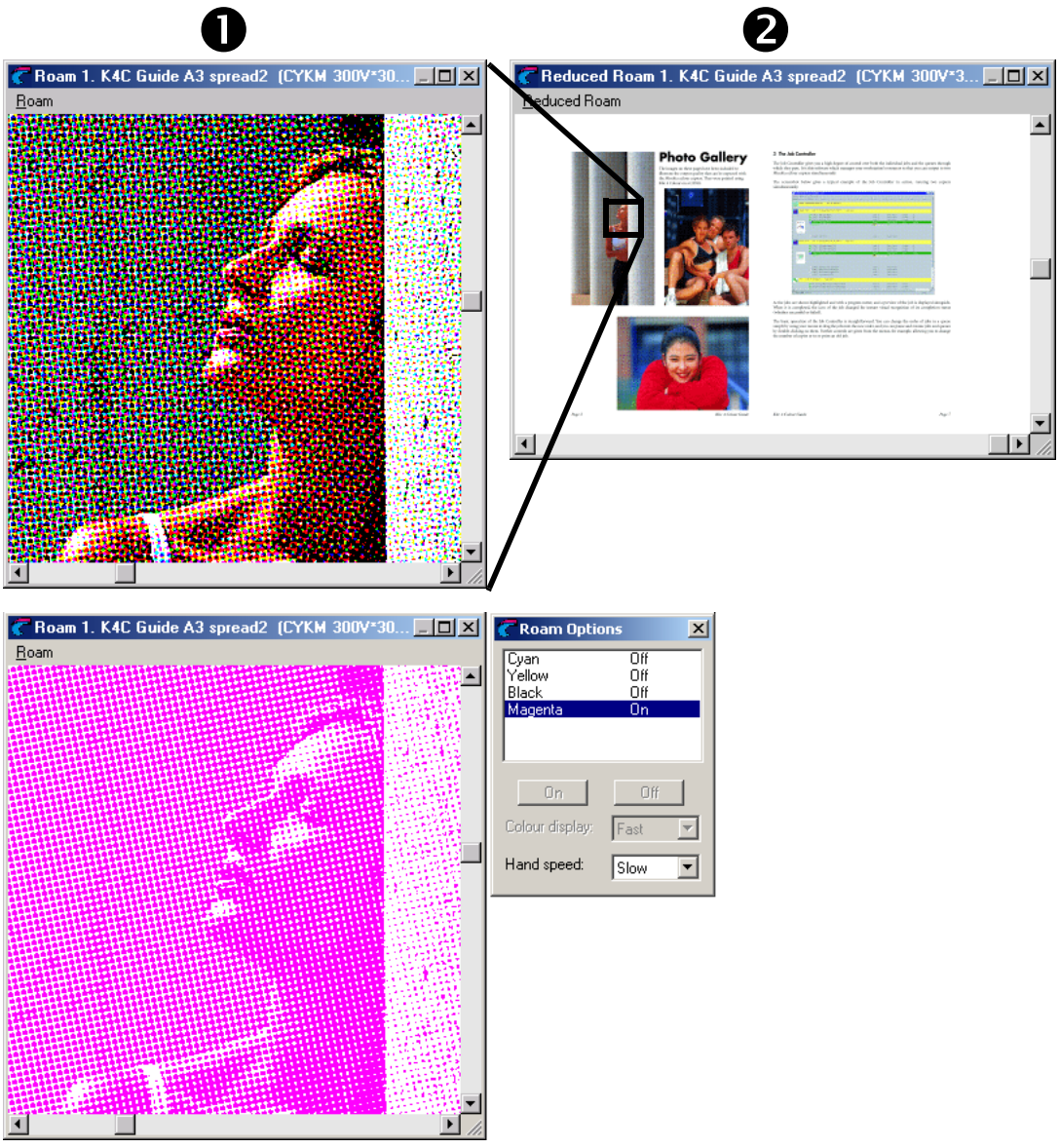
2.3 Previewing jobs on-screen

The Output Controller's 'Roam' facility lets you preview jobs on-screen before they are printed – for example, you may want to check that a job has separated correctly. You can view jobs at high or low resolution, and as a single separation or multiple separations together.

Note: You can also preview RGB, spot colours and greyscale, as well as CMYK separations.

Below, you can see the following job previews in Torrent's Output Controller:

1. A high-res preview with all separations (CMYK) shown.
2. The whole job ('Reduced Roam') with all separations shown together.
3. A high-res preview of the magenta separation only.



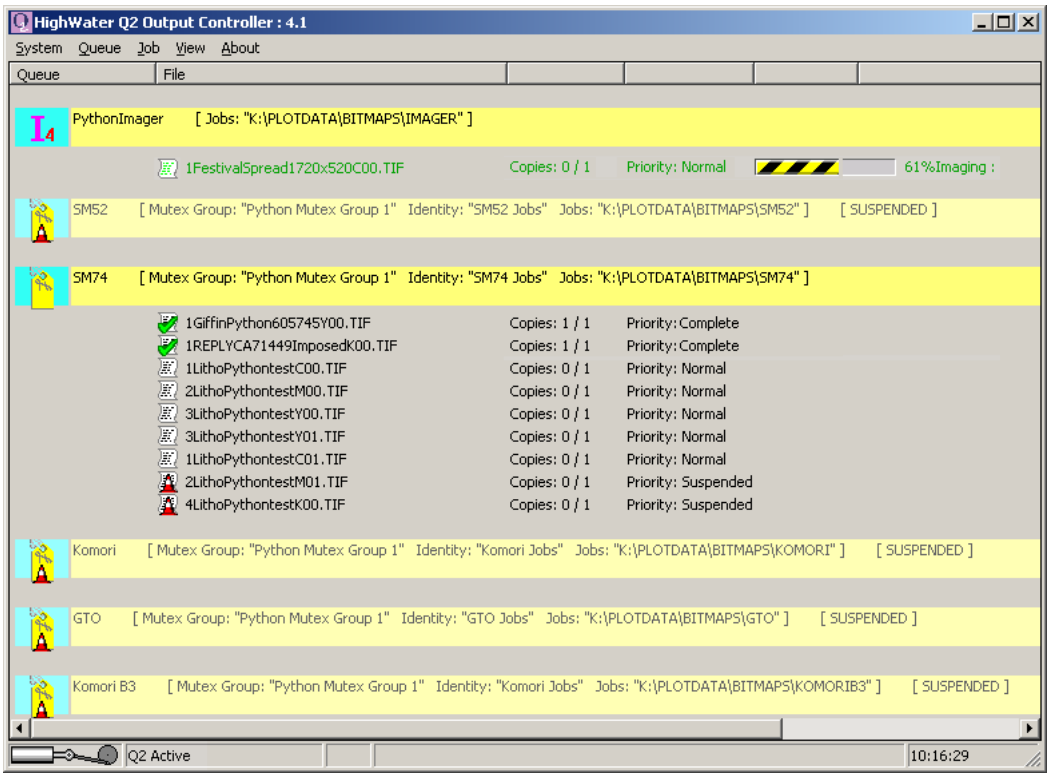
3. USING THE Q2 OUTPUT CONTROLLER

Once jobs have been output by the Torrent RIP as TIFF files they are ready to be output to the Python engine using the Q2 Output Controller.

Note: You can also use the Python Layout Tool to output jobs to Python. However, ideally you should use Q2 because it is more automated, faster, and requires minimal setup and initialisation when compared to using the Python Layout Tool.

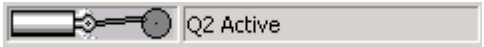
3.1 Q2's main window

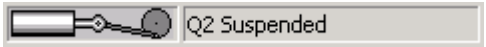
Q2's main window looks like this:



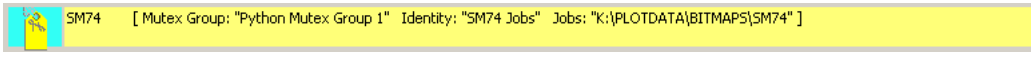
This window shows:

- **Q2's processing status** at the bottom of the window. This is either 'active' or 'suspended':





- **Queues.** Each queue is shown like this:



  The TIFF files that are output by the Torrent RIP arrive in the relevant queues ready for output to the Python engine (typically, each queue represents a different plate size). You activate a queue simply by double-clicking on it.

- **Jobs.** Each job is listed with a job status icon, the job name, the number of copies to

be output, its priority, and its current status.

You can activate and suspend jobs simply by double-clicking on them.

Each job has a 'job status icon', which is one of the following:

	Active job (green text) Settling/incomplete job (no text) Waiting job (black text)
	Job completed successfully
	Job suspended
	Job completed with an error
	Job aborted by user
	Job died, for example, the application or task disappeared

Job details (such as priority and how many copies to output) can easily be changed with a few mouse clicks or using the menu commands. You can also 're-queue' processed jobs so they can be re-output to the Python engine.

3.2 Outputting a job to the Python engine

Outputting a job to the Python engine is simple:

1. Activate the required queue and job, if necessary, by double clicking on them.
2. Make sure that the Q2 engine is active (if necessary, select **Resume Engine** from the **System** menu).
3. When the software asks you to do so, load a plate on the Python tilt-table and close the lid (see section 5.1 for details on loading a plate).
4. Q2 automatically outputs the job to the Python engine, with no further intervention required from the user.

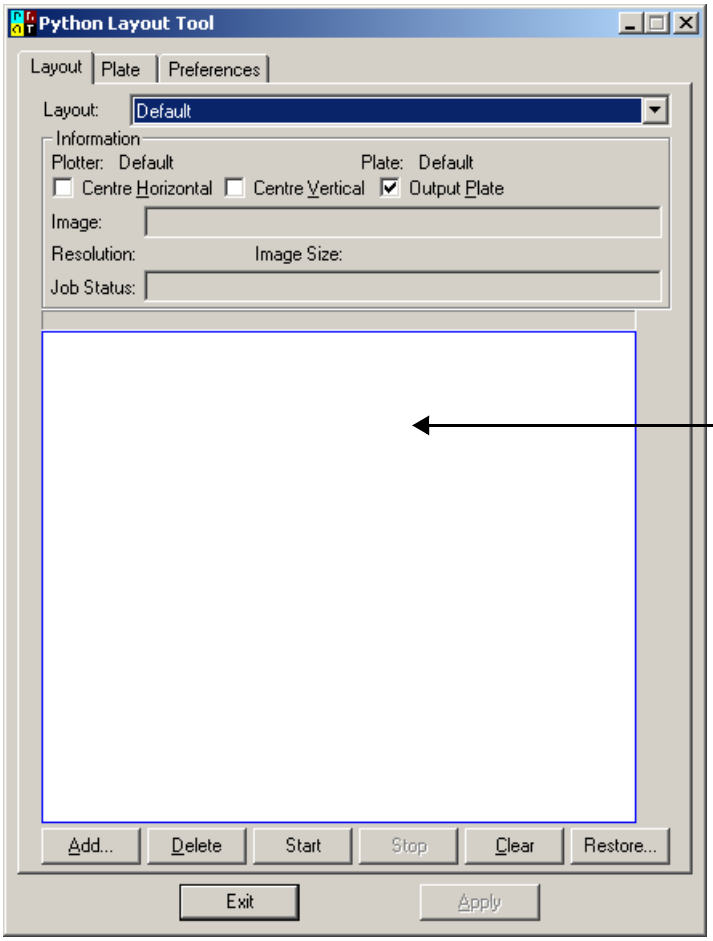
   Note: You can use the Status Monitor (see chapter 6) to view the progress of the Python engine as it outputs the job to plate.
5. Once the plate has been imaged it can be removed from the Python engine and processed.

   Note: If the plate auto-unload feature is available there is no need to manually remove the plate from the tilt-table.
6. When you are ready to output another job to Python, load another plate into the Python engine when requested and, if necessary, activate the required queue and job in Q2.

4. USING THE PYTHON LAYOUT TOOL

The Python Layout Tool provides an alternative to Q2 for outputting the TIFF bitmap files from the Torrent RIP to the Python engine.

The Python Layout Tool's main window looks like this:



4.1 The layout window

When you use the Python Layout Tool to output a job to the Python engine, you select a 'layout' which contains all the information needed to output the job correctly. Each layout contains the following information:

- The plate details (size, thickness and laser power).
- The position of the job on the plate.

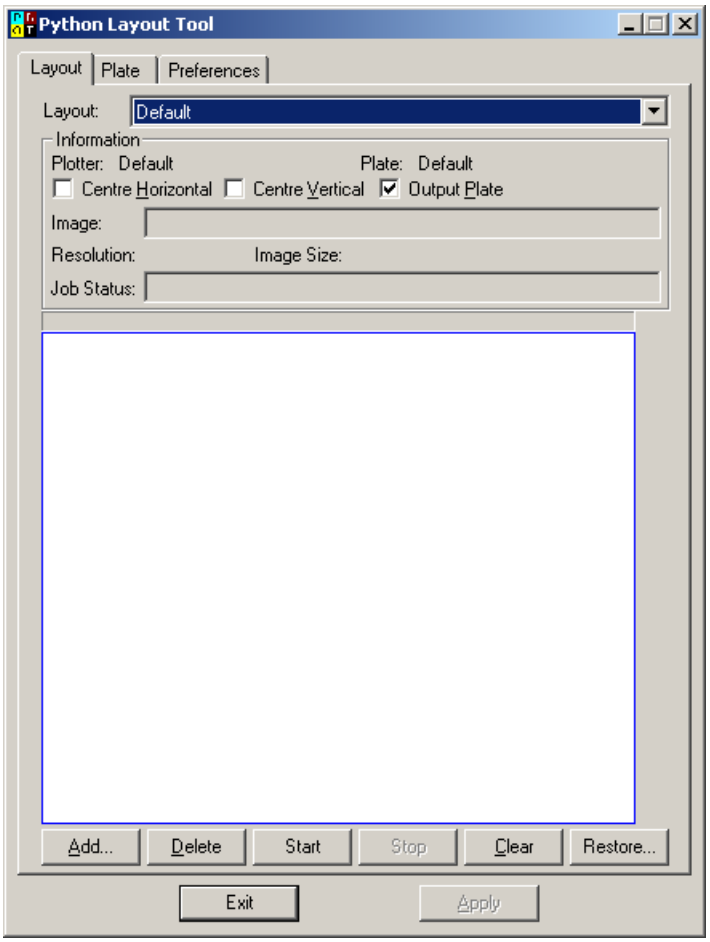
You can have any number of layouts, each one representing a different combination of these settings.

You use the Layout pane to select a layout, place a bitmap TIFF job, and then output it to Python, as described in the following sections.

4.2 Selecting a layout and checking its settings

To choose a layout and check its settings:

1. Click on the **Layout** tab to display the following window:



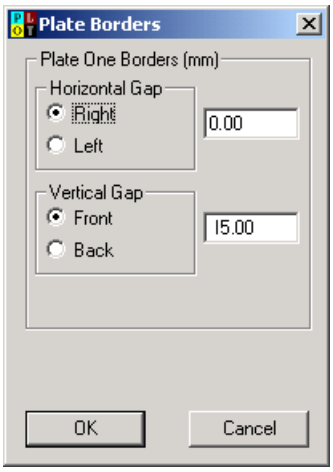
2. Select the required **Layout** from the pull-down list near the top of the window.
3. In the Information panel:
   - Check that the **Plate** name is correct.

     Note: To check the plate settings, click on the **Plate** tab. When you have finished, return to the Layout pane.
   - Select the **Centre Horizontal** and **Centre Vertical** options, if required.

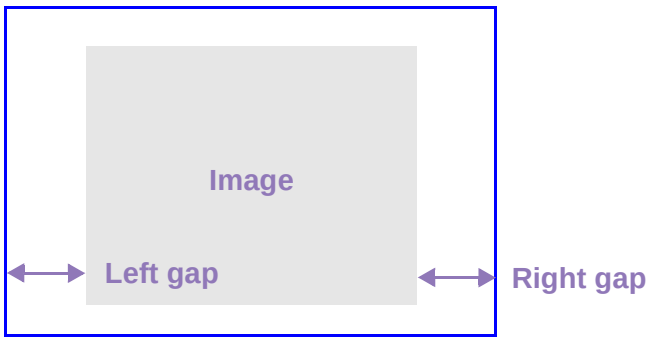
Setting the plate borders

To set the plate borders:

1. Right-click the mouse in the white layout area and select **Plate Borders...** from the pop-up menu. The following dialog appears:

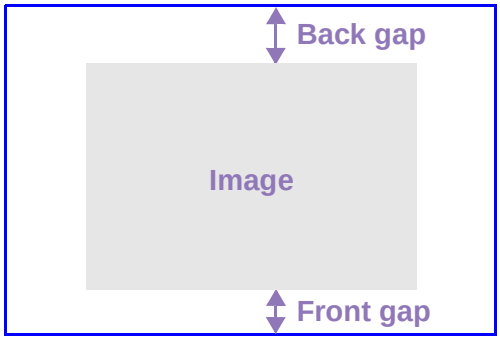


2. The **Horizontal Gap** setting specifies the amount of space between the right or left edge of the plate and the image. Set the **Right** or **Left** gap, as required.



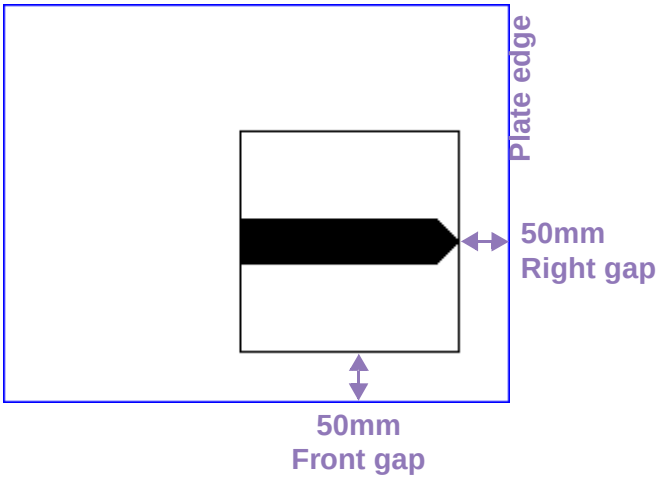
Note: Remember that Python can image right up to the edges of the plate in the horizontal direction so there is no need to set a horizontal gap.

3. The **Vertical Gap** setting specifies the amount of space between the top or bottom edge of the plate and the image. Set the **Front** or **Back** gap, as required.



Note: Remember that the **Front** gap must be set to take into account the part of the plate that is clamped (normally 15mm).

Example: If you set a **Right** gap of **50** mm and a **Front** gap of **50** mm, the image will be positioned thus on the plate:



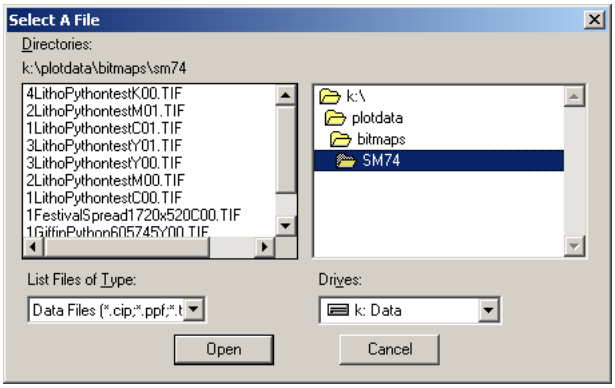
Note: The plate border settings are applied in addition to the **Centre Horizontal** and **Centre Vertical** settings to give more flexibility when positioning the image on the plate.

4. When you have finished, click on **OK** to close the Plate Borders dialog.

4.3 Placing a job on the layout

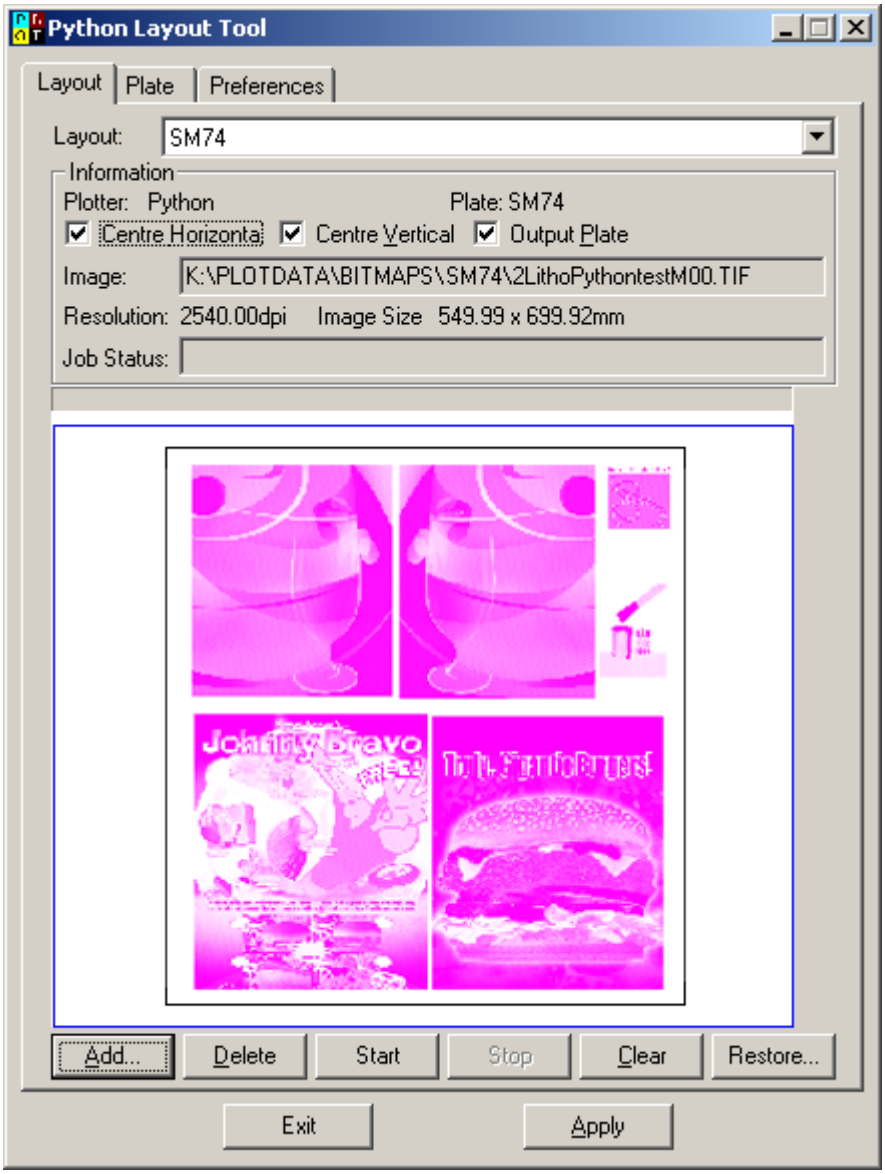
When the layout settings are correct you can place a job on the layout. To do this:

1. Right-click the mouse in the white plate area then select **Open File...** from the pop-up menu to display the following dialog:

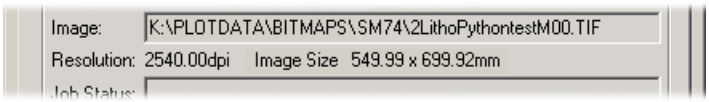


2. Locate and highlight the required TIFF file then click on the **Open** button.

3. A low resolution preview of the job appears in the layout window, for example:



4. If you place the mouse cursor over the job, the job's name, resolution and size are displayed in the Information panel:



5. You can view the job either as its separation colour (CMYK only) or as a grayscale image: right-click the mouse over the job, then select either **View Image In Grey** or **View Image In Colour** from the pop-up menu.

   Note: Spot and Pantone colours are displayed in black.

You have now finished placing your job on the layout. Outputting the job to Python is covered in the next section.

4.4 Outputting the job to Python

To output the job to the Python engine:

1. At the bottom of the Layout pane, click the **Start** button to output the image to the Python engine.
2. Set up the Python engine for output, as described in section 5.1.
3. As the job is output to Python, you will see a progress meter on the Layout pane, just above the job window.

   Note: You can use the Status Monitor (see chapter 6) to view the progress of the Python engine as it outputs the job to plate.
4. When the job has been output, carefully unload the plate from the Python engine and process it.

5. SETTING UP THE PYTHON ENGINE FOR OUTPUT

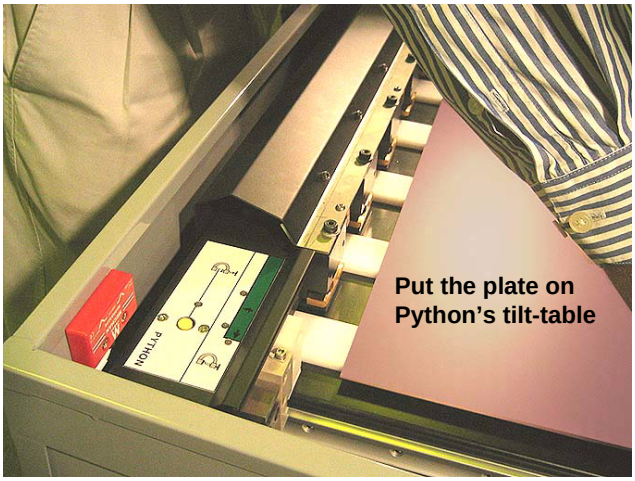
When you have set up either Q2 or the Python Layout Tool to send a job to the Python engine, you need to load a plate onto Python's tilt-table then close the lid. Python will then image the plate.

5.1 Loading a plate onto Python's tilt-table

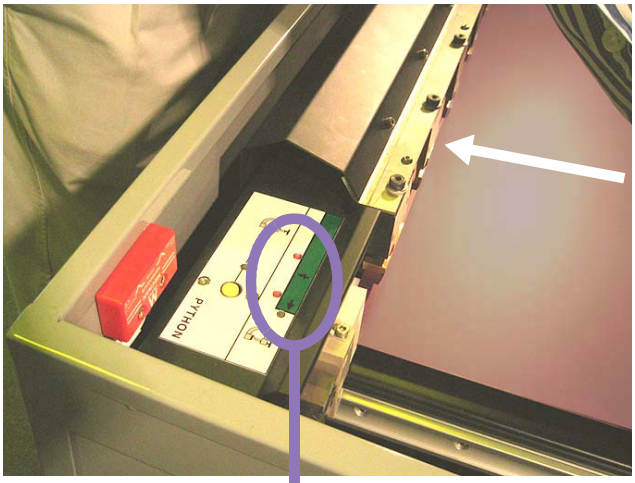
To load a plate onto Python's tilt-table:

1. Switch on the brightroom's yellow light, or other safety lights, and close the door.
2. On the Python workstation make sure that your job is ready to be output. Depending on which software application you are using:
   - Either enable the required queue and job in Q2 (see chapter 3).
   - Or set up the image for output in the Python Layout Tool and press the **Start** button (see chapter 4).
3. Wait until the software asks you to load a plate.

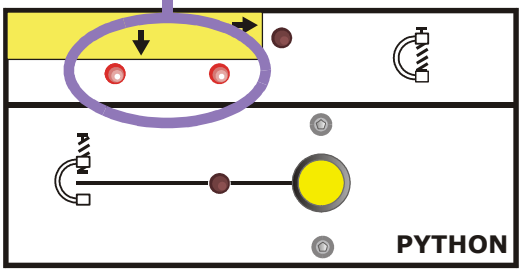
4. Open Python's lid and put the plate, emulsion side up, onto the tilt-table:



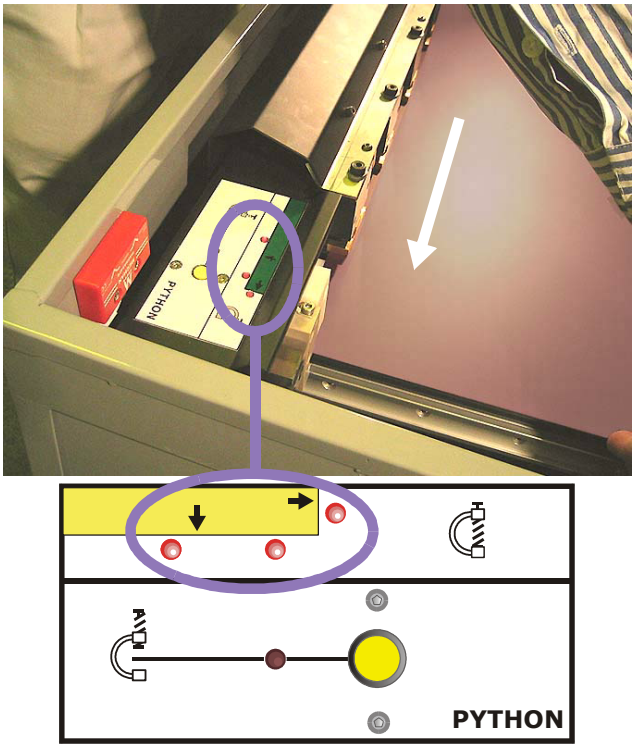
5. Pull the plate towards the front of the tilt-table until it contacts the two register pins under the clamp (the plate is in the correct position when the two left-most registration LEDs are lit):



Pull the plate forward under the clamp bar, and adjust its position until the two registration LEDs are lit



6. Carefully slide the plate sideways to the right until the plate makes contact with the third register pin:



Carefully slide the plate to the right and adjust until all three registration LEDs are lit

Note: Try not to move the plate back as you slide it to the right.

7. When the plate is in the correct position the third registration LED will light. Hold the plate in place until the clamp automatically engages.

   Note: If any of the three registration LEDs go out while you are positioning the plate, carefully reposition the plate until the three LEDs are lit, then the clamp will automatically engage.

8. When the plate is correctly clamped with all three LEDs lit, close Python's lid.

9. Now, Python will start its imaging cycle. The Status Monitor software shows Python's progress as it images the plate (see chapter 6).

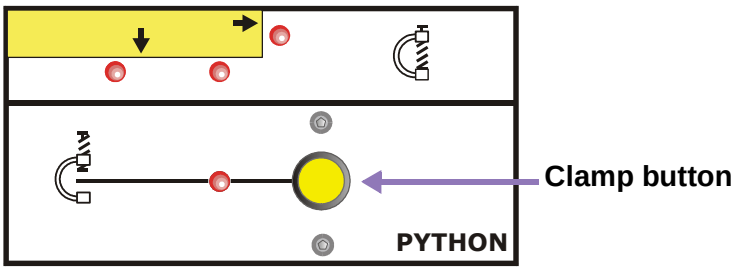
10. When Python has finished imaging the plate, you will see a message on the workstation. You can now unload the plate, as described in the next section.

    Note: If the plate auto-unload feature is installed, then there is no need to manually unload the plate.

5.2 Manually unloading the plate

If the plate auto-unload feature is not enabled on your Python system, then manually unload the imaged plate as follows:

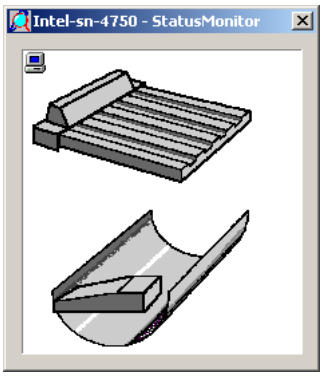
1. Make sure the plate will not be exposed to any light source that might fog it.
2. Open Python's lid.
3. Press the clamp button to disengage the clamp:



4. Carefully remove the plate from the Python tilt-table.
5. Process the plate.

6. THE STATUS MONITOR

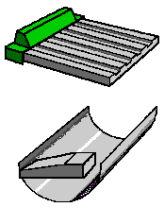
The Status Monitor software shows the activity of the Python engine. The images in the Status Monitor show when the Python engine is idle and what is happening at each stage of the plate imaging cycle. The Status Monitor's main window is shown below:



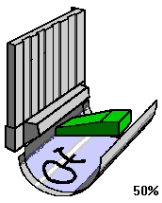
6.1 The Status Monitor's images

The Status Monitor uses a number of images to represent the various stages of the processing cycle, for both normal operation and error conditions. Some of the Status Monitor images are shown below.

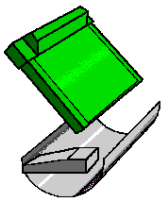
During normal operation



Clamp active
The clamp is active. A user is loading a plate into the clamp.



Expose 50%
(carriage flashing green)
The expose carriage is at the 50% imaging position.



Tilt-table half down
(tilt-table flashing green)
The tilt table is moving up or down.

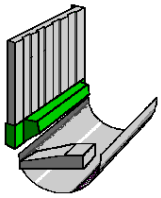
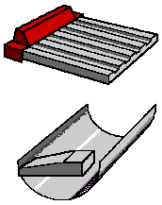
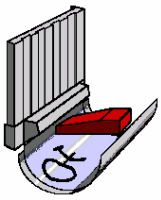


Plate loading
(clamp flashing green)
The clamp is active and loading the plate into the drum.

During an error condition

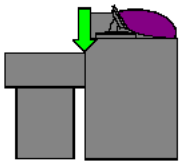


Clamp error
An error occurred while the user was loading a plate into the clamp mechanism.

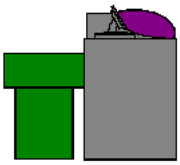


Expose error
An error occurred while the plate was being exposed.

Plate auto-unload images



At bridge
The plate is at the input to the bridge or processor.



Bridge busy
The bridge or processor is busy and unable to accept another plate. The engine will wait until the plate currently in the bridge or processor passes through and the device becomes available.

7. SAFETY

The Python engine, which incorporates a laser and moving parts, has been certified as complying to all necessary safety requirements. However, anyone installing, using or maintaining the Python system should carefully follow the safe working practices set out in this chapter, and in any other documentation supplied with the system.

During normal operation, Python is a Class 1 embedded laser product and the user cannot be exposed to the laser beam. However, once the laser carriage is removed, Python becomes a Class 3B laser product and appropriate safety precautions must, therefore, be taken.

7.1 Working safely with the Python system

When you are working with the Python system, you should always follow the recommended safe working practices set out below.

General safety precautions

Under normal operating conditions it is not possible to come into contact with the laser beam, even when Python's lid is open. However, all users/engineers must ensure that:

- All access doors to the Python room display the BSI-approved warning symbols.
- They have received training on safety procedures, as well as instructions on how to operate Python.
- When engineers are working on the laser, no-one enters the brightroom unless they are wearing safety goggles that meet approved standards.
- Python is never left in a condition where the operator can be exposed to the laser beam.

Protecting yourself from injury

- Make sure that nothing, especially your clothes, gets trapped in Python's lid.
- The edges of a plate are sharp so take great care when handling plates and, in particular, keep the edges of the plate away from your face.
- Make sure that you know how to switch off the Python system in an emergency (this is covered in the Python User Guide).

Protecting the Python drum and carriage from damage

- Do not put any object, other than a plate, on the tilt-table. When the imaging process starts, anything left on the tilt-table will fall down into Python's drum. This could damage Python's tilt-table, drum or carriage, or the plate.

Protecting the plate from being fogged by light

- In the brightroom, use the appropriate safety light (as recommended by the plate manufacturer) to prevent your plates getting fogged.
- While the brightroom is in use you need to prevent its door being opened. To do this, you could:
  - Use an external light on the brightroom to show when it is in use.
  - Put a message on the door to indicate that the brightroom is in use.

    Warning: For safety reasons we recommend that you DO NOT lock the brightroom door.
- If the workstation monitor does not have a yellow filter you can use the **Blackscreen** utility to darken the monitor when there is a danger that plates or other light-sensitive media being used nearby could be exposed to its light.
- After output, protect the plate from unsafe light sources until it is processed.

Protecting the plate from contamination

- When you attach or remove a plate from Python, avoid touching the part of it that will be exposed. You can wear special lint-free gloves to avoid getting fingerprints on the plate.
- Regularly inspect the tilt-table and surrounding area for dust and other particles. Keeping the table dust-free and clean will ensure that you maintain the highest plate quality.

Protecting your system from data loss or corruption

- When you have finished using Python you must always shut down the system properly to avoid losing or corrupting data on the Python workstation.

8. PYTHON – VITAL STATISTICS

This chapter provides plate and other Python information.

8.1 Plate information

The Python system supports the following plate types:

PLATE	POS/NEG	FILTER FITTED	PLATE TYPE
Agfa Lithostar Plus LAP-V / Ultra-V	Positive	Yes	Silver
Agfa Lithostar N91V	Negative	Yes*	Photopolymer
Mitsubishi Silver Alpha V	Positive	Yes	Silver
Fuji Film LP-NV	Negative	No	Photopolymer
Lastra P-LV-2	Negative	No	Photopolymer

*This is a 0.4D filter, which is different to the filter used for the Agfa LAP-V and Mitsubishi Alpha V plates.

Note: If you are considering changing the type of plate you use on the Python, the filter may need to be changed or removed. Please contact HighWater Designs or your support provider for more information about this.

More plate information

Plate thickness	0.15–0.3 mm
Grip area	15 mm at front edge of plate (please note that the grip area does not get exposed)
Imaging resolution	2540 dpi / 100 dpmm at 150-200 lpi
Spot size	10 microns

Positive and negative working plates

Plates may be exposed in two different ways:

Negative working plates

The laser exposes parts of the plate which will be inked on the press.

Positive working plates

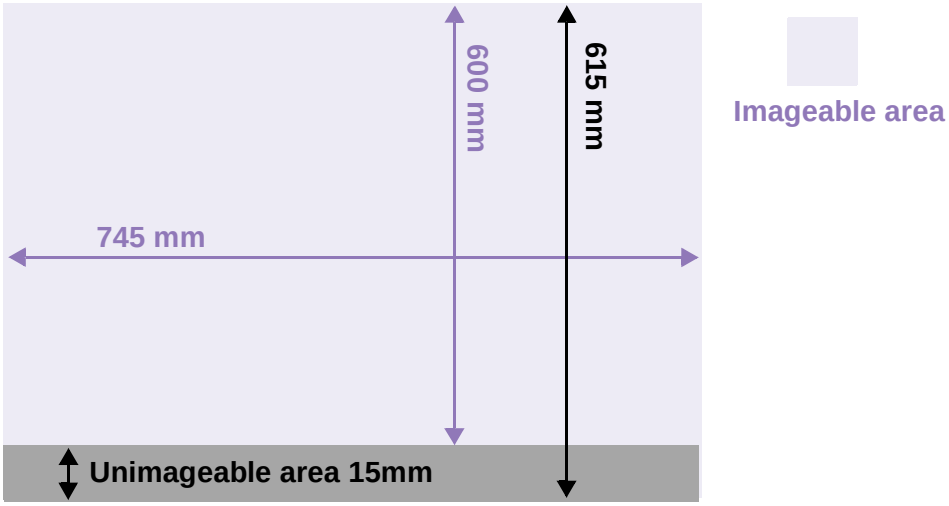
The laser exposes parts of the plate which will NOT be inked on the press, so all positive working plates are exposed right up to the edges in the horizontal direction (←→).

In either case, the physical appearance of the plate to go on the press is the same (positive image, right reading) apart from the unexposed grip area.

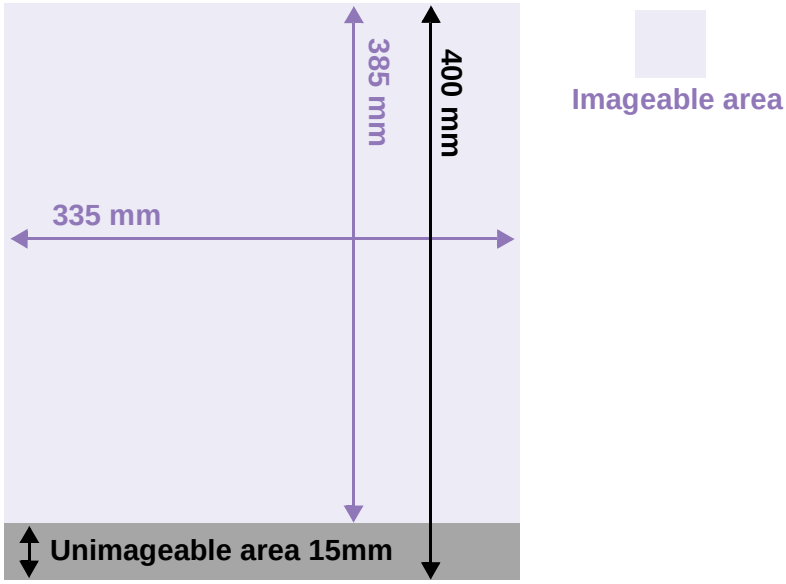
8.2 Plate sizes

The Python engine accepts all plates between the following sizes:

- **Maximum size:** 745 x 615 mm (maximum expose area: 745 x 600 mm):



- **Minimum plate size:** 335 x 400 mm (maximum expose area: 335 x 385 mm)



Python supports **all** plate sizes between the minimum/maximum sizes, including (but not limited to) the following plates:

Press size	A4 pages on plate*	Paper size
Hamada B452	2 up	A3
Heidelberg GTO 46	2 up	SRA3
Heidelberg GTO 52	2 up	A3
Heidelberg MO	4 up	SRA2
Heidelberg SM52	2 up	A2
Heidelberg SM72	4 up	B2
Heidelberg SM74	4 up	B2+
Komori 20	2 up	A3
Komori 26	4 up	B2
Komori 28	4 up	B2
Ryobi 34	2 up	SRA3
Ryobi 52	2 up	A3
Ryobi 75	4 up	B2+
Sakurai Oliver 52	2 up	A3
Shinohara 52	2 up	A3

* You need imposition software to group multiple pages together

8.3 Python laser details

Laser source	Violet diode laser, 60 mW, 405 nm
Imaging resolution	2540 dpi (100 dpmm)
Spot size	10 microns

8.4 Python engine measurements

Height	1225 mm
Bed height	900 mm
Footprint	1410 x 940 mm (w x d)
Weight	300 Kg
Weight when crated	410 Kg
Crate dimensions	1610 x 1100 x 1420 mm (w x d x h)

9. HIGHWATER DESIGNS' PROFILE

The HighWater group designs, develops and markets digital integration products for the electronic publishing and graphic arts industries. Established in the UK in 1987 with the formation of HighWater Designs Limited, the group's growth and success reflects the quality and integrity of its products. Today, the HighWater group generates an annual turnover in excess of £6m through a comprehensive worldwide distributor network.

The parent company develops leading-edge technologies for handling digital colour images within pre-press PostScript systems. Through global partnerships with major OEMs and dealerships in the pre-press market, HighWater's creative design team develops practical solutions for CtP, scanning, RIP, graphic manipulation and interfacing. With hardware and software products for all platforms, HighWater allows its customers to fully exploit and extend their existing investment in pre-press systems.

In addition to the Python, Torrent and Q2 Output Controller products, HighWater's products include:

- PixelProof – ROOM solution (RIP Once Output Many) colour proofing.
- iColour and Torrent ProofReady – colour proofing for the pre-press environment using Torrent's extensive colour management capabilities.
- Torrent Connect – PCI single board interface for all major imagesetters.
- InkMonitor – ink duct reporting software which calculates the ink coverage of a plate from a bitmap file generated by a RIP.

10. USEFUL CONTACT DETAILS

HighWater Designs

Support department:
Tel: 01242 542102
support@highwater.co.uk
www.4hws.co.uk

Sales department:
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www.highwater.co.uk

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Amari Plastics Limited (UK Distributors)
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Albert Road, St Philips
Bristol
BS2 OXJ
Tel: 01179 723900

Yellow Rooms
Stroud Office Interiors
Alder House
Inchbrook Trading Estate, Woodchester
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Tel: 01453 834867
Contact: Derek Osborne

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Encapsulite International
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