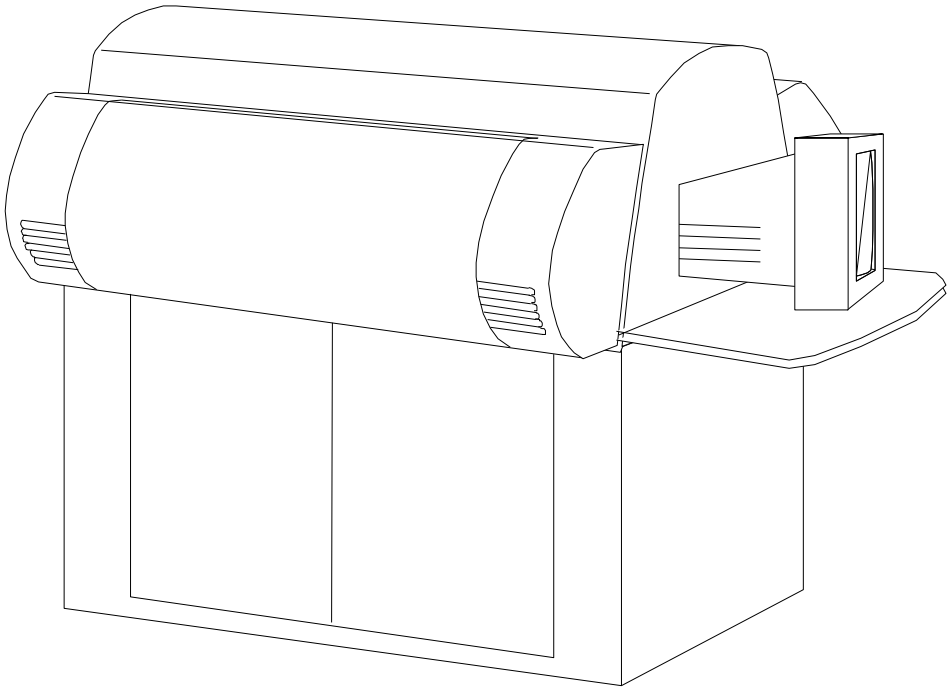
# ZBE CHROMIRA PRINTER

*User's Manual*



Breakthroughs happen...

# CHROMIRA MANUAL CONTENTS

# INTRODUCTION

Congratulations on your Chromira™ purchase! Chromira™ marks the beginning of a truly new generation of large format RA-4 digital printing technology. Designed to be one of the most affordable printers in the world, ZBE's inherently reliable LED-based technology will bring you years o profitable state-of-the-art large format digital RA-4 imaging.

Chromira will provide you ultra efficient productivity through ZBE's unique workflow system, which employs "Chromira Workstation" software. Chromira Workstation offers a user-friendly suite of integrated features that makes the Chromira digital imaging system one of the most productive digital solutions available from beginning to end. With this system, there are no "front end" bottlenecks. Whether you have 20 workstations or just one, print jobs can be submitted and prioritized from any workstation on the network. With a system that requires no front end operator, Chromira can deliver continuous, unattended imaging 24 hours / 7 days a week.

Other productivity enhancing features of Chromira Workstation include intelligent user-defined prioritized image nesting for minimal paper waste, Real Time Interpolation for sizing and rotating jobs on the fly, and ICC Profiling to allow the user to apply a profile directly to an image while Chromira prints. In addition, Chromira's advanced sharpening function does away with the lower color fringing created by many printers, making images look more natural. Chromira Workstation also has built-in image controls like precise image sizing, rotation, border creation, add crop marks, and convenient global corrections for color, density, or contrast manipulation.

Adding affordability to Chromira's other attributes makes Chromira a profitable investment. It images on cost-effective RA-4 photographic materials to yield low material costs with high profit margins and it reduces labor costs so that a highly trained dedicated technician is unnecessary. Furthermore, cost of acquisition and cost ownership is a fraction that of competing products, offering a significant competitive advantage over imaging systems.

In addition, Chromira offers an open architecture system and does not require expensive, dedicated RIPs. Chromira printers can utilize any RIP that outputs an RGB TIFF, with seamless and automatic integration into an existing RIP's workflow. This means that operators can select the RIP solution that best meets their needs and budget.

Chromira™: Made for affordability, productivity, quality, and reliability. ZBE thanks you for choosing Chromira for your digital imaging needs.

**Chromira™: The Best Printer in the World, by Design.**

# ABOUT ZBE

ZBE was founded in 1980 by Zac Bogart to design camera and motion control systems for special effects that have been used in many feature length motion pictures, including: "The Right Stuff", "Star Wars", "The Twilight Zone", "Top Gun" and others, as well as hundreds of animated short films and television commercials.

In 1985, ZBE developed a line of photographic laboratory equipment controls. These products provide higher quality control and increase production efficiency in professional color processing labs.

In 1990, ZBE developed the CC Reader Color Calibrator for color light sources. Thousands of CC Readers have been sold worldwide.

In 1991, ZBE developed the VC-CLS Light Source for variable contrast B&W printing. It is highly acclaimed in the field of Fine Art printing and is used by some of the world's most famous photographers.

In 1992, ZBE developed the Starlite 55 Colorhead. The Starlite 55 has gained the reputation of being the brightest, and fastest, professional color light source available.

In 1994, ZBE developed the Sentinel Auto-focus Enlarger. The Sentinel is known for being the fastest professional enlarger available.

In 1996, ZBE developed the ColorPro Automatic Color Analyzer. The ColorPro sets a new standard for automatic color analysis in the field of custom photo enlarging.

In 1997, ZBE released the Satellite 3-D Digital Scanning System. The Satellite is the first scanning system with the ability to scan all types of images from small films to large three-dimensional objects.

In 1998, ZBE introduced the Chromira Large Format RA4 Digital printer. Chromira marks the beginning of a truly new generation of large format digital printing technology. By doing away with expensive and finicky lasers, the new technology in Chromira brings large format direct digital RA4 printing into a price range for everyone.

Today, ZBE is the world leader in innovative products to meet your needs.

Our corporate headquarters in Santa Barbara, California houses our state-of-the-art manufacturing plant, our software development group, and our technical support and training team, as well as our sales and management staff.

Please come and visit us for a complete facility tour.

Remember, ZBE makes Intelligent Products for Intelligent Choices.

# GENERAL SPECIFICATIONS

**Material Size:** Roll to Roll, with width up to 30” and length up to 275’. Loading or unloading time: less than 1 minute.

**Materials:** RA4: Paper or Film.

**Print Sizes:** 30” x continuous. Image files scaled on-the-fly to any desired print size.

**File types:** TIFF (Mac or Windows) or Windows BMP. Open interface from RIP.

**Physical:** 64” L x 36” W x 60” H (162cm x 91cm x 152cm). Access required on 3 sides, desirable on all four. Will fit through 30” (76cm) door, by removing top of cabinet. Weight: 350lb. (159Kg) est. Daylight operated. Darkroom loading.

**Connections:** 120/230VAC, 1000 W. Network connections 10base T or 100base T. Compressed air (60-100 psi).

**Platform:** Windows NT (embedded in printer).

**Print Head:** LED Technology (Patents Pending).

**Resolution:** 300 PPI; 425 PPI visual resolution with ZBE’s proprietary *Resolution Enhancement Technology* (Patents Pending). Color Depth: 36 bit.

**Speed:** 5” per minute for 30” paper, depending of file size and degree of enlargement or reduction. Image scaling, rotation & color balancing performed “on-the-fly” while printing.

| | | |
|---|---|---|
| Eq: | 112 | 8x10 prints/hr from 30” material. |
| | 15 | 20x30 prints/hr from 30” material. |
| | 7 | 30x40 prints/hr from 30” material. |
| | 62 | square feet per hour. |
| | 2 | 100 ft rolls per 8 hr. shift |

**Throughput:** Operation of the printer workflow is highly optimized for maximum print throughput and fully unattended operation. The usual “front end” bottleneck is eliminated by removing the “front end”. Each workstation on the network now has full control of the usual “front end” functions.

Print files may be printed from any location on the network. No machine operator is required for printing. Printing begins immediately and proceeds as the file is received over the network. The print file need not be fully received at the printer to begin printing. At worst, network delays will cause the printer to pause with no resulting artifact in the print and no loss of print quality.

The user interface for submitting jobs and controlling printing parameters is refined for high throughput and particular ease of use. Each workstation submitting jobs to the printer can control all printing parameters as well as monitor the queue of work being printed.

Throughput, Cont'd: Each workstation has full control of: print size, image rotation, print job priority, borders, text notes on prints, color balance, and number of prints.

Multiple Chromira printers are supported.

Open System: Compatible with all commercial RIP packages. Dedicated RIP is NOT required. Compatible with any off-the-shelf color management software.

Sophisticated built-in Self-Diagnostics system.

Optional Automated print cutter. Automates cutting of package prints and nested individual prints from roll.

Notes:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by ZBE, Inc. can void the user's authority to operate the equipment.

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ZBE, Incorporated's Chromira Digital RA4 Printer and its assembly parts were determined to conform with the European Community norms. The Chromira was approved in all testing and evaluations necessary to verify compliance with the applicable requirements of UL 1950, CSA 22.2 No. 234, EN 60950 following the directive of 73/23/EEC, and of EN 50081, EN 5022, EN 50082, and EN 61000 following the directive 89/336/EEC. This was determined by the Communication Certification Laboratory (CCL), Salt Lake City, Utah, United States.

Warning: Do not access imaging mechanism when printing is in progress. Do not touch printing mechanism with hands or other objects when machine is in use.

# GETTING TO KNOW CHROMIRA

## Introduction

### *Ø Software*

This next section is meant to familiarize you with the Chromira Printer's software system. This system is comprised of three programs:

*Chromira Printer* Controls all internal operations of the Chromira machine. Performs all actual image data processing. Manages the print job queue, under the user's direction from Chromira Workstation.

*Chromira Workstation* Main user-interface. Functions as "front-end" for submitting work to the Chromira printer and for monitoring the queue from anywhere in the network.

*Chromira Balance* Allows user to calibrate the machine to get optimal color balance and print quality.

Each of these three programs will be described in more detail. The data flow between these programs, and the networking issues associated with them, will be discussed after.

# THE CHROMIRA SOFTWARE

## Chromira Printer

The *Chromira Printer* program, which controls the mechanical movements and electronic activity of the machine, runs only on the computer installed in the Chromira itself. It handles all of the image data processing as well as the print management, maintaining a queue of jobs to be printed. The user's control of this queue is executed through the use of *Chromira Workstation*, which is detailed later.

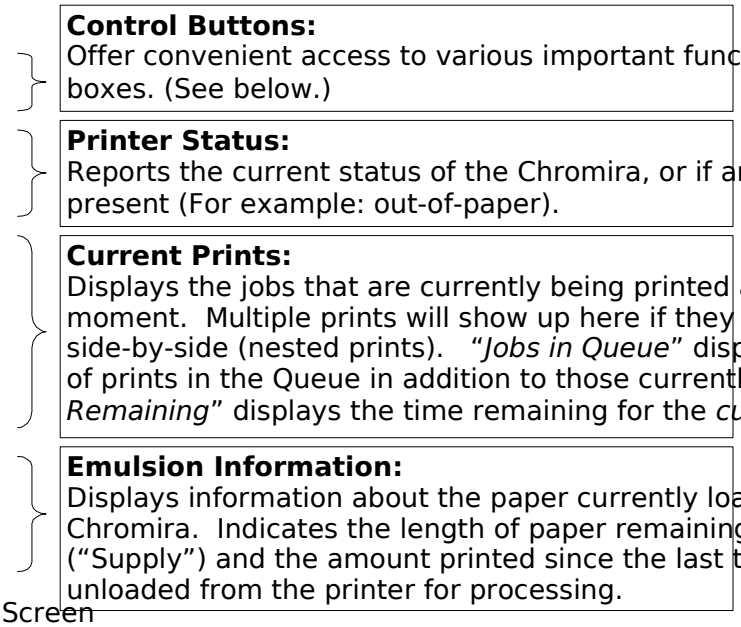
### *Starting it up*

When you first start the Chromira Printer program (Chromira Printer.EXE), a start-up self-test screen will appear and will run through a comprehensive battery of tests. If all is well at the end, the Chromira Printer's main screen will appear. If there are any failed self-tests, the self-test screen will remain, indicating them in red.

***Note:*** If there is no paper loaded in the Chromira, the "Tension Paper Test" will fail. This is normal. Simply click Finish to close the self-test screen and proceed to the main screen of the Chromira Printer program.

## *The Chromira Printer Main Screen*

This is the main operations screen of the *Chromira Printer* control program. This is the screen that will be displayed most of the time while the machine is in use or standing by. The various parts of this display are described here in more detail.




The **Chromira Printer** Main Screen

Control Button Descriptions:

Stop Print: This button will immediately pause printing action when clicked. A dialog box will be displayed, giving you the choice of either continuing the current print or canceling it.

Online / Offline: Like a standard desktop printer, this button toggles whether or not the Chromira will continue to print after the current print (if any). This can be thought of as a "hold-the-queue" button.

Emulsions: This displays the Emulsions Dialog Box, which allows you to select or modify emulsion files. By keeping Emulsion Files, the Chromira can keep track of different RA-4 materials. This function is described further in following sections.

Preferences: Displays the Preferences Dialog Box, where you can set various aspects of the Chromira's behavior.

Test Print: Places a Chromira Test Image into the print queue. This is the Calibration Image that you will use to calibrate the Chromira for optimal print quality.

Diagnostics: Displays the Chromira's Diagnostics Dialog Box, which allows you to run an array of comprehensive Self-Tests and other diagnostics routines.

Next, we will look at the various Dialog Boxes that allow changes to the Chromira's preference settings, and at the Emulsion files that allow Chromira to track different types of photo material.

## *The Chromira Printer Dialog Boxes*

In this section we take a look at the various dialog boxes available in the Chromira Printer software. These boxes allow us to modify various settings, such as those pertaining to the type of papers we use in the Chromira.

### *The Emulsion Dialog Box*

The Emulsion dialog box allows the user to select the type of photo material to be used in the printer. The Chromira can accommodate any number of different RA-4 type materials. Each material's settings are held in an "Emulsion File" (.EMU extension) on the Chromira's hard disk. This dialog box allows us to make changes to these files, and copy them for use with new emulsions.

The various parts of this box are explained below.

Emulsion File:
The Chromira Printer uses Emulsion Files to keep track of the different materials that are used in the printer. These files are saved in the Chromira Printer folder on the computer's hard disk with a ".EMU" extension. Each material gets its own Emulsion File, which holds all of the calibration information for it associated material.

Clicking the Browse button next to the Emulsion File readout will prompt you to select an Emulsion File. From the file browser window, you can copy an existing emulsion file to use as a starting calibration for a new material.

(Any blank area in file list)

To copy a file, use the right mouse button to click and drag an existing EMU file to a blank part of the file list. Click once (with the left mouse button) on the new file to re-name it. *Note:* be sure to include the ".emu" extension, or Chromira Printer will not recognize the new file.

Emulsion Profile:
The Chromira Printer can accommodate color profiles for precise color management of your printed output. If you use color management, and have a color profile for the Chromira, you can select the color profile that is to be used with all prints from this particular emulsion. You can do this by clicking the Browse button next to the Emulsion Profile readout, and selecting an ".ICM" Color Profile file. When first starting out with the Chromira, it is not necessary to use color profiles.

Material Name or Emulsion Comment:
This field is simply a comment area that can be used to name the material this file represents. This is the "Emulsion" name that appears in the main screen of the Chromira Printer program. You can type any words here that you wish, usually a description of the material, and perhaps the emulsion batch number from the particular roll you are using.

Other Emulsion Information:
These settings are important for the proper functioning of the Chromira and it's calibration system when using a given material. The fields are as follows:

*Width:* The width of the physical roll of material, in inches.
*Emulsion In/Out:* This setting tells the Chromira which way the material is wound on its core. It is important for the machine to know which direction to turn its cure hubs when tensioning the paper.
*Material Type:* Tells the Chromira what type of material the emulsion is: regular Paper, Transmission Film, Clear, etc. The Chromira's calibration system uses this information for optimal performance.
*Supply:*Indicates the amount of paper still remaining on the roll, in feet.
*Exposed:* The amount of paper that has been exposed. This number can be reset at any time from the Emulsion dialog box, or the main screen of the program. This number, if it is reset to zero each time prints are unloaded from the Chromira for processing, will indicate the amount of paper waiting for processing at any give time.
*Material Brand:*Tells Chromira the name of the roll's manufacturer.

Color Settings:
Each Emulsion File can store color offset settings to make different materials print the same color, given the same image file. These settings are usually automatically set by the Chromira's Calibration system, but you can make manual adjustments as well. The units are in standard CC's as measured on the print using a densitometer (like the X-Rite 810, etc.).

The color names indicated on the window tell you how the print will be affected. Change the color settings by clicking a color's up/down arrows in each channel. For example, clicking the up arrow in the *Cyan/Red* box will increase the cyan in your print.

### *The Preferences Dialog Box*

The Preferences dialog box allows you to set various operational settings for the Chromira. Some of these preferences will be important for the Chromira to fit into your working environment.

The settings are explained below.

Printer Name:
This field simply allows you to assign a name to this individual Chromira Printer. This is the name that appears for this printer when selecting among multiple Chromira printers from the Chromira Workstation program.

Printer Width:
This is the physical width of the Chromira, in inches. This number will generally be either 30 or 50, depending upon the size of Chromira you have.

Paper Edge Offset:
This is a number that allows you to adjust where the image is printed on the paper. Change this number if your images are being cut off along the left-hand edge of the paper (image too far to the left on paper), or if you consistently see a white strip along the left edge (image too far right on the paper).

The Paper Edge Offset number is in printer pixels, 100 per inch. The Calibration Image that is used for the Chromira's calibration has a scale at the left end of the image. This scale can be used to determine how much to change this number if your prints are not positioned properly on the page.

Width Scale / Length Scale:
Allows the operator to adjust the width or length of prints if the scaling is not correct.

Air Off Option:
This function turns off the air. The air will automatically shut off after the machine sits idle for a specified amount of time, as determined by the operator.

Pause Alarm:
Alarm sounds and pop-up window appears to notify the operator that the printer has paused.

Queue Empty Alarm:
Alarm sounds and pop up-window appears to notify the operator that the printer has an empty print queue.

Diagnostic Data Logging:
When checked, the printer creates a log of all software functions. This feature should only be turned on when instructed to by an authorized ZBE technician.

Reset Exposed Footage on Reload:
This function will reset the exposed footage anytime the machine has been reloaded.

Automatic Screen Blank When Door Opened:
With this feature checked, the Chromira monitor will blank to a dark screen when any of the paper access doors are open.

Automatic Screen Restore When Door Closed:
With this function checked, the Chromira monitor will to restore to its normal function when both of the paper access doors are closed.

Start Chromira "Online":
If this function is checked, the printer will automatically start printing anything ready in the print queue once the Chromira Printer Program is launched and the opening Diagnostics are run.

Audio Prompts:
Allows for audio when checked.

Low Paper Warning:
Warning message will notify the operator when the machine is low on paper.

Automatic Paper-Straightening:
With this function checked, the machine will drive the paper back and forth 2 times with a distance of 24 inches to allow the paper to straighten itself. After, the paper will be returned to its original position so no paper is wasted.

Print Info Customization:
Users can customize the data line. Following is a brief explanation of how to use it. Print Info Customization is located in the Printer application. Click on the Preference icon located in the center of the icon bar. Once opened, look to the bottom of the window. You will find the Print Info button. Click on it. See Diagram A for description of each item in window.

1. Optional Fields: This cell contains all the fields the operator can choose from.
2. Selected Fields: All items in this cell will print on the data line. The operator can add or remove by highlighting the selection and then clicking on the "Add" or "Remove" button. The operator may also change the order by highlighting the selection and clicking on the "Move Up" or "Move Down" button.
3. Preview: You can view the data bar by clicking on this button.
4. Settings: This function allows the user to set the size of the Print Info line.
5. Color Bar: Selecting this will print a gray and color gradient in the Print Info.
6. Remove Paths from file name: Selecting this will print file name only.
7. Add Thumbnail: Selecting this function will print a thumbnail of the image in Print info line. You can control the size by entering it in.

8. Lab Logo: Selecting this function will allow the user to add their own logo to the Print info. The file must be a TIFF or BMP file. Create a TIFF or BMP file, browse for it and then, select it.

## *Diagram A*

# Chromira Workstation

ZBE provides three programs, which are associated with the Chromira. The Chromira Workstation allows the user to submit and set preferences for each image ready for printing. It acts as the main “Front-End” for Chromira, letting you setup hotfolders and submit print jobs directly. The Chromira Workstation may be loaded on to any computer as longs as the computer meets certain criteria. Any number of copies may run concurrent with the ZBE Chromira. The Workstation runs anywhere on a Network that has access to BOTH Chromira PC and File Storage Server Computer.

## *Initial Setup*

To begin, one must first install the workstation program. A CD or Internet download is available for the operator. Contact ZBE if you are unable to locate a copy of the program. The computer must meet the following before installing the software.

1- The computer must be PC. If it is a Macintosh, Virtual PC must be loaded on it before installation of the software. Virtual PC will allow the workstation software to run on your Macintosh.
2- The computer must have at least a Pentium processor and 64 Megs of RAM. However, a faster processor along with more RAM will allow the Chromira to print faster.
3- The computer must have Windows 98 2nd edition or a more recent version.
4- The computer must interface with the network and must be able to see the Chromira Computer.

Loading the program on a computer with older operating systems can result in compatibility issues and certain errors.

Once it has been established that your computer meets the requirements, execute the Chromira install shield. Select the Chromira Workstation and follow the instructions. After installation is complete, a Workstation Icon will be displayed on the desktop. Double click on this Icon and it will launch the Workstation program. Now the operator must establish the location of the Chromira Printer. Located at the top of the Workstation window is a set of pull down menus. Locate the “printers” selection and select it. Once open, the Edit Printer window will appear (See Diagram below). Locate the Browse button and click on it. You must now browse for the Chromira.PR file. The Chromira.PR file is the Chromira Printer identification. The PR file is located in the Chromira Printer folder on the root drive (C:) of the Chromira computer. Once you have located the Chromira.PR file, select it and check it as active. If you have multiple printers, you must browse for all and then select the one you want to print to as active. When complete, click the OK button to end the initial set up. You are now ready to submit prints to the Chromira Printer via this location.

If your lab has multiple Chromiras, and you have set up the workstation to be able to print to any of the printers, you may also access the quick printer selection. This is located under the tool bar of the Workstation main screen. Just click the down arrow and select the printer you wish to use.

## *Main Print Screen*

The Main Print Screen is the one displayed after the Workstation software has been launched (See Diagram).

When the Workstation is displayed, the lower section is devoted to either one of the following three:

1- Print Queue: Lists all images from any workstation that has been submitted to the Chromira Printer. It counts for running prints, prints on hold, and prints waiting to be printed. The Print Queue will allow any number of images to be submitted, permitting the machine has enough paper length to print all images. If there is an insufficient amount of paper to print the amount of images submitted to the queue, the printer will display an error message and two buttons: “Hold/Release Job” and “Delete Job”.

   Hold/Release Job: This button will either place a job on hold or allow a job to go through, depending on its status prior to clicking on the button. First highlight the file or files and click on the button.

   Delete Job: This button will delete any files that are highlighted.

2- Printer History: Lists all images that were printed on the Chromira Printer.

3- Local History: Lists all images that were submitted from this workstation.

Checking any one of the three will make activate the selection.

For each of the three, the workstation software will display the following on an information bar above the queue window:

1- Status: Using the signal light icon will show if the Chromira is printing, on hold, or done.
2- File Name: Displays the file name of the image that has been submitted.
3- Print Width: Displays the actual width of the final print.
4- Print Height: Displays the actual height of the final print.
5- Quantity: Displays the numbers of images printed.
6- Priority: Displays the priority that was given to an image.
5- Paper Type: Tells the paper type loaded in the printer.
6- Start Time: Displays only with the “Print Queue”. Lists the time a job has started printing.
7- Finish Time: Displays with both the “Print Queue” and the “Print History”. Displays the time the Chromira completed printing a file.
8- Submitted: Displays only with “Local History”. Displays the time the file was submitted from the workstation.
9- Operator: Lists the workstation operator who submitted the image.

## *Submit Print*

The main function of the workstation is to submit prints to the Chromira Printer. Before explaining the process of submitting prints, an explanation of Printer functions is necessary.

The Chromira Workstation prints via the network. ZBE designed a system that removes the so-called “Front End” of the printer, so that files do not need to be loaded to the Chromira Computer for printing. The Chromira computer is designed to operate the printer and is not designed to be an images server.

ZBE calls this a “High Efficiency Workflow System”. How does it work? To begin, one should have a separate computer over the network to be designated as the image server. This should be a computer with a rather large hard drive and a fast processor. Each workstation should be allowed access to this computer in order to submit prints to the Chromira Printer. When submitting an image to the printer, the user locates the file through the workstation software. Once this is done, the workstation software submits what we call a Tag file to the Chromira Printer. This Tag file does not have the actual file in it. It holds the file name, location and print preferences. Once the Chromira Printer receives the tag file, it goes out over the network and finds the image file to be printed. It then opens up a small portion of the file and takes that information back to the printer. At the printer, it processes the information and starts printing. After completion of this task, it starts the whole procedure again, until the full file has been processed and printed. This system allows the printer to move small bits of information back and forth, thus creating little network traffic.

Now that you have a general idea of how the system works, you are ready to learn how to submit a print via the Chromira Workstation. To Submit a print, locate the pull down “File” menu. There you will find the Submenu “New”. Select it and the Submit print window will pop up. You may also click on the New icon in the tool bar. Another shortcut is Control + N. Once the window is open, the operator may choose anything that has to do with the print preference on this window. Below is an explanation of submit functions.

1- Print File: It is here the operator browses for the image to be printed.
2- Print Size: The print size function allows the operator to set the final print size. If “constrain proportions” is checked, you need only to set either the width or height. If constrain proportions is unchecked, one must set both width and height.
3- Borders: Allows the operator to set borders around the print. The borders will be the base color when material is unexposed.
4- Scale: With this function the operator can use the scale % to set the size of the print.
5- Resolution: The number of pixels displayed per unit of printed length in an image, usually measured in pixels per inch (ppi). An image with a high resolution contains more, and therefore smaller, pixels than an image of the same printed dimensions with a low resolution. The Chromira Printer is a 300 ppi printer. Thus any file that is not 300 ppi will need to be resampled up to 300 ppi using an interpolation method.
6- Interpolation: When an image is resampled, Chromira Workstation uses an interpolation method to assign color values to any new pixels based on the color values of existing pixels in the image. The more sophisticated the method, the more quality and detail from the original image is preserved. The Workstation program allows you to choose from one of the three following methods of interpolation:

    a. Bicubic Interpolation: The slowest, but most precise, method, resulting in the smoothest tonal gradations. Bicubic is set as the default interpolation method.
    b. Bilinear: This interpolation is a medium-quality method.

c. **Nearest Neighbor:** The fastest, but least precise, method. This method can result in jagged effects, which become apparent when distorting or scaling an image or performing multiple manipulations on a selection.

7- **Applying ICC Profile:** When checked, will apply the ICC Profile. For more information see the section titled ICC Profile.
8- **Constrain Proportions:** This function when checked allows the operator to keep the dimensions of the image without distortion.
9- **Resample Image:** Resampling refers to changing the pixel dimensions (and therefore file size) of an image. When you downsample (or decrease the number of pixels), information is deleted from the image. When you resample up (or increase the number of pixels), new pixel information is added based on color values of existing pixels. You specify an approximation or interpolation method to determine how pixels are added or deleted.
10- **Copies:** This function allows the operator to set the number of copies to be printed.
11- **Rotation:** This Function has 5 different selections which are listed below:

a. **Do Not Rotate:** When selected, will print the image as is.
b. **90 degrees CW:** Rotates image 90 degrees Clockwise.
c. **90 degrees CCW:** Rotates image 90 degrees Counter Clockwise.
d. **180 Degrees:** Rotates the image 180 degrees.
e. **Best Fit:** This function will rotate image to maximize paper usage lengthwise.

12- **Pause After Print:** This function, when checked, will pause the printer after the file has been printed.
13- **Submit Job on Hold:** Submits the image file on hold in the Print Queue.
14- **Delete File after Printed:** Deletes the file after it has been printed.
15- **Priority Setting:** This function allows the operator to set the print priority. Lower numbers stand for the highest priority.
16- **Nesting:** When “Ok to Nest” is selected, the printer will automatically nest the images across the width of the paper, thus yielding the greatest amount of paper usage. When “Print Alone” is selected the printer will print one print across the width of the paper. This selection leads to a greater amount of paper waste.
17- **Crop Marks:** There are three selections in this function. The first is “No Crop Marks”. This function prints with no crop marks around the image. The second selection is “Crop Marks”. This selection will print crop marks around the image. Each crop mark takes up a ¼ inch. The last of the selection is “Chromira Trim Marks”. This operates only with the Chromira Trim. Please see the Chromira Trim manual for direction on its function.
18- **Print Data:** This Function, when checked, will print a data line with the image. Please see the section in the Chromira Printer Software on Print data settings.
19- **Color:** This button opens up the Color Settings. These settings are “On-the-Fly” changes, meaning any color, contrast, or saturation changes will not effect the core file. They are only applied when the printer is printing the file. Each value is in CC units. There are different settings that can be made. They are listed as follows:

a. **Cyan/Red:** A positive value will add cyan to the print. A negative value will add red to the print.
b. **Magenta/Green:** A positive value will add magenta to the print. A negative value will add green to the print.
c. **Yellow/Blue:** A positive value will add yellow to the print. A negative value will add blue to the print.
d. **Dark/Light:** A positive value will add density to the print. A negative value will decrease the density of the print.

e. Contrast/Flat: A positive value will add contrast to the print. A negative value will decrease the contrast of the print.
f. Saturation/Less: A positive value will add saturation to the print. A negative value will decrease the saturation of the print.

20- Exit: Clicking on this button will exit the operator from the submit print window.
21- Print: Clicking on this button will submit the print to the Chromira for printing.

Sharpening: The operator has the ability to manipulate the focus of the file by applying this feature. It allows the user to sharpen the image without changing the structure of the TIFF file. To use the sharpening feature, the user must adjust the amount of sharpening until the desired effect is achieved. The "threshold" function determines the amount of pixels it samples in an area, which in turn adjusts the sharpening. A preview is available to view the amount of sharpening, which will occur to the image.

## *Pull Down Menus*

Located at the upper left-hand section of the workstation window is a series of pull down menus. Each one pulls down to a series of sub-menus. Each selection is listed below:

1- File
2- View
3- Settings
4- Printers
5- Hotfolders
6- Help

File: The "File" pull down menu opens up to three submenus. They are listed below:

1- New: This selection allows the operator to open up the Submit window, which can also be accessed by hitting Control + N on keyboard. See the section called "Submit Print" for information about submitting prints.
2- Create Default Print: This selection allows the operator to choose default settings for the submit window.
3- Exit: This selection will terminate the workstation program.

View: The "View" pull down menu opens up to two sub items. These two items are "Tool Bar" and "Status Bar". Selecting the tool bar will display quick click selections, which are locatedbelow the pull down menus. Selecting the status bar will activate the status bar at the bottom of the window.

Settings: The "Settings" pull down menu opens up to four submenus. They are listed below:

1- Queue Alarm: When checked, the workstation software will generate an alarm window stating the Print Queue empty.
2- Preferences: When selected, a window will pop up and in this window are the following items:

a. Default units: Allows the operator to select measurement units they wish to use.
b. Operator Name: Asks the workstation operator to list his name in the print queue when the image is submitted.

c. **Vertical Space Between Prints:** The operator can adjust the space between prints by entering a value here.
d. **Lab Name:** Gives the workstation operator the ability to list the lab name with the submission of the print.

3- **Long File Names**: Allows for long file names.
4- **Chromira Trim Marks**: Allows the operator to adjust the Chromira Trim marks. Please see Chromira Trim manual to set preferences. **Important:** Must have Chromira Trim to be able to use this function. If you do and do not have access to this function, please contact ZBE immediately to obtain the password to enable this function.

**Printers:** Please see section under initial set up.

**Hot Folders:** With this function, you can submit multiple files simply by placing them in a folder that has been designated as a hot folder. To begin, one must create a folder, with the intention of using it as a hot folder. This folder should be located on a drive with a lot of space. Once this is done, you will be ready to set up the hot folder using the Chromira Workstation. Select the pull down menu "Hot Folders". Select "Edit Hot Folder" function and the Hot Folder window will appear. The operator should then browse for the designated hot folder.

Once that is completed, click on the "Hot Folder Defaults" button. A window will pop up, resembling the submit window. It is here that the operator sets up the preferences for the hot folder. However, a major difference is in the size setting. Since most of all the files will be of different native sizes, the operator must only set one of the print size dimensions. For example, if the operator wishes all of the files to be 8 inches wide by whatever length, he then would set the width dimension to 8 inches and the printer will let the height dimension fall to whatever length compliments the width. Once all settings have been selected, click the save button and the window will disappear. In order to make the hot folder active, check "Select Active".

**Help:** Allows the operator to access the help log.

## *ICC PROFILES*

An ICC profile is a color space description. The ICC profile format was defined by the International Color Consortium (ICC) as a cross-application standard. ICC profiles help you reproduce colors accurately across different platforms, devices, and ICC-compliant applications.

The Chromira uses an ICC engine to interpret the ICC profiles that describe the RGB color space you are using in your system. You can select from existing ICC profiles or create your own. These profiles can then become part of your image files. The engine interprets the ICC profiles to automatically manage color issues among different color models as well as color issues between your monitor, other monitors, and the final print image. Although you do not have to use ICC profiles, it can greatly simplify color management.

There are two types of profiles that will be needed to successfully print for color accuracy. The first of the profiles is the Input Profile. The input profile is associated with the file to be printed. It will include color profiles generated by your monitor and or scanner. They typically are embedded into the file to be printed. However, if they are not, they may be applied when the file is submitted. The other profile needed is the Output Profile. This profile should be generated specifically for your lab situation. It is a process of printing a color chart from the printer and processing. Once done, it will be read on a spectrum analyzer. From there, the

information is compiled and an output profile is set.  In order to perform this task a color management system is needed.  For more information, please contact ZBE.

## *Installing Profiles in your System*

To begin, you will need an output profile.  Launch the Chromira Printer program and click on the emulsion icon.  Look through “Select ICC Profiles” and browse for the correct output profile for that emulsion.  Once you have browsed for it, the profile will live with that EMU file.  To remove, just browse for a new one.

Next, launch the workstation program.  Click New to open the submit window.  Locate the section that applies the profile.

Check the box if the file to be printed has the input profile embedded in it.  If it does not, click on the “Select Profile” button.

The following window will appear:

It is here that you must browse for the input profile.  Once done, click OK.

You may also override any existing profile.  Click the box that applies and browse for the profile.  This allows one to quickly change profiles without removing the existing ones.

For Rendering Intent, select the profile that applies to your Color Management system.

ZBE has provided the tools for the application of a color management system.  However, we (ZBE) are not Color Management experts.  We will provide as much support as we are capable.  However, it may be necessary for you to consult a color management expert to set up a system.

# Chromira Balance

The last program provided with the Chromira is the Balance Program. This program is very important for balancing the printer for your lab.

## *Initial Set Up*

In order to balance the printer, the operator must first give the location of the printer to the balance program. This procedure is similar to that of the workstation browsing for the printer. Click on the browse button located at the top of the window:

Find the Chromira.PR file and select it. Once this is done, verify that it has been accepted by looking at the emulsion and material type. The current emulsion and material type should be displayed.

### *Setting up the Densitometer*

The Chromira software will allow the user to interface with certain densitometers. Please see appendix for models and series of densitometers that are compatible with the Chromira. Also listed are the settings for each one. Follow the procedure, which applies, to your densitometer. Click on the “Setting” button to access the setting for the Chromira.

## *Balancing the Chromira Printer*

### *Overview*

The ZBE Chromira Printer provides the user with the means to calibrate the printer for use with nearly any RA-4 type of photographic material. This "self-calibration" allows your lab to maintain the Printer through an in-house procedure, without the aid, and associated delays and expense, of an outside technician.

This calibration is provided by the Chromira Balance Program. Chromira Balance allows the computer to "look" at a Test Print and make changes to the Emulsion (*.EMU) File associated with the photo material being calibrated.

This Calibration process involves running a series of Calibration Cycles. Each calibration cycle is comprised of the following steps:

1- Make a test print
2- Visually look at the Test Print and determine which analysis is required.
3- Run the required analysis on the test print (Scanner and /or Densitometer).
4- Apply the changes to the .EMU file associated with the material being calibrated.

These four steps are repeated until the quality of the print is good enough for production work. The details of each step are now described.

The balance procedure is comprised of two parts:

Scan Balance: The scan balance provides the user the ability to correct for scan lines which printers of this sort can produce.

Densitometer Balance: The densitometer balance controls the color balance of the printer.

Both of these balance procedures will be covered in detail in this section.

## *Procedure*

Start by deciding where the balance application should be installed. The Balance application does not need to be on the Chromira computer. It can be on any other computer as long as the computer meets the following requirements:

a. Computer is a PC, preferably Windows (any version, example, 95' 98') or Windows NT.
b. Computer is logged and shared on network so that it can communicate with the Chromira computer.
c. Computer has a scuzzy card to allow for the UMAX scanner.
d. Computer has a free com port for densitometer (optional).

If you do decide to install the balance application on another computer other than the Chromira printer, please see installation technician or call ZBE technical support.

### *Making a Calibration Image or Test Print*

Once the Balance Application location has been established, the next step is to start the calibration procedure. A calibration image will be needed for the balancing. The location of this image can be found on the *Chromira Printer* Application. Clicking on the calibration icon on the icon bar of the Printer application will automatically print the image.

**Calibration Image:** The Calibration image is used for the balancing procedure of the printer. To create the image, simply click on this icon and the Chromira will automatically size the image to the paper and print it on the paper already loaded on the machine.

Before you start the Test Print, it is important that you select and setup the proper Emulsion file for the photographic material you intend to calibrate. This can be done from the Emulsion dialog box in the Chromira Printer program.

These Test Prints are placed in the print queue just like all other Chromira print jobs; they will show up in the Chromira Workstation program's queue view. The Test Print is simply a job that prints the "Test Image.TIF" file located in the "C:\Chromira Printer" folder on the Chromira's computer. This Test Print job is setup automatically by the Chromira Printer program - it is recommended that you do not change any of the job settings (using Chromira Workstation).

## *Judging the Test Print*

When you retrieve the Test Print from the processor, you will need to determine whether it needs to be run through the Scanner Analysis or the Densitometer Analysis. This decision is usually quite simple:

> Test Print is not the correct color: Run a Densitometer Cycle
> Test Print has lines in it: Run a Scanner Analysis Cycle

There are other things to consider, in some cases. If the print is both off-color, and it has lines in it, then you will need to run both types of analysis. Following are a few rules that will guide you through this process:

**> The color balance of the Test Print is very wrong: The grey looks entirely like some other color.**
-- Even if the Test Print has lines in it, run only the Densitometer Analysis this time, then make your next Test Print.

**> The Test Print's color is moderately or slightly wrong: The grey scale has a tint of another color, or some of the patches look a little off-color AND the Test Print has lines in it.**
-- Run both the Scanner Analysis and the Densitometer Analysis. Run the Scanner Analysis first, then read it on the Densitometer. After both analyses are complete, make your next Test Print.

**> The Test Print has lines in it, but the color looks correct**
-- Run only a Scanner Analysis. Then make your next test image.

> The Test Print's color is wrong, but it has no lines in it.
-- Run only the Densitometer Analysis, then make your next test print. If the color correction was large (the color was very wrong), the Densitometer Balance effects may cause lines in the next test image, so another Balance cycle will probably be needed.

In summary, Densitometer balance changes (made by running the Densitometer Analysis) can introduce lines into the next print. The Scanner Analysis will not affect the color of the print, unless the lines in the print are very severe.

## *Performing a Scanner Analysis*

The Scanner Analysis is intended to remove any lines that appear in the Test Print. To perform a Scanner Analysis, you will need to use a computer with both a working UMAX PowerLook II or PowerLook III model scanner hooked up to it, and the Chromira Balance Program. The computer you use does not necessarily have to be the one in the Chromira.

1: Cut out the Test Print by cutting out the center section of the image, which is surrounded by a thick black border. Be very careful to cut outside the black border along the sides (vertical cuts). Your cut across the top of the image is the most important, and must be very straight. To trim the top of the Test Print, cut between the two thick lines that are located above the thick black border of the top portion of the image.

2: Place the Test Print on the scanner so that the top of the Print is toward you as you stand in front of the scanner. The print must also be centered left to right on the scanner. To aid in this, you can make small cuts at the tops of the two thin vertical lines that are just outside the thick black border. You can also use your fingernail to make dimples in the paper at these points. Then, when placing the paper on the scanner, you can align your cuts or marks with the "A4" arrows on the scanner. Once in position, carefully close the scanner's lid.

3: Click the "Scan" button in the Chromira Balance Program. The Balance program will perform a couple of automatic scans, and then analyze the scanned image. The balance changes that the program calculates will not be saved to the EMU file yet.

4: Click the Apply Changes button. This will put the changes that the Balance program calculates into the Emulsion (EMU) file. A backup of the EMU file (before these changes are applied) is also made on the Chromira's computer.

If you intend to run a Densitometer Analysis after this Scanner Analysis, you can skip straight to the Densitometer Analysis, then Apply Changes at the end of both Analyses.

## *Performing a Densitometer Analysis*

The Densitometer Analysis is used to correct the color of the Test Image, and to get all of the steps in the Grey Scale at proper grey intervals, providing the best tonal range for the photographic material being calibrated. To perform a Densitometer Analysis, you will need a densitometer and a computer running the Balance program.

It is highly recommended that you connect the densitometer to the computer through its RS-232 serial port. This will save having to type in the 17 RGB readings that are taken in this procedure. For this connection to work, you will need to select the COM port number and the baud rate for your densitometer hookup from the "Settings" button in the balance program.

1: To begin, click the "Densitometer" button on the Balance Program's main window. This will display the Densitometer dialog box as well as a graph of the target densities for

the range of patches from Black (Patch 0) to White (Patch 16). The program is now ready to accept readings, starting with the black patch zero (0).

2: Read the 17 patches at the bottom area of the test image. Start with the black Patch Zero (0). After each reading, the "Patch" number in the dialog box will increment one count and the reading windows for R, G, and B will still look blank. If you do not have the RS-232 port connection, you will have to type in the RGB readings into spaces provided, then click the up arrow next to the "Patch" value. You can always review your readings by using the up/down arrows next to the "Patch" value. The graph view will also change to reflect your readings.

3: Review your D-max targets if this is the first Densitometer Analysis for this material. For paper materials (matte, gloss, etc.) and for "flex" materials ("ultra-gloss", polyester based), the D-max targets should be about 2.10 for all three colors. For dura-trans or clear materials (transparent or translucent films), the D-Max targets should be set to about 2.90 to 3.00 to start with. Please see the section "D-max Failure" near at the end of this document, or contact ZBE, for more information.

4: Click the "Done" button. When the last patch, white patch 16, is read, the graph should look complete. If everything looks correct, the “Done” button will exit this dialog box back to the main screen, and calculate the changes to the EMU file that are necessary to correct the color balance. These changes will not be made to the EMU file itself until you click the "Apply Changes" button.

Remember to click the "Apply Changes" button when you have finished your analyses for this balance cycle.

## *Advance Settings*

Located in the lower left hand corner of the Balance window is a button marked “Advanced”. To access it, click on the button. The following window will appear:

Balance Gains:
Refers to the amount of correction the scanner will make with each cycle. The default setting is set to one for each of the three colors. These values should not be changed, unless directed by a ZBE technician.

Curve Gamma:
The Curve gamma determines the slop of the contrast curve. The default setting is set to 1.8. Once again, this value should not be changed unless directed by a ZBE technician.

## *Calibration Pitfalls*

As with any procedure, with the Calibration process of the Chromira, things can go wrong. There are two things that can happen during the process of calibrating your Chromira Printer:

D-max Failure
This is where you have exceeded the maximum exposure level that the material you are calibrating can handle. This is caused by the D-max Targets being set too high in the Chromira Balance program's Densitometer window.

Lines That Don't go Away
This is a situation where, no matter how many Scanner Analysis cycles you have run, there are still visible lines in your prints. This can be caused by several different things, including D-max failure, a network settings problem in Windows, or a mechanical problem with the Chromira printer itself.

These two pitfalls of the Chromira Balance process are described here in more detail.

## *D-Max Failure*

Digital photo writers of any type (laser- or LED- based) typically are not able to achieve quite as high a d-max as that achieved by conventional darkroom (enlarger) printing. Of course, this depends upon the photographic material being used, and the quality of the chemical process used to process your photographic prints. It is strongly recommended that you use a "digital" photo paper if possible.

For any photographic material, there is a level of exposure above which the image on that material will not get any darker, even if the exposure is increased. This maximum darkness is the D-max for that material.

The condition known as D-Max Failure can happen when you have set a D-max target in the Chromira Balance program's Densitometer window that is too high for the Chromira to achieve on the particular material being used.

This causes the Balance program to increase the Chromira's exposure output above the point where changes in the exposure output will make the desired change in the printed image density. When this happens, the Balance program no longer has "control" over the image quality at densities above this level.

This causes the two primary symptoms of D-Max Failure:

1. There are lines in the black (patch zero) that do not go away, even though the rest of the grey scale has a good balance (no lines).
2. The top two patches in the grey scale (patch 0 and patch 1) look very close to each other in density.

Keep in mind that these symptoms can, and usually do, happen in only one or two of the three primary colors. You can look at the shorter color scales below the main grey gradient in the Test Print, and see if either of these symptoms is happening in an individual color.

If this problem is caused by having set the D-Max targets too high in the Balance program, then the solution is to find the best D-Max targets that will work with your material.

To find the proper D-Max targets for your material, do the following:

1. In the Chromira Printer program, go into the Emulsion dialog box. At the bottom of this window, locate the color balance settings for the Emulsion. These are the Cyan, Magenta, Yellow, and Density values.
2. Add 200 to the Density value, and enter this new number here. This will drive the printed image into the D-Max failure zone, which is what we are looking to do for this test.
3. Close the Emulsion dialog box, and run a Test Print in the normal manner. Process the print when the Chromira finishes it.
4. Looking at the resulting Print, you should see that at least the top few patches look like they are all black. If they do not, then increase the Density setting in the Emulsion dialog box even more, and try another print.
5. On this D-Max Failed Test Print, take a densitometer reading of the darkest black, which should be at Patch Zero (0). Write down the reading's three values (R, G, B).
6. Subtract 7 to 10 points from each of the values that were read in the previous step. Write down these values. These will be the D-Max Targets to be used in the Chromira Balance Program's Densitometer window.
7. Important: Go back into the Emulsion dialog box in Chromira Printer, and set the Density setting back to it's original value, after you get a well-blown print.
8. Run a couple of Balance cycles, where you only do the Densitometer analysis. Do not scan the image during these cycles.
9. After two or three more prints, the Test Print's grey scale should have all its patches at nicely spaced density intervals. Once this is achieved, you can run Scanner analysis cycles to get rid of any lines that have gotten into the balance.

## *Lines That Do Not Go Away*

When performing Scanner analysis balance cycles, you should expect to see some reduction in the lines in the Test Print with each passing cycle. However, if you do not see improvement after a few cycles, then there is likely another problem. The lines that do not go away are caused by something the Scanner Analysis process cannot take care of.

The causes for this type of balance failure are:

1. D-Max Failure: You have exceeded the maximum exposure for this material, above which changes in the Chromira's output do not make corresponding changes in the Print.
2. Networking Problem: The Windows network is set up in such a way that the computer running Chromira Balance can not open and change the Emulsion (EMU) file on the Chromira Computer. Note that this can happen even if the Balance program is running on the actual Chromira Printer's computer. This problem arises from incorrect settings in the Windows Networking file access permissions.
3. Mechanical problem: One of several things has gone out of alignment in the Chromira's mechanical setup. This should never happen after the machine is installed, but the mechanical causes are listed here as an aid to technicians.

If D-Max Failure is suspected, please see the previous section regarding how to identify and fix that condition.

If D-Max Failure is not the cause for your Test Print lines not going away, verify that your network settings are correct. This can be a cause even if the Balance program is running on the Chromira Printer computer. When you click the "Apply Changes" button in Chromira Balance, you should see two messages in the text window of that program that say that the Emulsion

(EMU) file “has been backed up”, and that it “has been copied back to printer.” If you do not see these messages each time you complete a balance cycle (“Apply Changes”), or see some other error message concerning the Emulsion file, there is likely a sharing or permissions problem in your network settings.

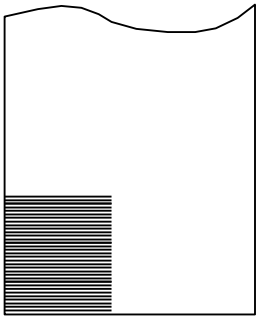
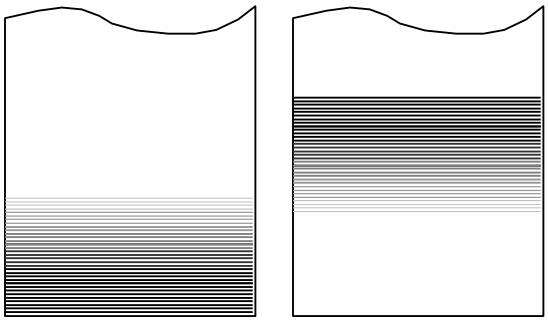
If you determine that these messages are not being issued by the Balance program, go into the “My Computer” icon on the Chromira computer, and right-click the Drive “C:”. In the resulting menu, select Sharing. In the share readout, you should see a share name “C”. If this is not the case, click the “Add Share” button and make a new share called “C”, and give it “Full Control” access to “Everyone”. You can double-check that the network settings are correct by using Network Neighborhood to browse to the C: drive on the Chromira Computer. Using “Network Neighborhood” instead of “My Computer” forces Windows to use the networking system to access the drive. If this was not the problem, you may have to ask a network administrator to help find this problem.

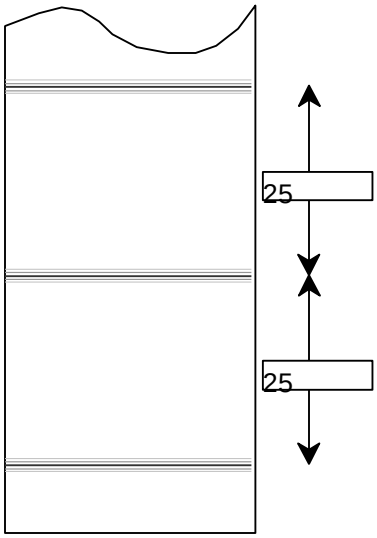
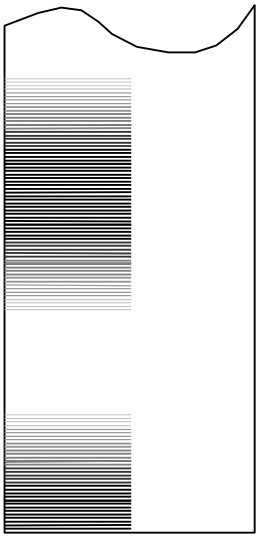
If the network settings were not preventing the Chromira Balance program to make changes to the EMU file, and the lines still do not go away, the problem may be a mechanical misalignment of the Chromira machine itself.

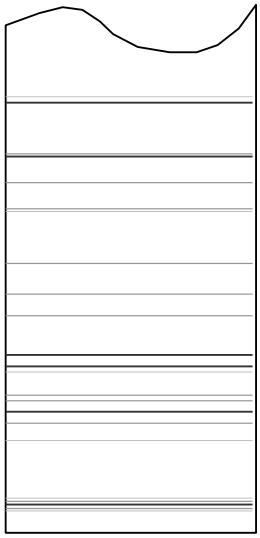
To check for this, run a batch of images that have even-colored backgrounds extending across the entire width of the printer. The batch should be about 5 or 6 feet in length and can be a series of smaller prints, or one large image; the important thing is that the image covers the entire width of the paper.

When this series of prints is out of the processor, view it so that you are looking at the lowest image right-side up. This will be the image that was printed first in the printer. Very carefully, examine the lines in the prints, to see if they happen: 1.) only on one side or the other, 2.) are all the way across the print, 3.) are across the print, but don’t happen all the time, 4.)go away after awhile, or 5.) come in after awhile. These lines usually appear as sharp white lines in your images. Following will be descriptions of various cases of lines, and their likely causes.

The following pages describe various types of lines that can appear in the prints.

| Description | Cause |
|---|---|
| Lines appear on one side of image (usually left-hand side), but go away after 24 inches or less of print, and do not come back.<br>  | Paper loaded incorrectly. Be sure that when you thread the paper onto the take-up core, you align the left edge with the end of the core.<br><br>The machine is likely OK. |
| Lines appear all the way across the paper, but go away after 24 inches or less of print, or fan in after about 24 inches of print.<br>  | The Chromira head is Experiencing a slight “drift” in balance. This can be overcome by printing about 12 inches of print, then immediately making a Test Print, and using it or the Scanner Analysis. This way, the print head will have been stabilized when it makes the test print.<br><br>Afterwards, always make a 12-inch print of some sort before printing critical images and before test prints. It is important that the jobs be queued up so that the printer does not stop printing for more than a few seconds before the Test Print is made. |

| Description | Cause |
| --- | --- |
| Lines appear all the way across the print, but only appear in small groups, or as sinlgle lines, every 25 inches of print.<br>  | There is likely a speck of dirt on the Chromira's drum that is riding underneath the Drum Position Encoder.<br><br>Remove the paper from the machine and clean the drum with alcohol and a soft, clean cloth, paying close attention to the area under the Drum Position Encoder. |
| Lines appear on one side of print, then fade away, and then come back after awhile then come back again, in a cycle, over a few feet.<br>  | This is a paper tracking problem, and will require alignment of the machine, or an adjustment by the user.<br><br>Please contact ZBE for more information. |

| Description | Cause |
| --- | --- |
| Lines appear all the way across the print, but appear inconsistently, in no apparent order. Printer may also experience slow printing speed.<br>  | The Drum Drive belts are dirty, or are at incorrect tension adjustment.<br><br>Please contact ZBE for more information. |

# TECHNICAL DOCUMENTS

## Simple Windows NT Networking Setup

This document outlines the setup of a simple Windows NT network. For this purpose, we assume that the "network" consists of only Windows NT Workstation, or Windows 95/98 Machines.

***Warning:*** This network setup will not have security restrictions in place when finished.

For further information and troubleshooting, please see www.microsoft.com. (Their website is surprisingly helpful!). ZBE assumes no responsibility for problems arising from network setup issues. This includes any consequences arising from lack of security setup.

We will set up the simplest form of Windows network, using the TCP/IP protocol and manually assigning each computer it's unique IP Address. This procedure assumes that each computer has a functional network card. You should also have your Windows NT Installation Disk handy (if doing this procedure on a Chromira NT computer, this disk will not be needed).

***Please perform the following steps on each NT workstation:***

1. Right-Click the Network Neighborhood icon and select Properties.
2. The Network Properties box will be displayed, showing the computer's Name and Workgroup.
3. Click Change, and give your computer the name you want it to appear under in Network Neighborhood. Click OK.
4. Click Change again. Choose a name for your Workgroup. Most people use their company name for this. The workgroup will be the same for all computers on this network.
5. From the Network Properties box, click the tab near the top that reads Adapters so that we can check that your network interface card (NIC) is present and accounted for.
6. In the list that will appear, you should see your network card listed. If it is not listed here, you will need to install a card in your computer along with its specific drivers, then add the new card in Network properties after rebooting. If your cards appears ok here, proceed to the next step.
7. Click the Protocol tab. In the list that appears here, you may see a listing for "TCP/IP Protocol". If it is here, proceed to the next step. If not, click Add, then select "TCP/IP Protocol" from the Select Network Protocol box.
8. Double-click the "TCP/IP Protocol" listing in the list of protocols. This will bring up the "Microsoft TCP/IP Properties" dialog box.
9. The IP Address tab should be showing (if not, click it). Verify that the Adapter shown is the one installed in this system, looked at in step #6.
10. Click the "Specify an IP address" dot.
11. Fill in the IP Address as "192.168.0.nnn", replacing the "nnn" (the last set of numbers) with a number from 1 to 253 which will be unique to this computer. Use the period (dot) key to advance through the four numbers.
12. Fill in the Subnet Mask as "255.255.255.0".
13. Make sure the Default Gateway is blank.

14. Click the DNS tab. This page should have all blank settings. If there are any entries under the "Service Search Order" list, delete them. Do likewise for the "Domain Suffix Search Order" list.
15. Click the WINS Address tab. The Adapter should show your network card, but all other fields should be blank. Also, both check marks should be off.
16. Click the Routing tab. Make sure the "Enable IP Forwarding" check box is blank.
17. Click OK in the "Microsoft TCP/IP Properties" dialog box.
18. Click the Services tab. In the list that will appear, verify that "Simple TCP/IP Services", "Server" "Workstation", and "Computer Browser" are listed. If they are not, you can add them by clicking Add, and selecting them from the resulting list.
19. Click OK in the "Network" dialog box.
20. This will return you to the Windows desktop, and the computer will ask you to reboot.
21. After re-booting, verify that you can "see" the other computers on the network. Windows takes up to about 3 minutes for the other computers in the Workgroup to appear. Network Neighborhood will appear blank until then.

## *Simple Troubleshooting*

> If no computers appear in the Network Neighborhood, and you know you have more than one setup according to the procedure outlined here, try "pinging" one, as follows:

- Start a Command Prompt (Start Menu, Programs, Command Prompt)
- At the command line, type "PING 192.168.0.nnn" replacing the "nnn" with a number from one of the *other* computers on your network.
- The program should respond with "Reply from…" and the IP Address you typed in.
- If you get "Request Timed Out" then the network wiring between the computers, or the hub, is not functional.
- If this works, the hardware (cabling, hub, network cards) is ok on both computers. This will mean that the problem is in the Network setup.
- If "ping" worked, try the Start menu, then Find, then Computer. Enter the name of the *other* computer. Click Find Now. This should find the other computer (if you got the name right!) even if it is in another Workgroup.
- If Find does not work, please review the settings you made during the setup procedure.
- If Find works, then you simply have to wait a bit for Windows to figure out the network.
- Also check that you have at least one drive shared on each computer for them to show up on the network.
- Be sure that you are logged on as "Administrator" on each machine you setup.

# Changing WinNT to allow non-Administrators to run the Chromira Application

- As Administrator,
- Go to Start → Settings → Control Panel → Devices
- Scroll down to the entry labeled “Galil”

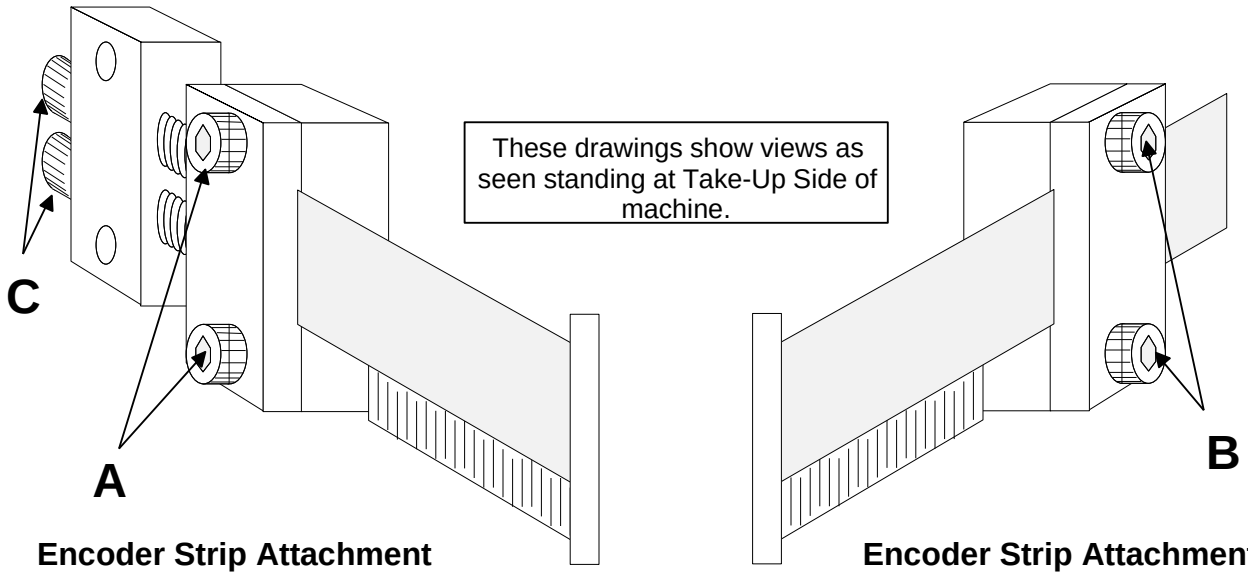
- Choose “Startup” and change the type to “Automatic”
- Reboot

# Replacing Chromira Linear Encoder Strip

This document outlines the replacement of the Chromira's Linear Encoder Strip. This Encoder Strip, mounted to the air-rail of the machine, passes through a Linear Encoder in the head carriage, and allows the computer to place the pixels onto the photo paper as the head traverses the length of the air-rail.

*Important:* The Linear Encoder Strip is very fragile, and should be handled with care. Never fold or bend it in any way.

The Linear Encoder Strip is held at each end by a clamp attached to the inner surface of the air-rail. Each clamp uses two screws (marked A and B in the drawing below) to secure the end of the Encoder Strip.




**Encoder Strip Attachment at Left End of Air-rail.**

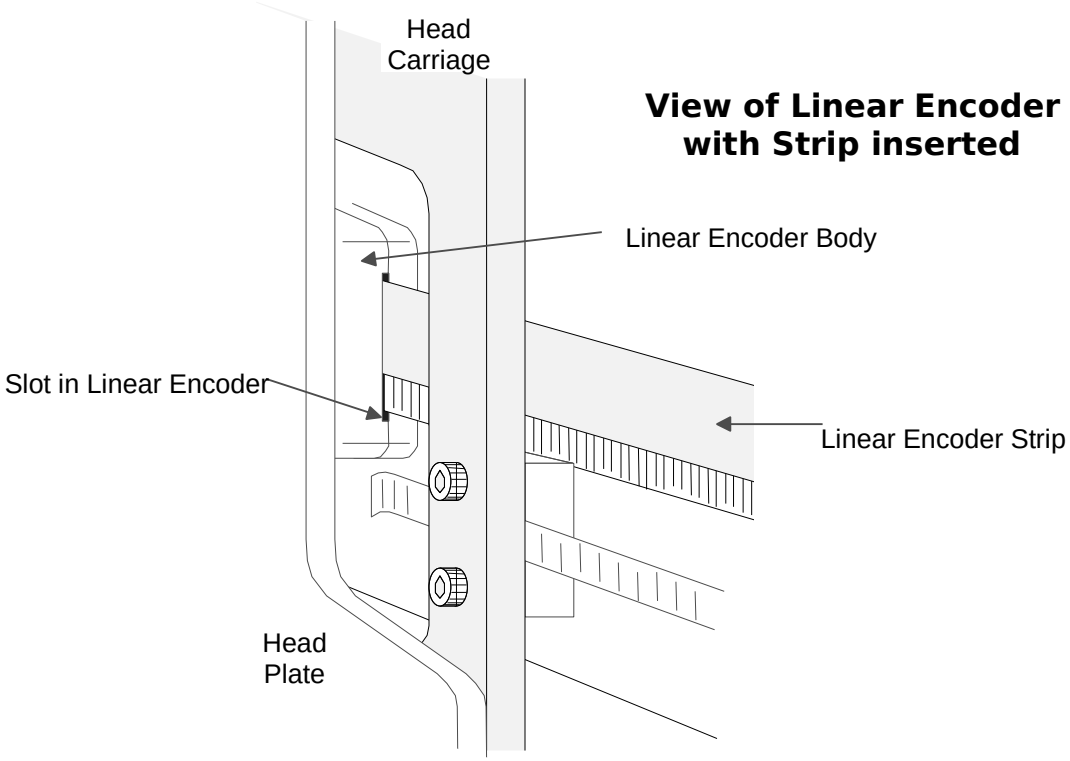
**Encoder Strip Attachment at Right End of Air-rail.**

## *Removing the Old Encoder Strip*

1. Loosen the two screws holding the left-end of the Encoder Strip, indicated as "A" in the above drawing (2 total screws).
2. With the Air-Pressure turned ON, move the head over to your left.
3. Loosen and remove the two screws ("B") holding the right end of the Encoder Strip. This will free both the retainer block and the end of the Strip.
4. Remove the Encoder Strip by carefully sliding it to the right. You may have to bend the free end toward you slightly to get the other end to clear, but keep it level. Move the head further to the left if necessary to get the old Strip out.
5. Once the old Encoder Strip is free, note which end was the right end and which was at the left. Also note that the thin film part of the Strip hangs at the bottom.

*Installing the New Encoder Strip*

1. Orient the new Strip in the same position as the old one. The thin film part of the strip should be at the bottom.
2. Gently move the head as far as it will go to the left.
3. Holding the new Encoder Strip level, bring the left end in between the head carriage and the air-rail. Insert the end into the narrow slot in the Linear Encoder located behind the head plate. This slot is hard to see; use a small flashlight for a better view. The Drawing below depicts this slot and the surrounding area.




4. Once the Strip is inserted through the Linear Encoder body, slide the head to the right a little, keeping the strip in place (slide the strip through the Encoder body at the same time), to gain access to the screws that hold the left end of the strip in place.
5. Insert the left end of the strip into the clamp that held the old one. The end of the Strip should protrude from underneath the far side of the clamp by about 1/8 - 3/8 inch (3-9mm). Once in position, tighten the two screws moderately to hold the end in place.
6. Slide the head nearly all the way to the right, but leave the right end clamp in sight.
7. The right end of the Strip should now be sitting near the proper location at the right end clamp.
8. Replace the clamp cover and the two screws that hold it in place (removed in Step #3). Some of the strip will be sticking out from the far side of this clamp. This is normal.
9. Tighten these two screws moderately to hold this end in place.
10. With the Linear Encoder Strip temporarily held in place, you can now align it.
11. At the left end of the Strip, tighten the two tensioning screws about two (2) turns each. These screws are marked “C” in the drawing on the preceding page. This will make the encoder strip taut between the two clamps.
12. With the head near the right end of the rail, look at the Encoder Strip’s position in the Encoder Body slot. It should be centered top to bottom. If it is not, loosen the screws on

the right end clamp, and grasp the end of the strip that protrudes from the far side of the clamp (with your fingers or a pair of needle-nose pliers). While holding the strip tight, position it up or down as needed, and tighten the screws with your other hand. Double check that the strip's position in the slot is centered top to bottom, and tighten the screws very tight to hold the strip in final position.

13. Move the head to the left, leaving access to the left end clamp.
14. With the head near the left end of the rail, look at the Encoder Strip's position in the Encoder Body slot. Center the strip as in the last step. Since the end of the Strip that protrudes from the far side of the clamp is short, needle-nose pliers may be needed to hold it for positioning. Tighten the screws very tight once the Strip is in final position.
15. Tighten the Strip Tensioning Screws to make the strip taut between its clamps.
16. Move the head back and forth, using a flashlight to view the strip's passage through the Encoder Body. Check that the strip does not make contact with the Encoder body in any way. If it looks good at each end, but rubs somewhere in the middle, the tensioning screws can be used to correct this. If the top of the strip rubs against the top of the slot, tighten the bottom tensioning screw. If the strip rubs at the bottom, tighten the top screw. Tilt in the strip can also be corrected using the tensioning screws.
17. Adjust the tensioning screws until the strip is straight. As a rule during adjustment, do not loosen these screws, as a loose screw will not hold a setting. Over-tightening a screw may cause the left end clamp to slip on the end of the strip, but this can be corrected by tightening the other one.
    If you run out of thread on either of these screws, you can loosen the clamp. Loosen the tensioning screws all the way and then, re-tighten the clamp.
18. If you need to adjust the left end of the strip in the other axis (side to side in the slot), use the screws on the other side of the air-rail, which hold the Tensioning Screw Block in place. There are four screws here: the outer two pull the block toward the rail; the inner two (which may be set-screws) are threaded in the rail, and push the block away from the rail. If adjustments are made here, make sure all four of these screws are tight when finished (if you loosen an outer screw, tighten the inner screw closest to it).
19. As a final check for Encoder Strip rubbing, gently place a finger on one end of the Encoder Strip, and move the head through its range of motion. Any contact between the Linear Encoder Body on the head, and the strip, will be felt through your fingertip as vibration in the strip.

# Chromira Scaling Factor Directions

Please follow this procedure exactly as stated:

1. Print the 100inV.tif file that was sent with the software.
2. When you are submitting this file to be printed, the resample button in Chromira Workstation should be unchecked.
3. The file has lines every 10 inches. It also has a line every inch for the first and the last 10 inches. After the file has been printed, you should take a tape measure and measure the entire file. You can use this measurement to set the scaling for your Chromira Printer.
4. For example:
   Say that you measured the file and it came to 99.25 inches. You would then divide 100 inches by this 99.25 inches. (You divide into 100 inches because this is the actual size of the digital file.)

   100 / 99.25 = 1.00756 (5 decimal points is fine)

5. Next, insert 1.00756 into the Chromira Printer application. After starting the Chromira Printer application, go to the Preferences screen. To get there, press the button with the “i” on it. You would then enter 1.00756 into the Length Scale box.
6. That is all it takes to successfully set the scaling for your Chromira Printer. To make sure that this scaling factor gets applied to each of your prints, you must check the resample button in Chromira Workstation when you submit a print. The scaling factors only get applied if this resample button is checked. It would be best to default the resample button as checked.

# Chromira Motion Control Reset and Re-Burn Procedure

**Please follow these procedures exactly as stated:**

The Galil Motion Controller allows Chromira to operate its motors and perform the precise movements needed for printing.

- **The following procedure should be performed if the Chromira Computer's Windows NT installation has been rebuilt using the ZBE System Recovery Disk.**

1. Start the Galil Registry program from Start Menu -> Programs -> Galil if it is not already running (or use the Configure Galil icon on the desktop if available).
2. In the menu bar of this program, click Registry.
3. The Modify Registry Information window should appear showing *<No Controllers>.* Click Add.
4. The Set Registry Information window will appear.
5. Change the Model to read "DMC1700" by clicking the arrow next to the Model box.
6. Check that the Timeout setting is "5000" and set the Delay setting to "0".
7. In the Bus Controller Parameters section of this window, the Address should read "824", the Interrupt should be "None" and the Data Record Access should be "None".
8. In the Win32 Device Driver section of this window, the option "Use Galil Driver" should be selected.
9. Click OK once all these settings are correct.
10. The Set Registry Information window should now show "Controller1: MC1700,Address=824"
11. If this is the case, click Close.
12. Re-boot the machine. This is necessary for the Galil System to initialize properly after the above settings have been made.

- **Perform the following procedure after the above has been completed.**

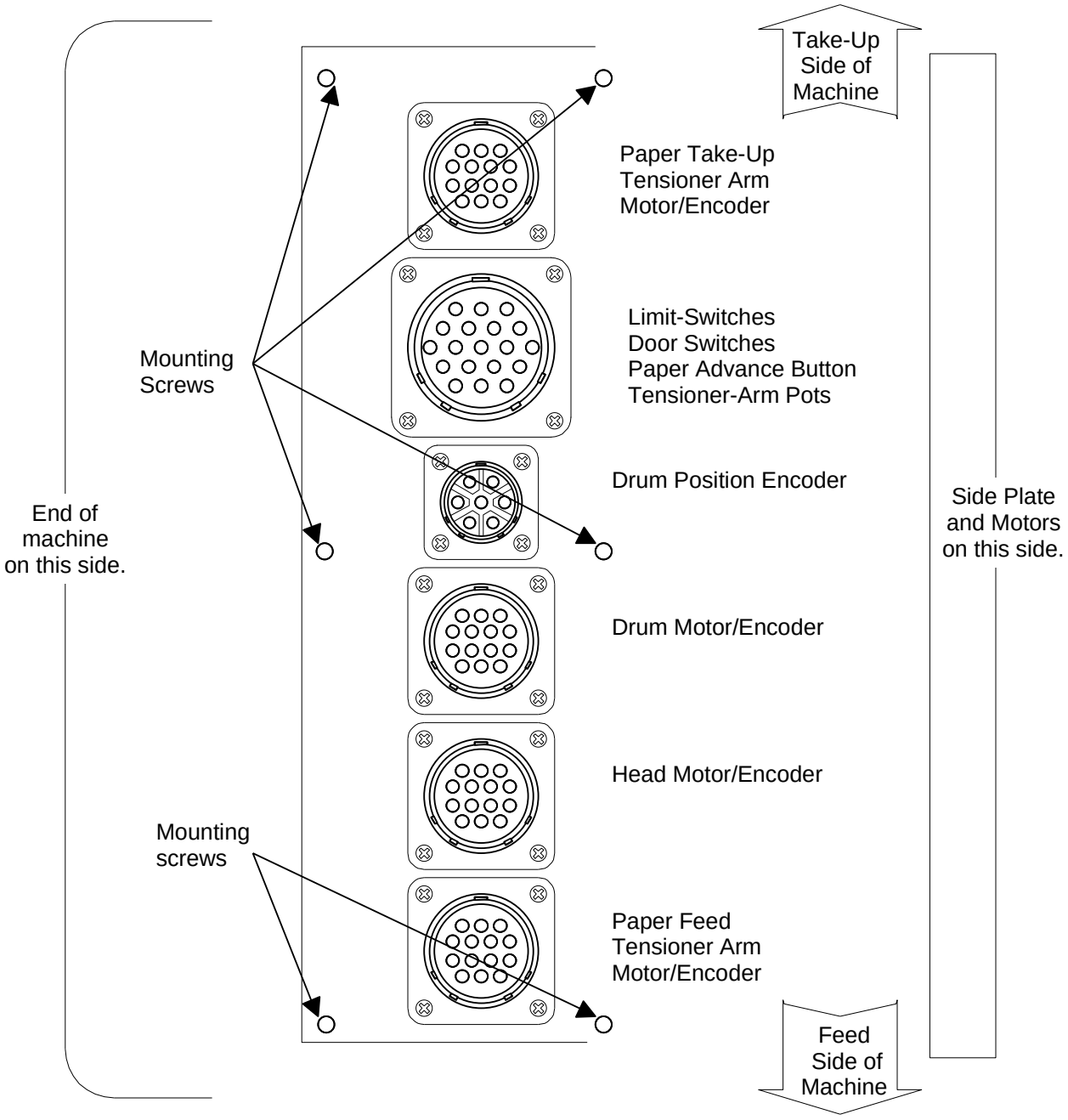
1. Shut down the Chromira Printer program if it is running.
2. Unplug the AC Power cord from the Motor Power Supply. This is the top-most plug in the AC power strip inside the Chromira cabinet.
3. In the Windows START menu, go into Programs, then into Galil. Run the Galil Terminal program.
4. In Galil Terminal, you should see a menu bar and a large white area that says that you are not connected with the controller.
5. In the menu bar, click Options.
6. In the Options menu, click the Master Reset item.
7. A Select Controller box will appear, with the DMC-1700 listed. Click OK.
8. A warning box will appear asking if you want to do a Master Reset. Click Yes.
9. After about two seconds, another window will appear stating that the controller has been master reset. Click OK.
10. Back in the main menu bar, select the item Terminal. A window will appear that has a white edit bar near the top, a large grey field in the middle, and some buttons along the bottom.
11. Click the Editor button at the bottom of this box. A small text editor window will appear.
12. In the text editor, click File, then Open. A standard Windows-style File Open box will appear.
13. Browse for the file C:\Chromira Printer\Motion Program.dmc . This is located in the same folder as the ChromiraPrinter.EXE program. Click Open. There should now be text in the editor window, with some rows of asterisks (*) at the top.
14. Click File again, then Download. The menu will go away, leaving just the Editor window again.
15. Close the Editor window. You will now be back in the Terminal Window.

16. Click in the white editor bar at the top of this window, and type the following command exactly as shown, pressing Enter between each:

| | |
|---|---|
| **SCANADV=7000**<Enter> | (The “SCANADV=7000” should appear in the grey area.) |
| **XQ#INIT** <Enter> | (The “XQ#INIT” should appear in the large grey area.) |
| **AB** <Enter> | (The “AB” should appear in the large grey area.) |
| **ST** <Enter> | (The “ST” should appear in the large grey area.) |
| **HX** <Enter> | (The “HX” should appear in the large grey area.) |
| **MO** <Enter> | (The “MO” should appear in the large grey area.) |
| **BN** <Enter> | (A brief pause, then the “BN” should appear in the large grey area.) |

17. The controller has now been reconfigured. Close this program completely so that you come back to a blank Windows desktop.
18. Re-connect the AC Power plug removed in step #2.
19. Restart the Chromira Printer program in the normal manner.

## *Appendix A: Chromira Deck Connector Functions*



## *Appendix B: Chromira Computer Rear-Panel Connections*

**LEGEND:**
This drawing depicts the rear of the PC that controls the Chromira Printer. Each connection is labeled as follows:

**Connection Name**
(Type of Connector found ~~on PC~~)
What it connects to

**Mouse**
(Mini-DIN 6-Pin)
Standard PS-2 Compatible Mouse connection

**Keyboard**
(Mini-DIN 6-Pin)
Standard PC-style keyboard connection

**Motion-Control Aux. Encoder**
(D-25 Male: two poss. locations, see drawing)
Connects to Motion Control Junction Panel

**Densitometer Serial Interface**
(D-9 Male)
Connects to X-Rite Densitometer

**Speaker-Output**
(1/8" Stereo Jack)
Connects to Speaker

**Video Output**
(High-Density D-15 Female)
Monitor Video Cable plugs in here

**Network**
(RJ-45 Female)
Standard 10/100-base-T Network Connection to Chromira internal extension cable.

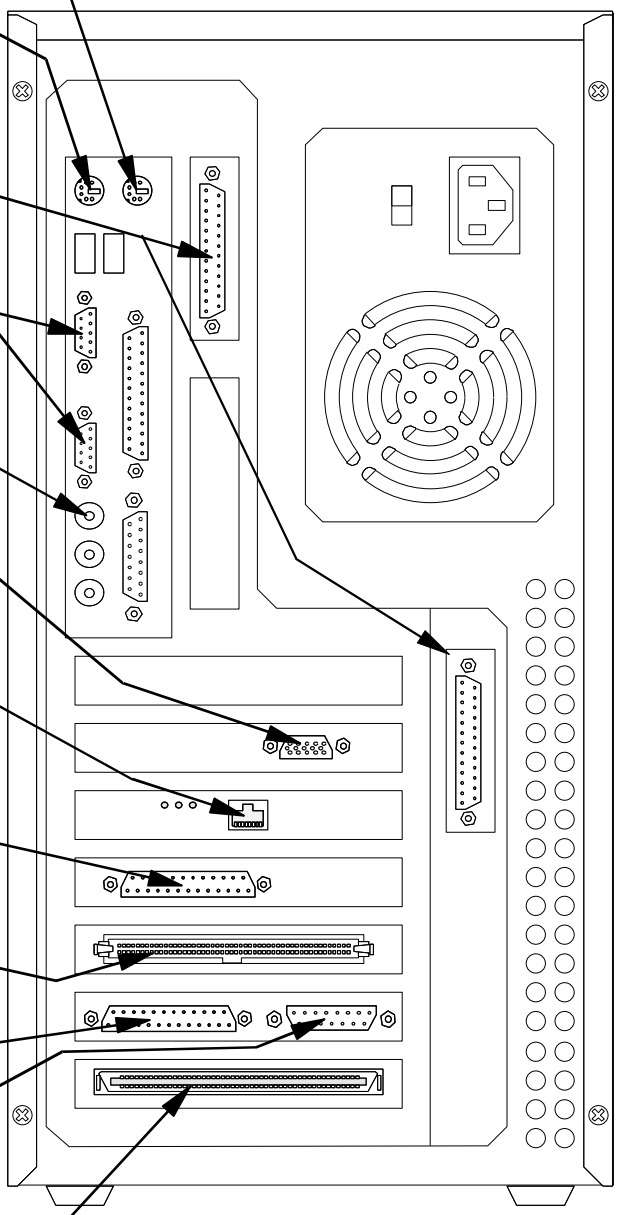
**SCSI Port**
(D-25 Female)
Connects to Chromira's Scanner

**Head Data Cable**
(100-Pin Male Header)
Connects to Chromira's Main Head Cable

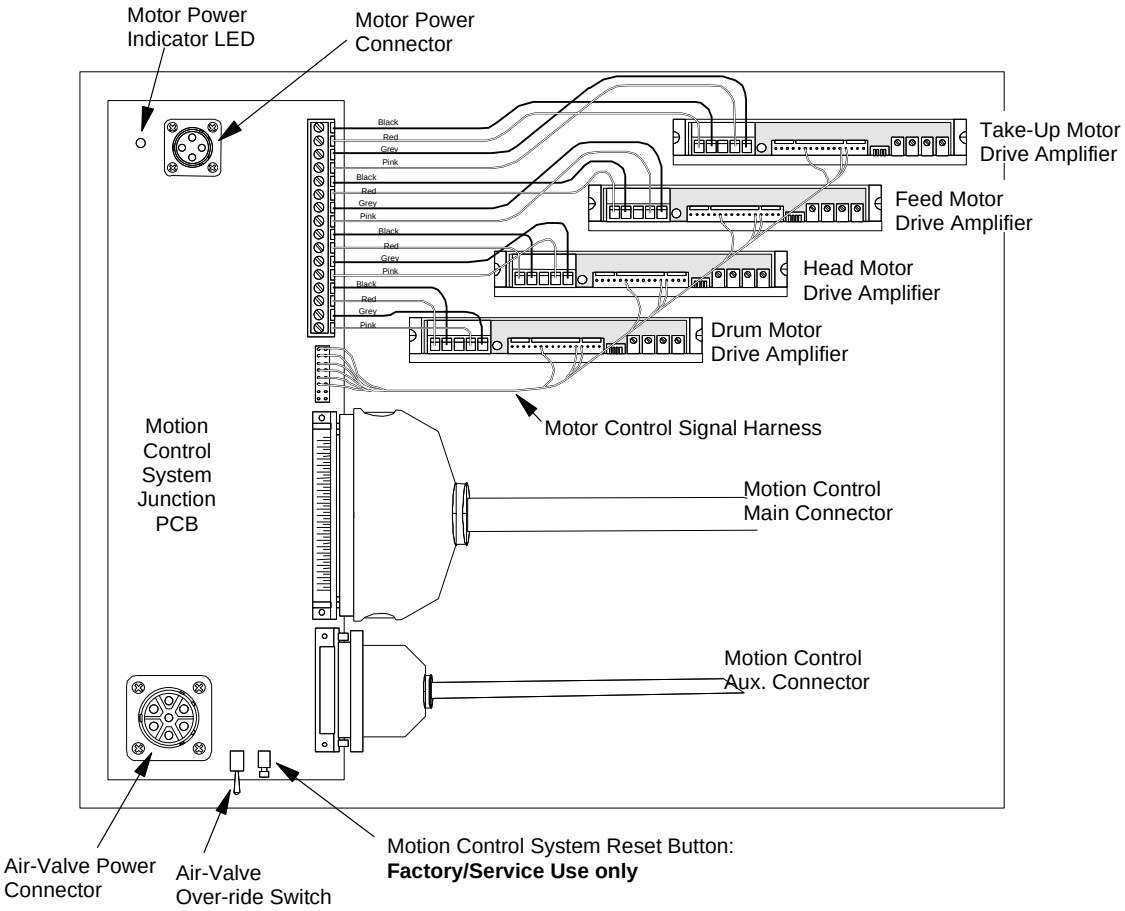
**Head Control Cable**
(D-25 Female)
Connects to Chromira's Main Head Cable

**Head Power Cable**
(D-25 Female)
Connects to Chromira's Head Power Supply

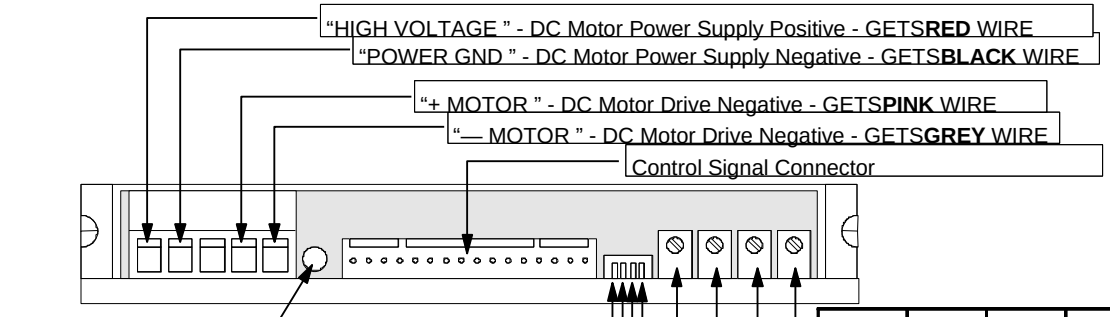
**Motion Control Cable Main Cable**
(Locking 100-Pin)
Connects to Motion Control Junction Panel



## *Motion Control Junction Board Layout*




## *Motor Power Amplifier Connections and Settings*




| **Axis > Pot** | **Drum** | **Head** | **Feed** | **Take Up** |
|---|---|---|---|---|
| Pot**1**: | Full CCW | Full CCW | Full CCW | Full CCW |
| Pot**2** : | Full CW | **8** turns CW | **6** turns CW | **6** turns CW |
| Pot**3** : | Full CW | Full CW | Full CW | Full CW |
| Pot**4**: | No adjust | No adjust | No adjust | No adjust |

# *Appendix D: X-Rite Densitometer Settings*

## *X-Rite 810/811 Configuration Menu Settings*

To set the Com Port Mode for use with ZBE Chromira Balance,
Press CAL, then button for “calibrate  NO” then “set modes YES”.

Press button under words to change their settings to:

| | | |
|---|---|---|
| p1: | BAUD | PN5 |
| | 9600 | OFF |
| p2: | aid | rci |
| p3: | COMP | DPT |
| p4: | LANG | |
| | ENG | |

***Note:*** All of these settings are case sensitive.

## *X-Rite 820 Configuration Menu Settings*

Press MENU, then button for Cnfg.  Settings are as follows:

| | | | | |
|---|---|---|---|---|
| | | Port | BAUD | PIN5 |
| PAGE-1: | modem | SER | 9600 | OFF |
| PAGE-2: | aid | COMP | DPT | ALF |
| PAGE-3: | auto | APRNT | tone | lock |

## *X-Rite Densitometer RS-232 Interface Cable Pinout*

Notes:
- This is a not a standard Null-Modem Cable.
- For PC’s with a 25-pin Serial Connector, use a standard RS-232 9-Pin-to-15-Pin adapter.

| D-9 Female Connector to PC | | D-25 Male Connector to 810 |
|---|---|---|
| Pin # | Function | Pin # |
| 2 | Data from 810 to PC | 2 |
| 3 | Data from PC to 810 | 3 |
| 5 | Ground | 7 |

## *X-Rite 880 Series Configuration Menu Settings*

To begin, be sure the balance program is Version 3.03 or higher.

To set the Com Port Mode for use with ZBE Chromira Balance, Press the p1 button (Far left) three times until the menu reads “FUNCTION MENU”. Press the edit button. Then press the cnfg button. Match the setting to the following:

| | | | |
|---|---|---|---|
| P1 | Lang | Tone | Net |
| | ENG | optional | OUT |
| P2a | RCI | PIN5 | XON |
| P2b | dpt | comp | alf |
| P2c | del | AXMT | ref |

P2d **baud** (the higher the baud the fast the data transfer)

Match this number with the baud settings in the Chromira Balance program

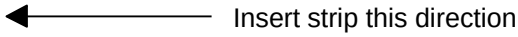
*Note:* All the settings above are case sensitive.

**To set the Chromira Balance to interface with the Densitometer, perform the following:**

Click the “Settings” Button on the main menu of the balance program.

- Be sure the cable is plugged into the correct COM Port and that this setting corresponds to it.
- Set the Baud Rate to match the baud rate of the densitometer.
- Set data bits to the default, 8.
- Set the Parity to the default, None.
- Set the Stop bits to the default, 1.
- Set the Densitometer model to X-Rite 880 Series.
- Click ok

To read a strip, click on the Densitometer bar and the Densitometer will read “Insert strip”. Insert strip (Printed on Chromira) as shown below:




Once strip is read, be sure it has read 17 regions on the Densitometer.  If it does not, click the cancel button in the Chromira Balance program and try it again.

## *X-Rite 414 Configuration Menu Settings*

To set the Com Port Mode for use with ZBE Chromira Balance, press Function and Color. Press Function again to select No for calibrate.  Then, press Zero to choose Yes for modes.

Press the Function key twice to reach the I/O-RS232 menu, then press Zero to select it. Press the Zero key to change settings for each field, and the Function key to change menu fields.

SEND: AUTO

BAUD: Don't care

PRINT HDR: ON/OFF

COMP: ON/OFF

Press the Function key two more times to return to normal operation.

To set the function, press the Function key until the screen displays DEN, then wait for the normal screen to reappear.

In the Balance application, press the settings button and set baud rate to the current selection on the densitometer, set data bits to 8, stop bits to 1, parity to None, and COM Port to the port on which the densitometer is currently connected.

## *X-Rite 404 Configuration Menu Settings*

Enter the mode menu as for the X-Rite 414, using the down arrow key at the far left in place of the FUNCTION key. Select the following settings:

RESP: GTMEN

COMP: ON/OFF

X10: ON/OFF

AID: ON / OFF

DPT: ON / OFF

In the Balance application, press the settings button and set the baud rate to 1200, data bits to 8, stop bits to 1, parity to None, and COM Port to the port the densitometer is currently connected to.

## *Eseco TR-90 Configuration Menu Settings*

To set the densitometer for use with Chromira Balance, first press the Menu button on the upper right of the keypad. Push the Select Probe (left arrow) button five times to scroll through the choices to the System Options menu. Press the Zero Cal key (Yes) to enter the menu. Choose Yes when asked if you want to change Output options, and enter the following settings, pressing the Read Enter button on the lower left to switch between screens.

| | | |
|---|---|---|
| Output Type: | SERIAL: Yes | PRINTER: Yes / No |
| End-of-line characters: | CR: Yes / No | LF: Yes / No |
| Baud rate: | Don't care. | |
| Data/Stop bits: | DATA: 7 / 8 | STOP: 1 / 2 |
| Serial print delay: | 8 | |
| Send DEN/RGB: | DEN: Yes / No | RGB: Yes |
| Digits per channel: | 3 / 4 | |
| Character between channels: | CR / LF / BLANK | |

Choose defaults on all other screens.

In the Chromira Balance application, press the settings button and adjust the baud rate, data and stop bits to the selections made in the menu. Set the COM to the port on which the densitometer is currently connected, and the Parity to None.

*Note:* Other model densitometers may work with the Chromira balance application. Check your manual for serial port information and setup instructions.

# JUNCTION BOARD REPLACEMENT PROCEDURE

This document covers the removal and replacement of the Chromira Junction board or Junction PCB.

Appendix A (refer back to page 44) shows the view from the top of the machine. There are six (6) screws that mount the junction board, and they are located from the top. Please label each AMP connector so they are all plugged in at the proper position.

Appendix C (refer back to page 46) is the view from the bottom of the machine. It is very important to connect all the cables in the right positions. The best thing to do is note the positioning before performing the task. ***Warning:*** Connecting the cables in the wrong slots can blow boards and/or the computer.

Amp Connectors: These are the cone-shaped connectors that have wire bundles connected to them.

***Note:*** Before starting the procedure, please power down the computer and unplug the main power plug of the machine.

Junction board replacement procedure:

1. Unplug main power and air value AMP connectors (See Appendix C).
2. Remove all AMP connectors from the top of the machine. (Please note positioning.) Unscrew the plastic ring at the base and the connector will pull out.
3. Remove amplifier cables. (It's very important to note positioning. Do not unscrew each lead. Each cable is screwed in to a connector. The connector itself will pull out of the slot in which it is housed on the PCB board.
4. Remove motor control signal cable (See Appendix C). It is very important to note the orientation. The connector will have a white mark on one side. That mark locates pin one. You must be sure to plug it back in with the white mark on the same side as the "1", as indicated on the junction board.
5. Remove both the motion control main connector and the motion control auxiliary connector. (See Appendix C for position.)
6. Unscrew each of the six screws that mount the board to the main deck. The screws are located on the top side of the deck (See Appendix A)
7. Remove board and replace with new one.
8. Screw each of the six screws back into place.
9. Replace all AMP connectors on the top side of the deck. (Please note positioning.)
10. Replace all amplifier connectors on the bottom side of the deck. (Again, please note positioning.)
11. Replace motor control signal cable. It is very important to note the orientation. The connector will have a white mark on one side. That mark locates pin one. You must be sure to plug it back in with the white mark on the same side as the "1", as indicated on the junction board.
12. Inspect motion control main and auxiliary cables for bent pins or overall damage.
13. If cables are fine, place them back in to position.
14. Replace all other AMP connectors on the bottom side of the deck.
15. Double check to see if all cables is properly seated.
16. Plug Chromira back in and power up the computer.

This completes the replacement procedure.

# Chromira Air-Solenoid Installation

## *Introduction*

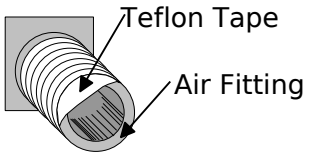
The Chromira Air-Solenoid allows the Chromira Printer to turn off its compressed air supply while not making prints. This will reduce the wear on your air-compressor and prolong its life.

This document describes the procedure for the installation of the Air-Solenoid and its related components.

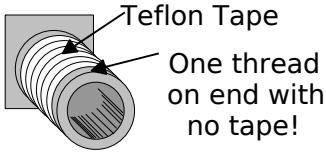
## *Warnings*

Before beginning this installation, please observe the following:

- Power should be turned off before doing any work on the Chromira.
- To avoid possible damage to the Motion Control Electronics, do not use your existing Motion Control Power Supply once the Air-Solenoid is installed. The Air-Solenoid installation kit will have a new Motion Control Power Supply included.
- When making air plumbing connections, avoid getting Teflon tape near the openings of, or inside, the air fittings. If Teflon tape gets inside the air duct, it will cause serious damage to the air rail.




**Avoid getting Teflon Tape within the air path!**




**Tape should be kept away from end of threaded fitting.**

## *What You Need*

You will need to have the following tools on hand before beginning:

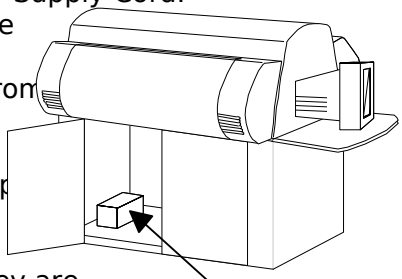
- ¼-inch blade Flat head screwdriver
- #2 Philips screwdriver
- Two adjustable (Crescent) Wrenches
- Utility Knife or razor blade
- Motion Control Power Supply (provided by ZBE)
- Air Solenoid (provided by ZBE)

The installation procedure starts on the following page. For any questions or other problems, please contact you ZBE dealer, or ZBE directly at:

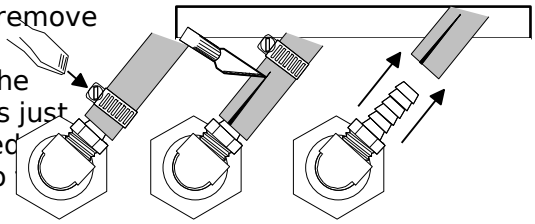
ZBE, Inc.
7220 Hollister Ave.
Santa Barbara, CA 93117
(tel) 805-685-2348 (fax) 805-685-9568
e-mail: support@zbe.com
www.zbe.com

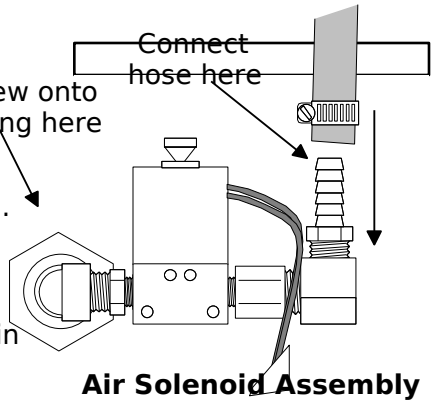
## *Chromira Air-Solenoid Installation Procedure*

1. Turn off the air supply to the Chromira. Disconnect the hose from the exterior fitting on the Chromira.
2. Shut down Chromira and disconnect the AC Power Supply Cord.
3. Locate the Motion Control Power Supply Unit in the lower chamber of the Chromira.
4. Unplug the Motion Control PSU's AC Power Cord from the power strip at the interior of the machine. (It should be the top-most plug in the power strip.)
5. Disconnect the cable that runs from the Power Sup to the Junction board located on the roof of the interior directly above the power supply.
6. Extract these cables from the troughs in which they are routed.
7. Take out all four screws from the top of the Power Supply case.
8. Take out the four screws inside the Power Supply, which hold it to the floor inside the Chromira, and remove the Power Supply from the machine.
9. Locate the Air Inlet Hose in the end-wall of the Chromira where it enters the interior. This is just behind where the Power Supply was mounted. Unscrew the clamp holding the air hose onto the brass fitting.
10. Cut into the side of the hose near the end to ease pulling it off the fitting. Pull hose from brass nipple.
11. Using two adjustable wrenches, unscrew the brass air inlet and remove the part inside of the deck.
12. Cut end of hose so that you have a nice cut end (with no slit from step #10).
13. Insert hose on air solenoid and tighten the clamp.
14. Attach Air Solenoid to fitting by turning fitting and holding the Air Solenoid stationary.
15. Locate the manual shut-off knob on the air solenoid assembly. This is the knob located at the top of the box-like assembly. The knob must be in the off position. To turn off, turn the knob in either direction. The knob will then pop up. Once you feel it move to the up position, it is off.
16. Remove top cover on motion control power supply
17. Mount the new Motion Control Power Supply to deck in the same position as the old one, using the four screws removed in step #8.
18. Put the new Power Supply's cover back on.
19. Route the two cables from the new Power Supply to the Junction Board (female connector goes towards the feed side and male connector goes towards take up side.)
20. Plug the wire from the Air-Solenoid, into the receptacle in the new Power Supply.
21. Locate the air solenoid switch on the power supply and set it to the off position.
22. Connect the new Power Supply's AC power cord to the top-most plug in the Chromira's power strip. Place the cable in the trough provided for it (where the old one was).



**Location of Motion Control Power Supply inside Chromira**




**Air Solenoid Assembly**

*Note:* All switches and manual shut-off knobs should be in the off position.  When in this position, it will allow the computer to have control of the air.  If a switch or knob is on, the air will stay on and the printer will fail the air solenoid test.

« This completes the installation of the Chromira Air-Solenoid and the new Motion Control Power Supply.  When the machine has started up again, go into the Preferences Menu in Chromira Printer, to set the amount of time the air will stay on after the machine is idle (time range 1 to 60 minutes).

# GENERAL ALIGNMENT PROCEDURE FOR CHROMIRA PAPER-TRACKING

This section describes the procedure for bringing a Chromira printer into alignment for proper paper tracking. This does not include optical alignment (viewer) or chassis setup (initial assembly). This document assumes that you know how to do the standard Core-Shaft Parallel Adjustment Procedure, and how to adjust the Drum parallel position, using the Main Bearing Tube (Donkey-Dick) push-pull mounting screws.

Start with a machine whose chassis is completely assembled, with dancer arms installed. The Dancer Arms must be aligned prior to installation onto the chassis.

## *A: FEED-SIDE CORE SHAFT ALIGNMENT and DANCER ROLLER LEVEL*

1. Start at the Feed Side of the Machine. Remove both core hubs from their shafts. Install and setup the Thou-Indicator for aligning the core-hub shafts.
2. Put the Feed Dancer in the “in” position. Place a test support between the Dancer Roller and the main tie-tube of the machine to hold the arm roughly in the paper-loaded position. Be sure that this support is at the midpoint of the Dancer’s Roller (this will be off-center of the drum). Use only one support located at the midpoint of the roller (not two on each end).
3. Measure and align the core drive shafts in the normal manner.
4. Once the shafts are in true parallel to the rail, change the indicator position to read the top-dead-center area of the Dancer Roller (Dancer Roller Vertical Parallel check). This is done by poking the indicator’s little feeler between the Dancer’s Tie-Tube and the Roller itself, resting upon the top of the Roller. Leave the Dancer Arm supported by the single support placed midway along the Dancer Roller.
5. Indicate along the length of the Dancer Roller. You should see about 15-20 thou of rise in the middle – this is normal. Take your measurements to indicate the difference in height at 1 inch in from each end of the roller.
6. Check that the Dancer Arm Roller Leveling Screw is installed on the side-plate of this Dancer Arm, and that the belleville washers are firmly compressed between the side plate lever, and the jam-nut installed on the screw. These washers should be fully compressed by the nut, and this screw should only turn with difficulty.
7. Adjust the Dancer Arm Roller Leveling Screw, and repeat the sweep at 1 inch from each end, until both ends read the same height. Remember that the middle will indicate a rise due to the pressure from the single support holding the Arm in position. Just worry about the ends – they need to be at the same reading.

## *B: DRUM PARALLEL ADJUSTMENT (Horizontal Plane)*

1. Place the Feed-Side Dancer Arm in the “out” position.
2. Leaving the Thou Indicator in place on the Feed-Side of the machine, reposition it to indicate the side-dead-center of the Chromira’s Main Drum for measuring the skew (in the horizontal plane) of the Drum.
3. Indicate along the length of the Drum, and adjust the Drum’s parallel in the horizontal plane to bring it into line if it is outside the normal tolerance for this adjustment.

## *C: TAKE-UP SIDE CORE-SHAFT ALIGNMENT*

1. Move and install the Thou Indicator on the Take-Up Side of the machine. (The rest of this section is the same as the procedure done on the Feed-Side of the machine.)
2. Remove both core hubs from their shafts. Install and setup the Thou-Indicator for aligning the core-hub shafts.
3. Put the Take-Up Dancer in the "in" position. Place a test support between the Dancer Roller and the Main Tie-Tube of the machine to hold the arm roughly in the paper-loaded position. Be sure that this support is at the midpoint of the Dancer's Roller (this will be off-center of the drum). Use only one support located at the midpoint of the roller (not two on each end).
4. Measure and align the core drive shafts in the normal manner.
5. Once the shafts are in true parallel to the rail, change the indicator position to read the top-dead-center of the Dancer Roller. This is done by poking the indicator's little feeler between the Dancer's Tie-Tube and the Roller itself, resting upon the top of the Roller. Leave the Dancer Arm supported by the single support placed midway along the Dancer Roller.
6. Indicate along the length of the Dancer Roller. You should see about 15-20 thou of rise in the middle – this is normal. Take your measurements to indicate the difference in height at 1 inch in from each end of the roller.

## *D: DRUM PARALLEL ADJUSTMENT (Vertical Plane)*

1. Load paper onto the Chromira. Make sure that the roll that is used has a perfect wind, and is not poorly aligned on its core.
2. Set up the Tenths Indicator to read the vertical position of the Drum in relation to the head (Main Drum Vertical Parallel Adjustment).
3. Perform the standard Main Drum Vertical Parallel Adjustment procedure.
4. Remove the Tenths Indicator.

## *E: FEED-SIDE DANCER ROLLER FINAL PARALLEL CHECK*

1. On the Feed-Side of the machine, set up the Thou Indicator for measuring the Dancer Roller Vertical Parallel, as in step 4 of section A. Advance the paper a few inches (using the paper advance button) before taking readings in the following steps.
2. Indicate the deviation of the top-dead-center of the Dancer Roller. It should be very close (<.003") to parallel. The rise due to paper tension at or near the midpoint of the roller will be about .005 to .010 inch. This is normal. Check that both ends are still at the same reading (level with each other). If they are not, try advancing the paper a little more (a few more inches), and take the readings again. If the ends are still not even (within .003), make the necessary adjustments to the Dancer Arm Roller Leveling Screw, advancing the paper a little after each adjustment. Technically, no adjustments should be necessary here.
3. Change the position of the Thou Indicator to read the side-dead-center of the Dancer Roller.
4. Check that the deviation here (Dancer Roller Horizontal Parallel) is no more than .007 inch.

   *Note:* There is no adjustment for the Dancer Roller Horizontal Parallel. If this is out-of-spec, the Dancer Arm will need to be removed, re-worked, and replaced.

5. Remove the indicator.

## *F: TAKE-UP SIDE DANCER ROLLER FINAL PARALLEL CHECK*

1. Set up the Thou Indicator to read the side-dead-center of the Take-Up Side Dancer Roller.
2. Perform the same Dancer Roller Horizontal Parallel reading as in step #3, part E. This deviation should also be within .007.

   *Note:* There is no adjustment for the Dancer Roller Horizontal Parallel. If this is out-of-spec, the Dancer Arm will need to be removed, re-worked, and replaced.

3. Remove the indicator.

## *G: CHECK PAPER-TRACKING PERFORMANCE*

1. Remove the paper form the machine, and double-check that it is rolled up perfectly. Ram it into the floor to even out the wind. (Bang the end that will go against the motorized flange on the floor.)
2. Re-load the paper onto the machine, making sure that the edge is aligned with the flange on the Take-Up Side of the machine.
3. Advance the paper for a good distance, and watch the edge of the paper winding up on the Take-Up Core. The surface formed by the rolling paper should be flat without ripples.