OPERATION MANUAL

Liberator XE XX12
Wide Format Thermal Imagesetter

December 2003
800-105509

OYO INSTRUMENTS, LP

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~ COPYRIGHT NOTICE ~

~ DISCLAIMER ~

OYO Instruments, LP makes no warranties as to the accuracy, validity, or fitness for use of the contents of this Manual. OYO Instruments, LP reserves the right to revise the information in this Manual at any time without prior notice.

~ FCC INFORMATION ~

This equipment has been tested and found to comply with FCC 47 CFR Part 15 Emission Requirements for Class A.

~ CERTIFICATION ~

This device complies with the European EMC Directive 89/336/EEC as amended and with the Standard for Safety of Information Technology Equipment, including Electrical Business Equipment (UL 1950 and CAN/CSA C22.2 No. 950).

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December 2003

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~ STATEMENT OF LIMITED WARRANTY ~

OYO Instruments, LP ("OYO") warrants its imagers (excluding print heads) for twelve (12) months. OYO warrants its print heads for three (3) months. The purchaser of the imager may extend the print head warranty to twelve (12) months via the execution of a film supply contract.

This warranty commences on the date of original shipment from OYO. Any part of the imager manufactured or supplied by OYO and found in reasonable judgment by OYO to be defective in material or workmanship will be repaired or replaced by an OYO authorized service center without charge for parts and labor.

To obtain warranty coverage, a Return Material Authorization (RMA) number must be obtained and the imager, including any defective parts, must be returned to an authorized service center within the warranty period. Failure to follow the RMA procedure may void the warranty.

This warranty does not cover any imager that has been subject to misuse, neglect, negligence, accident, or any imager that has been operated in any way contrary to the imager cleaning procedures (as specified in the OYO Operator's Manual). This warranty does not apply to damage resulting from improper maintenance or from damage caused by imager modifications made by user.

This warranty does not extend to repairs made necessary by (i) normal wear or (ii) by the use of parts, accessories, or media not distributed by OYO. The use of such uncertified items, especially media, may adversely affect the imager's operation, performance or durability and therefore void this warranty.

OYO reserves the right to change or improve the design of any imager without assuming any obligation to modify any product previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE APPLICABLE WARRANTY PERIOD. ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE DISCLAMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE APPLICABLE WARRANTY PERIOD. OYO'S OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND OYO DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION. SOME STATES AND COUNTRIES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTIY MAY LAST, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

OYO ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, EXPENSE OF RETURNING THE IMAGER TO AN AUTHORIZED SERVICE CENTER, SERVICE PERSONEL'S TRAVEL TIME, TELEPHONE AND FASCIMILE CHARGES, RENTAL OF A LIKE PRODUCT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LOSS OR DAMAGE TO PERSONAL PROPERTY, LOSS OF REVENUE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME, OR INCONVENIENCE. SOME STATES AND COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCEDINTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

To locate your nearest OYO service center dial:
(800) 747-7651 or (713) 986-4444 in the United States
(01582) 573980 in the United Kingdom
Or send e-mail to support@oyo.com

Revised April 2003

~ IMAGER CLEANING PROCEDURES ~

To increase the reliability and useful life of your imager, OYO has designed the following cleaning procedures. The regular use of these procedures is required to ensure compliance with OYO's warranty protection for both the imager and the print head. The use of any other procedure may void the warranties offered by OYO.

The thermal print head, rollers, media conditioner, and interior of the unit should be cleaned after use of every roll of media, or sooner if required.

Print head Cleaning Instructions:

- Wear only latex (non-powder) disposable gloves (part # 540V1106001). When handling and cleaning the print head, the use of latex gloves is required to keep salts and oils present on the operator's hands from depositing onto the print head surface.
- Use only 98% isopropyl alcohol cleaning wipes (part # 160V1106001). A mixture containing a greater percentage of water may act as a carrier for salts (ions) which may lead to print head corrosion.
- With the cleaning wipe, rub the entire length of the print head.
- After cleaning, dispose of all cleaning material. Do not reuse.
- Make sure surface of print head is completely dry before closing unit.

Imager Cleaning Instructions:

- In order to remove any contaminants and/or residue from the rubber platen roller and metal idler roller, these components of the imager unit should also be cleaned with 98% isopropyl alcohol cleaning wipes. All surfaces should be completely dry before closing the unit.
- The inside of the imager unit, including the media conditioner, should be vacuumed thoroughly before loading the next roll of media.
- The back and side filters should be checked and vacuumed monthly (or replaced, if necessary) to ensure adequate airflow across the thermal print head.

Other Precautions:

- The print head should never come into direct contact with the platen roller (black drive roller). Either a piece of Mylar or film should be placed between the print head and the roller if no media is loaded in the imager.
- Do not place media or media hubs directly on the floor or on any other unclean surface. Doing so may cause contaminants to be picked up and introduced into the imager and cause print head damage.
- Avoid using the first and last wraps of media on the roll. This portion of the media may contain contaminants due to handling. The manufacturer provides extra media on each roll to compensate for this procedure.
- The front panel of the imager should be opened every three months and shavings from the cutter removed with a vacuum.

Revised April 2003

~ RETURN MATERIAL AUTHORIZATION (RMA) PROCEDURES ~

OYO provides warranty support and service through its facilities in Houston, Texas. To obtain warranty support and service, please take the following steps:

1. To determine the extent of warranty support and service necessary, contact your OYO Technical Support Department at (800) 747-7651 or (713) 986-4444 between 8:30 AM and 5:30 PM CST, Monday through Friday, or by facsimile at (713) 986-8724. Or e-mail OYO at support@oyo.com and indicate your daytime telephone number (including area code) and business address. If the OYO support technician determines that your imager should be returned to OYO for repair, obtain a Return Material Authorization (RMA) number from your OYO support technician.

2. Complete a copy of the attached RMA form. Additional copies of RMA forms can be obtained from OYO's Technical Support Department.

3. Return the imager or appropriate imager component to OYO within 30 days, freight prepaid, in either its original packaging or packaging affording an equal degree of protection. OYO can provide approved packaging for a charge.

4. Remove all media from the imager and place a sheet of acetate over the rubber platen roller, also covering the closed loop wheel in the film path (figure1). Film or media, power cord, hubs, and cabling do not have to be returned with the imager.

5. Use a plastic sheet large enough to wrap around the entire imager when placing the imager in a box. When lifting the imager, place lift straps around each end of the imager from the bottom for 2-person lift (figures 2 & 3).

6. Enclose in the package a completed copy of the RMA form.

7. Indicate your RMA number on the outside of the package and on any shipping documentation. The customer is responsible for the cost of shipping and insurance when sending products to OYO for warranty service or repair.

8. Deliver all packages to:

OYO Instruments, LP
Attn: Service Department
7007 Pinemont
Houston, TX 77040

In the case of repairs covered by OYO's warranty, OYO will pay for shipping costs associated with the return of the imager or components to the customer's site, utilizing any shipping services it deems appropriate. The customer is responsible for any incidental expenses such as import duties. All repairs will be warranted for ninety (90) days or the remainder of the original warranty period, whichever is longer. **Failure to follow these procedures may void your warranty coverage or significantly delay warranty repairs.**

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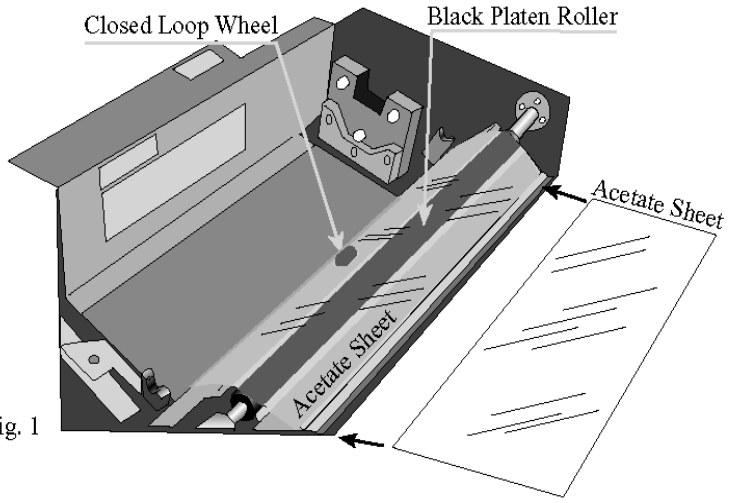

Fig. 1

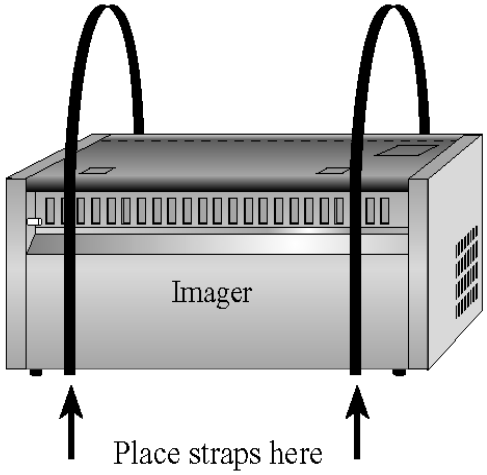

Fig. 2

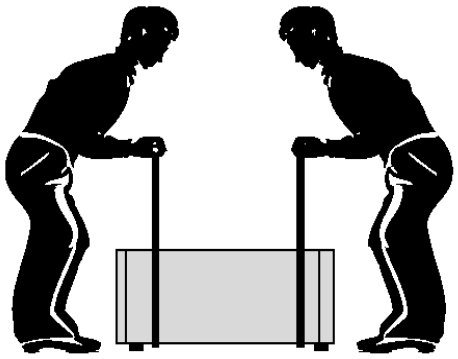

Fig.3

2-Person Lift

~ RETURNED MATERIAL AUTHORIZATION (RMA) FORM ~

CUSTOMER INFORMATION:

YOUR NAME:_____ COMPANY NAME:_____

COMPANY ADDRESS:_____

_____

COMPANY PHONE:_____ COMPANY E-MAIL:_____

IMAGER/PLOTTER INFORMATION:

MODEL:_____ OYO RMA #:_____

DATE:_____ SERIAL NUMBER:_____

DETAILED REASON FOR RETURN:

Provide (i) a printout of print set-up from control panel on imager and (ii) a film sample showing problematic area.

WHAT EVENT LED UP TO THE FAILURE? DESCRIBE HOW TO REPRODUCE THE PROBLEM.

Additional Notes: (OYO Use Only)

Complete and fax this form to OYO at 713-986-8724 for RMA # assignment. OYO will return this RMA form to you via facsimile, indicating the assigned RMA # and any necessary instructions. When shipping the imager or parts to OYO, please return a copy of this form in your shipping package.

To be filled out by OYO Technical Support Department:

RMA Number Assigned:_____ **Authorized by:**_____

Revised April 2003

~ THERMAL MEDIA ~

OYO's thermal imaging products are precisely aligned and adjusted at the factory for proper operation. The use of OYO certified media and accessories, as well as regular maintenance and cleaning is essential to ensure the optimum performance of the imager.

Depending on the environment and usage, the imager may require cleaning even after short periods of operation. Follow the cleaning and maintenance procedure given in Chapter 5.2 of the Operation Manual.

Changing from paper media to film media requires the user to pay extra attention to the cleaning process. It is imperative that all paper dust is removed from the imager to ensure optimum performance.

The following types of thermal media are supplied by OYO for use in the Imager.

1. **Report Grade Thermal Paper -** This lightweight paper is susceptible to scratching. It cannot be erased without marring the image. This paper leaves residue, but proper cleaning, as described in the cleaning procedures, will prevent excessive wear.

2. **Presentation Grade Thermal Paper -** This heavy top-coated paper is resistant to scratching. It can be erased without marring the image. This paper leaves residue, but proper cleaning, as described in the cleaning procedure, will prevent excessive wear.

3. **Thermal Film** - OYO supplied film has been specially formulated and certified for use with OYO's imagers. Some film may leave residue, but proper cleaning, as described in the cleaning procedure, will prevent excessive wear.

4. **Thermal Proofing Media** - OYO supplied proofing media has been approved for use with OYO's imagers. Some proofing media may leave residue, but proper cleaning, as described in the cleaning procedure, will prevent excessive wear.

Contact your OYO sales representative at (800) 747-7651 or (713) 986-4444, or contact us via e-mail at ***sales@oyo.com*** to obtain the part number and price of OYO's certified media products for your imager.

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DATE	BRIEF DESCRIPTION of CHANGE	BY

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CHAPTER 1

INTRODUCTION

1.1 GENERAL DESCRIPTION

OYO Instrument's Liberator Thermal Imagesetter is a high-resolution, wide-format graphics device designed for office use. It utilizes direct thermal printing technology; with few moving parts and no liquid chemicals to contend with, it operates efficiently and requires only nominal maintenance

1.2 FUNCTIONAL DESCRIPTION

The Liberator is a raster-scan device that plots information on thermal-sensitive media by sequentially addressing an array of nibs (dots) along a fixed thermal print head and incrementally moving the media a fraction of the dot length. Fig. 1-1 is a block diagram of the Liberator. The components include (a) thermal print head and its driver circuitry; (b) micro-stepper motor and its control circuitry; (c) pressure roller (platen) which is driven by the micro-stepper motor; (d) media cutter, and (e) interface electronics and power supplies.

Thermal-sensitive media from the supply roll is fed between the platen and the thermal print head. The micro-stepper motor turns the platen, moving the media past the print head in steps of 0.052 mils (1.32 μm). Stepping can be controlled directly by the Liberator or indirectly by the data source. As the media moves, the nibs in the thick-film print head are addressed through the interface circuitry and heated by applying power to produce an array of dots representing graphic. Each dot is 0.85 x 1.25 mils (21 x 32 μm) for 1200x1200 dpi models. The heated nibs in contact with the thermal-sensitive media develop color (black) through a thermo-chemical reaction in the media's coating. Scanning and stepping is repeated until the desired image is produced.

1.3 MEDIA DESCRIPTION

The thermal-sensitive film used in the Liberator consists of a base polyester, a coating of heat reactive silver, and a protective topcoat. The film is approximately 5 mils (0.127 mm) and is developed to an optical density of approximately 3.5 Ortho and 4.0 UV.

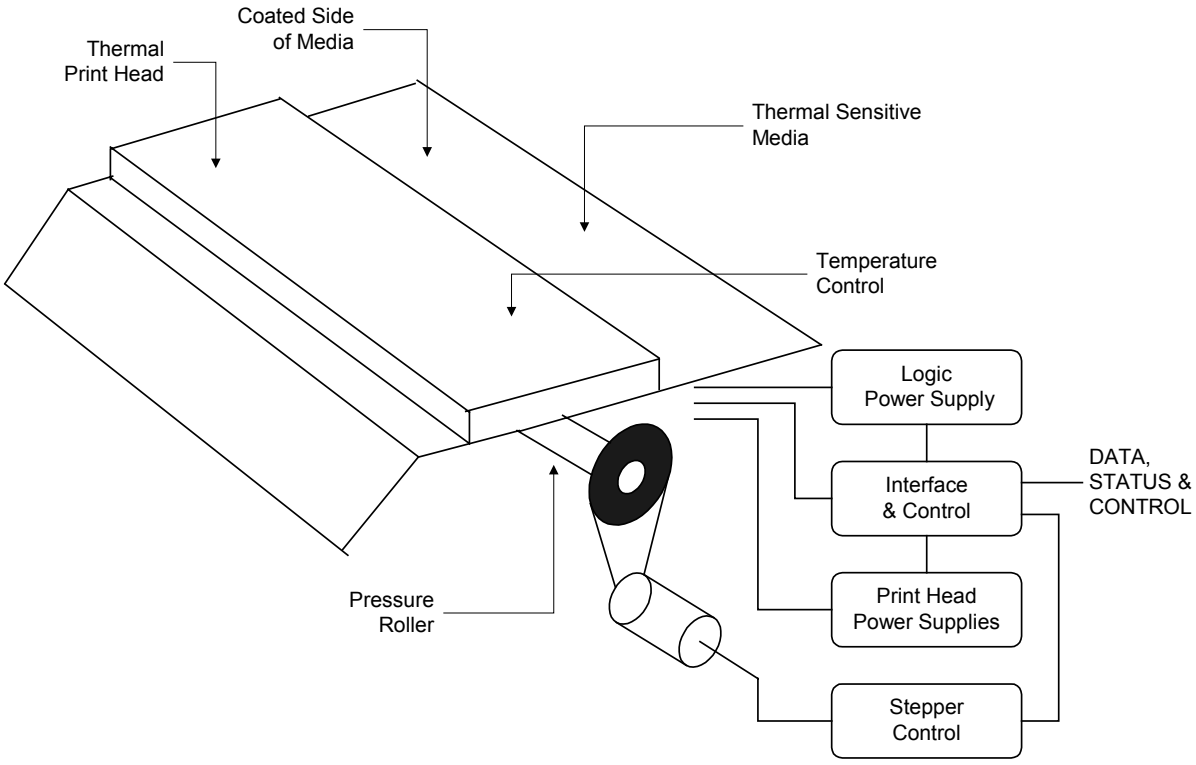

Fig. 1.1
FUNCTIONAL BLOCK DIAGRAM

1.4 MOUNTING CONFIGURATIONS

The Liberator is housed in a rugged, low profile cabinet that is normally mounted on a horizontal surface. Fig. 1.2 shows the tabletop configuration. The switches and indicators are accessible and visible.

Media Take-up equipment is required to automatically wind the printed media. This is an available option except XE5412 (standard equipment).

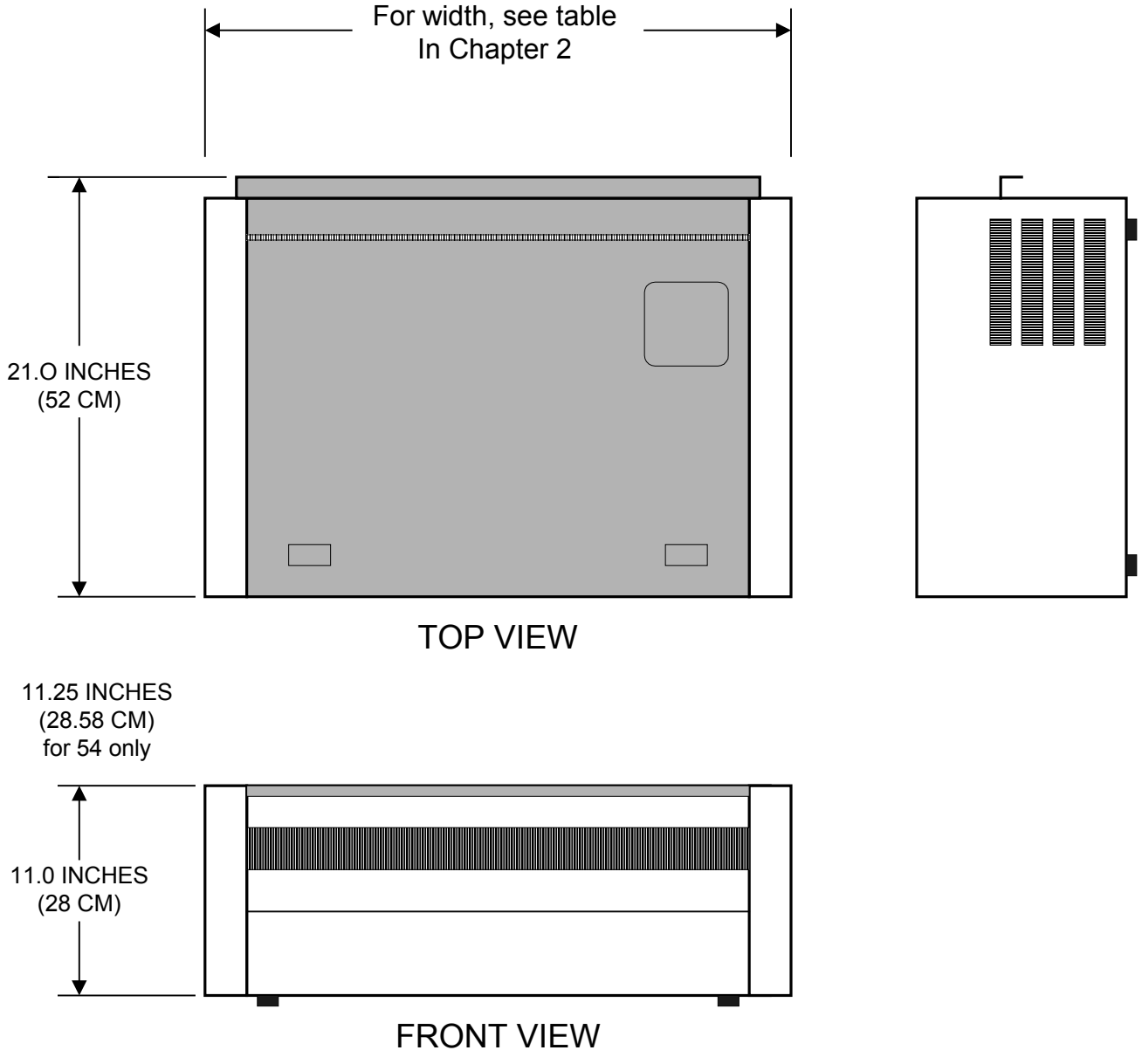

FIG. 1.2
TABLE TOP CONFIGURATION

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CHAPTER 2

2.1 FUNCTIONAL/ELECTRICAL/PHYSICAL/ENVIRONMENT

Printhead Configuration ..... Single-substrate, linear array
Printing Method ..... Direct thermal technology
Resolution ..... 600 x 600 dpi or 1200 x 1200 dpi
Media Drive ..... Stepper motor
Paper Type ..... ThermoImpression® proofing media
Paper Length ..... 200 foot roll
Film Type ..... ThermoImpression® polyester film
Film Length ..... 180 or 200 foot roll
Nib Size ..... 0.85x1.25 mils (0.021x0.032 mm)
Optical Density (Film) ..... 4.0 typical (UV)
Stepping Increment ..... 0.052 mils (1.32 µm)
Stepping Accuracy ..... ± 0.01% or ± 0.002 in/20 in or 0.05 mm/500 mm
Dot Alignment Error ..... ± 0.01%
Interface Type ..... 10/100 Ethernet or USB 1.1

Model	Liberator XE1812	Liberator XE2812	Liberator XE3612	Liberator XE4212	Liberator XE5412
Part Number	818-105466	828-105500	636-105500	842-105460	854-105500
Media Width	18.25 in (46.35 cm)	28.5 in (72.4 cm)	36 in (91.44 cm)	42 in (107 cm)	54 in (137 cm)
Plot Width	17.92 in (45.52 cm)	28.16 in (71.53 cm)	35.84 in (91.04 cm)	41.81 in (106.2 cm)	53.76in (136.55 cm)
Dots per Scan	21502	33790	43006	50174	64510
Bytes per Scan	2688	4224	5376	6272	8064
Plot Rate (1200x1200) (600x600)	0.05 ips 0.10 ips	0.05 ips 0.10 ips	0.05 ips 0.10 ips	0.05 ips 0.10 ips	0.05ips 0.10 ips
Height	11 in (27.9 cm)	11 in (27.9 cm)	11 in (27.9 cm)	11 in (27.9 cm)	11.25 in (28.6 cm)
Width	29 in (73.7 cm)	37.5 in (95.3 cm)	45 in (114 cm)	53 in (135 cm)	63 in (160 cm)
Depth	21 in (53.3 cm)	21 in (53.5 cm)	21 in (53.5 cm)	21 in (53.5 cm)	21 in (53.5 cm)
Net Weight	110 lb (50 kg)	130 lb (59 kg)	155 lb (70 kg)	185 lb (84 kg)	232 lb (105 kg)

POWER REQUIREMENTS	
Voltage	115 or 220 VAC (auto-switch)
Frequency	50-60 Hz
Power Usage	90 Watts idle mode, 1000 Watts plot/print mode
Operating Environment	Temperature, 15 to 35 °C (60° to 95° F) Storage Range: –10° to 70° C (14° to 158° F) Humidity, 5 to 95% non-condensing

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CHAPTER 3

INSTALLATION

3.1 UNPACKING

When unpacking the Liberator, visually inspect the unit for any damage, which may have occurred during shipment. Promptly notify and submit claims to the carrier for damage to or loss of parts. Check to make sure that the power cord and media hubs are present.

3.2 MOUNTING

The Liberator is designed to operate on horizontal surfaces. Plastic feet are provided on the bottom of the unit for tabletop configurations.

Although the Liberator is designed for rugged environments, it should not be subjected to shock or vibration in excess of its specified ratings
Install the Liberator in a location where it is not subjected to heat or direct sunlight. Keep away from large objects that might obstruct ventilation around the unit. A clean, dust-free environment is highly recommended.

3.3 POWER CONNECTION (110 VAC or 220 VAC)

Verify that the AC voltage and frequency match the rating stamped on the plate on the rear of the cabinet. Plug the power cord into an independent wall outlet. Sharing the same outlet with other noise-generating equipment should be avoided. If an earth ground is not provided in the wall outlet, use the rear terminal to connect the unit to a high conductivity ground path such as a cold water pipe. The **power switch CB1** is located at the back of the unit and contains an integral circuit breaker (12 amps at 115 VAC).

! Important Notice!
Both power supplies inside the Liberator are **AUTO-SWITCH**.
No changes are required to switch from 110 VAC to 220 VAC or back.
But, if a media take-up is used (see 3.5.1), the media take-up AC select switch must be set to match the input voltage!

It is essential that the unit is correctly connected to the data source and that the media supply roll be properly installed prior to operation. Carefully follow the loading and interfacing instructions in Section 3.4 and Chapter 5. Improper loading or incorrect interfacing may cause damage to the unit and void the warranty.

3.4 LOADING ROLL MEDIA

1. Turn off the power switch (CB1).

2. Lift the two latches on both sides of the Liberator (front) and hinge up the top section.

3. Remove the media roll and the packing core hubs by pulling straight up on the plastic hubs.

4. Insert the special hubs (not the packing ones) into a new roll of media. Orient the media so that the ***emulsion side*** of the media will be ***up*** when it is fed under the media cutter. This will assure that the print head on the hinged section above come in contact with the ***emulsion side*** of the media when it is latched back into place. The media is wound so the ***emulsion side*** is facing the inside of the roll.

5. Replace the media roll by firmly pressing the hubs straight down into the retainer mechanism. The hubs will snap into place. Make sure that the emulsion side is properly oriented.

6. Pull the media out evenly and smoothly, and feed it ***under*** the media cutter mechanism.

7. Now gently lower the hinged top section onto the media and latch the top section down.

The following steps can be performed to make sure that the media is loaded properly:

- Turn on the power switch.

- Press the **ON LINE** key on the front panel to switch the Liberator to OFF LINE.

- Verify that the media is feeding properly by pushing the FEED (**FEED/PARM-**) key on the front panel. The media should move evenly across the print head.

- Press the CUT (**CUT/PARM+**) key on the front panel. If the media cutter moves across the media area without cutting the media, the operator has failed to feed the media ***under*** the cutting mechanism when loading the new roll.

3.5 INSTALLATION AND ADJUSTMENT OF MEDIA TAKE-UP (*Optional*)

3.5.1 Installation of Media Take-Up

Tools Required:

1. Screw driver-medium flat blade
2. Hex wrench-3/32
3. Hex wrench-5/32, 90 degree

Procedure:

Set the media take-up AC select switch to match the input voltage to the Liberator (set to 115 V if using 115 VAC input; set to 230 V if using 230 VAC input).

1. Install four (4) 10-32 x .50 long hex washer screws and four (4) keyhole studs as shown. Do not tighten the screws all the way down. Tighten enough so that the keyhole studs are secure but slightly loose.

2. Place the media take-up assembly on the Liberator floor stand. Line up the keyhole cutouts of the media take-up with the four (4) screws/studs installed per above step.

3. Secure the media take-up assembly with the remaining two (2) 10-32 x .50 long hex washer screws as shown.

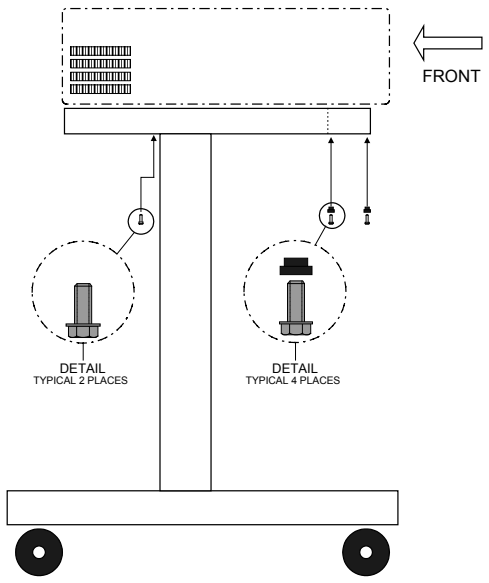


Fig. 3.1
MEDIA TAKE-UP INSTALLATION

The following steps require that media be installed in the Liberator.

3.5.2 Adjust Media Supply Reel *Refer to Fig. 3.2*

Feed the media on to the media supply reel and check the "fit". The gap between the edges of the media and the flanges should be equal. To adjust do the following:

- Release (untighten) the lever clamp "**A**" securing the media supply reel. Pull the knob "**B**" outward and remove the media supply core.

- Using a 3/32 hex wrench, loosen the 10-32 setscrew "**C**" securing the left side drive flange hub to the left side drive shaft. Move the drive flange hub right or left as required to correctly adjust it. Tighten the 10-32 setscrew, place the media supply core back in place and re-secure the media supply reel.

- Re-check the media "fit". If not equal on both ends, repeat the steps above.

3.5.3 Adjust The Media Tension *Refer to Fig. 3.2*

- Loosen (do not remove) the two (2) screws securing the right side cover to the right side panel. Slide the right side cover forward and off the panel.

- Note the tension in the media as it winds on to the media take-up assembly. If the tension is not equal on both ends, loosen (do not remove) four (4) 10-32 soc cap screws securing the right side panel to the right side frame. Adjust the 10-32 soc cap screw "**D**" on the bottom flange of the right side cover **up** or **down** until the desired tension is reached. Tighten screws and replace cover when done.

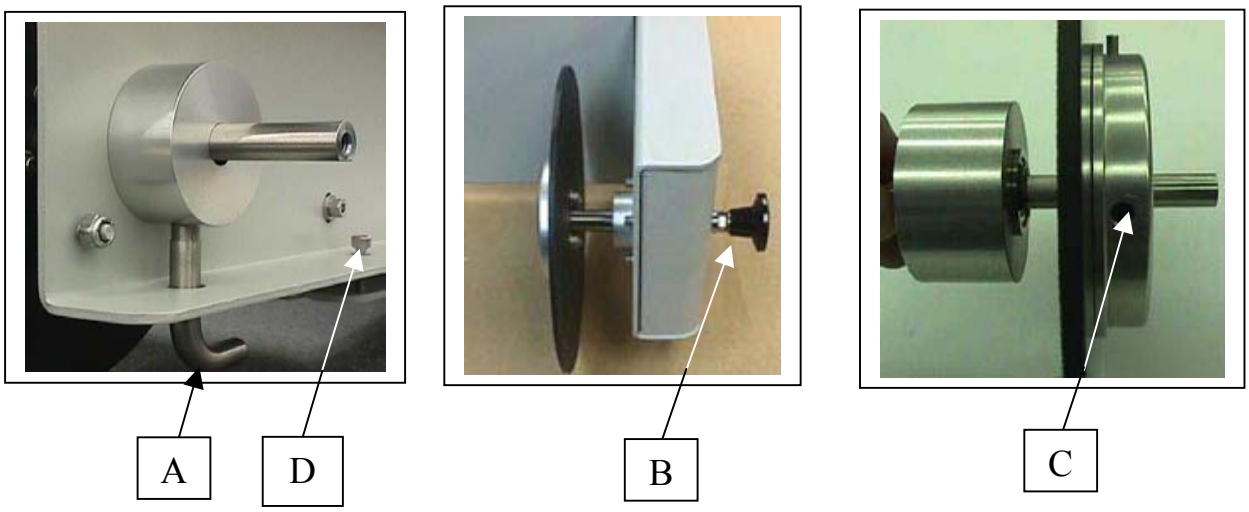


Fig. 3-2
PAPER TAKE-UP ADJUSTMENT

CHAPTER 4

OPERATION

OYO Thermal Imaging Products are precisely aligned and adjusted at the factory for proper operation. The use of OYO supplied media and accessories as well as regular maintenance and cleaning are essential to ensure optimum product performance.

Depending on the environment and usage the product may require cleaning even after short periods of operation. Please follow the cleaning and maintenance procedure given in Chapter 5 of the Operation Manual.

Changing from using paper media to film media requires that the user pay extra attention to the cleaning process. It is imperative to remove all paper dust to ensure optimum film performance.

The following types of thermal media are supplied by OYO for use in the Product:

1. **Thermal Film:** OYO supplied film has been specially formulated for use with OYO products. Some film may leave residues, but proper cleaning, as described in the cleaning procedure, will prevent excessive wear.

2. **Thermal Proofing Media**: OYO supplied proofing media has been approved for use with OYO products. Some proofing media may leave residues, but proper cleaning, as described in the cleaning procedure, will prevent excessive wear.

Contact your OYO sales representative at 800-747-7651, 713-986-4444 or sales@oyo.com to obtain the part number and price of OYO supplied media.

4.1 PRECAUTIONS

Do not turn off the main power or pull the power cord from the wall outlet without first turning off the POWER switch located on the back of the unit.

The Liberator employs only low voltage power supplies. However, hazardous voltages are present in the motor driver and in the AC input wiring. Reasonable safety precautions should be used to avoid electrical shock. Turn the unit off before replacing the media supply roll or servicing any component.

Circuits installed on the thermal printhead are composed of CMOS ICs. Care must be taken during operation and service to avoid damage from static electricity. ***When replacing the printhead, conductive mats and grounding straps should be used to prevent damage due to electrostatic discharges (ESD).***

Never attempt to operate the unit without media moving across the printhead! Such a condition may cause severe damage and void the warranty.

4.2 CONTROL PANEL KEYPAD FUNCTIONS

To access control panel selections, the Liberator must be taken off line by toggling the **ON LINE** key once. The green ONLINE light will go off, and the "OFF LINE" message will be displayed. The layout of the control panel is shown in Fig. 4.1.

4.2.1 Front Panel Indicators

There are two LED indicators (**ON LINE** and **STATUS**) on the panel. Both indicators are bi-color (green and red).

When the **ON LINE** indicator is lit green, the Liberator is in On Line state and ready to accept data; when it goes off, the Liberator is in OFF LINE state and can go to the MENU or ITEM mode to change parameters.

If the Liberator detects any error, the **STATUS** indicator will be lit red. An error message will also be shown on the VF display. See Section 4.4 for detailed error messages.

The Liberator will not accept any data when the **STATUS** indicator is lit red with error message displayed. A ***flashing red*** color **STATUS** indicator means WARNING! The warning message will be seen on the VF display (such as "Low Media").

The **STATUS** indicator will be lit green when the Liberator performs certain functions, such as media cut and media form feed.

4.2.2 Keypad

MENU: This key allows the operator to cycle through the MENU selections during Liberator OFF LINE: SYSTEM menu, JOB menu, IMAGE menu, NETconfig menu or Print the System Setup.

ITEM: This key allows the operator to cycle through all the ITEMs listed under one of the basic menus.

ON LINE: This key switches the Liberator between ON LINE and OFF LINE. The Liberator will be ready to receive data only during ON LINE, with the ON LINE indicator on the panel lit green.

ENTER: This key allows operator to go from MENU to ITEM selection and also to save the selected parameter into Liberator's "permanent" memory. Two asterisks "**" will appear next to the parameter to indicate that it is now the ***default***. As a "permanent" default, the selection will remain valid even if the Liberator is switched OFF, or RESET is performed.

CUT/PARM+: This key initiates the plotter MEDIA CUT function only when the "Imager OFF LINE" message is on the display. It is also used as a parameter scroll up key (PARM+) when the Liberator is in the ITEM mode.

FEED/PARM-: This key will move the media 3.5" long only when the OFF LINE message is on the display. It is also used as a parameter scroll-down key (PARM-) when the Liberator is in the ITEM mode.

When parameters are displayed for a selected ITEM, the **PARM+** and **PARM-** keys allow the operator to cycle up or down through the parameter selections (options) that are available.

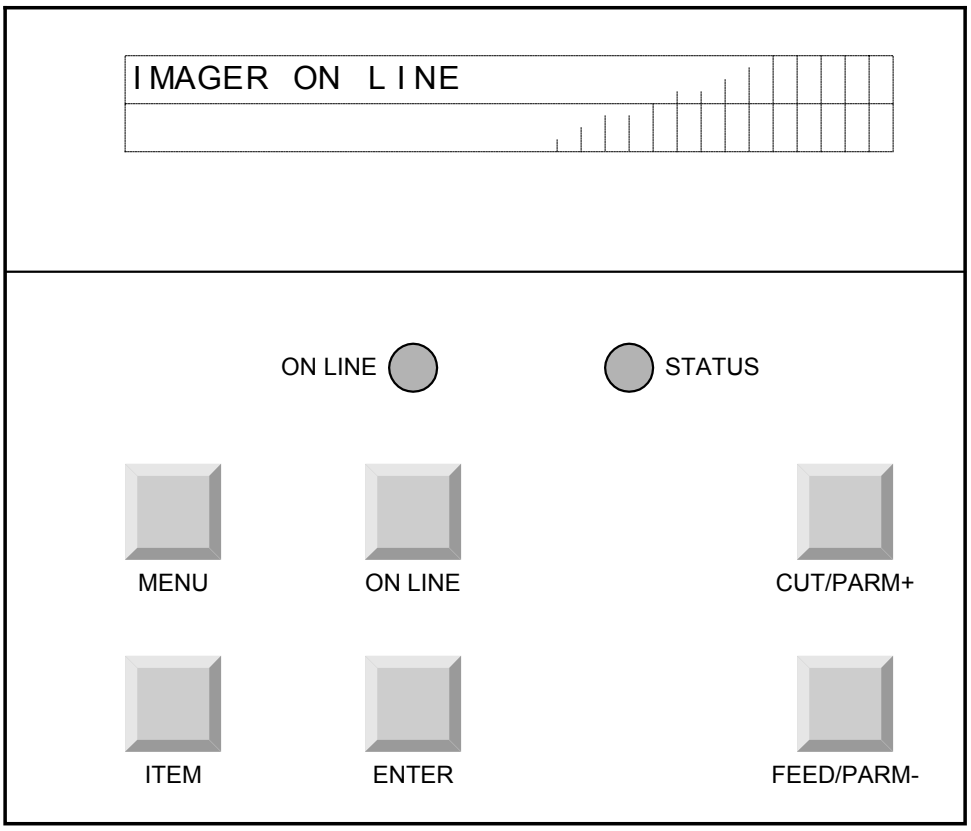


FIG 4.1
CONTROL PANEL KEYPAD

4.2.3 Menu and Item Modes

Table 4.1 shows the menus and menu items available with the basic Liberator configuration. Detailed description of menu items is given below.

After the Liberator is powered up, the default state is ON LINE, with the ON LINE indicator lit green and the message "... Imager" displayed. Press the **ON LINE key** to switch the Liberator to the OFF LINE state.

After "... OFF LINE" appears on the display, pressing the **MENU key** causes the first menu (SYSTEM menu) to appear. Pressing the **ITEM** or **ENTER key** enables the ITEM mode, causing the first item (see Table 4.1) to appear on the display. Pressing the **ITEM key** will cycle through all the items under the current menu. When the Liberator is in the ITEM mode, pressing the **MENU key** will exit the ITEM mode and go back to the MENU mode.

Table 4.1 MENU selection

Liberator Off Line→	SYSTEM menu →	JOB menu →	IMAGE menu →	NETconfig Menu →	Print the Setup ←
	System Test ↓	Imager Resolution ↓	Contrast Level ↓	Delay Buffer Size ↓	
	Media Type ↓	Automatic Media Cut ↓	Show Transport Parm ↓	Net Interface Status ↓	
	Fan Control ↓	Closed-loop Control ↓		IP Address Mode ↓	
	Show Media Remaining ↓	ENM ↓		IP Address ↓	
	Reset All Parameters ↓	Enhanced Temp Control ↓		Subnet Mask ↓	
	Total Image Footage ↓			Gateway ↓	

Notes:

1. Arrows "→ " and "← " mean pressing the MENU key; "↓ " means pressing the ITEM key.

2. The Liberator will go from the MENU mode (first row) to the ITEM mode after the ITEM or the ENTER key is pressed.

3. The Liberator will go back to the MENU mode from the ITEM mode by pressing the MENU key.

4.2.4 Parameter Selection

ITEMs for each of the four menus (SYSTEM, JOB, IMAGE, and NETconfig) and their PARAMETER selections are listed in Table 4.2, 4.3, 4.4, and 4.5 respectively.

In the ITEM mode, the item along with its default parameter value is on the display. Pressing the **PARM+** or **PARM-** key will scroll up or down through all the available parameter values for that specific item.

Any available parameter value can be selected and permanently saved by pressing the **ENTER** key when it is displayed. Two asterisks "**" will appear on the display next to the selected parameter value, indicating its acceptance.

4.3 TESTING

The Liberator features built-in plotting/printing tests to verify that the unit is operating normally, and to provide a guideline for choosing the appropriate contrast setting. The self-test functions should be used after initial installation and in case of trouble-shooting.

4.3.1 Test Procedure

- Make sure that the media is loaded.
- Turn on the power switch.
- Press the **ON LINE** key to switch the Liberator to OFF LINE. This status will be seen on the Front Panel VF Display.
- Select the **SYSTEM menu** and the **System Test** item.
- The **PARM+** or **PARM-** key may be used to select the desired test:
  - **Platen Accuracy**
  - **Open-loop Check** (for Closed-loop control=Yes only)
  - **Plot Calibration** (for Closed-loop control=Yes only)
  - **Checkerboard**
  - **Nib Test**
  - **Contrast Test**
  - **Dot Size Test**
  - **ENM Data Check**
- Press **ENTER** to initiate the test.

Table 4.2 ITEMs of SYSTEM Menu

ITEM	PARAMETER	DEFINITION
System Test	- Platen Accuracy... - Open-loop Check... - Plot Calibration… - Checkerboard - Nib Test - Contrast Test... - Dot Size Test... - ENM Data Check	- Platen accuracy test - Platen accuracy adjustment (**Note 1**) - Platen accuracy adjustment (**Note 1**) - Raster Test - Printhead Nib Test - For a range of contrast settings - For a range of contrast settings - Print out the onboard ENM data
Media Type	- Proofing Media - Film	Liberator will select correct energy level for different media
Fan Control	- Automatic On/Off - Always On - Turn Off Now	Mode and action of fan control (**Note 2**)
Show Media Remaining	- Yes: English unit - Yes: Metric unit - No	Display the remaining media length in the roll after each imaging job.
Reset All Parameters	- No - Yes	Reset System/Job/Image item parameters to factory preset values
Total Image Footage	- Display Only	Display the accumulative image footage of use on film and paper

Notes:

1. There are two platen accuracy control modes: 1) ***Closed-loop OFF mode*** and 2) ***Closed-loop ON mode*** that each image output be brought to within a precision spec (against an accuracy ruler). The Open-loop Check is for the initial setting and the Plot Calibration test is for the fine tuning of the control parameters to be used in ***Closed-loop on mode***.

2. In the Automatic mode, the fan will be turned on whenever the printing process starts, and off after the printing is completed and the system has cooled down. In the Always On mode, the fan is on all the time and can be turned off when "Turn Off Now" is selected.

Table 4.3 ITEMs of JOB menu

ITEM	PARAMETER	DEFINITION
Imager Resolution	- H: 600 dpi V: 600 dpi - H: 1200 dpi V: 1200 dpi	H (horizontal): along the printhead V (vertical): the direction of media movement.
Automatic Media Cut	- No - Yes	Cut the media after each plot
Closed-loop Control	- No - Yes	Turn off or on the closed-loop control of platen accuracy adjustment **(Note 1)**
ENM (Enhanced Nib Management)	- No - Yes	Selectable when the media is film. ENM mode is always off when the media is proofing media.
Enhanced Temperature Control	- No - Yes	**Note 2**

Notes:

1. In the ***Closed-loop control: YES mode***, the movement of media is adjusted such that each image output be brought to within a precision spec (against an accuracy ruler).
2. When "**Enhanced Temp Cntrl**" is set "yes", the imagesetter will pause between jobs to allow the printhead to cool. During the pause, the messages: "Cooling Delay..." and "Hit ITEM to Resume" are displayed on the front panel. The imagesetter waits until the printhead reaches optimal operating temperature and then continues imaging automatically. If desired, the user may press the "item" key to skip the delay.

Table 4.4 ITEMs of IMAGE menu

ITEM	PARAMETER	DEFINITION
Contrast Level	-35% to +20% (5% increment)	Adjust image contrast level
Show Transport Parm	- No - Yes	Display transport parameters for debugging usage in Platen Accuracy Test and after Form Feed, or end of plot during on-line imaging

Table 4.5 ITEMs of NETconfig menu

ITEM	PARAMETER	DEFINITION
Delay Buffer Size	- 3" image - 6" image - 12" image - Full Buffer	The imagesetter will wait until the delay buffer is filled with incoming raster data before starting to output.
Net Interface Status	- Connected - Not connected	Display the status of device's network connection
IP Address Mode	- DHCP - Static (and Setup New Static IP)	
IP Address		
Subnet Mask		
Gateway		

Network Printing

There are two options for the imagesetter to be used in network printing:

1) ***Local Connection***
   The imagesetter is connected directly to the second network RJ-45 connector on the RIP PC via a crossover ethernet cable. In this configuration, only the local host can send jobs to the imagesetter.

2) ***Remote Connection***
   The imagesetter is connected to any network RJ-45 connector on the local area network (LAN) via a regular ethernet cable. In this configuration, any host on the LAN may send jobs to the imagesetter.

The pre-configured Local Connection

The imagesetter and the RIP PC (if supplied) are configured for use in the first option (Local Connection, with a crossover ethernet cable also supplied) when shipped out of factory.

The IP configuration of the imagesetter is set in Static IP mode with:

IP Address: 192.168.100.101
Subnet Mask: 255.255.255.0
Gateway: 192.168.100.1

The RIP PC has two network RJ-45 connectors. The first one (marked as NETWORK next to the RJ-45 connector) is set in DHCP mode and can be used for normal network access. The second one (marked as PLOTTER next to the RJ-45 connector) is to be interfaced with the imagesetter via a crossover cable, and is set in Static IP mode with:

IP Address: 192.168.100.100
Subnet Mask: 255.255.255.0
Gateway: 192.168.100.1

In the rare case that the user's LAN is also 192.168.100.x then both the imagesetter and the second NIC on the RIP PC need to be reconfigured to use a different third number on the IP address and Gateway. For example, 192.168.200.101 and 192.168.200.1 for the imagesetter, and 192.168.200.100 and 192.168.200.1 for the and the second NIC on the RIP PC.

In case there is a need for Remote Connection

- Obtain from the network administrator a static IP address to be used by the imagesetter.
- Connect the imagesetter to any RJ-45 on the LAN
- Use the NETconfig menu of the imagesetter to enter the desired IP address as described below

IP Address Mode and Setup for the Imagesetter

Static IP mode

If the imagesetter is already set in Static IP mode and a new static IP address is to be assigned, then in the "IP Address Mode" item, select "Setup New Static IP". If it is in DHCP mode, select "Static"

- To select the desired IP Address, use the **PARM+** or **PARM-** key to scroll each digit and use the **ENTER** key to select each digit.
- Repeat the same procedure for selection of Subnet Mask and Gateway.
- After the Gateway is selected, the imagesetter will print out all the three parameters just entered.
- Press the CUT key to cut the output and examine the parameters. If corrections of parameters are necessary, press the **PARM+** or **PARM-** key to repeat the procedure.
- If all the parameters are entered correctly, press the **ENTER** key.
- Power off the imagesetter and restart it.

DHCP mode

The imagesetter can also be selected in DHCP mode if such a need arises, then power off the imagesetter and restart it. However, this mode is not recommended since the RIP host assumes the imagesetter is in Static IP mode while printing images.

Access to Onboard Web Server

To get access to device's onboard web server, open a web browser and enter the URL as http://xxx.xxx.xxx.xxx.xxx where xxx… is the IP address of the imagesetter. The authentication Username is "**guest**" and Password is "**welcome**", both case sensitive.

RIP setup

- Go to Page Setup Manager and Edit/New
- Select "Config device…"
- Select "Net TCP/IP" in the Output field.
- Enter IP Address, Subway Mask and Gateway the same as those set on the imagesetter.

4.3.2 Basic Tests

Checkerboard: This test pattern displays checkerboard squares along the media for 4 inches. A sample pattern is shown in Fig. 4.2.

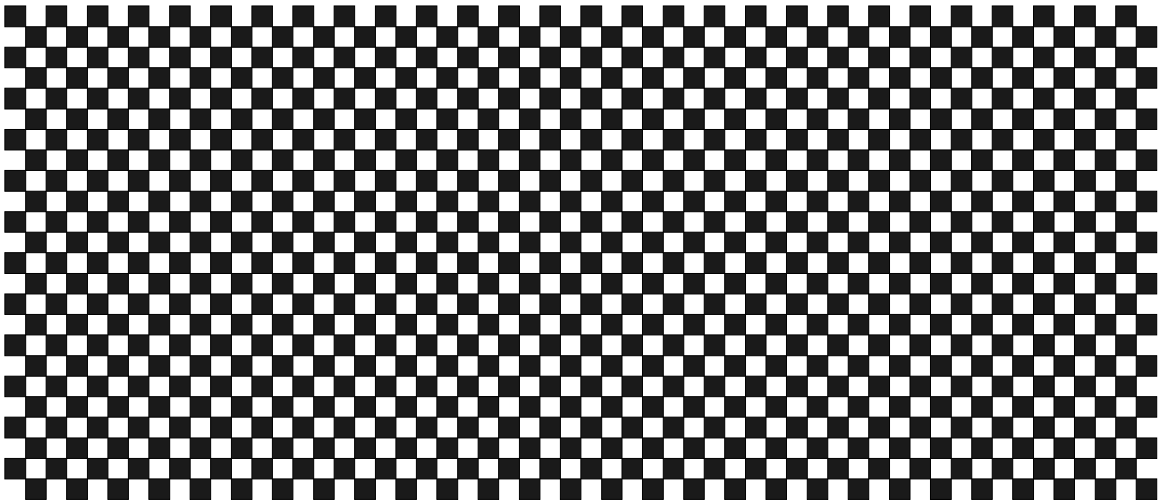


FIG. 4.2
1200x1200 DPI CHECKERBOARD PATTERN

Platen Accuracy: This test checks the stepping accuracy of the Liberator and prints the nominal distance lines with inch annotations. A sample pattern is shown in Fig. 4.3. Selections of different lengths ranging from one to eight feet and of different patterns (checkerboard, normal grid, filled, or blank interior) are available. The printed image may be measured with an accurate scale to determine the platen accuracy. In case that the platen accuracy adjustment is needed in the ***Closed-loop Control ON mode***, the Plot Calibration or the Open-loop Check test may be applied (please refer to Section 4.3.3 Advanced Tests).

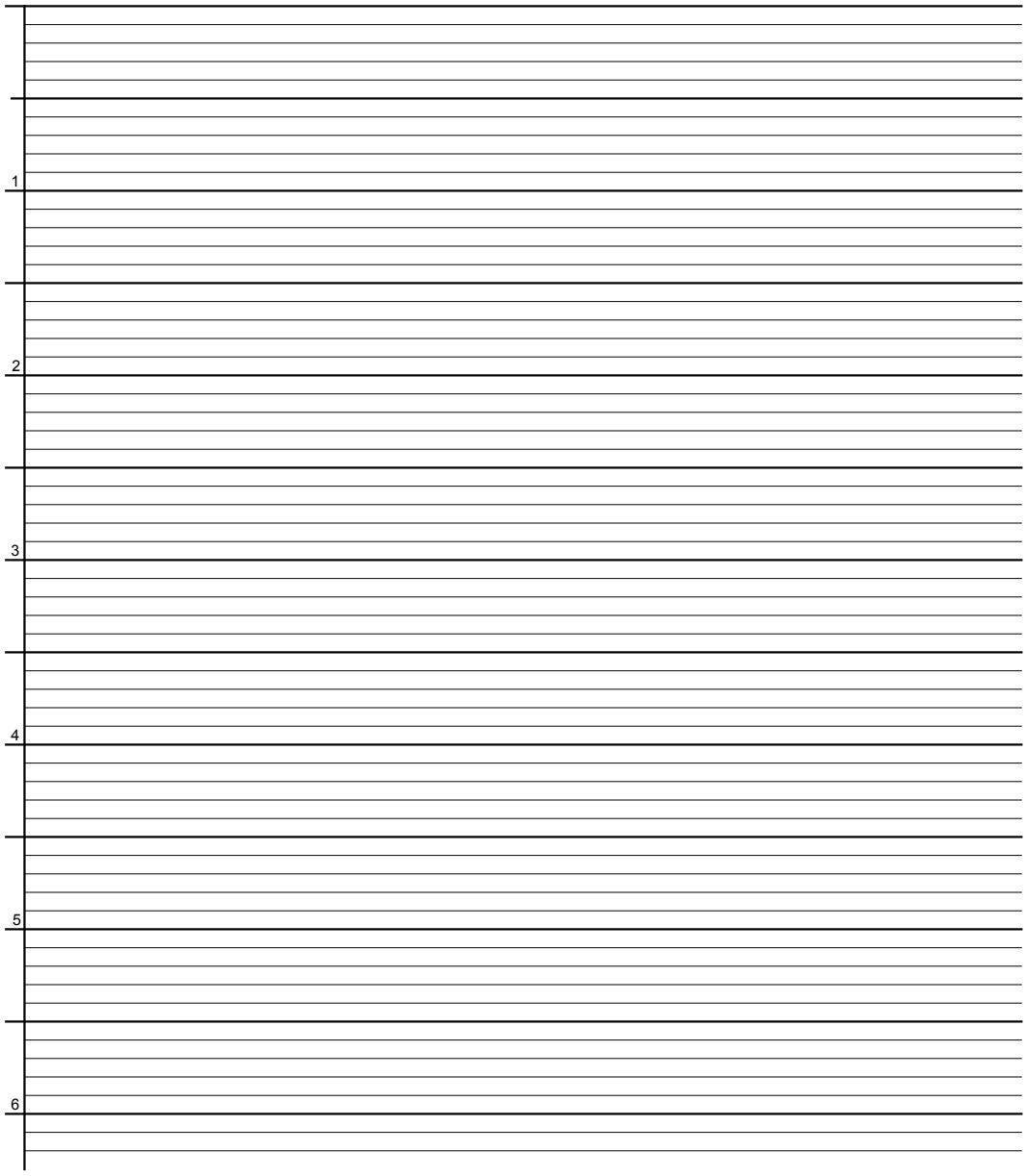


FIG. 4.3
PLATEN ACCURACY TEST PATTERN

Nib Test: This test checks whether any failed nib of the printhead exists. In addition to the leading and tail mark lines, a vertical line of a half-inch at 1200x1200 dpi is plotted for every 8th nib; and at the end of each line, the next adjacent nib continues the plot. This pattern repeats until all the nibs have been printed. A sample pattern is shown in Fig. 4.4.

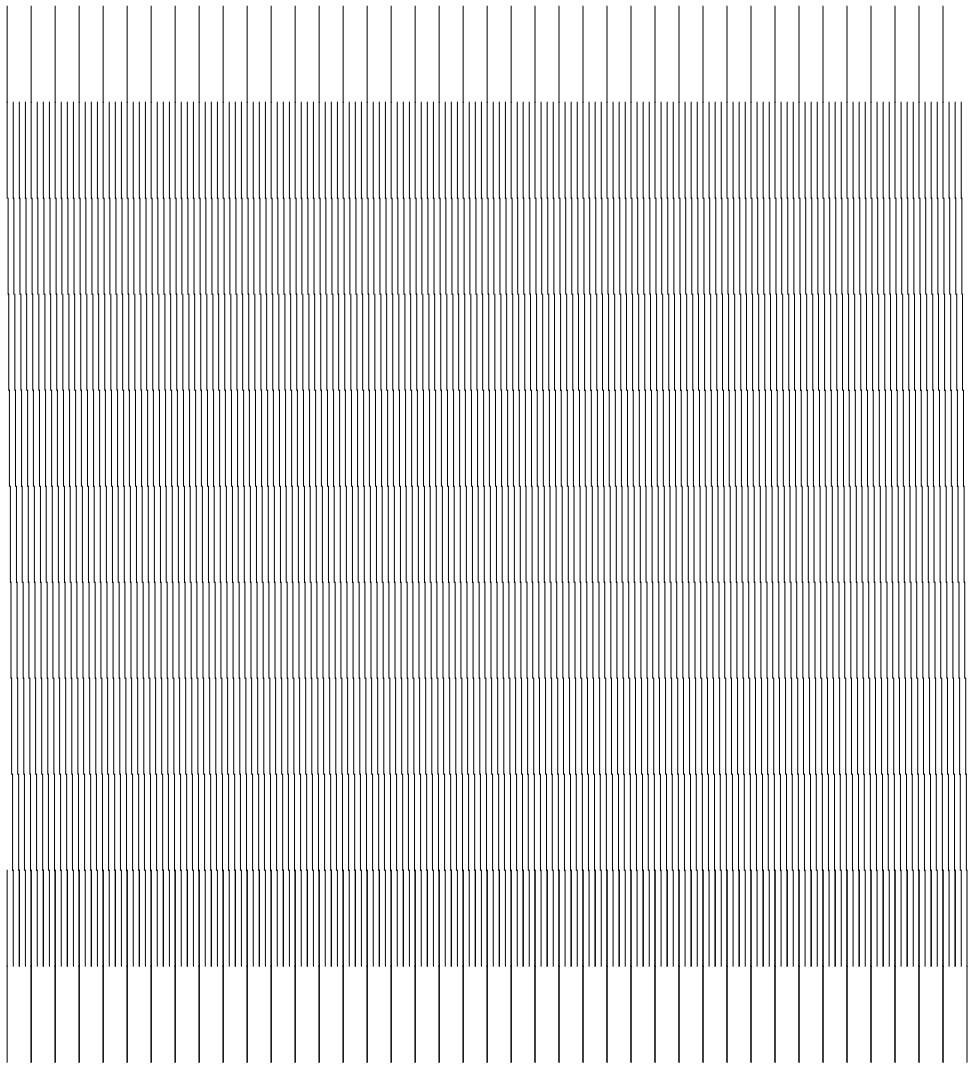


FIG. 4.4
1200x1200 DPI NIB TEST PATTERN

4.3.3 Advanced Tests

Open-Loop Check: This test is for the initial setting of the control parameters used in the ***Closed-loop Control ON mode*** and is seldom needed by the user; however, it is provided as a diagnosis and adjustment tool in case that the platen accuracy can not be corrected by only utilizing the Plot Calibration test. In such a case, it is recommended that the user contact the factory technical support before performing the OPEN-LOOP CHECK test. The procedure is listed below for reference:

1. Enter this test mode by pressing the **ENTER** key when "OPEN-LOOP CHECK..." is displayed under SYSTEM menu, SYSTEM TEST item.

2. Once in the test mode, the **PARM+** or **PARM-** key may be used to scroll through the "number of slots" choices among 640, 1280 and 1920. Note that 32 slots are approximately one inch long. Press the **ENTER** key to select the desired test length (for example, 640 slots ~20"). The **ITEM** key may be used to exit this test mode.

3. Selection of different image patterns (checkerboard, normal grid, filled or blank interior as in the Platen Accuracy test) is also available. Press the **ENTER** key to run the test which would output an image of the selected length and pattern.

4. After the output image is printed, the message "W=xxxx L=yy S=zzzz" will be displayed (*W and L indicate the number of window slots and of lines used for internal diagnosis. S is the total number of scan lines of the printed image. The displayed W value should be equal to the number of test slots selected by the user. The user may ignore these numbers unless there is an abnormality in the platen accuracy adjustment. In such a case, please contact the factory technical support*.) . Press the **CUT/PARM+** key to cut off the output image.

5. Use an accurate scale to measure the length of the printed image. Image should be measured from the beginning of the test pattern to last imaged point. Note: This is not likely to be the last tick mark, but instead the ending point of the vertical bounding box.

6. After cutting off the output image, the nominal test length (such as 20.000" when # of TestSlots=640 was selected) is first displayed. The user may use the **PARM+** or **PARM-** key to enter the actual measured length digit by digit. Use the **ENTER** key to move the cursor pointing to the digit to be entered.

7. After entering the last digit, press the **ENTER** key.

8. If the user has entered an incorrect number carelessly, press the **PARM+** or **PARM-** key to restart the process of entering the measured length; else, press the **ENTER** key.

9. After the measured length is entered, the Liberator will adjust its internal platen accuracy parameter and save it in the nonvolatile memory to be used for **both media types**.

10. After performing the OPEN-LOOP CHECK test just once, the user may go to the PLOT CALIBRATION test for fine adjustments.

The OPEN-LOOP CHECK is to be performed on only one type of media (either paper or film). After the OPEN-LOOP CHECK the user should run PLOT CALIBRATION on

both media types (paper and film) to fine tune the control parameters for each media type. DO NOT perform OPEN-LOOP CHECK for the other media.

Plot Calibration: This test is for the fine adjustment of the control parameters used in the ***Closed-loop Control ON mode***. Usually the platen accuracy has been adjusted within the specification at the production facility before delivery of the Liberator. The user may run the Plot Calibration test for fine adjustment if there is a need. The procedure is as follows:

1. Enter this test mode by pressing the **ENTER** key when "PLOT CALIBRATION..." is displayed under SYSTEM menu, SYSTEM TEST item.

2. Once in the test mode, use the **PARM+** or **PARM-** key to select either "Use internal plot" or "Use external plot" mode.

The "**Use internal plot**" mode:

3. In this mode, the **PARM+** or **PARM-** key may be used to scroll through the test length choices among 36", 48", 60" and 72". Press the **ENTER** key to select the desired test length. The **ITEM** key may be used to exit this test mode.

4. Selection of different image patterns (checkerboard, normal grid, filled or blank interior as in the Platen Accuracy test) is also available. Press the **ENTER** key to run the test which would output an image of the selected length and pattern.

5. After the output image is printed, the message "W=xxxx L=yy S=zzzz" will be displayed (*W and L indicate the number of window slots and of lines used for internal diagnosis. S is the total number of scan lines of the printed image. The user may ignore these numbers unless there is an abnormality in the platen accuracy adjustment. In such case, please contact the factory technical support*.) . Press the **CUT/PARM+** key to cut off the output image.

6. Use an accurate scale to measure the length of the printed image. The test file should be measured from the center of the first horizontal line to the center of the last horizontal line.

7. After cutting off the output image, the nominal test length (such as 36.000", ...) is first displayed on the front panel. The user may use the **PARM+** or **PARM-** key to enter the actual measured length digit by digit. Use the **ENTER** key to move the cursor pointing to the digit to be entered.

8. After entering the last digit, press the **ENTER** key.

9. If the user has entered an incorrect number carelessly, press the **PARM+** or **PARM-** key to restart the process of entering the measured length. After the correct number is entered, press the **ENTER** key.

10. After the measured length is entered, the Liberator will adjust its internal platen accuracy parameter and save it in the nonvolatile memory.

11. The user may repeat the PLOT CALIBRATION test to confirm the corrected result, or to perform one more round of adjustment if necessary.

The "**Use external plot**" mode:

1. In this mode, it is assumed that the user has already had an output image of known nominal length and also measured the actual length of the image. The nominal ideal length of 36.000" is first displayed on the front panel. The user may use the **PARM+** or **PARM-** key to enter the ideal length digit by digit. Use the **ENTER** key to move the pointing cursor to the digit to be entered.

2. Then the user may enter the actual measured length digit by digit, similar to step 1, and use the **ENTER** key to move the pointing cursor to the next digit.

3. After entering the last digit, press the **ENTER** key.

4. If the user has entered an incorrect number carelessly, press the **PARM+** or **PARM-** key to restart the process of entering the measured length. After the correct number is entered, press the **ENTER** key.

5. After the measured length is entered, the Liberator will adjust its internal platen accuracy parameter and save it in the nonvolatile memory.

6. The user may repeat the PLOT CALIBRATION test to confirm the corrected result, or to perform one more round of adjustment if necessary.

Contrast Test: After entering this test mode, the **PARM+** or **PARM-** key can be used to select the range of contrast settings to be tested. To run the test, press **ENTER**. For each contrast setting, two rows of checkerboard squares are displayed.

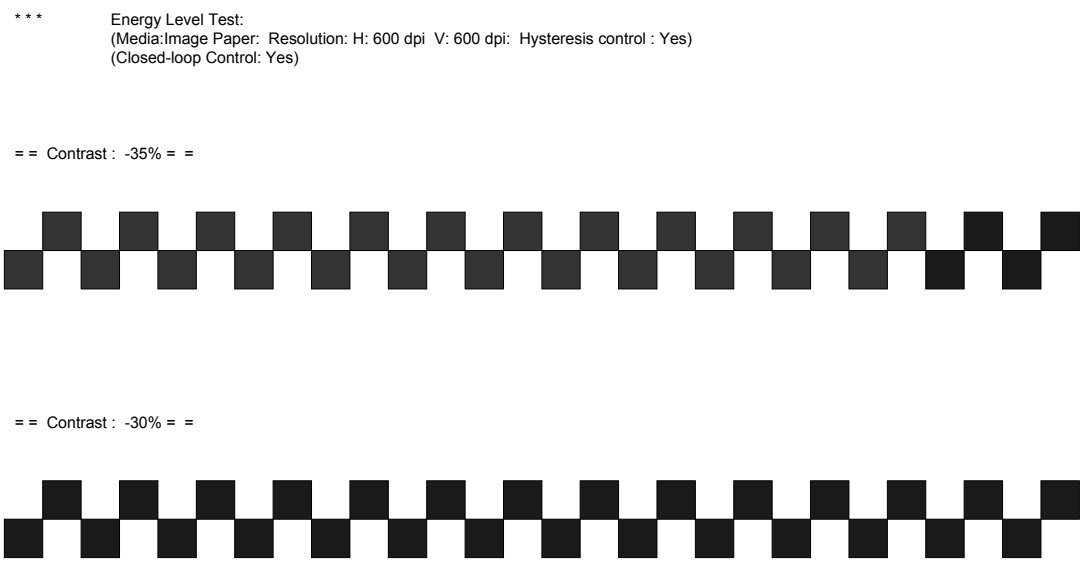


FIG. 4.5
CONTRAST TEST PATTERN

Dot Size Test: This test is similar to the Contrast Test, except that the image is of mesh pattern, with each square representing a 2x2dot. A microscope or a magnifying lens may be used to examine the mesh patterns. This test may provide a guideline to selecting the appropriate contrast setting for those application images with demanding resolution requirement.

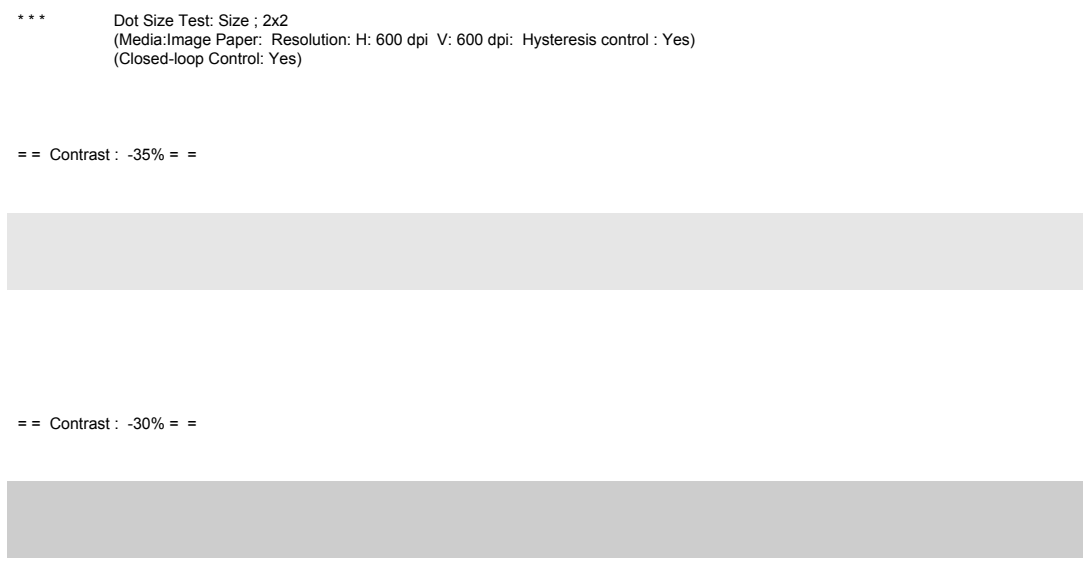


FIG. 4.6
DOT SIZE TEST PATTERN

4.3.4 Guideline For Selecting Contrast Setting

Note that the use of inappropriate contrast setting for a specific media may void the warranty on the printhead. In order to achieve best image result as well as to prolong the life of printhead, the following guideline may be referred:

- In the Contrast Test, an optical densitometer may be used to measure the optical density (o.d.) of the plot at each contrast setting, and a comparison of o.d. at all the settings can be made. Usually the curve of o.d. has a steep rising slope as the contrast setting increases. Then it reaches the saturation point and either slides down or stays almost flat. The setting at the saturation point would be the best choice.

4.4 ERROR MESSAGES

The following Error Messages may appear on the VF Display. There are three categories of error messages. The error messages along with their cause and remedy are listed below.

4.4.1 Errors Due To Inappropriate System Configuration

- **"No plotter connector"**
  Cause: The printhead connector is not plugged in.
  Remedy: Turn off the Liberator and plug in the connector.

- **"The lid is open!"**
  Cause: The top section is not completely latched.
  Remedy: Close and latch the top section. Then reset the system by either pressing the reset button or turning the system off and on.

4.4.2 Errors Occurred During Plotting Operation

- **"Out of media!"**
  Cause: Media runs out.
  Remedy: Load a new roll of media.

- **"Thermohead overheat!"**
  Cause: The printhead is overheated.
  Remedy: Turn off the Liberator immediately. Wait for the printhead to cool down before restarting. If the overheating problem persists, please contact technical support.

4.4.3 Errors From Electronic Subsystems Interfacing

- **"TE Interface error!"**
- **"Unknown TE error"**
- **"TEIF Comm error!"**
- **"TEIF Recv error!"**
- **"TEIF Timeout error!"**
- **"Unknown TEIF error!"**

Cause: Unknown TEIF (Thermal Engine interface) error or bad communication between the TE controller and the system processor.

Remedy: Reset the system. If the problem still persists, please contact technical support.

CHAPTER 5

MAINTENANCE

5.1 GENERAL DESCRIPTION

The Liberator is precisely aligned and adjusted at the factory for proper operation. No mechanical or electrical adjustments are required during routine use.

Do not loosen screws marked with red lacquer. Components secured with marked screws have been precisely aligned at the factory using special fixtures. Loosening the screws may cause misalignment of the components.

5.2 MAINTENANCE

To increase the reliability of the print head, the following cleaning procedure is recommended. The use of this procedure is required to ensure continued warranty coverage of the print head and the Liberator.

5.2.1 How to Clean the Print Head

1. Wear latex (non-powder) disposable gloves (part # 540V1106001).
2. Open 98% isopropyl alcohol cleaning wipes (part # 160V1106001).
3. With the cleaning wipe, rub the entire length of the print head.
4. After cleaning, dispose of all cleaning material. Do not reuse.
5. Make sure surface of print head is completely dry before closing unit.

5.2.2 Other Maintenance

1. The rubber platen roller and metal idler roller should be cleaned with 98% isopropyl alcohol cleaning wipes to remove any contaminants and/or residue. All surfaces should be completely dry before closing the unit.
2. The inside of the unit should be vacuumed and the media conditioner, if installed, should be cleaned thoroughly before loading the next roll of media.
3. The back and side filters should be checked and cleaned if necessary to ensure good airflow across the thermal print head.

5.2.3 Frequency of Cleaning

The thermal print head, rollers, media conditioner, and interior of the unit should be cleaned at the end of every roll of media or sooner if required.

The back and side filters should be vacuumed or replaced monthly or sooner if necessary.

5.2.4 Other Precautions

- The print head should never come into direct contact with the platen roller (black drive roller). Either film or Mylar should be placed between the head and the roller if no media is loaded in the imager.
- The filters on the back and side of the imager should be checked and cleaned monthly (more often if necessary) to ensure good airflow over the print head.
- Do not place media or media hubs directly on floor or other unclean surface. Doing so may cause contaminants to be picked up and introduced into the machine, which can ultimately cause print head damage.
- Avoid using the first and last wraps of media on the roll. This portion of the media may contain contaminants due to handling. The front panel of the imager should be opened every 3 months and shavings from the cutter removed with a vacuum.

5.3 TROUBLE SHOOTING

5.3.1 Power Failure

The power switch CB1 serves as the AC power on switch as well as circuit breaker for AC overload protection. The individual power supplies are also fused for additional protection on each unit.

5.3.2 Paper Supply Failure

If the paper fails to feed properly, check for paper jams at the supply roll and in the transport assembly. Also, check to make sure that the stepper motor is operating by pressing the PAPER FEED (FEED/PARM-) key when the system is off line and observing the rotation of the platen.

5.3.3 Test Pattern Failure

If the built-in test failure occurs in generating the test patterns shown in Figs. 4.2 or 4.3, refer to the TROUBLESHOOTING FLOW CHART in Fig. 5.1.

5.3.4 Optical Density Failure

Clean the print head as described in Sec. 5.2. Check the adjustment of power supply voltages as described in the Sec. 5.5. If no plotted or printed image is present during execution of the self-test function the PLOTTER CONTROLLER PCBA may be inoperative. If only a portion of the image is missing, one or more of the print head nibs may be inoperative or damaged.

5.3.5 Data Transfer Failure

If the unit operates properly during execution of the self-test function, but does not plot or print incoming data, check the interconnections between the unit and the data source.

5.3.6 Control Panel Failure

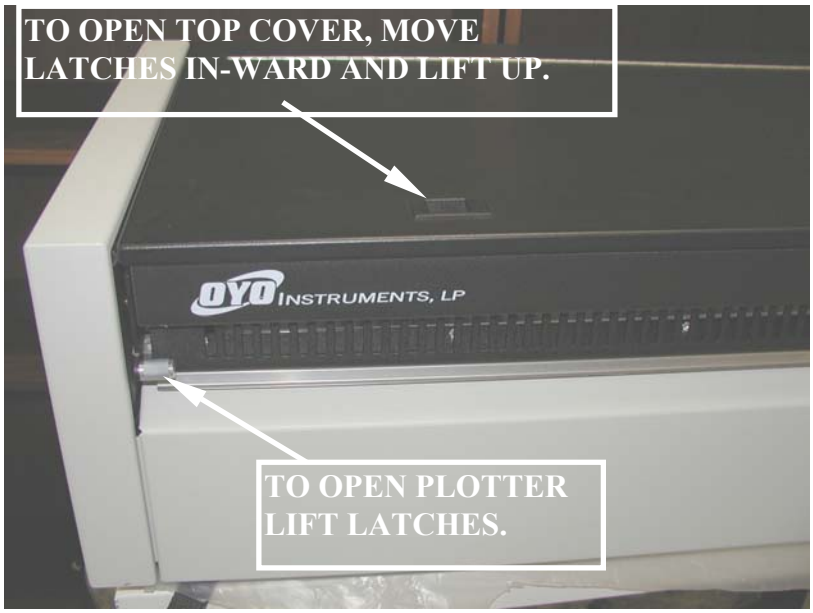
Consult OYO Instruments Technical Support Group.

5.4 UNIT ACCESS

This section describes how to open or remove various covers and panels to permit access to the interior of the unit to add media or perform maintenance.

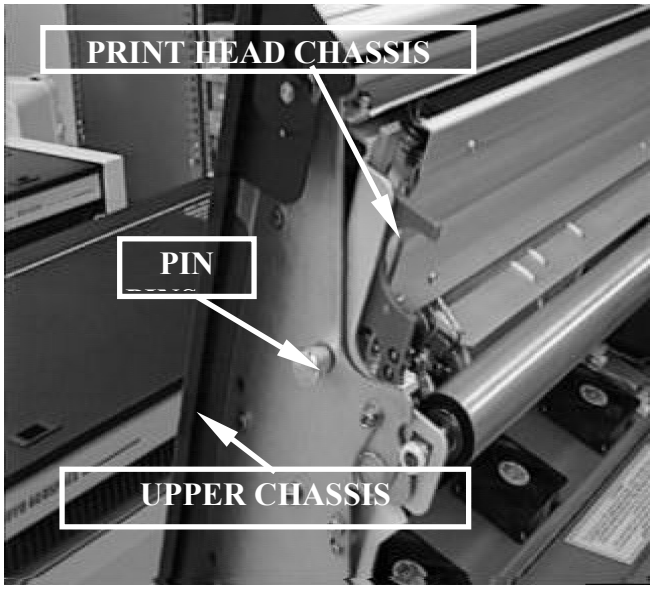
5.4.1 Entry Routes - Parts are accessible as follows:

Top Cover-Open the top cover (door) by moving the two (2) latches on top of the unit inward and lifting the cover upward. Refer to the photo below.



Top Chassis/Print Head Chassis-Open the chassis by pulling the two (2) levers on the front of the unit forward and lifting the chassis upward. Refer to the photo above.

To separate the upper chassis from the print head chassis, * pull both of these pins (one at each end) outward and the chassis will separate. Refer to the photo.



Caution: Hold the print head chassis while pulling the pins outward so that the chassis will not fall.

* The pins will remain in the "outward" (unlocked) position if they are rotated approx. half a turn when pulled out.

End Covers-Remove the end covers (right or left) by removing two (2) pan head screws securing the cover(s) to the rear of the chassis. Gently pull the back of the end cover outward and then slightly forward. This should disengage the cover from the end cover lock located in the front of the unit. Refer to photos below left.

End Cover Entry

Front Cover Entry

Front Cover-Remove the front panel by first removing the two end covers (see above) and then removing four (4) pan head screws (2 each side) securing the front panel to the chassis. Refer to the photo above right.

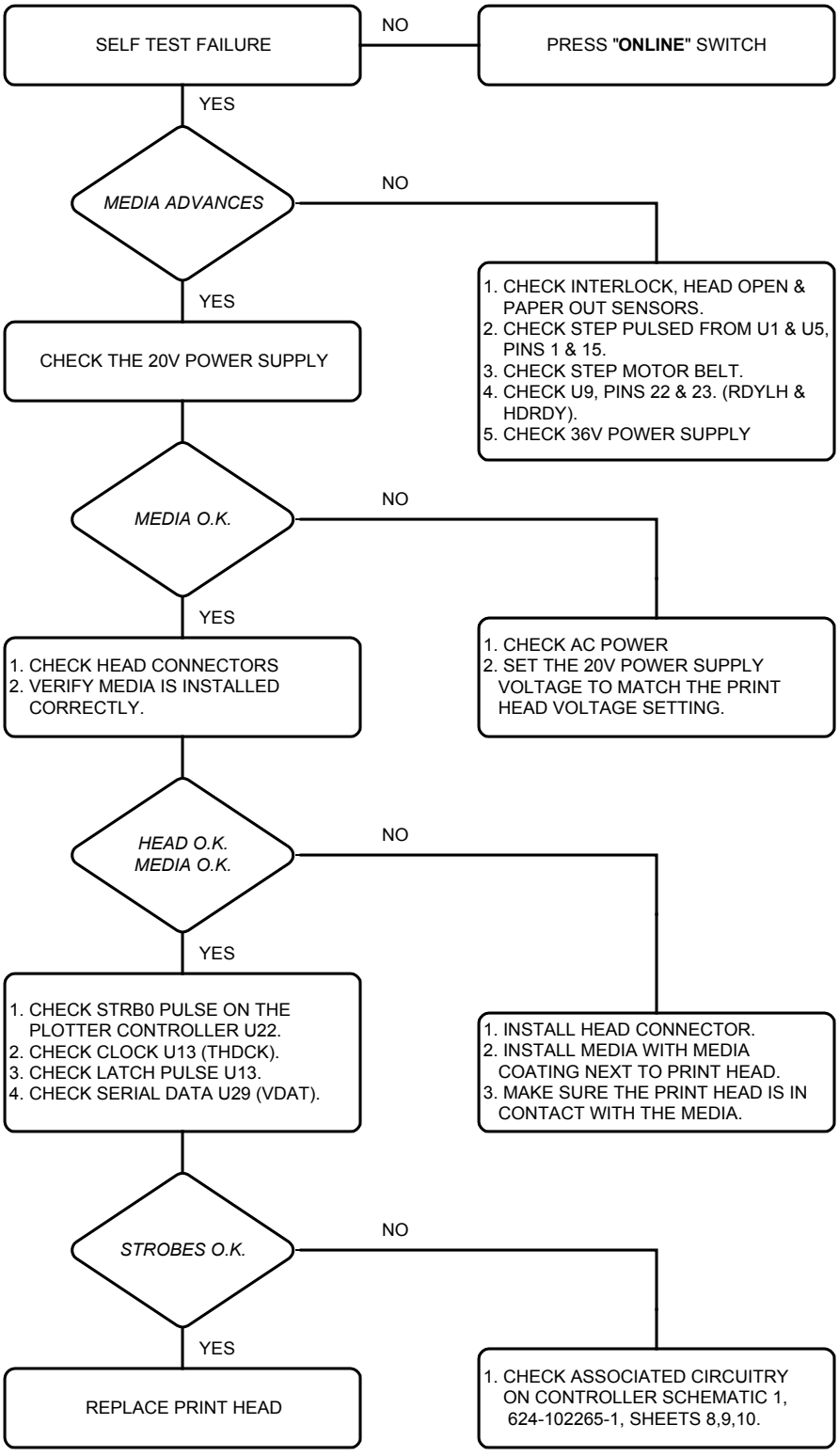


Fig. 5.1
TROUBLESHOOTING FLOW CHART

5.5 POWER SUPPLY ADJUSTMENT

5.5.1 20V Power Supply

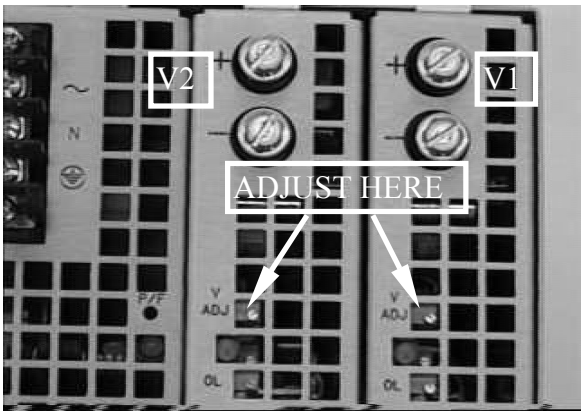
The print head voltage is set to match the 20V power supply voltage at the factory. Is done as follows: If either the print head or the 20V power supply is changed, the voltage (V_1 + V_2) must be reset as follows:

Tools Required:

1. Screw Driver-Medium size flat tip
2. Alignment Tool (for 20V power supply adjustment)
3. Digital Multimeter (+/- 0.1% accuracy)
4. Electrostatic Wrist Band and Anti-Foam Pad

Procedure:

1. Press the ON LINE switch to off-line (LED is OFF).
2. Press MENU to access SYSTEM MENU.
3. Press ITEM to **FAN CONTROL**.
4. Press CUT/PARM+ or FEED/PARM- to **ALWAYS ON** .
5. Press ENTER.
6. Press ON LINE; Power supply will now come on.
7. Remove left end cover screws in rear of plotter, remove left end cover.
8. Connect the RED lead of the multimeter to the V1 positive (+) lead of the power supply. Connect the BLK lead of the multimeter to the V1 negative (-) lead of the power supply.
9. Set the volt meter to a higher voltage range than the voltage being set.
10. Using the " PRINT HEAD VOLTAGE " table, select the voltage which corresponds to the print head resistance (marked on the print head).
11. Use a small screwdriver to turn the V1 potentiometer on the power supply. Turn clockwise (CW) to increase and counter-clockwise (CCW) to decrease.
12. Repeat steps 8 - 11 to adjust V2. Refer to the photo.
13. Repeat steps 1 - 2.
14. Select AUTOMATIC ON/OFF



*** NOTE *** **Nominal V_1 ~ 13.3V**
Nominal V_2 ~ 6.7V

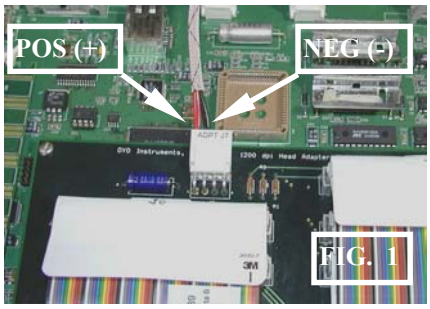
5.5.2 5V Power Supply

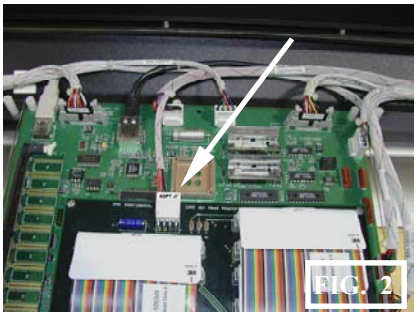
Tools Required:

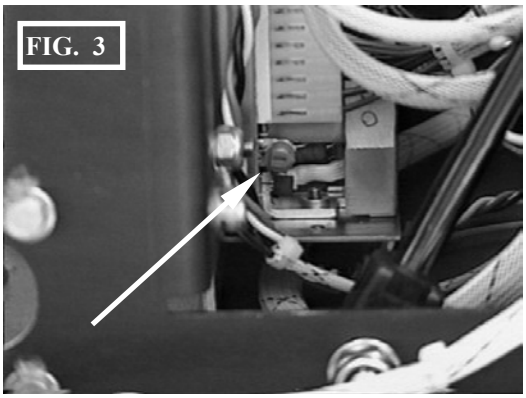
1. Screwdriver-medium flat blade
2. Screwdriver-small flat blade
3. Digital Multimeter (+/- 0.1% accuracy)

Procedure:

1. Remove the right end cover.
2. Open the top cover.
3. Connect the RED lead of the multimeter to the POS (+) lead of the 5V power source connector located on the PCBA. (See FIG. 1 and FIG. 2 below)
4. Connect the BLK lead of the multimeter to the NEG (-) lead of the 5V power source connector located on the PCBA. (See FIG. 1 and FIG. 2 below)
5. Set the multimeter to a higher voltage level than the voltage being used. (Approx. 10VDC or more)
6. Turn on the power.
7. Use a small screwdriver to turn the blue potentiometer on the power supply. Turn clockwise (CW) to increase and counter-clockwise (CCW) to decrease. (See Fig. 3 below)
8. Set voltage to 5.1 V.







Resistance (Ohms)	Voltage V1	Voltage V2	Resistance (Ohms)	Voltage V1	Voltage V2	Resistance (Ohms)	Voltage V1	Voltage V2
1800	12.87	6.43	2150	14.00	7.00	2980	13.51	6.75
1810	12.90	6.45	2160	14.03	7.01	2990	13.53	6.76
1820	12.93	6.47	2170	14.06	7.03	3000	13.55	6.77
1830	12.97	6.48	2180	14.09	7.04	3010	13.57	6.79
1840	13.00	6.50	2190	14.12	7.06	3020	13.59	6.80
1850	13.03	6.52	2200	14.15	7.07	3030	13.61	6.81
1860	13.07	6.53	2210	14.18	7.09	3040	13.64	6.82
1870	13.10	6.55	2700	12.89	6.45	3050	13.66	6.83
1880	13.13	6.57	2710	12.91	6.46	3060	13.68	6.84
1890	13.17	6.58	2720	12.94	6.47	3070	13.70	6.85
1900	13.20	6.60	2730	12.96	6.48	3080	13.72	6.86
1910	13.23	6.62	2740	12.98	6.49	3090	13.74	6.87
1920	13.27	6.63	2750	13.00	6.50	3100	13.76	6.88
1930	13.30	6.65	2760	13.03	6.51	3110	13.78	6.89
1940	13.33	6.67	2770	13.05	6.52	3120	13.80	6.90
1950	13.36	6.68	2780	13.07	6.54	3130	13.82	6.91
1960	13.40	6.70	2790	13.09	6.55	3140	13.85	6.92
1970	13.43	6.71	2800	13.12	6.56	3150	13.87	6.93
1980	13.46	6.73	2810	13.14	6.57	3160	13.89	6.94
1990	13.49	6.75	2820	13.16	6.58	3170	13.91	6.95
2000	13.52	6.76	2830	13.18	6.59	3180	13.93	6.96
2010	13.56	6.78	2840	13.20	6.60	3190	13.95	6.97
2020	13.59	6.79	2850	13.23	6.61	3200	13.97	6.99
2030	13.62	6.81	2860	13.25	6.62	3210	14.00	7.00
2040	13.65	6.83	2870	13.27	6.63	3220	14.01	7.01
2050	13.68	6.84	2880	13.29	6.65	3230	14.03	7.02
2060	13.71	6.86	2890	13.31	6.66	3240	14.05	7.03
2070	13.75	6.87	2900	13.33	6.67	3250	14.07	7.04
2080	13.78	6.89	2910	13.36	6.68	3260	14.09	7.05
2090	13.81	6.90	2920	13.38	6.69	3270	14.11	7.06
2100	13.84	6.92	2930	13.40	6.70	3280	14.13	7.07
2110	13.87	6.94	2940	13.42	6.71	3290	14.16	7.08
2120	13.90	6.95	2950	13.44	6.72	3300	14.18	7.09
2130	13.93	6.97	2960	13.46	6.73	3310	14.20	7.10
2140	13.96	6.98	2970	13.49	6.74			

Find the resistance printed on the print head label in the plotter. Refer to the chart above and find the voltage corresponding to the resistance on the label.

Table 5.1
PRINT HEAD VOLTAGE CHART