

Operators and Technicians Manual

Industrial, Direct Thermal Gaming/Lottery Machine Voucher Printer



PSA-66-ST (RS232 Interface) **PSA-66-001N (Netplex Interface)**

While PSA-66-ST refers to both the PSA-66-ST (RS232) and PSA-66-001N (Netplex) versions of the printer, this manual is written primarily for the RS232 interface. For additional information on the Netplex interface, please contact International Game Technology.

PSA-66-ST Operators and Technicians Manual

Industrial, Direct Thermal Gaming/Lottery Machine Voucher Printer

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REV.D



The PSA-66-ST (RS232 Interface) printer described in this manual is in compliance with all applied CE standards.

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Table of Contents

1	Product Overview	1
2	Operator Interface.....	2
2.1	Operator Controls and Indicators	2
2.2	Printer Sensor Functions	3
2.3	Bezel Operation.....	3
2.4	Keypad LED Operation and Printer Status Conditions.....	4
2.5	Printer Errors.....	4
2.6	Paper Loading	5
2.7	Feeding Paper	6
2.8	Cut Button.....	6
2.9	Self Test.....	6
2.10	Clearing a Paper Jam.....	7
3	Printer Service	9
3.1	Removing the Inner Module.....	9
4	Ports and Dip Switches	12
4.1	Overview	12
4.2	PSA-66-001N Netplex Printer	12
4.2.1	Netplex Front Bezel Port	12
4.2.2	Netplex Cable	13
4.3	PSA-66-ST RS232 Printer.....	14
4.3.1	RS232 Front Bezel Port	14
4.3.2	RS232 Cable	15
4.3.3	RS232 Dip Switch Settings.....	16
Appendix A	General Specifications.....	17
Appendix B	Paper Specifications.....	19
Appendix C	Part Numbers – Printers and Spares	20
Appendix D	Part Numbers – Bezels	28
Appendix E	Schematics.....	30
Appendix F	Service Tool Kit	43
Index	44

List of Tables

Table 2-1	Sensors	3
Table 2-2	Bezel Display Status.....	3
Table 2-3	Keypad LEDs Status Reporting.....	4
Table 2-4	Errors and Error Descriptions	4
Table 4-1	Netplex Front Bezel Port Pins	12
Table 4-2	Netplex Base Port Pin-out.....	13
Table 4-3	Netplex Rear Bezel Port Pins.....	13
Table 4-4	Netplex Port Pin-out	13
Table 4-5	RS232 Front Bezel Port Pins.....	14
Table 4-6	RS232 Base Port Pin-out	15
Table 4-7	RS232 Cable Port Pin-out.....	15
Table 4-8	RS232 Rear Bezel Port Pins	15
Table 4-9	RS232 10 Position Dip Switch Settings.....	16

List of Figures

Figure 2-1	Operator Indicators and Controls	2
Figure 2-2	Load a Paper Stack.....	5
Figure 2-3	Feed Paper into Paper Loading Slot	6
Figure 2-4	Sample Configuration Ticket	7
Figure 2-5	Undo the Mechanism Fastening Screw	8
Figure 2-6	Open the Lid	8
Figure 3-1	Slide the Unit until It Locks.....	9
Figure 3-2	Pull Out the Paper Tray.....	10
Figure 3-3	Release the Ribbon Cable	10
Figure 3-4	Press the Release Lever	11
Figure 3-5	Remove the Printer.....	11
Figure 4-1	Netplex Front Bezel Port	12
Figure 4-2	Netplex Cable	13
Figure 4-3	RS232 Front Bezel Port	14
Figure 4-4	RS232 Cable	15
Figure 4-5	RS232 Dip Switches	16
Figure B-1	Ticket Dimensional Specifications	19

1 Product Overview

The PSA-66-ST is an advanced thermal printer capable of creating high quality complicated output with a minimum of development and effort on the part of the user. The printer module supports both serial and a Netplex current loop interface to allow it to operate in any standard slot machine on the market.



Note: While PSA-66-ST refers to both the PSA-66-ST (RS232) and PSA-66-001N (Netplex) versions of the printer, this manual is written primarily for the RS232 interface. For additional information on the Netplex interface, please contact International Game Technology.

Features of the PSA-66-ST include:

- May be mounted at an angle or horizontally
- Simple paper loading—no loose parts
- Variable paper capacity via paper trays—200, 400, and 600 ticket trays
- Promotional printing capabilities
- Page mode printing with TCL printer language
- Line printer capability
- High quality laser-like san serif fonts in multiple sizes
- Advanced graphics printing
- Windows® connectivity
- 3 inch per second print speed
- 2k input buffer
- Wide temperature range operation
- Standard and customized serial interfaces available—RS232 and Netplex

2 Operator Interface

2.1 Operator Controls and Indicators

The PSA-66-ST printer is equipped with two status indicators and two operator controls to allow the operator to know the status of the printer at all times.

The status indicators are:

- The front bezel light
- The Status and Error LEDs on the keypad

The operator controls for the printer are:

- The FEED button
- The Platen Release Lever

Figure 2-1 below illustrates the location of these indicators and controls.

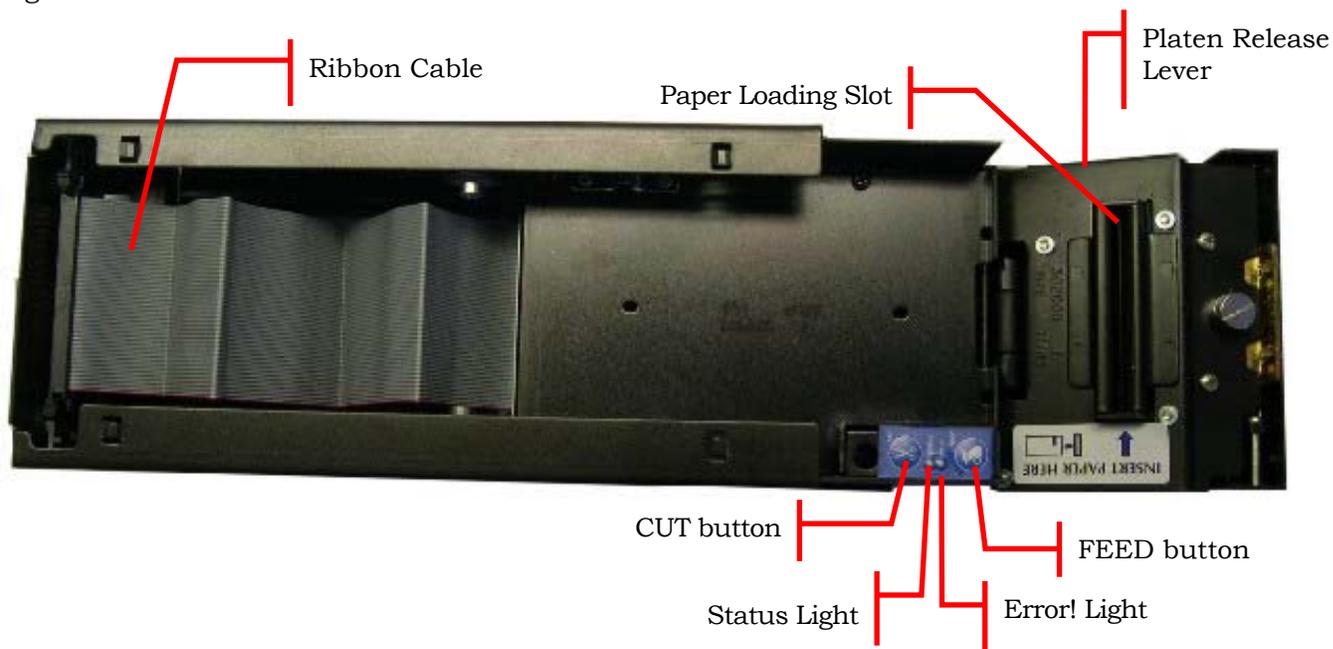


Figure 2-1 Operator Indicators and Controls

2.2 Printer Sensor Functions

There are six primary sensor functions on the PSA-66-ST printer. These sensors work with the game firmware to provide reliable, trouble-free operation. Any error conditions as a result of these sensors are indicated by the front bezel light and keypad LEDs.

Table 2-1 Sensors

Sensor	Description
Paper Out	The Paper Out sensor is located within the pivoting printer head module. It terminates the print operation when paper has run completely out and for proper form registration. The PSA-66-ST will cease printing and feeding operations once it detects a Paper Out condition. A Paper Out condition is corrected automatically by loading more paper to the unit.
Paper Low	The Paper Low sensor is located in the paper well. It determines when the paper stack has approximately 30 tickets remaining. A Paper Low condition will be automatically reset once a stack with a greater height has been loaded. Paper low sensing only runs when the system is at idle and takes a few seconds to detect the new paper level.
Paper Taken	The Paper Present sensor is located in the presentation chute of the unit. It determines when the customer has actually taken their cash-out voucher.
Paper Jam	The printer supports detection of a Paper Jam condition through use of the Paper Present sensor.
Printer Platen Engaged	The Printer Platen Engaged sensor detects when the printer platen is in use.
Printer Open	The PSA-66-ST printer uses the Printer Open sensor to inform you that the printer is open.

2.3 Bezel Operation

The front bezel display allows the operator to determine the state of the printer on the casino floor, at a distance, without disturbing the game. The table below lists the various conditions indicated by the bezel.

Table 2-2 Bezel Display Status

Bezel Display	Status
Solid On	Printer Idle and Ready
Slow Blink	Paper Low or Printer Error
Fast Blink	Ticket Printing and/or Ticket in Chute
Off	Printer Power Off

2.4 Keypad LED Operation and Printer Status Conditions

The keypad LEDs provide a more detailed reporting of system status. Table 2-3 below lists the status of the keypad LEDs in a variety of status.

Table 2-3 Keypad LEDs Status Reporting

Condition	Status_LED	Err_LED
Unit in Powered Off	OFF	OFF
Unit Ready	ON	OFF
Unit Flushed	ON	ON
Paper Out	OFF	ON
Head Up	OFF	ON
Temperature Error	OFF	MED BLINK
Voltage Error	OFF	SLOW BLINK
Print Head Error	ON	FAST BLINK
Missing Black Index Mark	ON	FAST BLINK
Paper Jam	ON	FAST BLINK

2.5 Printer Errors

Although there are a variety of error conditions that can occur, most printer errors are a result of the printer running out of paper or the operator raising the head up lever. This section lists the possible errors which can occur, and how each condition is remedied.

Table 2-4 Errors and Error Descriptions

Error	Error Description	Remedy
Paper Out	Results when the printer does not detect paper present. The printer scans for a Paper Out condition at all times.	Load a new paper stack.
Head Up	Results from lowering the head release lever.	Raise the blue lever on the side of the unit.
Temperature	Results when the printer is in an over temperature condition. If the printer is operating in an environment where the ambient temperature is roughly room temperature, this error would most likely be the result of a hardware problem.	The printer will automatically resume operation after the detected head temperature reaches legal operation limits.
Voltage	Results if the printer detects a power supply voltage (+24VDC to +25VDC) outside of legal limits. This error could be the result of a poor cable connection.	The printer will automatically resume operation after the power supply is detected within legal limits.
Print Head	Results when the printer senses an internal error due to connectivity or interfacing problem with the thermal print head. This can be a result of a cable problem between the main controller board and the printer engine.	The printer will remain in this error state until the power is cycled or the unit is reset. If the problem persists, the printer will require service.

Error	Error Description	Remedy
Missing Black Index Mark	Results if the paper type selected is indexed paper, and while feeding paper or printing a black mark is not seen within approximately 10" of paper. This error alerts the user to the presence of the wrong kind of paper in the printer or that the paper was inserted in the wrong direction (so the black mark index is rotated 180 degrees).	Raise the head release lever (presumably to change the paper).
Paper Jam	Results the printer detected an error in the paper path for presenting the ticket to the customer.	Open the printer head and inspect for a jammed ticket.

2.6 Paper Loading

In general, the only printer service required is to load new paper stacks. The automatic paper loading feature simplifies this process to essentially two steps; putting the paper stack into the Paper Tray and inserting paper into the Paper Loading Slot.



Note: The Platen Release Lever, the FEED button, and the CUT button are merely provided as supports for this process. These usually are not required to load paper.

To load paper:

1. Pull open the Printer Drawer until the Paper Tray is completely accessible.
2. Place the paper stack in the printer as indicated by the band around the stack and the Paper Feed label.

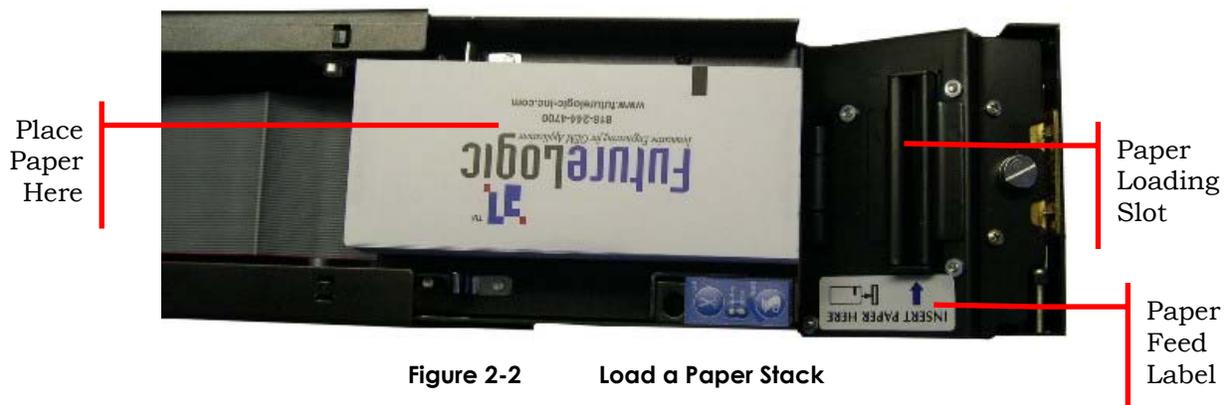


Figure 2-2 Load a Paper Stack

3. Insert paper into the Paper Loading Slot.

The printer will automatically pull through a form or two, leaving it registered at the top of a form.



Figure 2-3 Feed Paper into Paper Loading Slot

4. Remove the excess tickets from the printer.

2.7 Feeding Paper

The printer is designed to run with black mark indexed paper.

Use the FEED button to feed paper into the printer. Each long press (~1 second) of the FEED button will result in paper advancing to the top of the next form.

2.8 Cut Button

The CUT button performs no function in the PSA-66-ST printer.

2.9 Self Test

Press the FEED button during power up or reset to run a self test. This self test prints a configuration ticket if the test passes successfully. The test ticket (illustrated in Figure 2-4) contains important information on how the unit is configured.

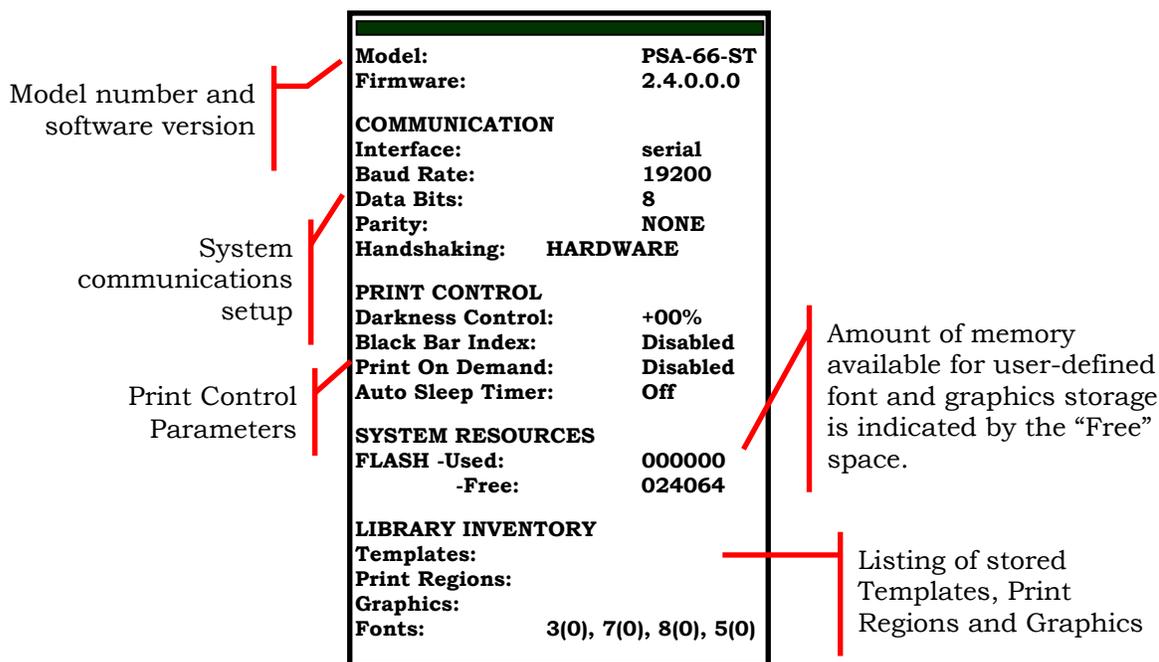


Figure 2-4 Sample Configuration Ticket

2.10 Clearing a Paper Jam

The printer is designed to operate reliably with a minimum of paper jamming. If you need to clear a paper jam, follow the instructions below. After you clear a paper jam, perform this operation in reverse to load paper.

When clearing a paper jam:

- Ensure that all paper paths from the entry point at the back of the paper well, through the printer and cutter and the presentation chute are clear of paper or obstructions.
- Use the Platen Release Lever located on the side of the unit.
- Use the Mechanism Fastening Screw on the top of the printer.
- Do not allow a screwdriver or other probing object to come into contact with the printer. This can cause permanent damage.

To clear a paper jam:

1. Undo the Mechanism Fastening Screw on the top of the printer.

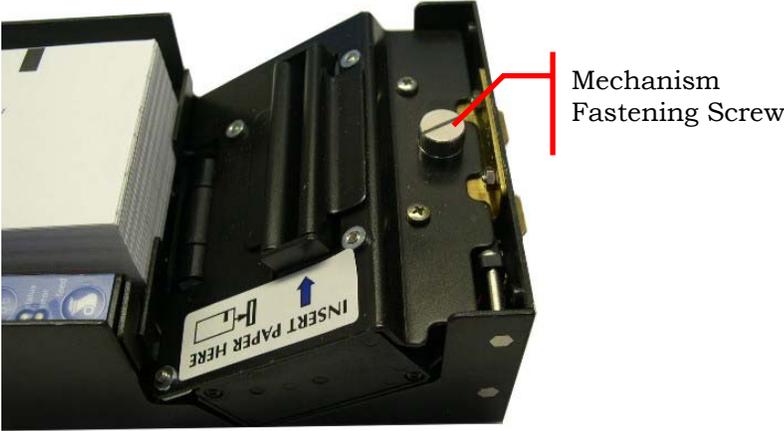


Figure 2-5 Undo the Mechanism Fastening Screw

2. Swivel the printer open to expose the Paper Path.

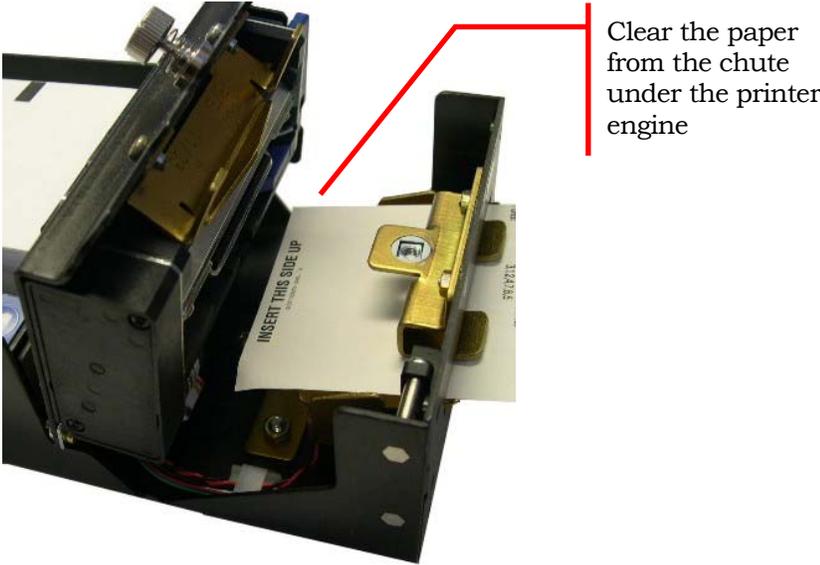


Figure 2-6 Open the Lid

3. Remove any jammed paper.

3 Printer Service

Should the printer require service outside of the game, the sliding module (which includes the majority of the electronics) may be easily removed and replaced.



CAUTION!

ESD Sensitive Equipment!

Electronic boards and their components are sensitive to static electricity. Care must be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operations purposes unless it is otherwise protected.

Discharge your clothing before touching the assembly. Discharge tools before use.

Whenever possible, unpack or pack this product only at EOS/ESD safe workstations. Where a safe workstation is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools.

3.1 Removing the Inner Module

The sliding module of the PSA-66-ST may be removed from its stationary module by following the simple steps given below. To re-install the sliding module, reverse the steps.



Warning: Turn off the power. The printer is not hot-connectable. Any attempt to hot connect can permanently damage the printer!

To remove the inner module:

1. Turn off the power.
2. Slide the unit open until it locks in the open position.

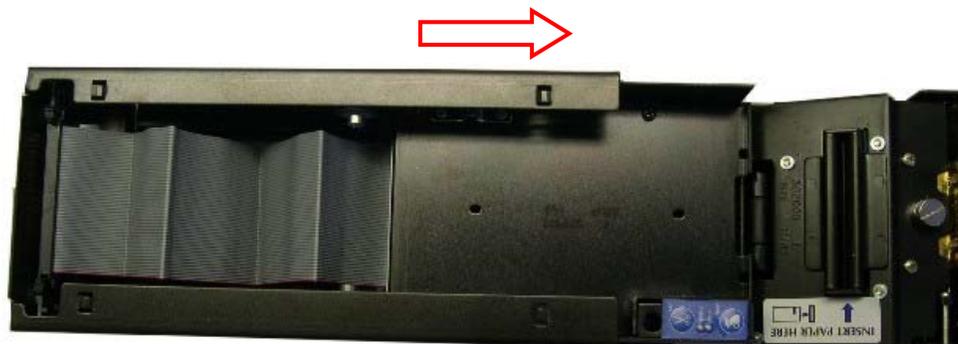


Figure 3-1 Slide the Unit until It Locks

3. If you can access the Ribbon Cable which attaches the sliding module to the stationary module, go to the next step.

If you cannot access the Ribbon Cable because of the Paper Tray, grab the back of the Paper Tray and rock it forward, pulling it out of the unit.



Figure 3-2 Pull Out the Paper Tray

4. Release the Ribbon Cable by spreading the finger latches at the rear of the unit.



Figure 3-3 Release the Ribbon Cable



Note: The black end of the Ribbon Cable connects to the rear Daughter Board. The gray end of cable connects to Main Controller.

5. Press in the Release Lever under the front of the sliding module to release the sliding printer module.

This will release the locking mechanism. You can now pull the unit out of the stationary module.



Figure 3-4 Press the Release Lever

6. Remove the printer from the machine.

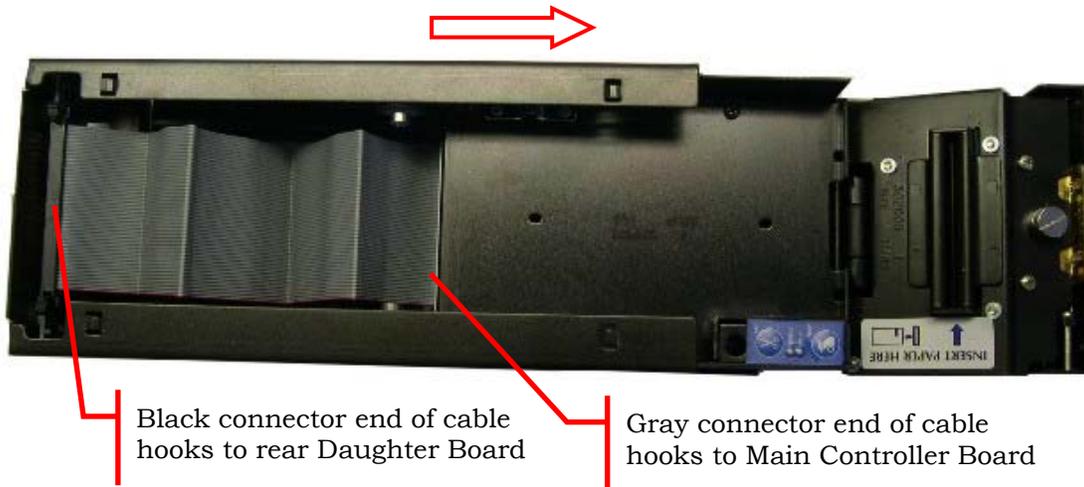


Figure 3-5 Remove the Printer

4 Ports and Dip Switches

This section provides details on the connector pin-outs on the PSA-66-ST printer.

4.1 Overview

There are two versions of the PSA-66-ST printer:

- **PSA-66-001N.** Netplex Printer.
- **PSA-66-ST.** RS232 Printer.



Note: While PSA-66-ST refers to both the PSA-66-ST (RS232) and PSA-66-001N (Netplex) versions of the printer, this manual is written primarily for the RS232 interface. For additional information on the Netplex interface, please contact International Game Technology.

4.2 PSA-66-001N Netplex Printer

4.2.1 Netplex Front Bezel Port

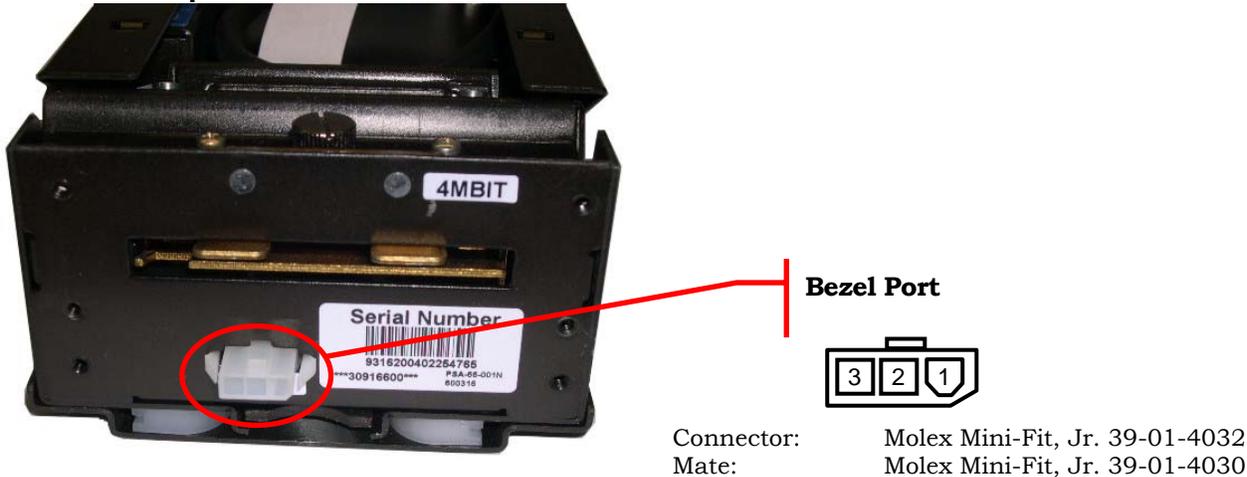


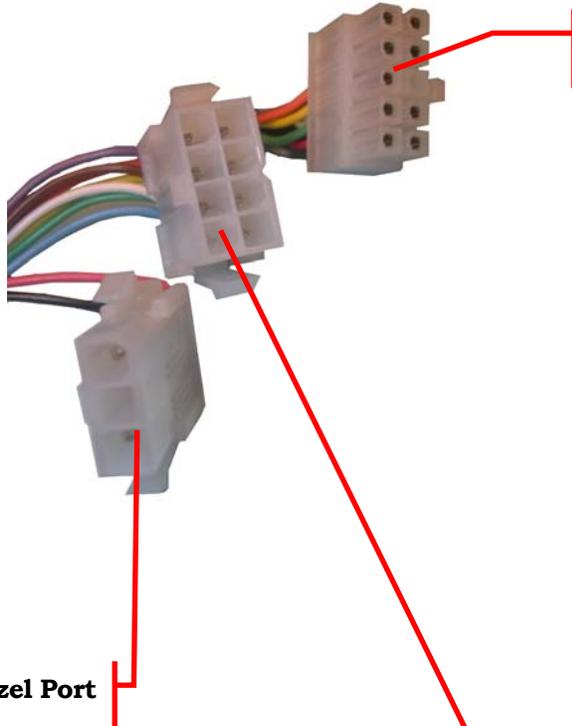
Figure 4-1 Netplex Front Bezel Port

The bezel port drives a printer front action alert light built into the front bezel. The table below lists information on the bezel port.

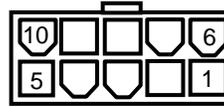
Table 4-1 Netplex Front Bezel Port Pins

Pin	Function
1	Modulated +24VDC
2	No connect
3	GND

4.2.2 Netplex Cable



Base Port



Connector: Molex Mini-Fit, Jr. 39-30-2100
Mate: Molex Mini-Fit, Jr. 39-01-1100

Table 4-2 Netplex Base Port Pin-out

Pin	Function
1	MRESET
2	Netplex TX
3	+13V
4	Netplex RX
5	GND
6	+24VDC
7	GND
8	+24VDC
9	Modulated +24VDC
10	GND

Bezel Port

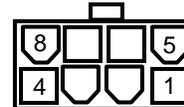


Connector: Molex Mini-Fit, Jr. 39-01-4032
Mate: Molex Mini-Fit, Jr. 39-01-4030

Table 4-3 Netplex Rear Bezel Port Pins

Pin	Function
1	Modulated +24VDC
2	No connect
3	GND

Netplex Port



Connector: Molex Mini-Fit, Jr. 39-01-2081
Mate: Molex Mini-Fit, Jr. 39-01-2080

Table 4-4 Netplex Port Pin-out

Pin	Function	I/O
1	MRESET	I
2	Netplex TX	I
3	+13V	-
4	Netplex RX	O
5	GND	-
6	+24VDC	-
7	BGND	-
8	NO CONNECT	-

Netplex Cable P/N 150-00009

Figure 4-2 Netplex Cable

4.3 PSA-66-ST RS232 Printer

4.3.1 RS232 Front Bezel Port

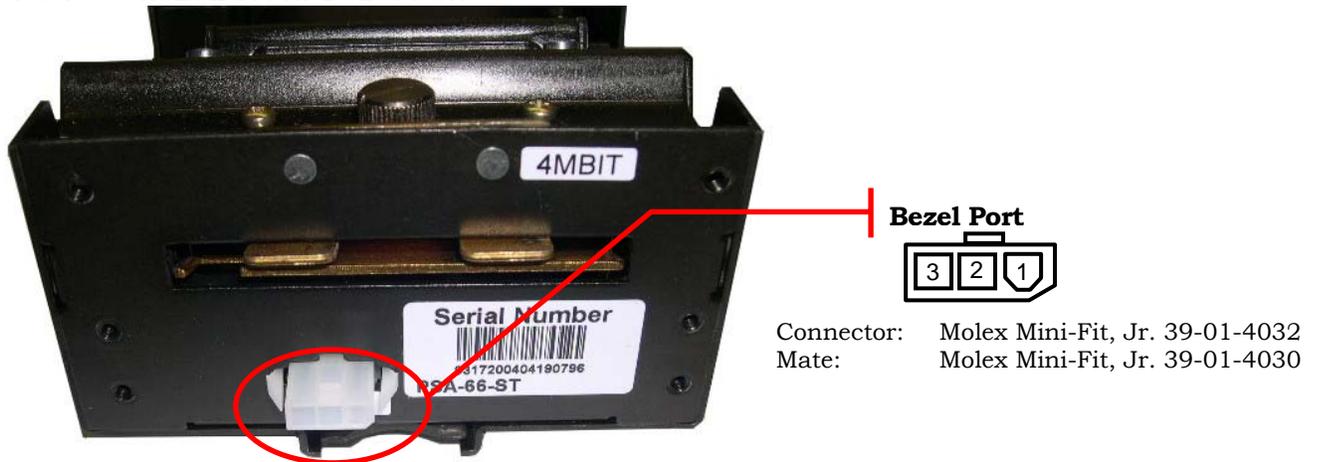


Figure 4-3 RS232 Front Bezel Port

The bezel port drives a printer front action alert light built into the front bezel. The table below lists information on the bezel port.

Table 4-5 RS232 Front Bezel Port Pins

Pin	Function
1	Modulated +24VDC
2	No connect
3	GND

4.3.2 RS232 Cable

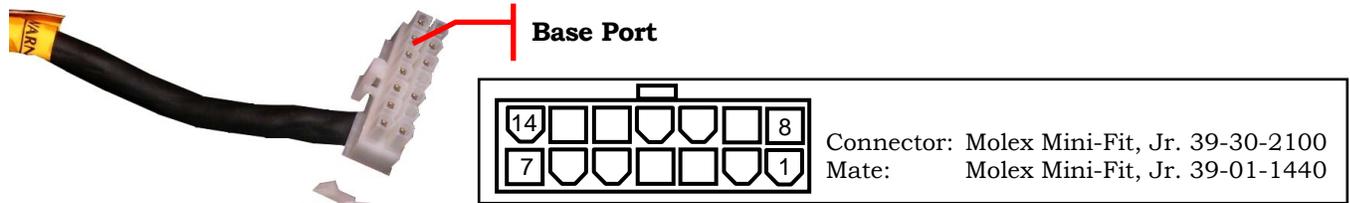


Table 4-6 RS232 Base Port Pin-out

Pin	Function
1	MRESET
2	Netplex TXD
3	+12 VDC (RS232 optional)
4	Netplex RXD
5	GND
6	+24 VDC
7	GND
8	+24 VDC
9	Modulated +24VDC
10	GND

RS232 Cable Port

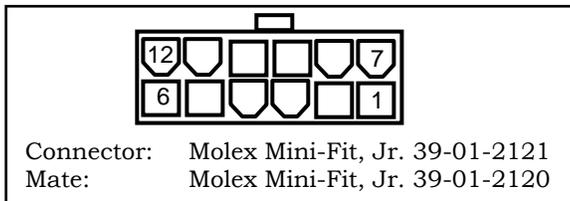


Table 4-7 RS232 Cable Port Pin-out

Pin	Function	I/O*
1	MRESET	I
2	TXD	O
3	+12 VDC (optional)	-
4	RXD	I
5	GND	-
6	+24VDC	-
7	GND	-
8	+24VDC	-
9	NO CONNECT	-
10	NO CONNECT	-
11	DTR	O
12	RTS	O

Bezel Port



Table 4-8 RS232 Rear Bezel Port Pins

Pin	Function
1	Modulated +24VDC
2	No connect
3	GND

RS232 Cable P/N 150-00012

RS232 Eval Cable P/N 150-00013

Figure 4-4 RS232 Cable

4.3.3 RS232 Dip Switch Settings

The printer has a set of 10 dip switches which appear through an access slot on the bottom of the stationary module. The dip switches are used to select the communications protocol. The switches **must** be set according to the table below.



Note: Set dip switch 7 properly to maintain future compatibility between machines.

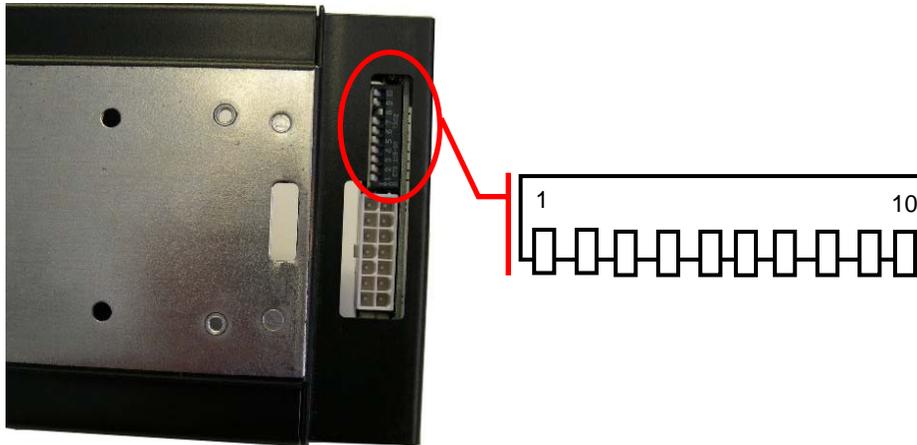


Figure 4-5 RS232 Dip Switches

Table 4-9 RS232 10 Position Dip Switch Settings

POS	Function	Configuration	
1 2 3 4 5 6	Reserved	OFF	these switches must always be left off
7	INTERFACE SELECT !Note: this must be set for future compatibility	OFF ON	Not allowed RS232
8 9	COMMUNICATIONS PROTOCOL	9=OFF 8=OFF 9=OFF 8=ON 9=ON 8=OFF 9=ON 8=ON	illegal setting, do not use serial 38400,N,8,1 serial 9600,N,8,1 serial 57600,N,8,1
10	HANDSHAKING	OFF ON	XON/XOFF + RTS hardware handshake RTS hardware handshake only

Appendix A General Specifications

General	
Dimensions (WxDxH)	114mm x 286mm x 68mm
Weight	7 lbs.
Power Requirements	24Vdc @ 2.7A
Sensors	Paper Low, Paper Out, Ticket Taken, Ticket Jam, Ticket in Chute, Black Mark (Includes a Host Controllable Buzzer)
Printing Speed	75mm/Second (3"/Second)
Print and Present	2.2 Seconds
Printing Width	62mm (true near-edge printing)
Storage	200 Tickets
Ticket Tray	Interchangeable, 400, 600 Ticket Tray
Resolution	8 dots/mm (203 dpi)
Firmware	Application in Memory is Reprogrammable (via Flash BIOS)
Self Test	Yes
Page Mode	Full Page Mode Printing (Simultaneous 4 Orientation Printing: 0°, 90°, 180°, 270°) Line and Box Draw Printer Resident Bitmap Graphics Printer Resident (Stored in Flash) Graphics
Paper Loading	Automatic Hands Free
Paper Feed	Manual
Method	Direct Thermal, Top Coated, Fanfolded and Perforated
Width	66mm
Length	156mm
Thickness	4.5 mil, 1 Color/2 Colors
Bezel Control	Two High Current Ticket Printing Bezel Control Ports
User Interface	2 LED Indicators, Paper Advance Button
Promotional Printing	
Template Capacity	Up to 30 Coupons
Graphic Storage	256k
Characteristics	
Printer Languages	TCL Printer Language (Page Description Language) Subset of ESCP2
Fonts	4 (5.5 cpi, 7.5 cpi, 10 cpi, 20 cpi)
Font Scalability	May be Independently Scaled from 1x – 7x in Both Height and Width
Bar codes	Interleaved 2 of 5, Code 39, UPC-A, UPC-E, UPC-E+2, UPC-E+5, Codabar, EAN-13, EAN-8, Code 128, MSI
Memory	512k Flash & 128K RAM

Interface	
Communications	Bi-directional RS232C
	Full Handshaking Set
	Netplex
Environmental	
Operating temperature	0°C to 70°C
Storage temperature	-20°C to 85°C
Operating humidity	5 to 95% RH
Reliability	
Maintenance	No User Maintenance Required
	Printer Head Completely Removable with Quick Release Bars
Print Head Life	50km Min. (320,000 Tickets Based on US Currency Size)

Appendix B Paper Specifications

Please contact your sales representative for more information on approved papers.



Note: Use only approved paper in the PSA-66-ST and PSA-66-001N Printers. Use of improper paper may cause damage to the device and will void the printer's warranty.

Nominal paper thickness: 4.5mil
 Paper dimensions: 65mm x 156mm (width dimension ± 1 mm)

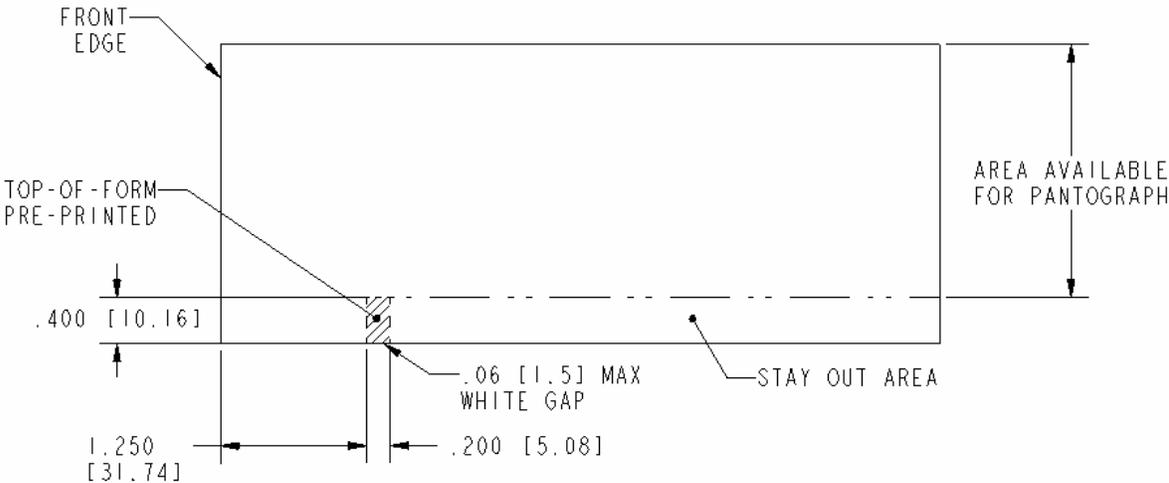


Figure B-1 Ticket Dimensional Specifications

Appendix C Part Numbers – Printers and Spares

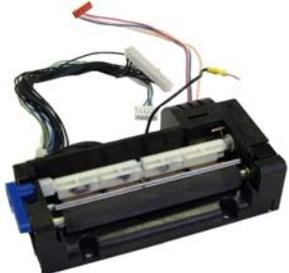
This appendix provides the part number and description of each printer and spares.

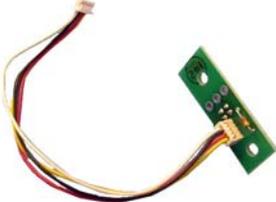
Printer		
Part Number	Description	
220-00015	PSA-66-001N Printer, Netplex*	
220-00016	PSA-66-ST Printer, RS232	

*Netplex equipped printers meet the Netplex specification of International Game Technology Corporation. For additional information, please contact IGT.

Spares		
Part Number	Description	
100-00001	Stationary Module, Complete With All Parts, Netplex	

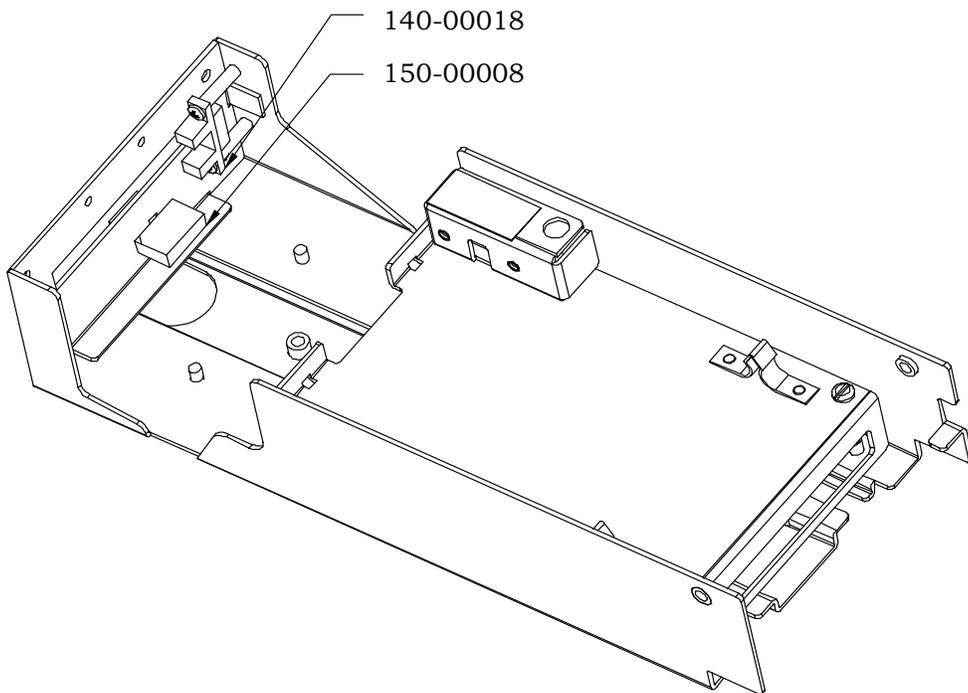
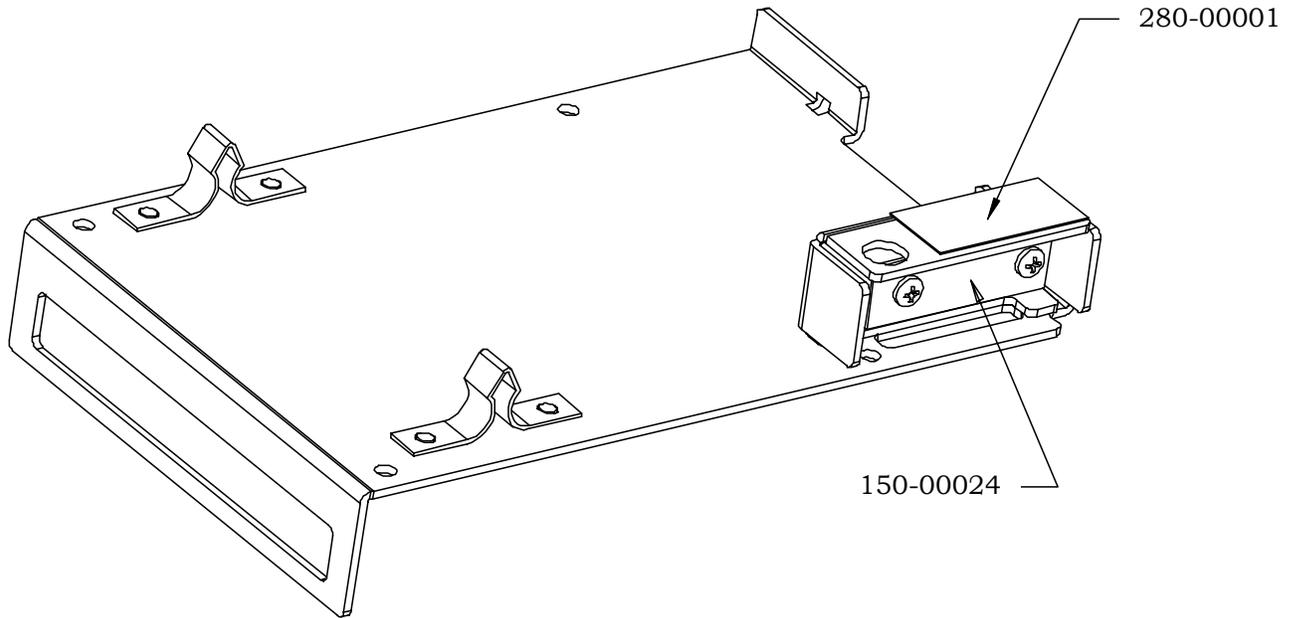
Spares		
Part Number	Description	
100-00003	Stationary Module, Complete With All Parts, RS232	
100-00007	Stationary Unit, Chassis Only Assembly	
100-00008	Sliding Unit, Chassis Only Assembly	
310-00035	200 Ticket Tray	
310-00036	400 Ticket Tray	

Spares		
Part Number	Description	
310-00037	600 Ticket Tray	
400-00005	Printer Mechanism (for Printers with Serial # starting at 0)	
400-00006	Printer Mechanism (for Printers with Serial # starting at 9)	
140-00004	PCB, Motherboard, Netplex Firmware	
140-00026	PCB, Daughterboard, Netplex	
140-00005	PCB, Motherboard, RS232 Firmware	

Spares		
Part Number	Description	
140-00027	PCB, Daughterboard, RS232	
150-00024	PCB and Cable, Paper Low Assembly	
150-00010	Cable, Ribbon, 50 Pin To 50 Pin	
150-00009	Cable, Netplex Communications And Bezel Port	
150-00012	Cable, RS232 Communications And Bezel Port	
150-00008	Cable, Front Bezel Port	
140-00018	Cable Assembly, Ticket Taken (Requires Gold Bursting Bar Set)	

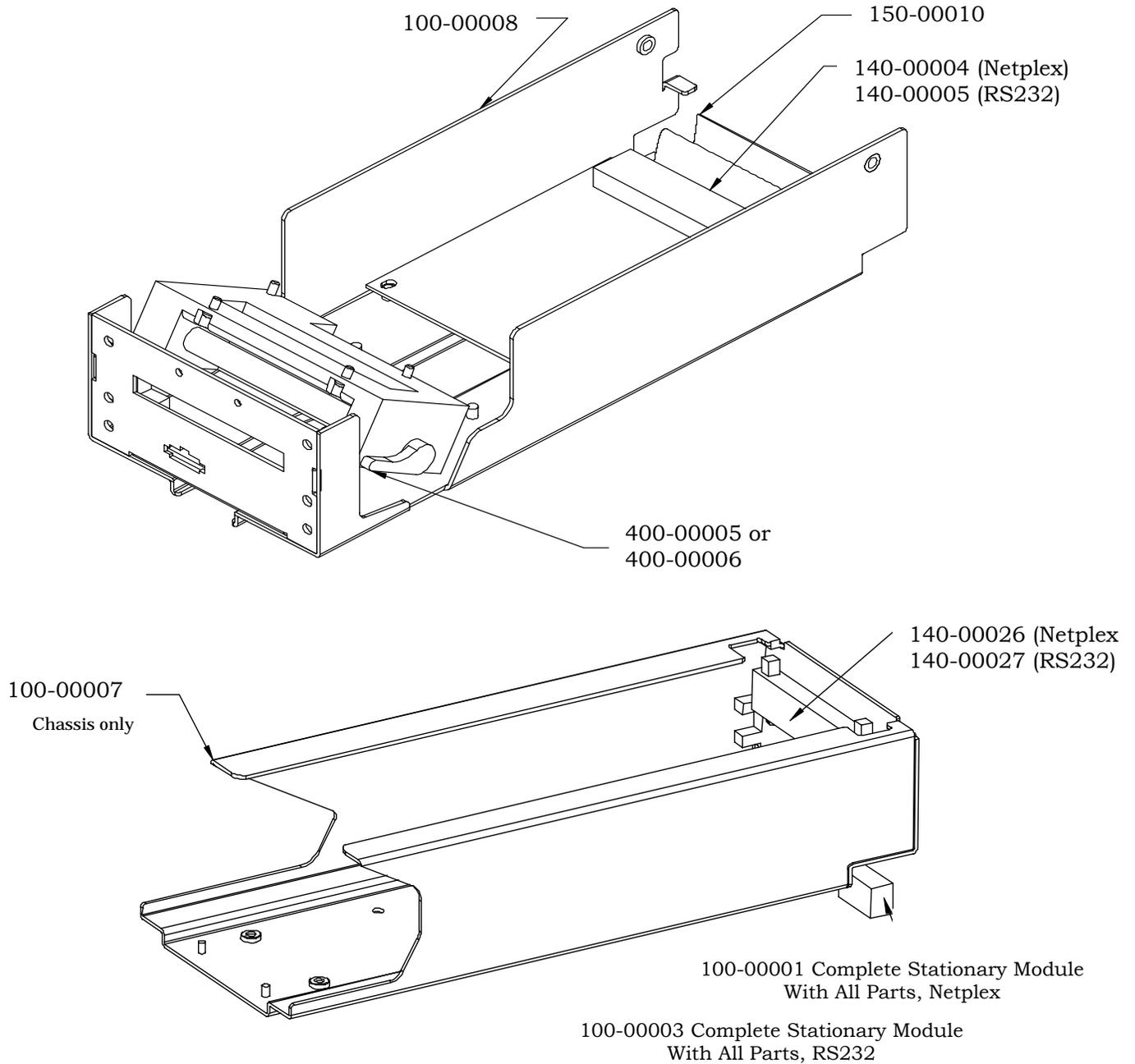
Spares		
Part Number	Description	
280-00001	Membrane Control Panel	
486-00017	Chassis Fasteners Hardware Kit	
485-00000	Spring, "W" Shape, Bulk Bag	
485-00001	Spring, Release Lever Extension, Bulk Bag	
485-00002	Spring, Ground Flat, Bulk Bag	
360-00006	Packaging, Inner Box	
360-00007	Packaging, Master Box	
150-00006	16 Pin to 16 Pin Print Mechanism Cable (use with Part # 390110)	
150-00013	Cable, Evaluation, PSA-66-ST RS232	
350-00031	24V Power Supply (use with Part #s 5005000, 5005001, 5005007)	
5005000	Download Support Kit, PSA-66 XXX	

Spares		
Part Number	Description	
5005001	Netplex Test Kit, PSA-66	
5005002	Gold Bursting Bar Set (Bottom Guide, Blade Bracket, Top Bracket)	
310-00040	Guide, Bottom, Gold	
310-00041	Bracket, Blade, Gold	
310-00042	Bracket, Top, Gold	
370-00001	Stationary Guide, Teflon LH	
370-00002	Stationary Guide, Teflon RH	



PSA-66-ST

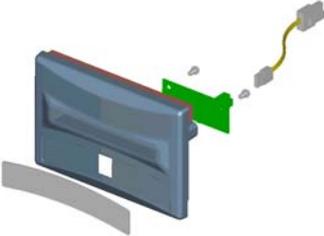
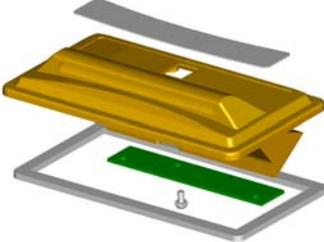
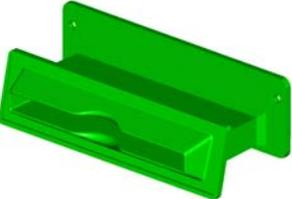
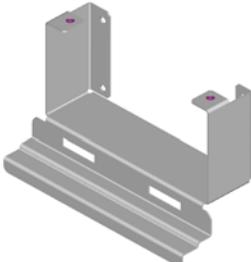
Operators and Technicians Manual



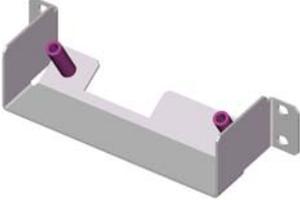


Appendix D Part Numbers – Bezels

The bezel systems shown in this section are designed to bolt to the four M3 holes on the front chassis plate of the printer and their descriptions given below.

Part Number	Description	Bezel
140-00028	Upright Bezel Kit	
130-00001	Slant Top Bezel Only	
130-00002	Slant Top Bezel Kit	
130-00000	Vision Upright and Slant Top Guide Bezel Only/S2000 Upright	
310-00118	Upright Bezel Bracket	



Part Number	Description	Bezel
310-00069	Upright Vision/S2000 LED Bracket	
140-00014	PCB Assembly, Vision Upright	

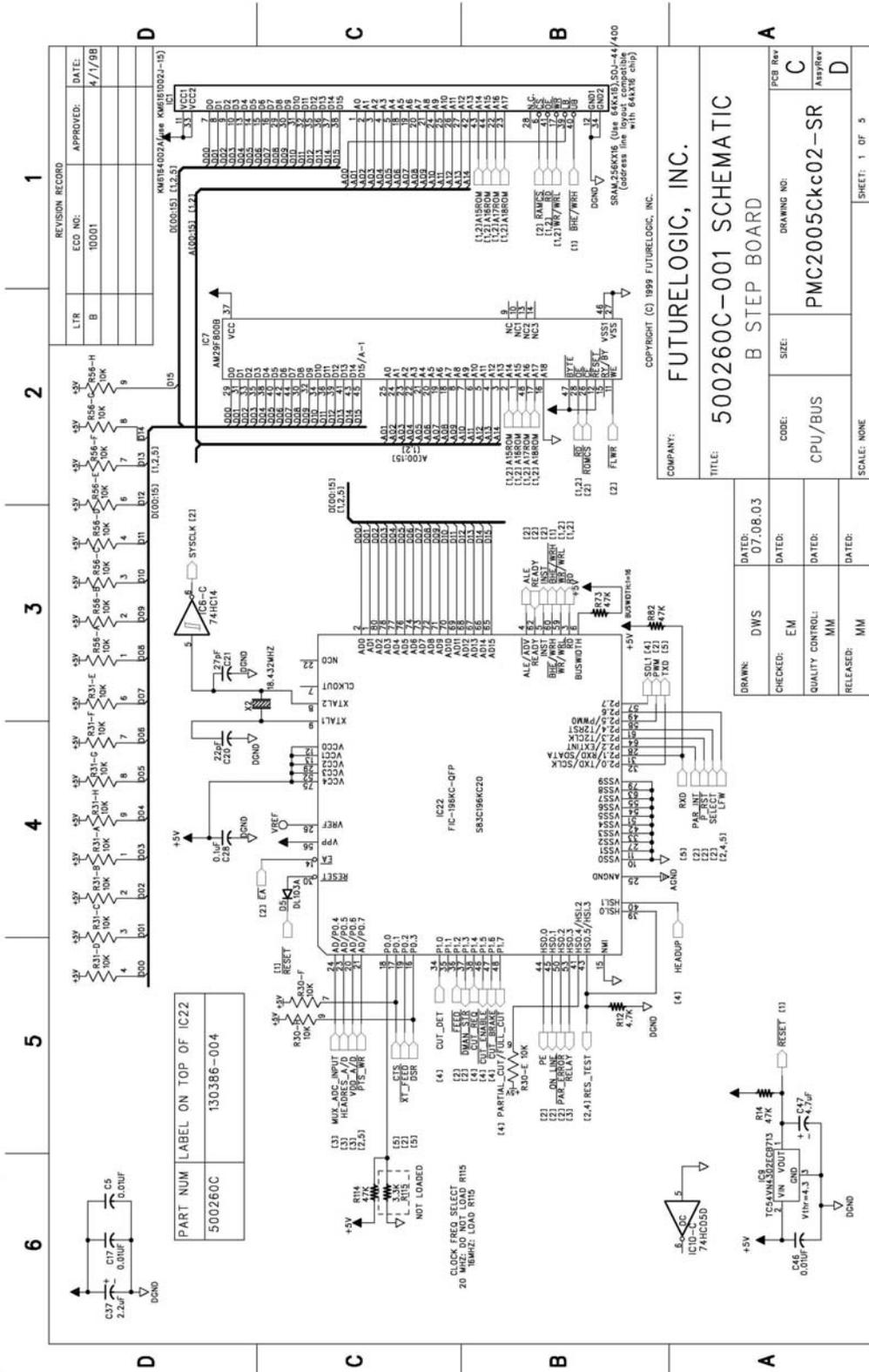


Appendix E Schematics

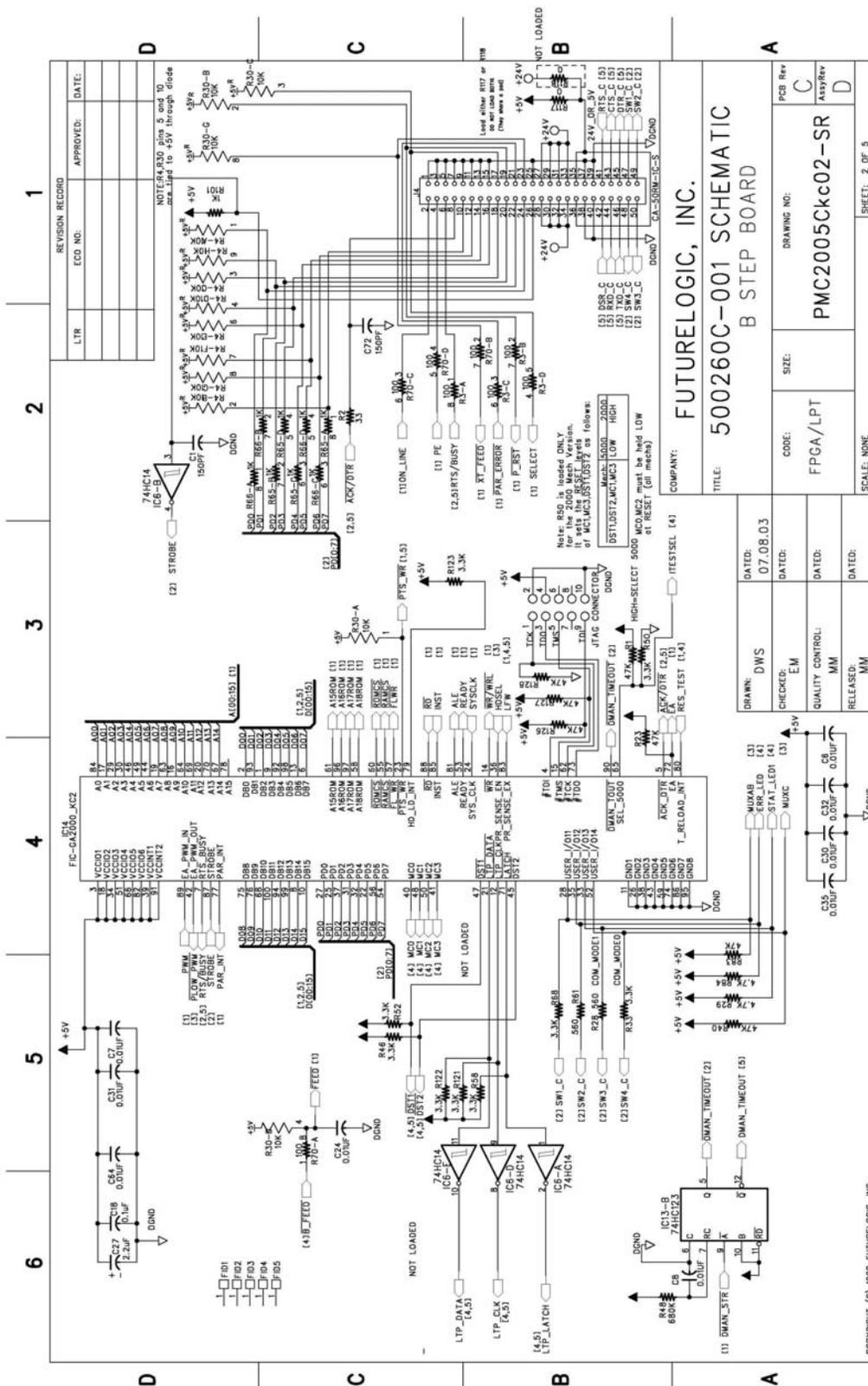
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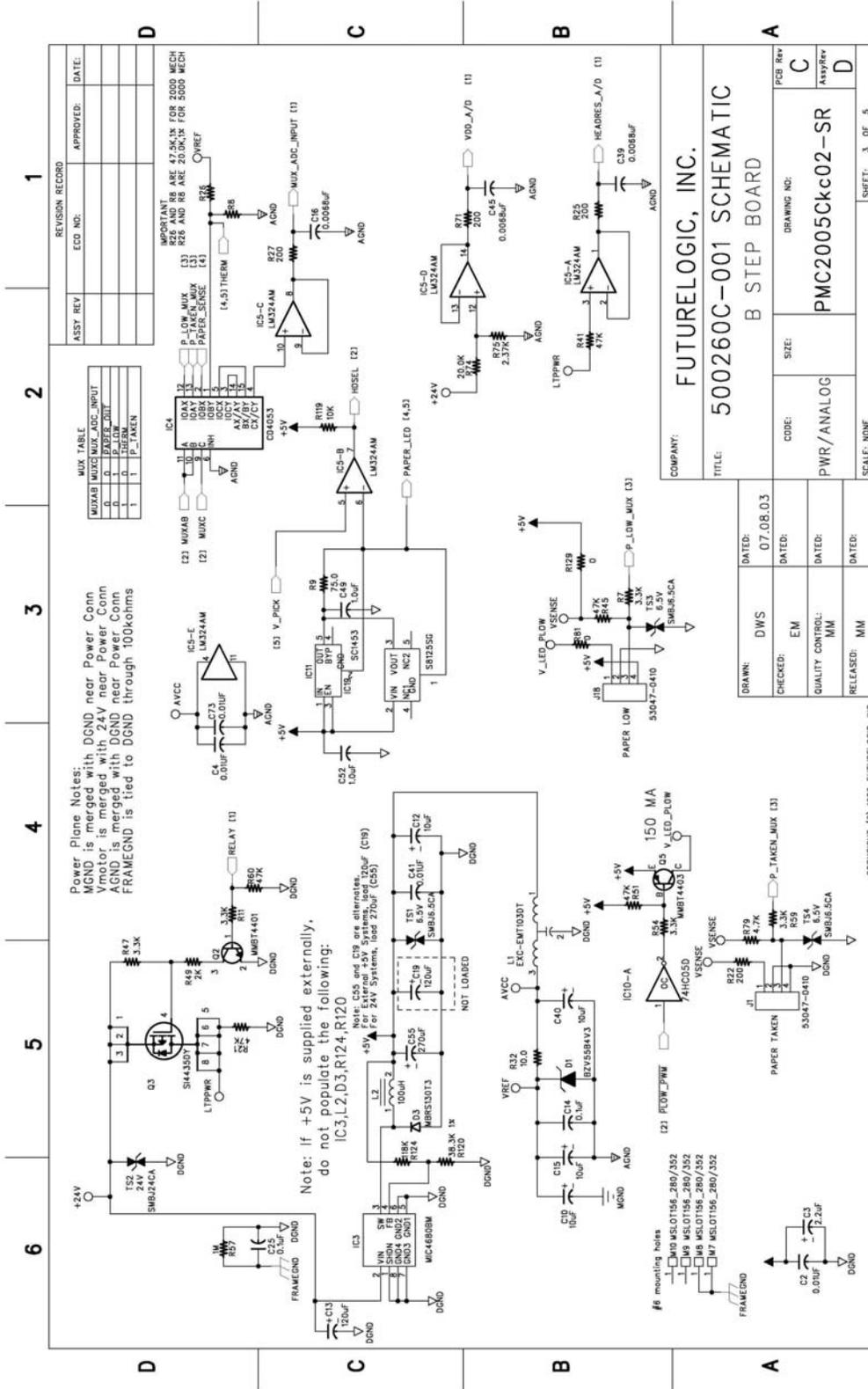
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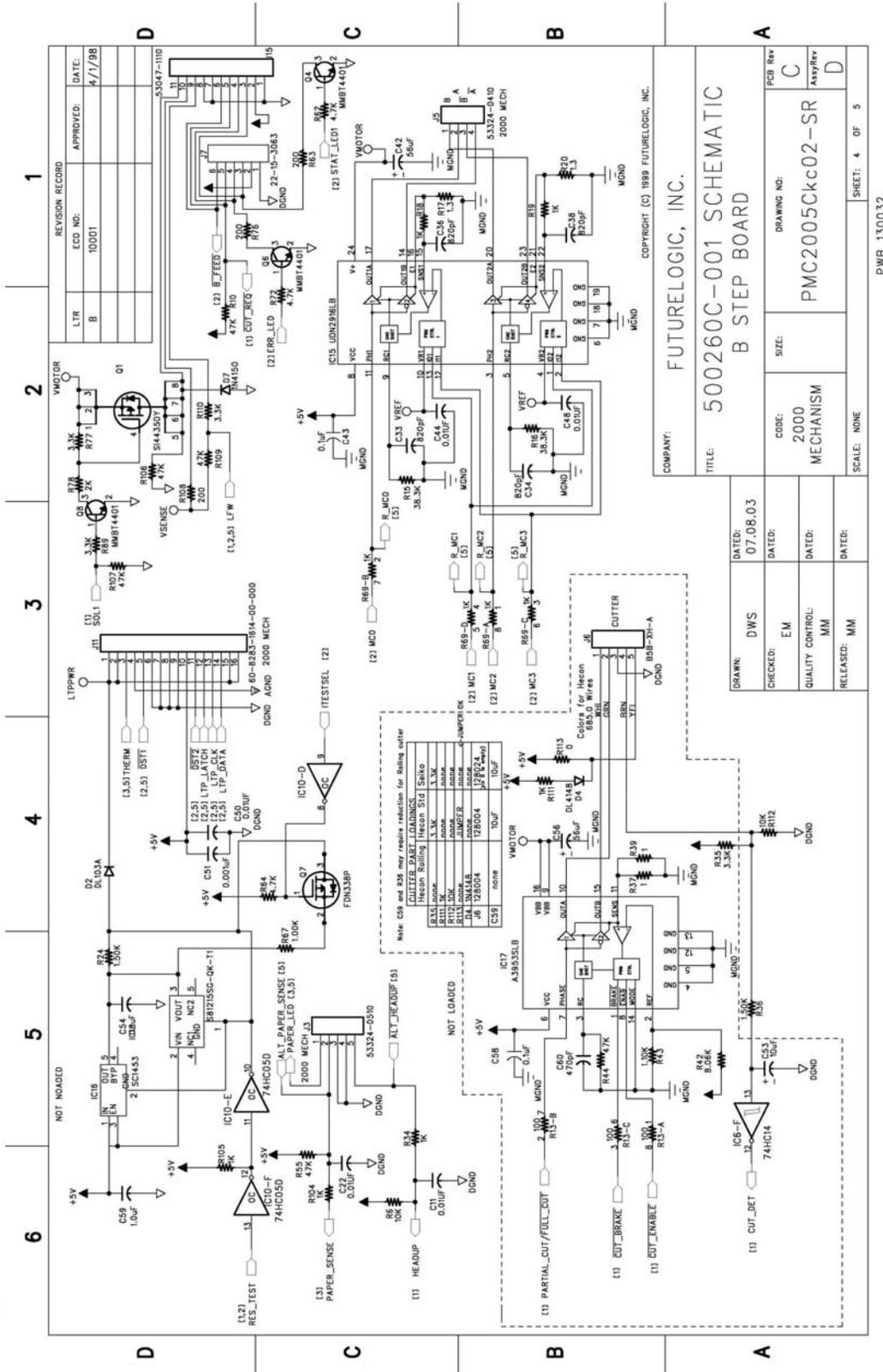
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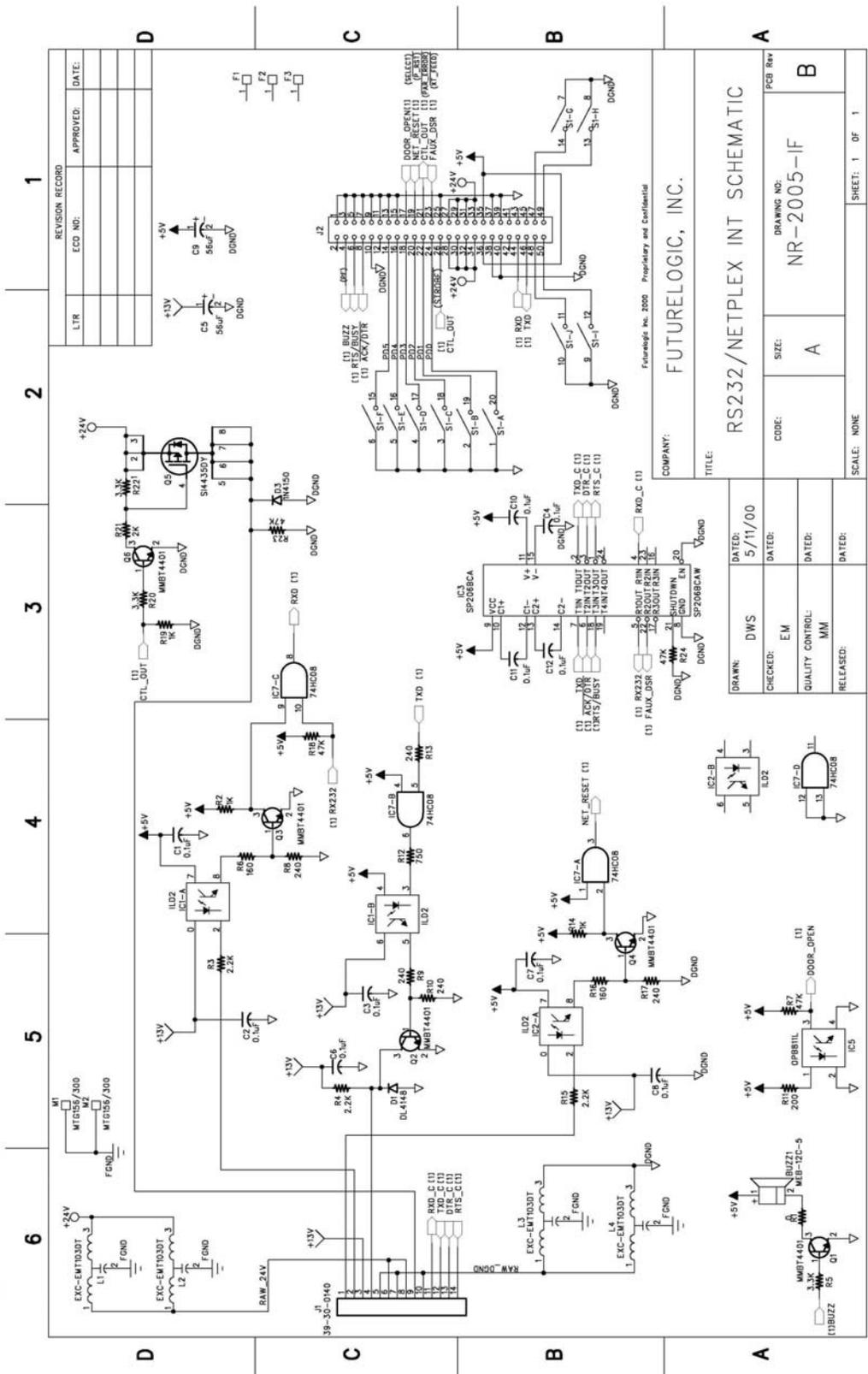
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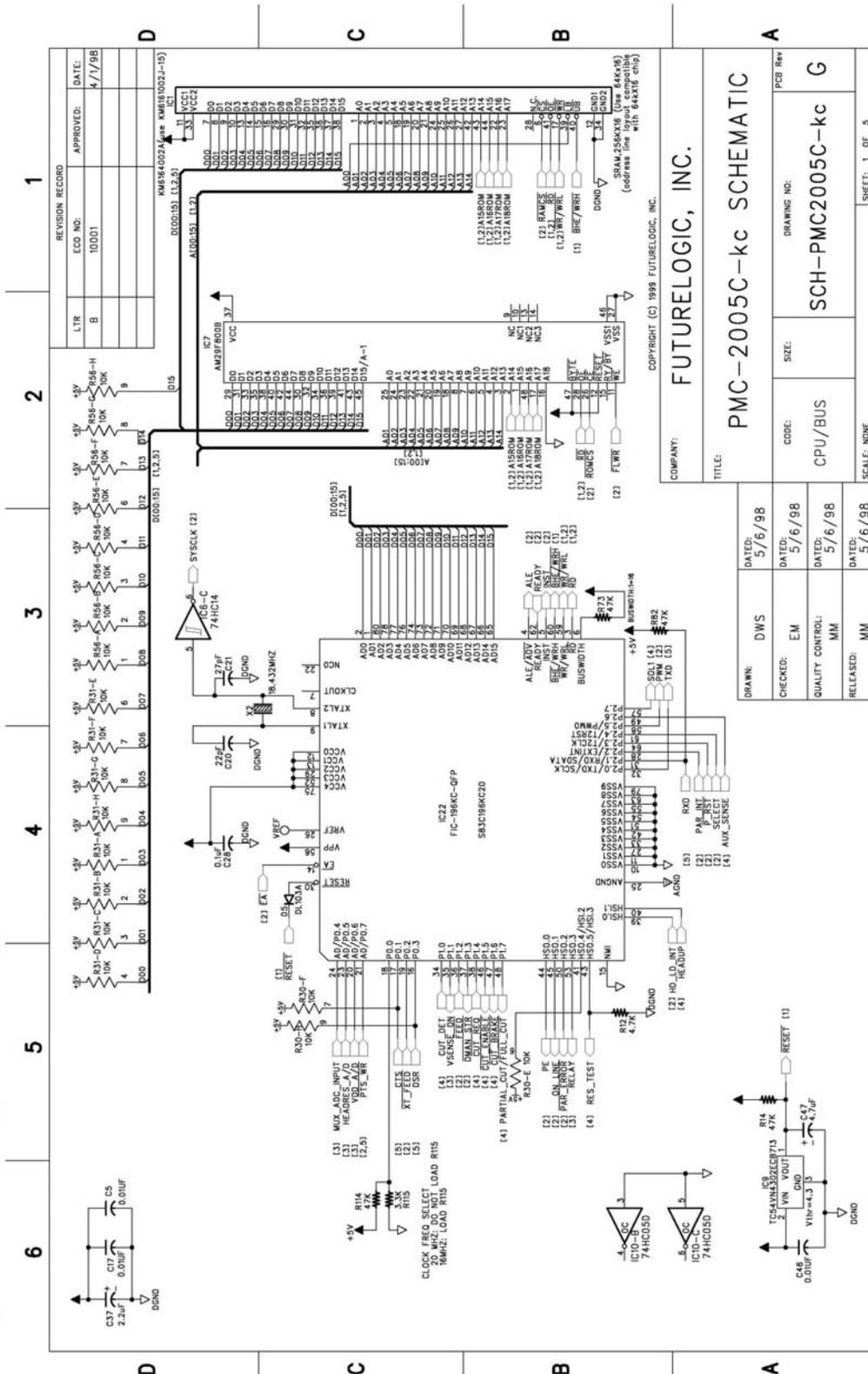
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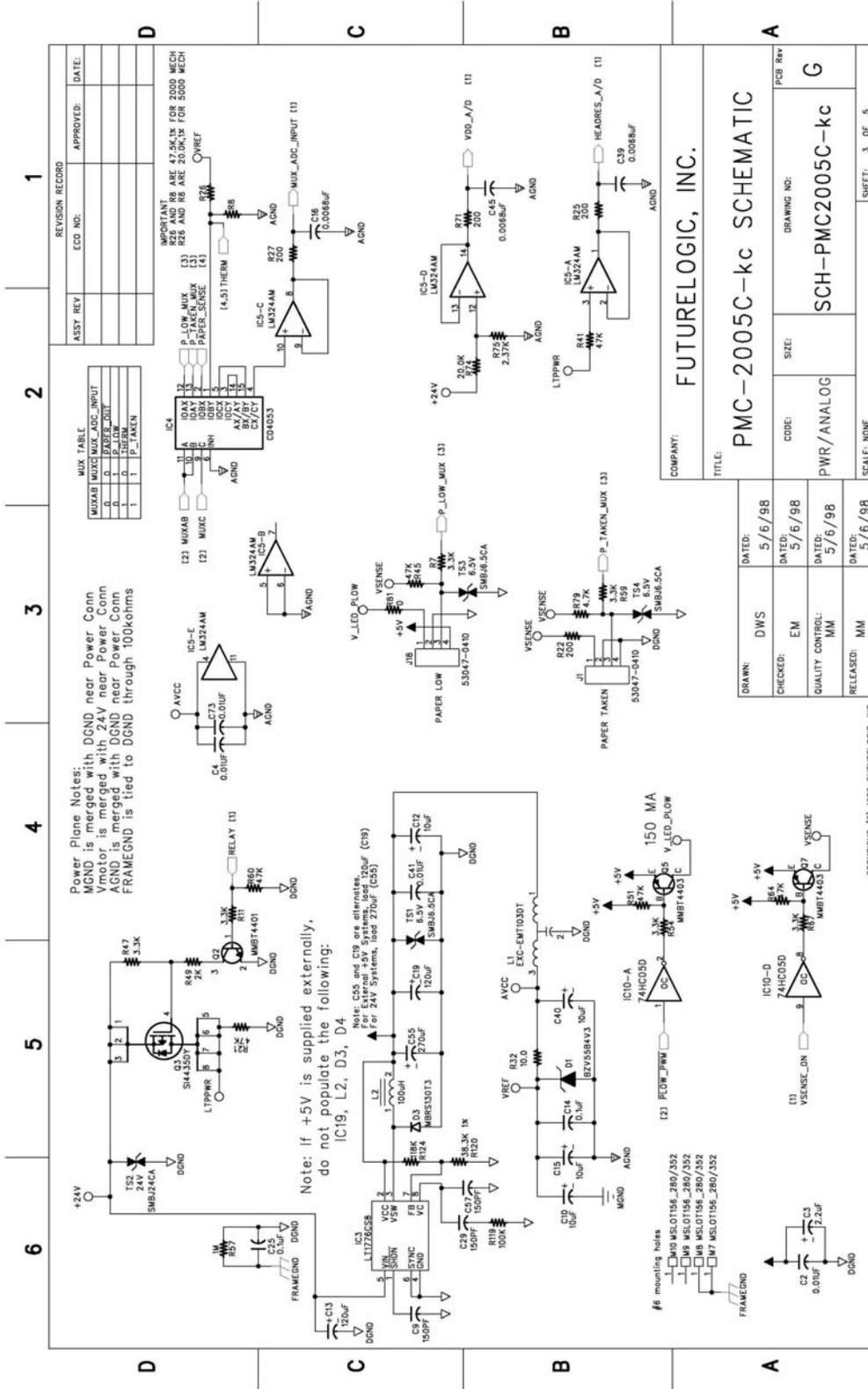
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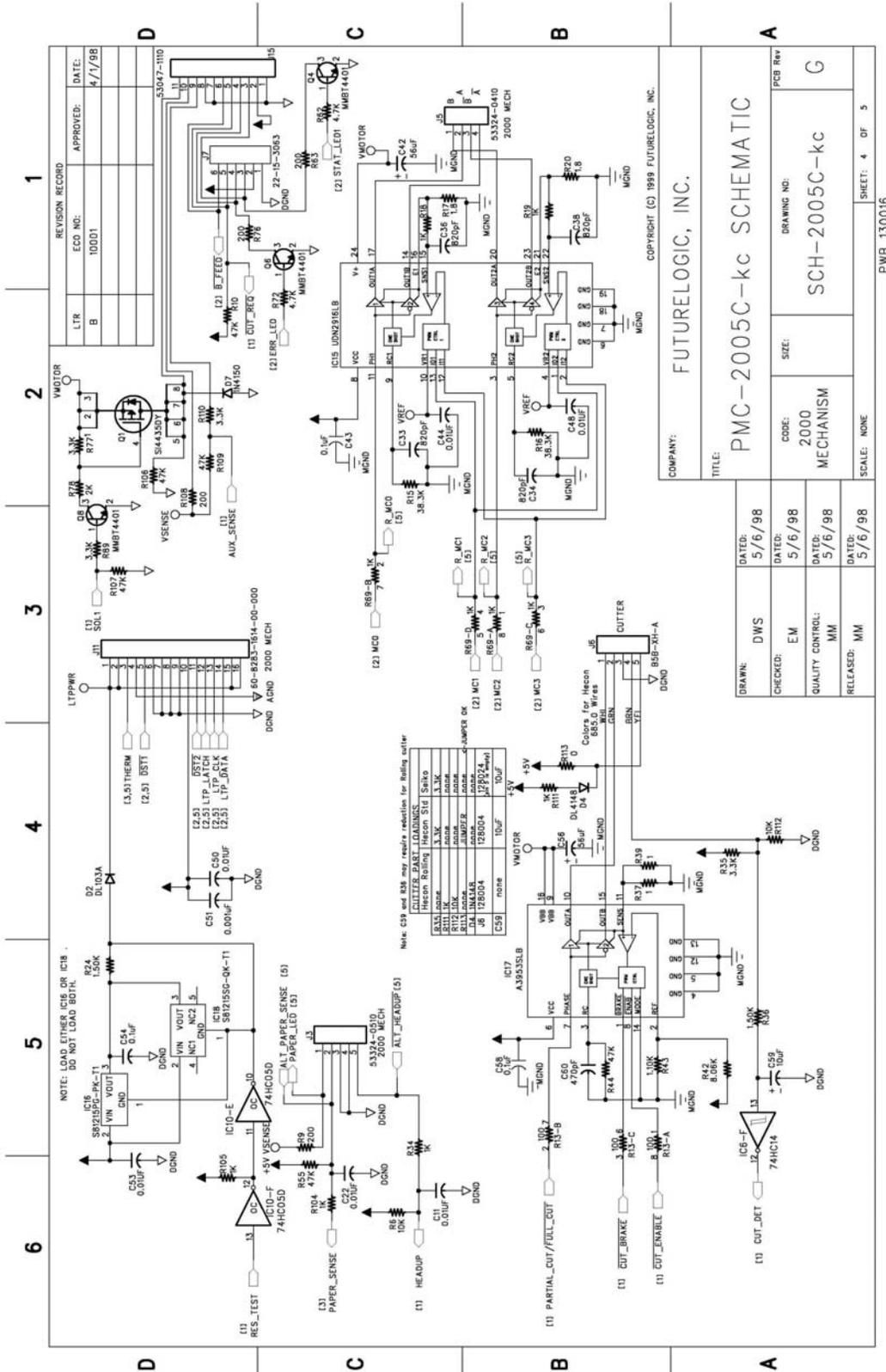
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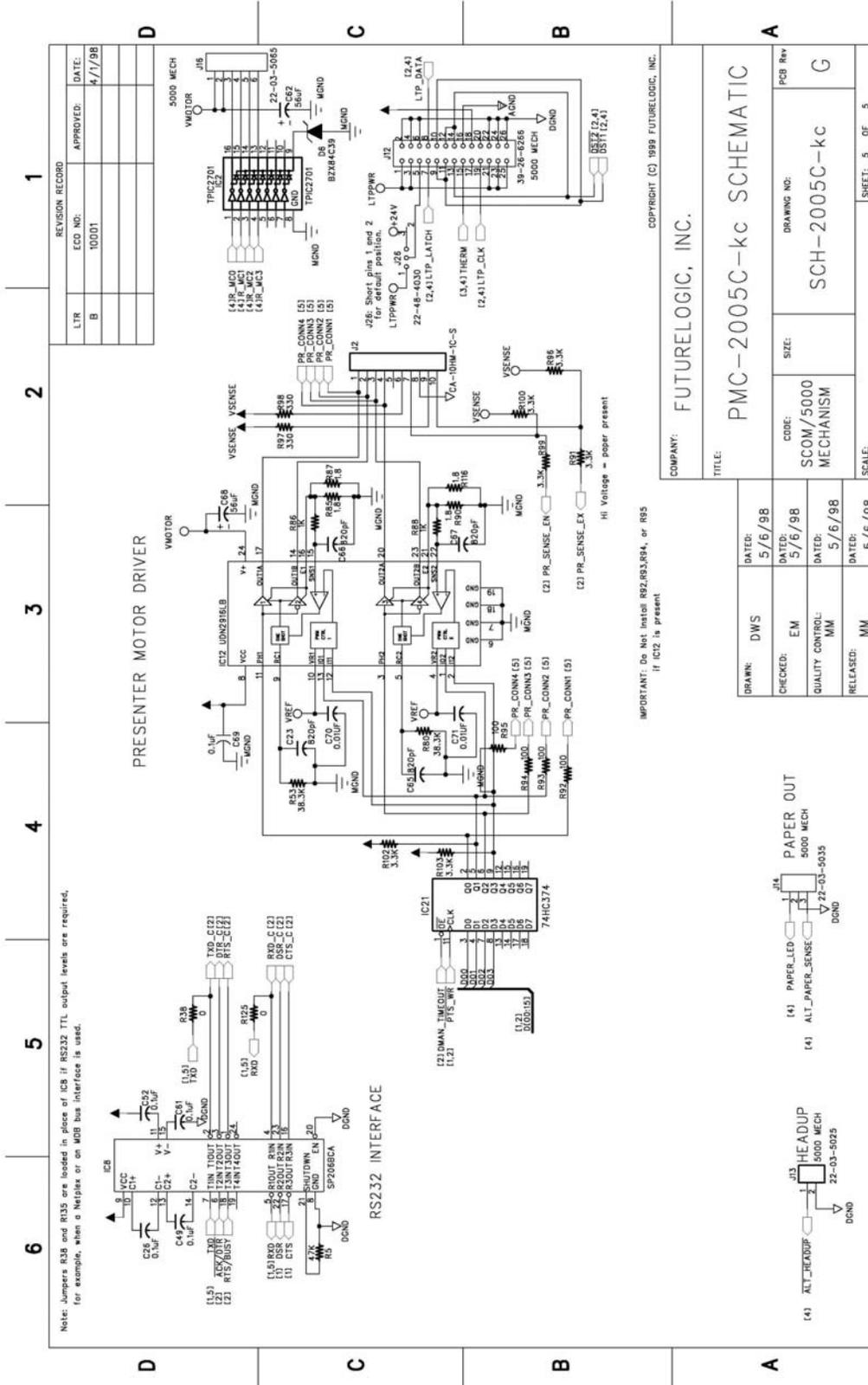
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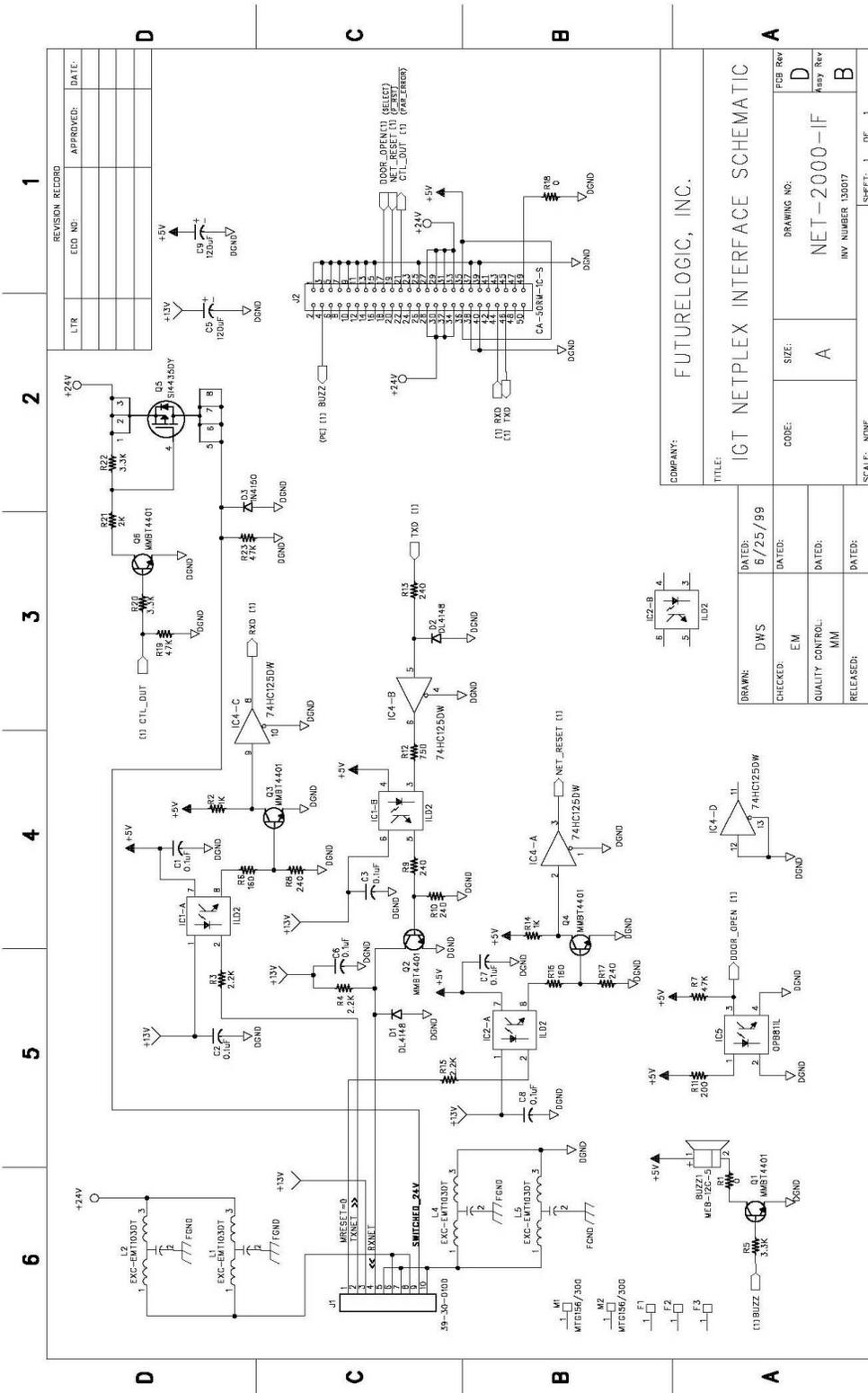
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COMPANY: FUTURELOGIC, INC.

TITLE: IGT NETPLEX INTERFACE SCHEMATIC

DRAWN: DWS	DATED: 6/25/99	FDR REV: D
CHECKED: EM	DATED:	ASST REV: B
QUALITY CONTROL: MMJ	DATED:	
RELEASED:	DATED:	

CODE: A
DRAWING NO: NET-2000-IF
REV NUMBER: 13007

SCALE: NONE
SHEET: 1 OF 1

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Appendix F Service Tool Kit

This appendix identifies the components of a service tool kit which a tech should use to perform any repair on the PSA-66-ST unit.

Table F-1 Service Tool Kit Items

Item	Description
Laptop	With at least 1 available COM port (must be COM1 or COM2) Containing: FLI Downloader version 1.1 Netplex Exit Tester* RS232 Exit Tester CommWrangler
Download support tool	
Netplex test kit*	For testing Netplex printers
Hand tools	Power driver P1& P2 extended tips 9/32 nut driver Needle nose pliers Pocket screwdrivers: standard and Phillips (Phillips should be a small diameter shaft) Diagonal cutters 1 power strip
Thermal ticket stock	
Complete stock of repair parts	
PSA-66-ST Repair Manual	PUBN-000019
PSA-66-ST Operators and Technicians Manual	MNL-000001

*For additional information on the Netplex interface, please contact International Game Technology.

Index

- | | |
|---|---|
| <p>B</p> <p>bezels, 3
part numbers, 28</p> <p>C</p> <p>clearing a paper jam, 7
controls, 2
CUT button, 6</p> <p>E</p> <p>errors, 4</p> <p>F</p> <p>FEED button, 2, 6
feeding paper, 6</p> <p>H</p> <p>Head Up
error, 4
keypad LED, 4</p> <p>I</p> <p>inner module, removing, 9</p> <p>K</p> <p>keypad LEDs, 4</p> <p>L</p> <p>loading paper, 5</p> <p>M</p> <p>Missing Black Index Mark
error, 5
keypad LED, 4</p> | <p>N</p> <p>Netplex
Base Port, 13
Base Port Pins, 13
Bezel Port Pins, Front, 12
Bezel Port, Front, 12
Netplex Port, 13
Port Pin-out, 13</p> <p>P</p> <p>Paper Insertion Slot, 2
Paper Jam
clearing, 7
error, 5
keypad LED, 4
sensor, 3
Paper Low sensor, 3
Paper Out
error, 4
keypad LED, 4
sensor, 3
paper specifications, 19
Paper Taken sensor, 3
Platen Release Lever, 2
Print Head
error, 4
keypad LED, 4
printer
errors, 4
general specifications, 17
overview, 1
part numbers, 20
schematics, 30
self test, 6
status conditions, 4
Printer Open sensor, 3
Printer Platen Engaged sensor, 3
PSA-66-001N. <i>See</i> Netplex
PSA-66-ST. <i>See</i> RS232</p> |
|---|---|

R

removing the inner module, 9

RS232

Base Port, 15

Base Port Pin-out, 15

Bezel Port Pins, Front, 14

Bezel Port, Front, 14

Cable Port, 15

Cable Port Pin-out, 15

Dip Switch settings, 16

S

schematics, 30

self test, 6

sensor

Paper Jam, 3

Paper Low, 3

Paper Out, 3

Paper Taken, 3

Printer Open, 3

Printer Platen Engaged, 3

spares, part numbers, 20

status indicators, 2

T

Temperature

error, 4

keypad LED, 4

V

Voltage

error, 4

keypad LED, 4



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