SP-401 Series
Panel Mount Thermal Printers
User‘s Manual

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Manual SP-401 – Part No. 790128-0010 (Rev. D – 11/29/04)

1 Introduction

This manual contains installation, operating and maintenance procedures for the Telpar SP-401 series of low cost miniature thermal printers. The SP-401 printers are available in 20 and 40 column Graphics and Non-Graphics configurations. These printers are microprocessor controlled to provide a wide range of printing capabilities. The SP-401 series of printers are small size and of a rugged design, which makes them ideal for mobile use. In their standard configuration, they may be powered from any AC or DC power source between 8 and 30 volts. A 115 VAC power supply is available as an extra cost option, and also a 230 VAC power supply can be ordered as an option.

The SP-401 printers utilize a thermal print head to print dot matrix characters. International character sets are supported by the SP-401 printers. The serial interfaces support data rates of 50 to 19200 baud. The parallel interface is a Centronics type which is compatible with the parallel printer ports on most personal computers.

The SP-401 series of printers may be ordered with a variety of options. Options are a real time clock, bit image graphics mechanism, paper low sensor, and a paper take up journal. Please contact Telpar for details regarding these options.

The SP-401 printer is available with either an RS232/20ma loop interface, an RS-485/20 ma loop interface, or a parallel interface.

SP-401, Usage in a Windows Environment

Printing in a Windows environment consists of sending data to the printer in a BIT-MAPPED GRAPHICS format. Since the printer mechanisms used in the SP-401 series of printers do not have enough resolution to print graphics well, no Windows drivers have been written for the SP-401 series of printers and none are currently planned.

However, testing has shown that the SP-401 series of printers CAN be used for printing TEXT in a Windows environment by selecting the Generic/Text Only printer driver which is furnished with Windows. Select the Generic/Text Only driver and then use ONLY the Roman 10 cpi font. Any graphics images imbedded in a document (including True Type fonts) will be ignored when the document is sent to the printer. PAGE SET-UP for using the SP-401/40 column wide printer is to set all margins to 0 and select a paper width of 4 inches. PAGE SET-UP for using the SP-401/20 column wide printer is to set all margins to 0 and select a paper width of 2 inches.

2 Operator Information

2.1 Turn on and Self Test

The operating controls of the SP-401 have been kept to a minimum. A convenient self test feature allows the operator to quickly determine that the printer is operating correctly. The functions of operating controls are as follows:

Control	Function
Thumb Wheel	Used on non-graphic model SP-401 printers to advance the paper. Do not rotate thumbwheel in a downward motion, this will damage the paper feed mechanism.
L.E.D.	Indicates power on and paper installed when green, paper out when flashing red and green, optional paper low when red.
Switch	Power off in down position, Power on in middle, and paper advance in the top (spring loaded) position.
Latch	To secure the main body of the printer to the mounting box.

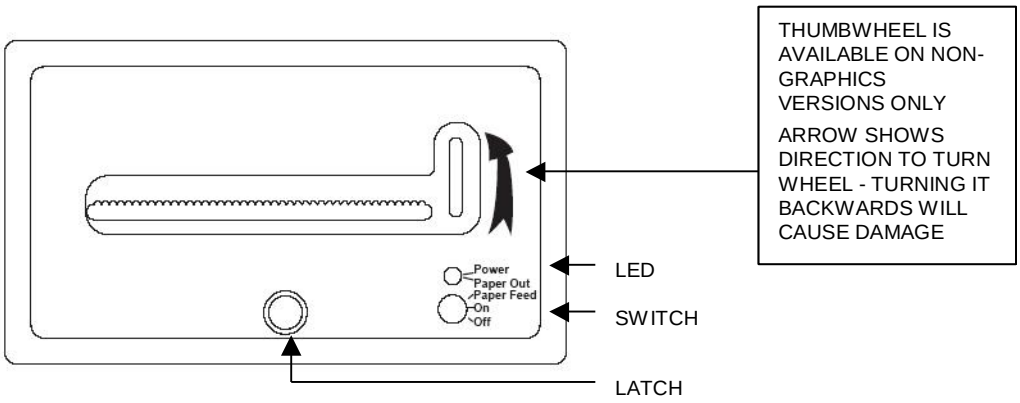


Figure 1 - SP-401 Front Panel

To activate the self test feature, shut the printer off, then in one quick motion, move the power switch to the paper advance position and hold it there until the self test text begins. Once the self test routine begins you may let go of the switch and let the printer finish the self test. To stop the self test before the end of the message, power down the printer.

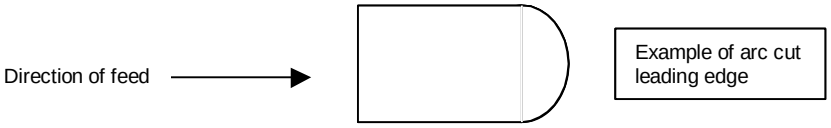
For units with Debug Function Test Software (Firmware versions 9.0 and above) The self test stops after 7 lines are printed and the printer is set to debug mode. Data sent to the printer while it is in debug mode will be printed out (by the printer) in the format as sent to the printer. ASCII printable characters (21 through

7 F hex) will be printed out as the actual character for readability 20 hex, the space character is printed as a rectangle. Non-printable characters will be printed in Hexadecimal form with a < before and a > after the hexadecimal code. To end the debug function, power down the printer.

For the highest quality output and maximum thermal head life, it is recommended that Telpar paper be used.

2.2 Paper Loading

Rotate the printers Front Panel Latch counter clockwise to release the printer from the panel mount box. Once released, slide the printer out of the box for paper loading. Install the paper spindle into a the roll of thermal paper. Position the roll of paper so that it will feed from the top, then place the roll and spindle into the paper support brackets, making certain that the paper is level. It is recommended that the paper be cut back beyond and tape or glue residue and then cut into an arc before feeding into the printer mechanism. (Note: Scissors cut is preferred).



To load paper, turn on the power. Now feed the cut edge of the paper into the guide until the paper stops. This printer will automatically feed the paper 10 line feeds when the optical sensor detects paper. At this time it is recommended that a self test be performed to ensure that the paper is installed correctly, (thermal side up) and that it is feeding properly. The printer may now be installed back into the panel mount box. Slide printer into the panel box unit fully seated. Rotate the Front Panel Latch clockwise to fasten the printer in place with the box.

In the event of a paper jam condition do not force paper into the unit, or try to pry the paper out of the unit, this may damage the thermal print mechanism. Disconnect primary power and interface cable before servicing the unit. Open printer and remove the face plate by removing the two 4/40 nuts on the back of the face plate, this will allow access to the printer mechanism. Carefully remove paper with a set of tweezers, or a small pair of needle-nose pliers. Once paper is cleared from the mechanism, re-assemble the unit. At this time, re-load the paper.

2.3 Journal Take Up

The SP-401 printers are offered with a Journal Take Up as an option. Paper should be loaded onto the journal only after a self test is performed to ensure that the printer functions properly. The journal take up is activated automatically when the printer performs a carriage return or line feed. To install paper onto the take up journal, feed paper successfully through the printer mechanism to allow approximately 4 inches of paper to feed out of the face plate. Position the take up journal to show the pinch rod on top. Unscrew the fastener on the right side of the take up journal and remove the right side disk and pinch rod assembly. Drape paper under the guide rod and over the top of the take up journal spinde, then reinstall right side disk and pinch rod. Paper should be repositioned between the take up journal and the pinch rod at this time. Power printer and press the paper advance to remove slack in the paper.

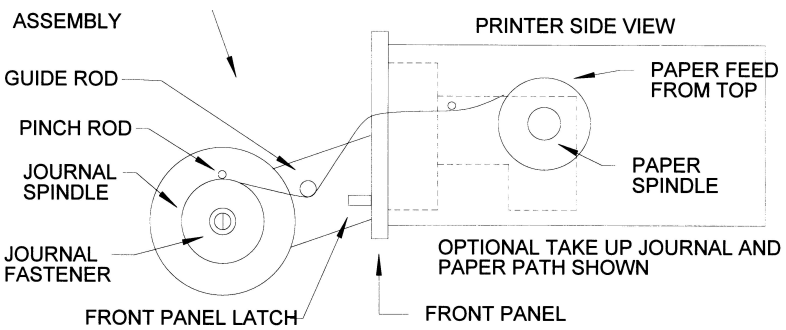


Figure 2 - SP-401 Paper Feed

3 Installation

3.1 Unpacking and Inspection

Carefully unpack and inspect your SP-401 for any damage which may have occurred in transit. Should any damage have occurred, notify Telpar, save the shipping carton and packing materials, and file a damage claim with the carrier. Specify the nature and the extent of the damage.

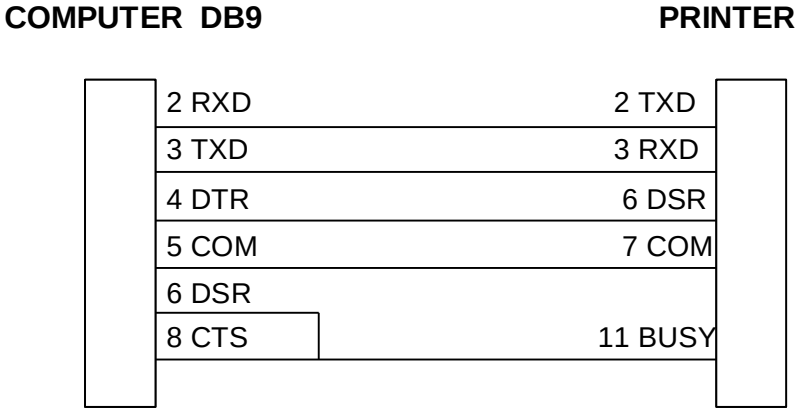
Before installing or operating the printer, check the following:

1. Ensure that the primary power setting is correct for your installation.
2. Ensure that the printer mechanism and paper path are clear of all packing materials or other foreign matter.
3. Ensure that paper is installed. **Do not operate the printer without paper**. Refer to Section 2.2 for paper loading instructions.

3.2 Installation

3.2.1 Serial RS-232 Interface Cable Suggestion

Connect the data interface cable to the SP-401; if the RS-232 interface has been selected use a null modem cable to connect to the host. If the current loop interface has been selected, a cable will need to be locally fabricated. A suggested cable diagram is shown below. For more information on communication signals see section 4.1.



3.2.2 Parallel Interface Cable

This parallel cable configuration is used to interface the SP-401 with all IBM and IBM compatible systems. This cable connects the interface to the printer with a 1:1 cable connection, and is terminated by a DB-25P on each end. This 25 pin cable configuration is available at most computer supply stores. Ex. Pin 1 to pin 1, pin 2 to pin 2, pin 25 to pin 25. **Note:** Cable length for the standard mode of parallel printing should be limited to 25 feet or less.

> **Note:** Cable length for the standard mode of parallel printing (through MS-DOS) should be limited to 25 feet or less.

4 Interface Specifications

4.1 Serial Interface

The interface connector is located on the rear of the SP-401 printers. Connector P1 is the serial port. Pin assignments are shown below. See Appendix B for details.

Note: A valid baud rate must be set at all times for proper printer operation. See section 4.1.1 for switch settings.

The SP-401 has two types of serial interfaces, RS-232 and 20 mA current loop RS-485 & 20mA current loop. In general, the RS-232 interface is preferable if the printer is located close to the host computer and can be connected with a cable run of 50 feet or less.

RS-232/20 mA Interface

Pin	Signal	Description
1	GROUND	Protective ground
2	TXD	Data output from the printer to the host
3	RXD	RS-232 data input, or 20mA positive input
5	CTS	Inhibits TXD line when held at -10v by the host
7	GROUND	Signal ground
11	BUSY	-10v when printer is unable to receive data
20	DTR	+10v when printer is on line
22	RET	-20mA current loop return

RS-485/20 mA Interface

Pin	Signal	Description
1	DTR -	
2	DTR +	
3	20 mA positive input	
7	TXD -	
8	TXD +	
10	GND	
19	RD -	
20	RD +	
22	20Ma RETURN	20 Ma current loop RETURN

4.1.1 Serial Interface Switch Settings

The data word parameters must be set in the printer to correspond with the settings of the host computer. These are set using the DIP switches SW1 located on the back of the SP-401 chassis. See Appendix B for a visual aid.

Set the baud rate using SW1-5 through SW1-8 according to the table below.

SWITCH	SW1-8	SW1-7	SW1-6	SW1-5
BAUD RATE				
50	ON	ON	ON	ON
75	OFF	ON	ON	ON
110	ON	OFF	ON	ON
134.5	OFF	OFF	ON	ON
150	ON	ON	OFF	ON
300	OFF	ON	OFF	ON
600	ON	OFF	OFF	ON
1200	OFF	OFF	OFF	ON
1800	ON	ON	ON	OFF
2000	OFF	ON	ON	OFF
2400	ON	OFF	ON	OFF
3600	OFF	OFF	ON	OFF
4800	ON	ON	OFF	OFF
7200	OFF	ON	OFF	OFF
9600	ON	OFF	OFF	OFF
19200	OFF	OFF	OFF	OFF

Set the stop bits, data bits and parity using SW1-1 through 4 according to the table below.

Switch	Function	Off	On
SW1-1	Stop bits	2	1
SW1-2	Data Bits	8	7
SW1-3	Parity	Enable	Disable
SW1-4	Parity	Even	Odd

Select current loop or RS-232 interface using JP2 and JP3 on the component side of the back board. See Appendix B for a visual aid for proper jumper placement.

Jumper	RS-232	20 mA
JP3	pins 1,2	pins 2,3
JP2	pins 1,2	pins 2,3

4.2 Parallel Interface

A DB 25S connector (P1) is used for the parallel interface. The pin assignments and brief signal descriptions are listed below.

Pin	Signal	Description
1	STROBE	1 usec. Pulse to clock data into the printer
2	DATA 0	
3	DATA 1	
4	DATA 2	Eight data bit input signals to the printer;
5	DATA 3	Signal levels are high for logic 1 and low
6	DATA 4	for a logic 0.
7	DATA 5	
8	DATA 6	
9	DATA 7	
10	ACK	6 usec pulse from printer when data received
11	BUSY	High when printer is unable to receive data
12	PE	Always low. There is no PAPER ERROR signal supplied at the parallel interface
13	SELECT	High when printer is on line
18-24	GROUND	Signal Grounds

4.3 Flow Control

The SP-401 printers employ a 7K byte data buffer as a standard feature to allow the host computer to rapidly transfer data. Under some circumstances it may be possible to completely fill the 7K buffer. When the buffer is within 50 bytes of being full, the SP-401 printers signal the host computer to pause until a line of data is printed, or until the buffer is under the 50 byte limit. The flow control information is sent to the host using hardware and software protocols.

The hardware protocol uses the BUSY line of the parallel interface or the BUSY line of the serial interface. These pins are asserted or negated as necessary to turn off and turn on the flow of data. The software protocol (Serial interface only) uses the XON and XOFF ASCII characters (^Q and ^S) which are sent back to the host to start and stop the data stream. Some host systems may not support one or both of these protocols.

5 Programming Information

5.1 General

The SP-401 printers have several different operation modes. Standard printers can print text and dot addressable graphics.

5.2 Printable Characters

When the SP-401 printers are initially powered up and placed on-line, their default mode is to process incoming data as ASCII text characters and print them out in the normal font. The standard printable character set is listed in Appendix A of this manual.

5.3 Graphics Mode

The SP-401 Series printers can print dot addressable graphics. There is a mechanism dedicated for graphics use which allows the dot lines to connect vertically after a line feed. Please contact Telpar for details on this optional mechanism. The host computer controls each dot printed and each dot directly corresponds to one bit of a graphics byte.

The following sequence must be sent to the printer at the beginning of each line of graphics.

```
ESC+"S"+n1+n2+n3+n4 (256 Dot per Line)
```

The sequence ESC+"S" enables the graphics mode. The length of the bit image data is declared by the digits n1, n2, n3, n4. The printer will return to the character mode once the number of graphics characters has been printed. Graphics data sent after the maximum number of columns has been reached will be truncated.

An example of graphics where 192 bytes of bit image data are input as follows:

```
1BH, 53H, 30H, 31H, 39H, 32H, = ESC+"S"+0+1+9+2
```

The relationship between graphics data and the printer dot head is as follows:

Print Head	Graphics Data
1 (Top)	DO (LSB)
2	D1
3	D2
4	D3
5	D4
6	D5
7	D6
8 (Bottom)	D7 (MSB on graphics models only)

5.4 Text Mode/Data Mode

The SP-401 printers can print in either Text mode or Data mode. To print in Data mode shut off printer and jumper pins 1&2 of header P1 on the main board. The printer will remain in this print mode until the jumper P1 is removed. The difference between Text Mode printing and Data Mode printing is that Text Mode print is upside down and right to left when exiting the printer, Data Mode is right side up and left to right when exiting the printer. See Appendix B for a visual aid on jumper placement.

5.5 Real Time Clock Option

The SP-401 is capable of printing the time and date on command with the installation of the Real Time Clock Option. To display the time that is currently set, the printer must receive the control code 05 decimal, (05) hex. To set the time to a new value the printer must receive the escape sequence ESC,t and the new parameters in the following format; hh:mmA (hrs:minutes A for am., P for pm., ex. 12:22P. To display the date that is currently set, the printer must receive the control code 06 decimal, (06) hex. To change the value of the date that is currently set, the printer must receive the escape sequence ESC,d and the new parameters in the following format; mm-dd-yy (month-day-year), ex. 01-22-95.

5.6 Auto Time and Date

The auto time date option can only be used in conjunction with the real time clock option. This feature allows the time and date to be printed automatically after the printer has received a carriage return. To enable this feature, jumper pins 1 and 2 of header JP6 on the serial interface board, or pins 1 and 2 of header JP4 on the parallel interface board. (back board) See Appendix B for a visual aid on jumper placement.

5.7 International Character Sets

International Character Sets are available for the SP-401 series printers. Standard printers are initialized with the U.S.A. character set. Once a set has been changed to another the printer will stay in that character set until another set is chosen, or the printer is powered down. To change the international character the printer must receive the following ESC sequence: ESC+”R”+n (n=0-6). See the list below for the n character set designations.

n	NATION	n	NATION
0	JAPAN	4	SWEDEN
1	FRANCE	5	ITALY
2	GERMANY	6	U.S.A.
3	U.K.	7	CUSTOM

5.8 Control Codes and Escape Sequences

Category	Symbol	Decimal (hex)	Function
Control Code			
	PRNT_T	05 (05)	* Display Time (optional)
	PRNT_D	06 (06)	* Display Data (optional)
Bell		07 (07)	Causes a “flash” of power/paper out led.
Asterisk	LF	10 (OA)	Single Line Feed
Denotes	CR	13 (OD)	Carriage Return (print buffer)
Optional	SO	14 (OE)	Double Width Print On
Codes	SI	15 (OF)	Double Width Print Off
	RESET (CAN)	24 (18)	Clears all Data from Print Buffer
	ESC	27 (1B)	Escape
ESC Sequence			
	ESC,S ts	83 (53)	Enables Bit Image Graphics (256 Byte max.) See Section 5.3
	ESC,d ts	100 (64)	* Set Date Format mm-dd-yy
	ESC, t ts	116 (74)	* Set Time Format hh:mmA A for am P for pm

5.9 Test Program

This is a test program written in BASIC for the SP-401 Parallel Interface printer. This program will test the standard control code and escape sequences executed by the SP-401.

```
10      CLS
20      WIDTH LPRINT 255 :REM sets output line width
30      LPRINT CHR$(14)          :REM double width print on
40      LPRINT"SP-401"
50      LPRINT"THERMAL PRINTER"
60      LPRINT CHR$(15)          :REM double width print off
70      LPRINT"Telpar"
80      LPRINT"4181 Centurion Way"
90      LPRINT"Addison TX 75244'
100     LPRINT"(972) 233-6631"
110     LPRINT CHR$(10)          :REM single line feed
120     LPRINT
130     LPRINT
140     LPRINT"THIS IS A GRAPHICS TEST"
150     LPRINT CHR$(27)+"S0255" :REM Length=255
160     FOR X=1 TO 255
170     LPRINT CHR$(255):        :REM fires all dots
180     NEXT X
190     LPRINT
200     LPRINT
210     CLS
220     LPRINT"CLOCK TEST" : REM(Note: The Clock Mode is Optional)
230     PRINT"PLEASE HAVE YOUR PRINTER TURNED ON TO SET THE
TIME/DATE",CHR$(10)
240     FOR X=500 TO 10000 STEP 300:SOUND X,2:NEXT X
250     LPRINT CHR$(14);"CLOCK TEST"
260     LPRINT CHR$(15)
270     INPUT"DO YOU WISH TO CHANGE THE TIME? (Y/N)";Y$:CLS
280     IF Y$="N"OR Y$="n" THEN GOTO 330
290     LPRINT"THE TIME CURRENTLY SET IS";CHR$(5)
300     PRINT"ENTER TIME AS hh:mmA (hours:minutes A for am P for pm)"
310     INPUT A$
320     LPRINT CHR$(27)+"t";a$;"THE NEW TIME IS"
330     LPRINT CHR$(14);CHR$(5)
340     LPRINT CHR$(15)
350     INPUT"DO YOU WISH TO CHANGE THE DATE? (Y/N)";Y$:CLS
360     IF Y$="N" OR Y$="n" THEN GOTO 410
370     LPRINT"THE DATE CURRENTLY SET IS";CHR$(6)
380     PRINT"ENTER THE DATE IN THE FOLLOWING FORMAT mm-dd-yy (month-day-year)"
390     INPUT A$
400     LPRINT CHR$(27)+"d";A$;"THE NEW DATE IS"
410     LPRINT CHR$(14);CHR$(6)
420     LPRINT CHR$(15)
430     END
```

6 Maintenance

6.1 Introduction

The SP-401 printers are designed to require a minimum of maintenance and service. This section provides instructions for cleaning and maintenance. Electrical and mechanical repairs should be performed by qualified personnel only. Make certain that all electrical connections are disconnected before any service is performed on the SP-401 printers.

6.2 Required Tools and Supplies

1. Common hand tools
2. Denatured alcohol
3. Cleaning rags
4. Cotton swabs
5. Lubricant IBM #23, LUBRIPLATE #70, SILCON#35

6.3 Cleaning

The SP-401 exterior cabinet may be cleaned with a non-abrasive cleanser. Care should be taken to prevent liquids from entering inside the mechanical assembly. If in a dirty environment the mechanism may be removed and the parts may be cleaned with alcohol and a cotton swab. The mechanism may also be "blown out" with compressed air. Do not direct air flow to printer platen, this may remove the soft rubber printing surface from the platen. When the mechanism is clean and free of dirt, a light silicon lubricant may be applied (sparingly) to the moving mechanical components.

6.4 Maintenance Chart

Clean Office or Light Use	Once Per Year
Clean Factory Environment Medium Use	Monthly
Dirty Factory Environment Heavy Use	Weekly

6.5 Warranty

Telpar — Printer Limited Warranty

For one (1) year after shipment of the printer product to Buyer, Telpar warrants the product against defects in materials and workmanship provided the product has been operated and maintained in accordance with manufacturer's operating and maintenance specifications. This warranty specifically excludes ribbons, paper and other consumable items.

THIS WARRANTY IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. TELPAR MAKES NO OTHER WARRANTY AND BUYER SPECIFICALLY WAIVES ANY OTHER WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THOSE DESCRIBED HEREIN.

Telpar's liability hereunder is limited to the repair or replacement of defective parts. This liability does not extend to normal wear and tear. Telpar will, solely at its option, remedy all valid warranty claims either by:

(a) Repairing or replacing the defective unit at Telpar's factory; or

(b) Repairing or replacing the defective subassembly at Telpar's factory.

If so directed by Telpar, Buyer shall return the defective unit or subassembly, transportation prepaid by Buyer, to Telpar's factory. After repair or replacement has been accomplished, Telpar will return the unit or subassembly, transportation prepaid by Telpar, to Buyer.

As a precondition to any warranty service, prior to return of any units or subassemblies to Telpar by Buyer, Buyer must contact Telpar's Order Administration Services and receive authorization in the form of a Return Material Authorization (RMA) number. Telpar reserves the right to refuse any goods it has not previously authorized for return, or any goods shipped without transportation prepaid.
No warranty shall apply to any damage resulting from or caused by Buyer, if Buyer shall make any changes, modifications, additions or deletions of hardware, software or firmware in the Printer products sold hereunder without Telpar's advance written consent.

Upon receiving an RMA from Telpar, warranty service may be obtained by returning the merchandise, freight prepaid, with a copy of your invoice.

Telephone:	800-872-4886 or 972-420-4700
Fax:	972-420-4272
Email:	info@telpar.com

Upon inspection, Telpar will make necessary repairs or replacement and return the merchandise, shipping prepaid.

APPENDIX

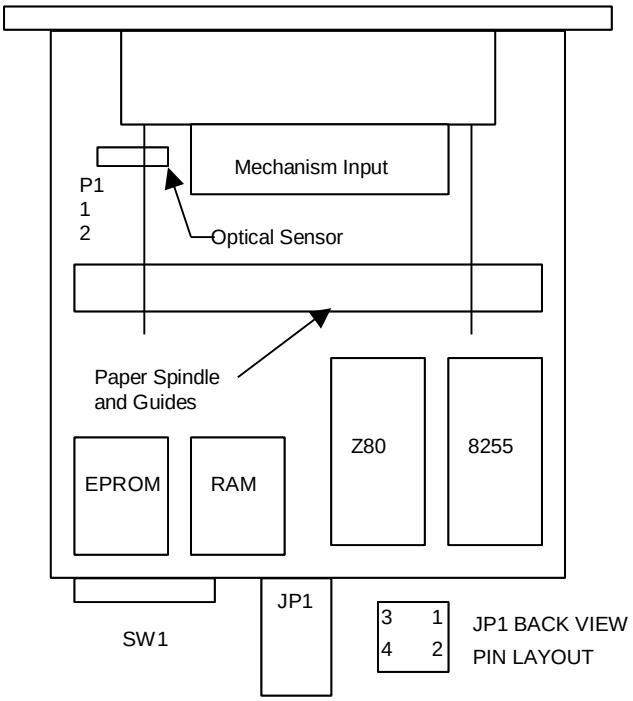
Appendix A. Printable Characters

ASCII codes listed below are the printable ASCII characters for the SP-401 printers. Decimal and Hexadecimal values are given.

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
32	20	SP	56	38	8	80	50	P	104	68	h
33	21	!	57	39	9	81	51	Q	105	69	I
34	22	“	58	3A	:	82	52	R	106	6A	j
35	23	#	59	3B	;	83	53	S	107	6B	k
36	24	$	60	3C	<<	84	54	T	108	6C	l
37	25	%	61	3D	=	85	55	U	109	6D	m
38	26	&	62	3E	>>	86	56	V	110	6E	n
39	27	‘	63	3F	?	87	57	W	111	6F	o
40	28	(	64	40	@	88	58	X	112	70	p
41	29	)	65	41	A	89	59	Y	113	71	q
42	2A	*	66	42	B	90	5A	Z	114	72	r
43	2B	+	67	43	C	91	5B	[	115	73	s
44	2C	,	68	44	D	92	5C	\	116	74	t
45	2D	-	69	45	E	93	5D	]	117	75	u
46	2E	.	70	46	F	94	5E	^	118	76	v
47	2F	/	71	47	G	95	5F	_	119	77	w
48	30	0	72	48	H	96	60	‘	120	78	x
49	31	1	73	49	I	97	61	a	121	79	y
50	32	2	74	4A	J	98	62	b	122	7A	z
51	33	3	75	4B	K	99	63	c	123	7B	{
52	34	4	76	4C	L	100	64	d	124	7C	|
53	35	5	77	4D	M	101	65	e	125	7D	}
54	36	6	78	4E	N	102	66	f	126	7E	~
55	37	7	79	4F	O	103	67	g	127	7F	DEL

Appendix B. Jumper Designations

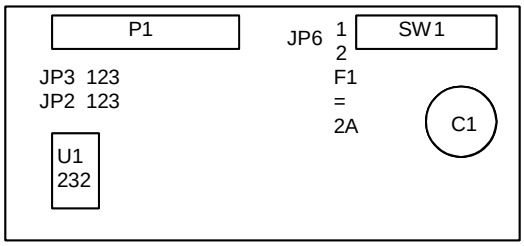
Main Controller Board (Top view)



P1 = Data Mode/Text Mode (see section 5.4)
Open = Text Mode
Closed = Data Mode

JP1 = Power input 8 to 30 VAC/DC
Pins 1 & 2 AC
Pin 3, Negative DC
Pin 4, Positive DC

Serial RS-232/20mA Back Board



JP2,JP3=Jumpers to change RS-232 to 20ma loop interface.
Jumper pins 1 and 2 for RS-232.
Jumper pins 2 and 3 for 20ma operation.

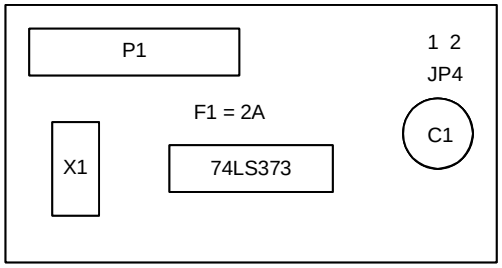
JP6 = Auto Time and date after carriage return

F1 = 2 amp fuse

Jumper	RS232	20mA
JP3	pins 1&2	pins 2&3
JP2	pins 1&2	pins 2&3

Figure 3 - Jumper Designations

Parallel Back Board



JP4 = AUTO TIME AND DATE
AFTER CARRIAGE RETURN

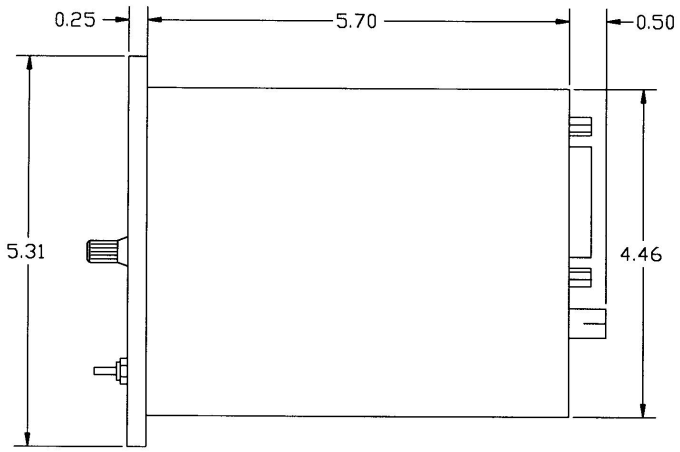
OPEN = DISABLE (JUMPER OFF)
CLOSED = ENABLE (JUMPER ON)

Appendix C. Specifications

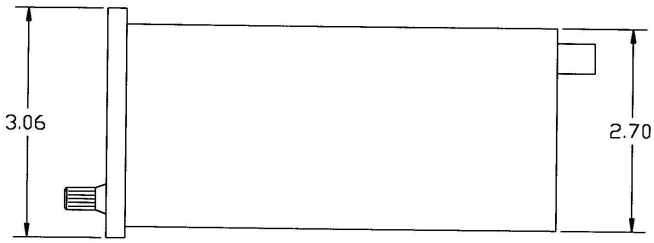
Specifications	SP-401 SERIES Thermal Printers
Performance:	
Max. Print Rate	0.6 Lines/second
Line Density	6 Lines/inch
Print Head Life	500,000 character lines
Buffer Size	7000 character
General:	
Number of Columns	20,40
Graphics	256 Byte Maximum
Print Modes	Data or Text (Jumper Selectable)
Dot Diameter	0.014 inches (0.35mm)
Dot Spacing	0.014 in (0.35 mm) vertical, 0.010 in (0.25 mm) horizontal
Line Spacing	0.060 in (1.5 mm)
Paper Width Roll Stock 80ft/roll	3.125 inches (79.4mm) Use Telpar Paper for Best Results
Temperature Range	Operating: 0° to +50° C; storage -25° C to +85° C.,90% max. RH (non condensing)
Power:	
Voltage and Power	10 to 30 vac, 8 to 30 vdc 110 / 230 vac with wall adapters, 2.5 watts standby, 12 watts printing
Interface:	
Serial	RS-232/20 mA serial interface (DB-25S Connector)
RS485/20mA	
Parallel	Centronics Parallel Type (DB-25S Connector)
Mechanical:	
Dimensions	2.7” H x 4.5” W x 5.7” D (68.6 mm x 114.3 mm x 144.8 mm)
Weight	2.25 lb. (1.02 kg.)

Appendix D. Dimensions

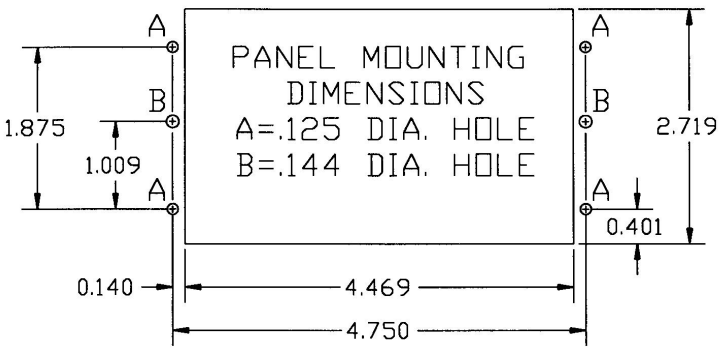
The sketches below show printer outline dimensions and panel mounting dimensions.



Top view



Side view



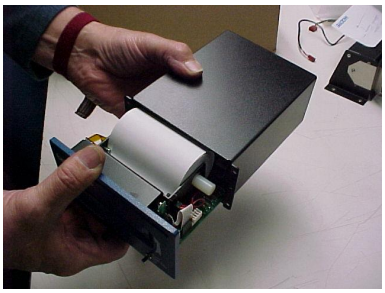
Panel cutout

Appendix E. Cleaning procedure

Check unit visually for damage.

Remove cover by rotating the latch counter-clockwise until the latch disengages from the cover.

Once latch disengages the cover will slide out easily.



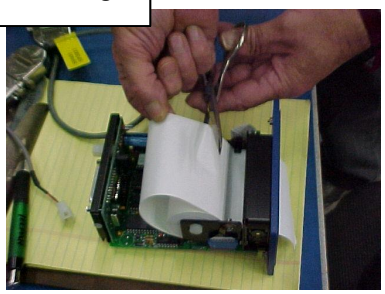
Paper Removal

Caution!,

Remove power prior to this operation. Do not insert metal objects of any kind while printer is powered, as this will damage the printer

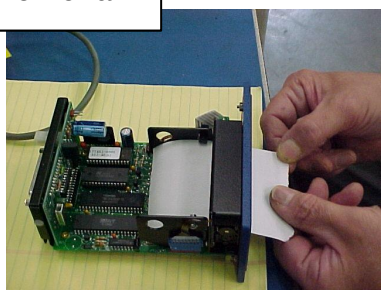
Remove paper by cutting and pulling it straight through the front as shown.

Cutting



Caution!, Attempting to pull the paper from the back of the mechanism will damage the printer.

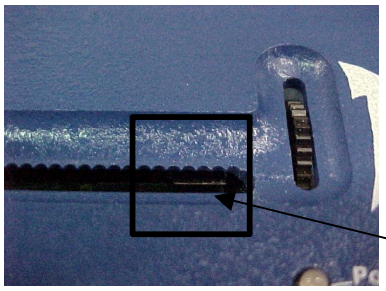
Removal



Plug unit into power supply and turn on. Unit should cycle once then stop and LED should blink green-amber-red.

Inspect paper path and stainless steel clip. If LED isn't blinking or unit didn't cycle properly or clip is missing,

damaged or dislodged send unit to Telpar for repair.



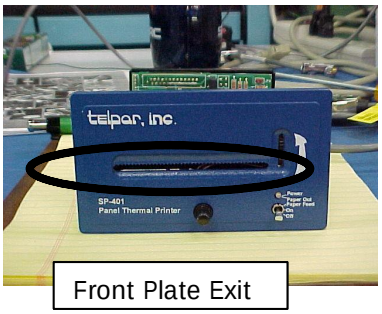
Stainless Steel Clip

Caution!,

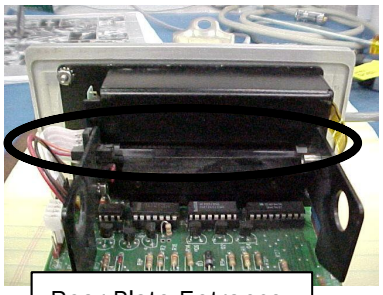
Do not attempt to re-align clip as this may cause further damage to printer mechanism.

LED

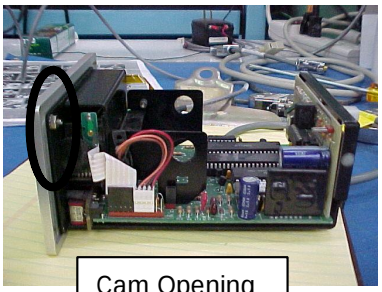
Turn power off and remove power supply. Clean unit with low-pressure compressed air. The following points are to be addressed during cleaning: Front Plate Exit, Rear Plate Entrance, Cam Opening and Gears. Utilize a cleaning card with isopropyl alcohol to clean platen, if necessary.



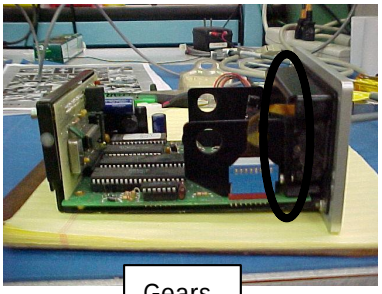
Front Plate Exit



Rear Plate Entrance

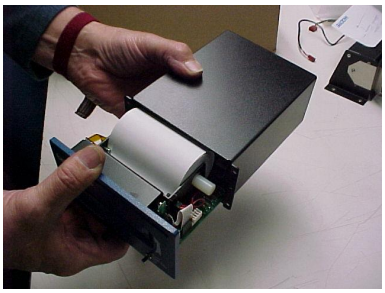


Cam Opening



Gears

Plug unit into power supply re-install paper and run a self- test. If unit fails to operate properly, write a brief description of the issue on the paper roll and send the unit to Telpar for repair.



Attach cover onto the printer assembly prior to operation or shipping.