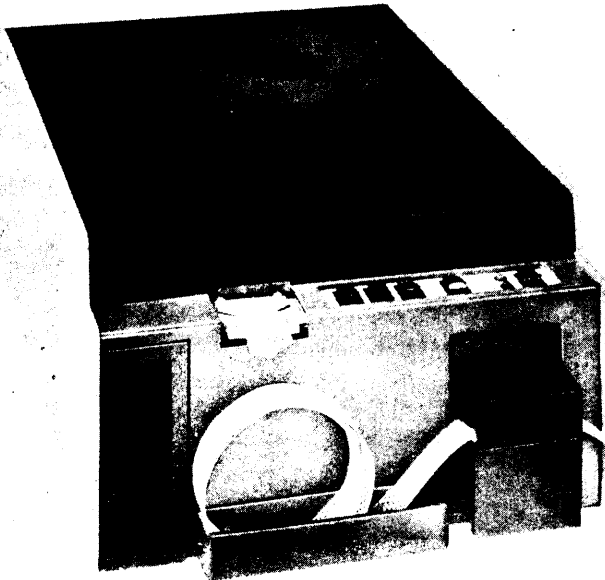
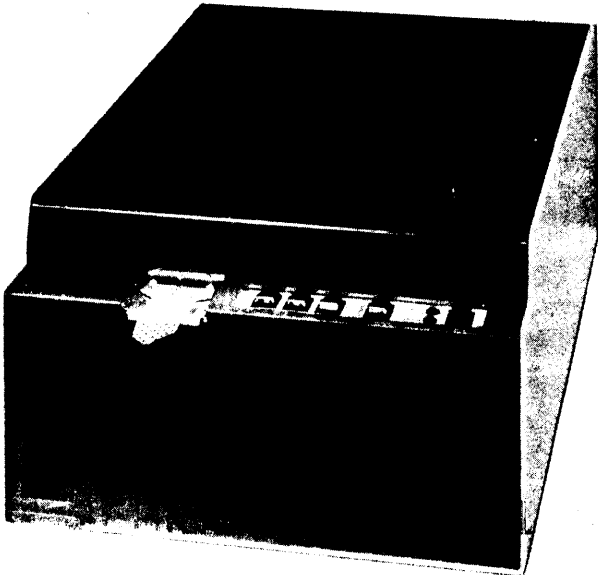


SP75



SRP3075



“S” SERIES TECHNICAL MANUAL

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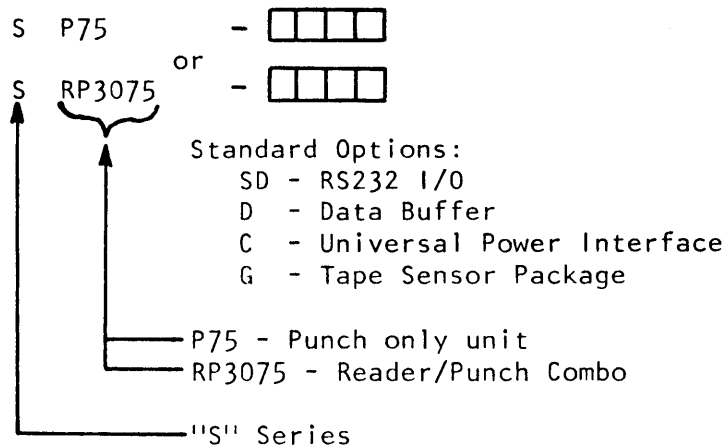
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1. FOREWORD

This document describes the physical, operational and electrical characteristics of "S" series punches and reader/punch combo's. This manual should be read in it's entirety prior to interfacing the unit with any other equipment. The unit may be provided with several different options allowing for an RS-232 input-output port, Universal Power Interface (100VAC - 230VAC, 50 or 60 HZ line power) and tape sensor status.

1.1 MODEL NUMBERS

To facilitate the understanding of the features and options of various standard units, the following model numbers are broken down:



A unit may have any one, some, or all of the standard options. Units without the SD options are parallel interface units. A typical model number might be SP75-CG which designates a punch only parallel interface unit with Universal Power Interface and Tape Sensor Package; an SRP3075-SDC would designate a reader/punch unit with serial I/O, Data Buffer and Universal Power Interface.

2. INSTALLATION & OPERATION

2.1 GENERAL

The SRP series of products are self contained, table top units with reader and punch. The SP series are similar to the SRP series but are provided with punch only. The units with "SD" as part of the suffix are provided with RS-232 compatible I/O. Those without the "SD" suffix are provided with DTL/TTL compatible parallel interface.

The speeds and interfaces provided on the various models are shown below:

<u>Model</u>	<u>Description</u>	<u>Maximum Punch Speed</u>	<u>Maximum Reader Speed</u>	<u>Interface</u>
SRP-3075	Reader/Punch Combo	75 c/s	300 c/s	Parallel - DTL/TTL
SRP-3075SD	Reader/Punch Combo	750 Baud*	3000 Baud*	Serial - RS-232
SP-75	Punch	75 c/s		Parallel - DTL/TTL
SP-75SD	Punch	750 Baud*		Serial - RS-232

* Switch Selectable

The units are packaged in an attractively styled cabinet which consumes 12 inches of table width. Operator controls are conveniently located, punched tape exits toward the operator and the front mount reader (SRP series only) transports tape from left to right. The punch and tape handling, which accommodates both roll form or folded tape interchangeably, is covered with a smoked charcoal dust cover. For ease of service, the unit consists of six modules; punch, reader (SRP series only), power supply, control panel, punch board, and serial board (SD version only).

Tape is read on the "SRP" with a dual-sprocket, stepper motor driven, optical reader. Tape is perforated with the revolutionary "MODUPERF" mechanism. The hardened steel die block assembly is capable of cutting all types of tape: oiled or unoled, rolled or folded, MYLAR and MYLAR laminates (See Section 2.9). The die block is rated to cut 1,000,000 feet of paper tape.

2.2 UNPACKING

When removing the unit from its shipping container, observe all instructions and cautions which might appear on the outside of the carton. Also, be careful not to lift or handle the cabinet by fragile parts which could be damaged.

The units have been carefully tested, inspected, and packed to insure arrival in good condition. Each is enclosed in a protective, dust-proof plastic bag, and surrounded by a cardboard sleeve with integral shock absorbing material; then enclosed in a heavy cardboard carton. All packing material, including the carton itself, should be saved, in the event the unit must be forwarded or returned.

Inspect the unit immediately after removal from the packing container to determine if any damage has occurred in transit. Special attention should be given to the tape reader and the plastic cover. If any damage is evident, report it immediately to the transporting company.

2.3 STORING AND SHIPPING

If the unit is not to be put into operation until some future time, re-package it using the original packing materials. The unit may be stored under any of the following conditions:

Temperature -40°C to 66°C (-40°F to 151°F)
Relative Humidity 5% to 95% Non-condensing

Should it become necessary to ship the unit, carefully pack the equipment in a suitable container to avoid damage during transit. Whenever possible, the original shipping container from the factory should be used. If other containers are utilized, a procedure similar to the original factory packaging should be followed. (See section 2.2 for container description).

CAUTION

DO NOT package the equipment in a rigid container without utilizing shockmounts or shock absorbant packing material. A rigid container will allow shock on the outside to be transmitted undamped to the unit which may cause damage.

Empty Chad container before the unit is packed for shipment. Also empty the chad chute (black plastic part on top of punch) and close its opening with masking tape (or equivalent). This will prevent chad from spreading throughout the equipment during shipment.

2.4 INSTALLATION

The unit should be installed in an area that is free of excessive dust, dirt, corrosive fumes, and vapors. To insure that the unit has proper ventilation and cooling, the ventilation openings on the bottom and rear of cabinet should not be obstructed. It is NOT recommended that any padding or cushioning material be placed under the unit, as this could restrict the air flow. The unit may be installed on any solid, level surface of sufficient size to accommodate the physical dimensions of the unit. The area or enclosure in which the unit will operate has to meet the following environmental conditions:

Temperature: 5°C to 40°C (41°F to 104°F)
Relative Humidity: 5% to 95% Non-condensing

See Section 4 (SP75) or 5 (SRP3075) for appropriate interface signal connections.

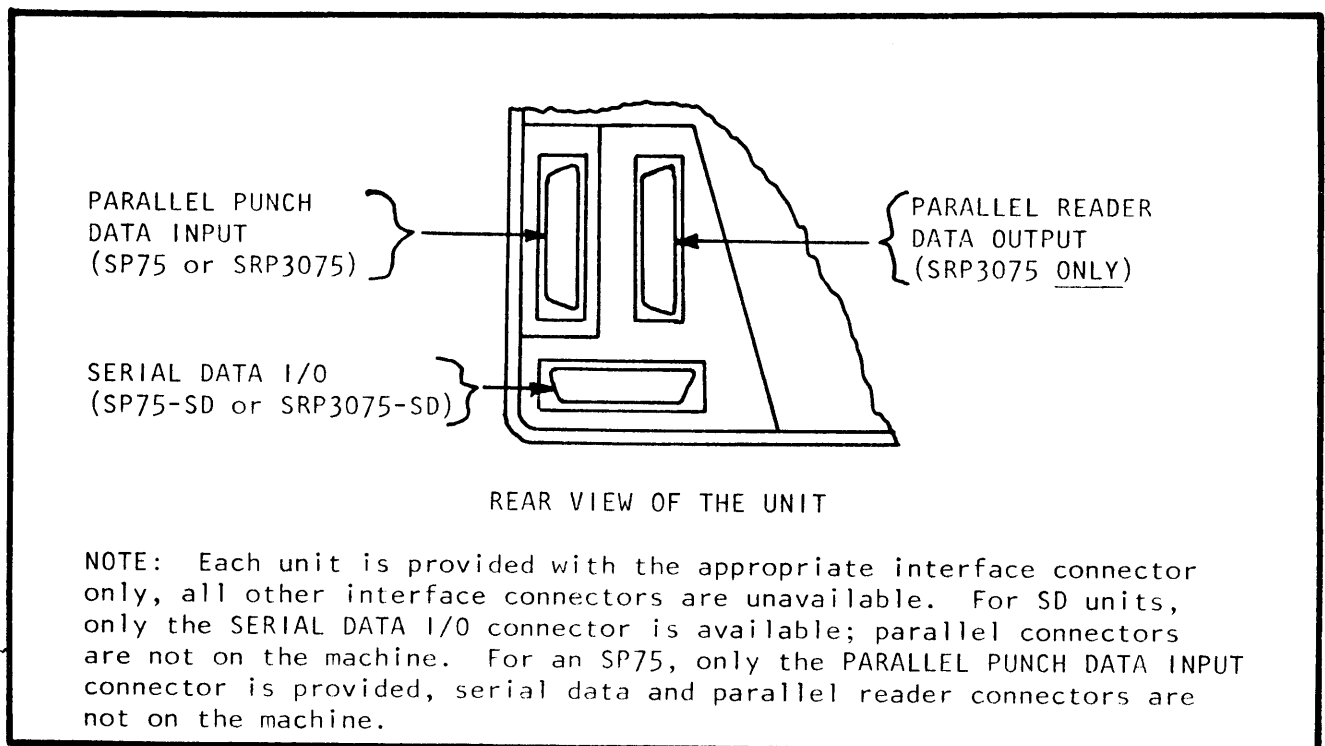
2.5 POWER INTERFACE

Before making any power line connection, place the power switch on the "OFF" position. The AC power cord extends from the rear of the cabinet and is terminated in a three-prong male, US type plug for standard power interface or an unterminated European cord for Option C (Universal Power Interface).

CAUTION

Make sure the available AC power matches the voltage and frequency requirements of the unit.

These requirements and the proper fuse values are shown on a label on the rear of the cabinet. The specified voltage should be met within $\pm 10\%$, the frequency within ± 2 HZ.



Interface Connections (Rear of Unit)

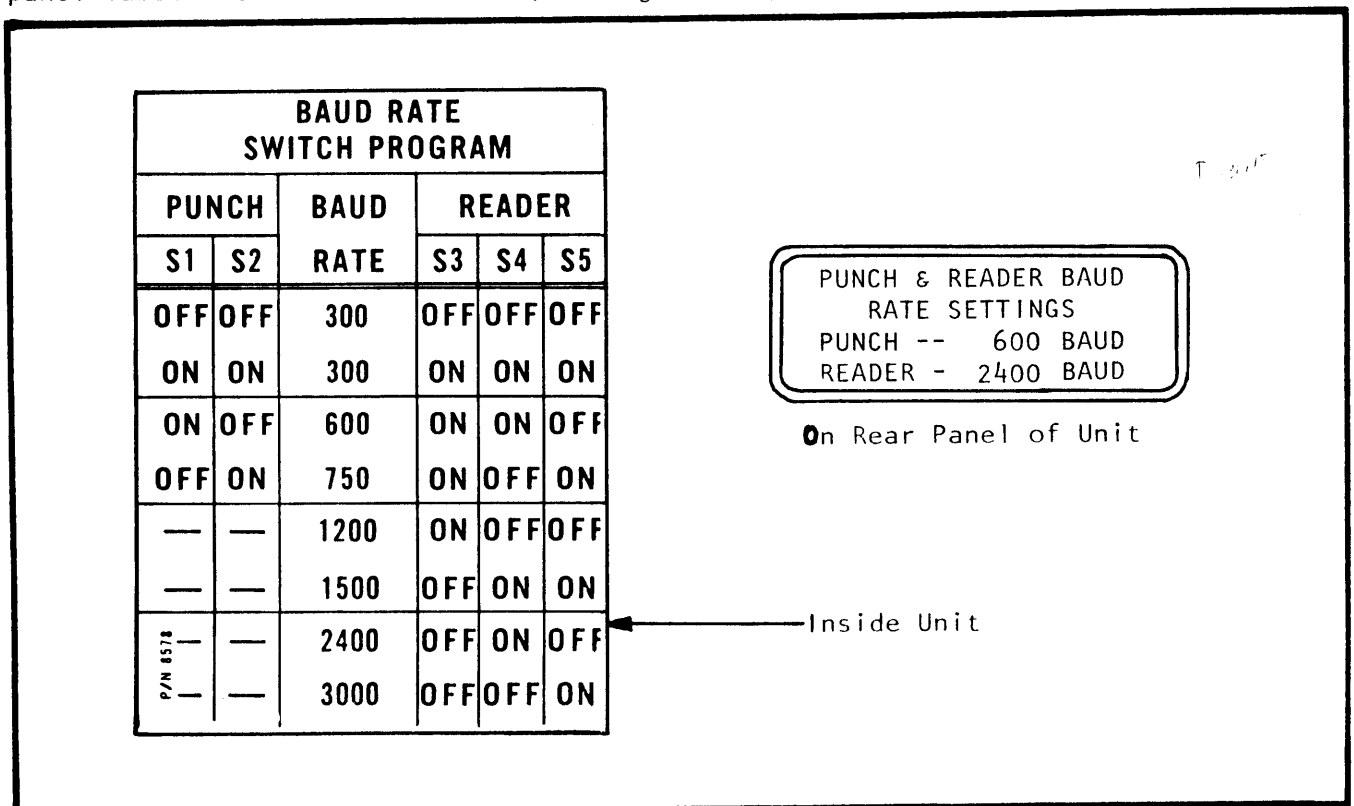
Figure 2-1

2.6 SIGNAL INTERFACE

The I/O connections to the unit are provided by one or two 25 pin connectors which are located the the rear of the unit. See Figure 2-1 for proper connector/s to use. See Section 4.2 for SP75 interface signal definitions and Section 5.2 for SRP3075 interface signal definitions.

2.7 BAUD RATE SELECTION

Only machines furnished with the RS-232 serial interface option "SD" have the capability for selection of the operating baud rate. On the rear of the unit, a decal notes what the operating baud rates are, see Figure 2-2 (Factory Standard baud rate settings are noted in the sample). If it is desirable to change the baud rate/s, removal of the rear panel will allow access to the serial board DIP switch. Reset the switch according to the table and then remark the rear panel label with the new rate/s (See Figure 2-2).

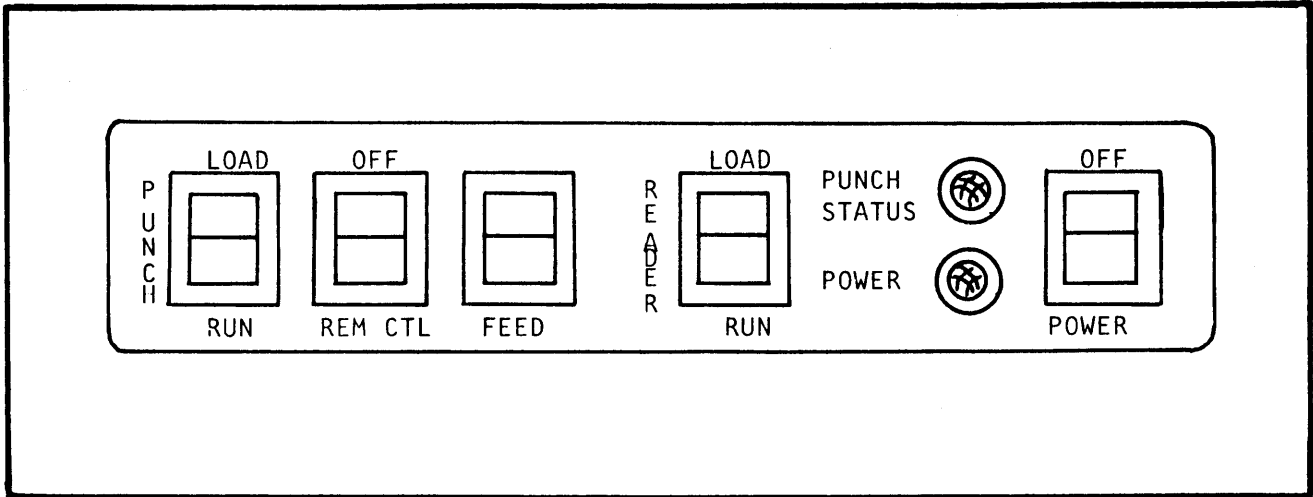


Baud Rate Decals

Figure 2-2

2.8 OPERATING GUIDE

To best utilize the equipment the operator should familiarize himself with the use of the controls, loading tape and care of the unit by reading the entire section.



Control Panel Switches & Indicators

Figure 2-3

2.8.1 CONTROLS AND INDICATORS

Refer to Figure 2-3 above; operation of the unit is controlled by switches located at the right top front edge of the unit. Each control switch and indicator is discussed below.

PUNCH LOAD/RUN

When in the LOAD position, new tape may be loaded into the machine; no data is allowed to be received at this time. When switched to the RUN position, the punch motor will come on and the unit will flag the interconnected system that it is ready to receive data; if no data is to be punched, the punch motor will turn off after a few seconds.

REM CTL (REMOTE CONTROL)

In a parallel interface machine (unit without SD options) a flag is provided to the interconnected system to note the switch position.

In a serial interface machine (Option SD), the REM CTL switch may be used to control the punch (and reader) turn on and off in response to the control characters DC1 - DC4, see the chart below:

CHARACTER	REMOTE CONTROL SWITCH	FUNCTION
DC1	REM CTL. OFF X X	Start Reader Punch DC1
DC2	X X	Start Punch Punch DC2
DC3	X X	Stop Reader Punch DC3
DC4	X X	Stop Punch Punch DC4

FEED

By momentarily pressing the FEED switch, the punch will turn on and advance the tape while punching feed holes only at approximately 75cps. The FEED switch should only be actuated after reception of data stops (on parallel interface machines without data buffers (D), pressing the switch while receiving data will cause data to be lost).

READER LOAD/RUN

This switch is not functional on SP75 units. On SRP3075 units, in the LOAD position, the reader will be inhibited from reading and will flag the inter-connected system of the status. In RUN position, the reader is enabled and data is transmitted.

PUNCH STATUS INDICATOR

This green LED indicator will be on whenever the punch is capable of receiving data. If the unit is equipped with option G, Tape Sensor Package, then a Tape Out or Tight Tape condition will extinguish the LED and flag the interconnected system that the unit is not ready to receive data.

POWER INDICATOR

This red LED indicator will be on whenever the power switch is in the POWER position (the system connected to an AC power source).

OFF/POWER SWITCH

This is the unit main power on/off switch.


2.8.2 TAPE LOADING - ROLLS

The unit will accommodate one inch wide tape rolls with a two inch core diameter and up to eight inches outside diameter. Rolls of paper, MYLAR, or MYLAR laminates may be used. In all cases, the threading procedure is identical.

Refer to Figure 2-3 and label on unit when following this procedure:

- a. Check the roll of tape to be certain that it is flat and not distorted or "coned" in the center. If this distortion does exist, lay the roll on a flat surface and push downward to force the distorted areas back into place. Do not break the seal on the roll at this time.
- b. Make sure the knob is installed in the center of the disc.
- c. Place the roll on the disc so it will unwind clockwise.
- d. Break the seal on the tape roll, tearing (or cutting) off the first layer of tape and making sure the segment of tape that was glued is removed. This will prevent undue difficulty in threading the tape through the punch block. When tearing off the leading edge of the tape, attempt to make the tear as even as possible, or scissors should be used to assure a clean cut.

NOTE: When using MYLAR based tapes, it is necessary to use scissors to cut the tape.

- e. Route the tape around the idler rollers, under the tape guide, and through the slot in the die block as illustrated. The TOP and  on printed tape (when used) will show now on top.
- f. Now, with the POWER and PUNCH switch in the ON position, with one hand push the tape further forward until the leading edge butts up against the feed sprocket; at the same time depress the FEED switch with the other hand. As you continue to push the tape forward, the feed sprocket will become engaged with the tape and pull it through the machine. Continue to depress the FEED switch until approximately 1 foot of tape hangs from the front of the unit. The unit is now ready for operation.

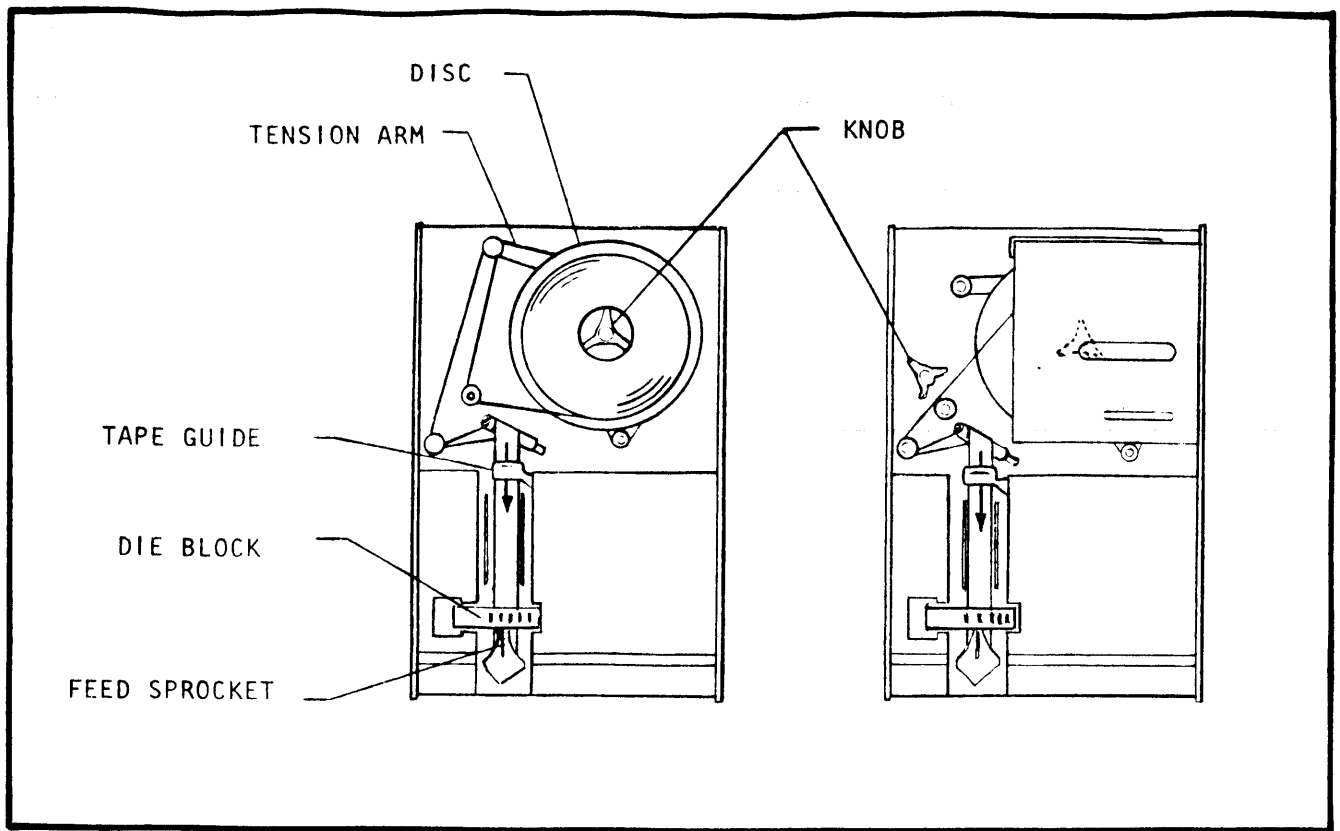
2.8.3 TAPE LOADING - FAN FOLD

The unit will accommodate standard fan fold packs containing 1 inch wide folded paper tape. The packs outside dimensions are approximately 1.1 in. x 7.5 in. x 8.6 in. For information on recommended tape materials see Section 2.9.

Refer to Figure 2-3 when following this threading procedure:

- a. Make sure the knob is installed in the storage hole as illustrated and not on the disc.
- b. Take the fan fold pack and open the top side which is farthest away from the openings (slots) in the pack. This side has 3 flaps. Do not open the bottom side which has 4 flaps.
- c. Tear off the 3 flaps.

- d. Place the pack on the disc as illustrated with the torn side of the longest flap up. It might be necessary to move the tension arm slightly counterclockwise to allow the pack to rest flat against the disc.
- e. same as with rolls; see section 2.8.2
- f. same as with rolls; see section 2.8.2



Tape Loading

Figure 2-3

2.8.4 TEARING OFF TAPE

To tear off (or cut off) punched tape, it may be desirable to push the FEED control button to allow some additional tape at the end of the punched message. Holding the tape firmly, pull the tape quickly upward and slightly toward the back of the machine. The cutting blade will then sever the tape easily. Do not attempt to tear off the tape by pulling it to one side or the other. The cutting blade can not work most efficiently when used in this manner.

2.8.5 CHAD CONTAINER

The chad bin, which slides in and out like a drawer, is located on the left front of the unit. It easily accommodates the chad produced when punching one full 1000 ft. roll of tape. The chad bin should be emptied after each roll or pack of tape. Although an overflow feature is provided to prevent damage to the die block in case the chad bin is not emptied, an overflowed chad bin should be

avoided, it only creates unnecessary clean up work of the chad bin cavity.

NOTE: Empty chad bin after each tape load.

2.8.6 TAPE READER

The SRP3075 only utilizes an optical tape reader with a sprocket drive to move the tape. To LOAD TAPE in the reader: raise the lid to expose the read station, slide the tape under the upper and between the lower tape guide, engage the feedholes with the drive sprockets and lower the lid carefully. The tape is now ready to be read.

When making tapes, it is advisable to precede any data with enough leader tape so no character alignment is necessary when loading tape in the reader. The reader operates in the READ-FEED mode. A character is first read and then the tape is advanced until the next character is in alignment with the read station. If it is necessary to read a particular character, align the character to be read with the read station when loading the tape.

It is advisable to use only good quality tapes. See section 2.9 for recommended materials. Transparent spots, uneven density and width out of tolerance, typically associated with substandard tapes, may cause reader error.

2.8.7 OPERATOR CARE

GENERAL - Keep the cover closed whenever possible.

- Do not use the cover to hold pencils, papers, paper clips, etc.
- Use only a lint free cloth to clean the unit. Do not use solvents or harsh cleaning agents. If excessively dirty, a mild detergent solution or desktop cleaner may be used sparingly.

PUNCH - As required, clean die block area with a soft bristly brush.

READER - As required, remove any dirt/lint accumulations in the read station area and underside of lid with a soft bristle brush.

2.9 RECOMMENDED TAPE MATERIALS

PAPER TAPE. Unoiled colored or buff tape is recommended. Black tape should be avoided since sometimes carbon dye is used which is very detrimental to the wear characteristics of the punch pins. The tape should be from a quality manufacturer and meet EIA Standard RS-227-A.

CAUTION: Oiled buff tape is not recommended if the tape will be read with a photo-optical reader. The 5 to 12% oil in these tapes sometimes causes highly transparent spots to occur. These spots, combined with the light yellow "buff" color, may exceed 40% light transmissivity and cause reader errors. While oiled tapes of gray and darker colors are acceptable since their transmissivity is well below 40%, the oil in the tape is of no value since it has an insignificant effect on the life expectancy of the MODUPERF punch head.

MYLAR TAPE. Metalized Mylar, Mylar/Foil/Mylar, or Paper/Mylar/Paper tapes may be used. They may range in thickness from .0025 in. to .0040 in. There again, it is recommended that the tape should be from a quality manufacturer.

LIFE EXPECTANCY OF PUNCH HEAD:

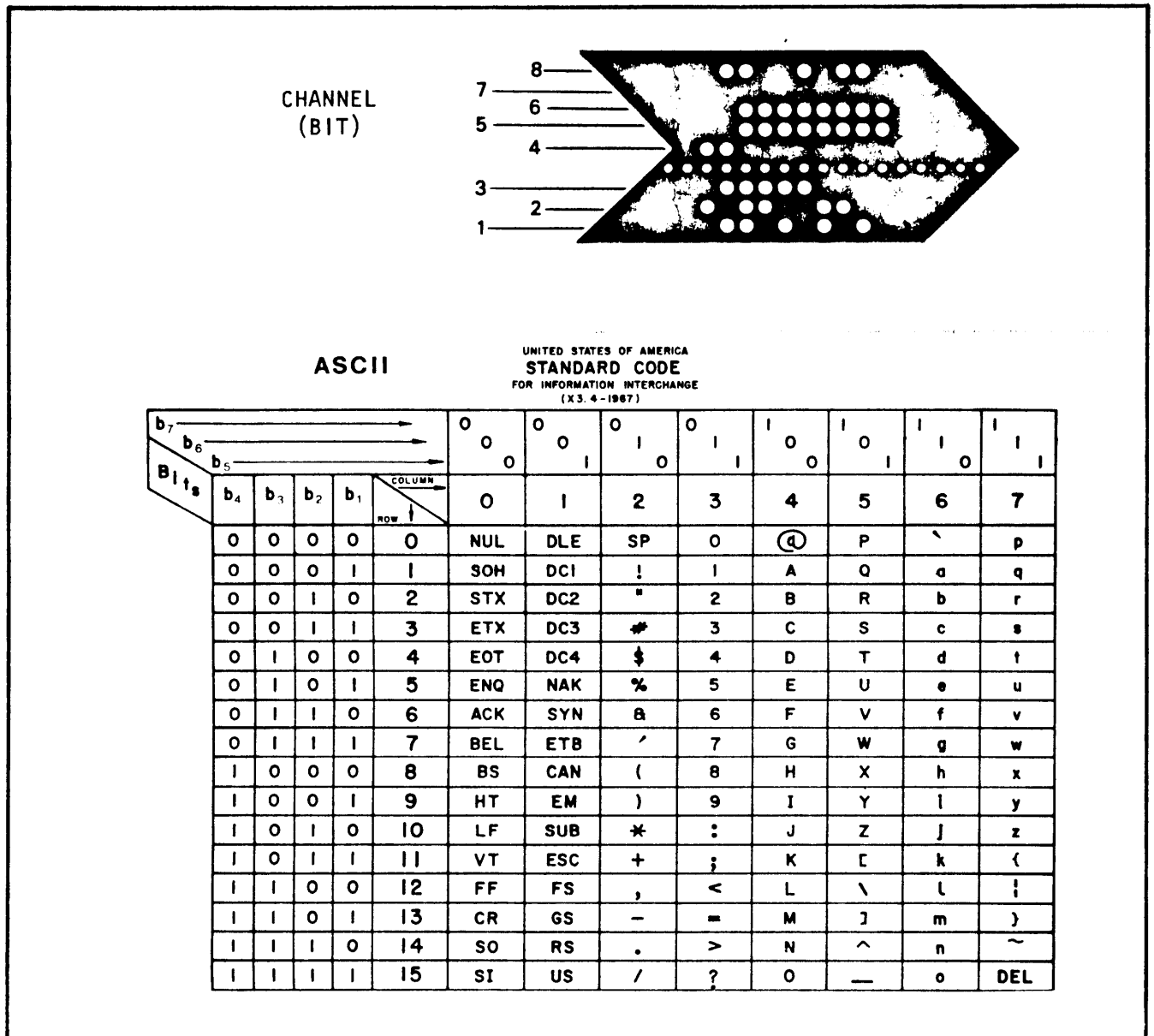
Paper Tape; any color but black	1,000,000 feet of tape
Paper Tape; black color	500,000 feet of tape
Mylar Tape	500,000 feet of tape

Both PAPER and MYLAR tapes, if of poor quality, will cause problems in punching and/or reading. For example, the tape might have the following defects; transparent spots, width out of tolerance, splices in roll not continuous, torn folds (fanfold), tape delamination (mylars), etc. Data Specialties has tested the tapes of the suppliers listed below and found them to be acceptable. This list is not meant to be exclusive.

P, M	Arvey Corporation 3500 N. Kimball Ave. Chicago, IL 60618 (312) 463-1400	P	Occidental 1188 Montague View San Leandro, CA 94577 (415) 352-3202
P, M	Chase Foster 199 Amaral St. East Providence, RI 02914 (401) 434-2340	P	Paper Manufacturers Company 9800 Bustleton Avenue Philadelphia, PA 19115 (215) 673-4500
P	Eastern Specialties P.O. Box 350 Holyoke, MA 01040 (413) 533-7103	P	Ribco 200 Railroad Avenue Paterson, NJ 07509 (201) 271-4848
P, M	Numeridex, Inc. 241 Holbrook Drive Wheeling, IL 60090 (312) 541-8840		P-Paper Tapes M-Mylar Tapes

2.10 ASCII CODE CHART AND TAPE SAMPLE

The sample tape is shown with leader (null) preceding and following the data. The point of the tape indicates direction of tape motion. Bit No. 8, while not defined by the ASCII Code, is used for even or odd parity or other checking schemes. The sample illustrates even parity. (see Figure 2-4)



ASCII CODE CHART AND TAPE SAMPLE

Figure 2.4

3. DESCRIPTION OF OPTIONS

The SP75 and SRP3075 are parallel DTL/TTL compatible interface machines which, when options are included, may become serial I/O, have a Universal Power Interface or Tape Sensor Package built in. Refer to Section 1.1 for a description of model numbers.

3.1 SD OPTION - SERIAL I/O

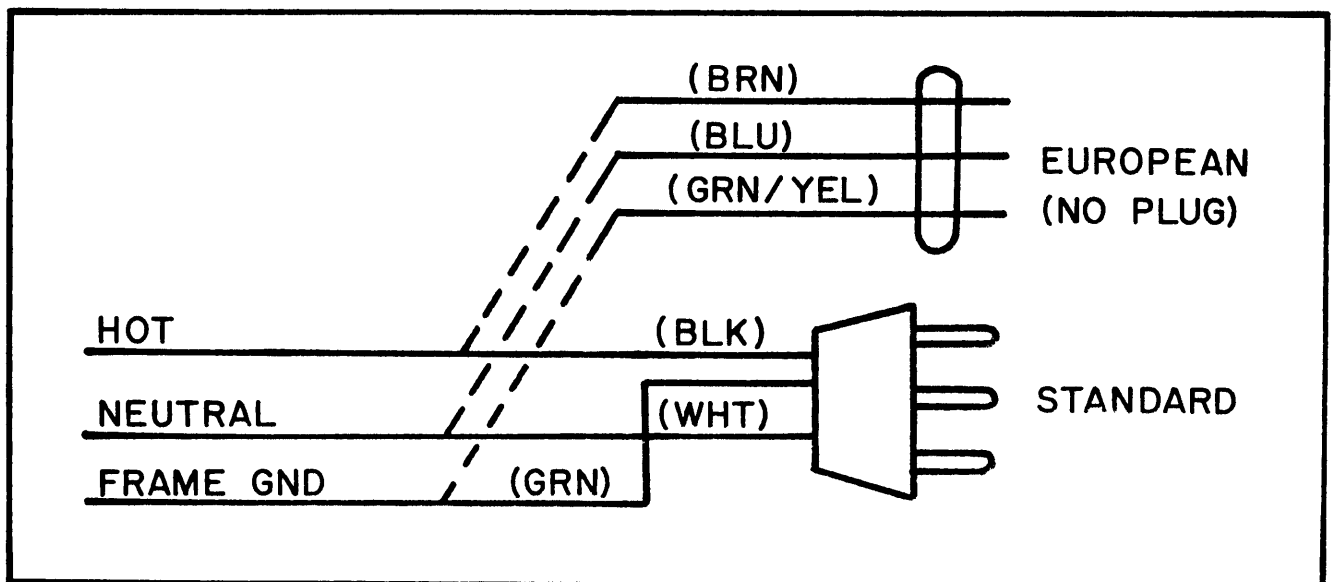
When specified, the SD option eliminates the parallel interface and provides an RS-232 compatible serial I/O interface. The S indicates that the unit is a serial machine and the D indicates that data buffers are included. Since parallel logic handshaking signals for turn on and control of the punch are missing, the data buffer is required to allow the unit to store data while waiting for the motor to come up to speed.

3.2 D OPTION - DATA BUFFER

When the unit is waiting for data to be transmitted to it, Punch Ready (Pin 12) is true and the AC motor is OFF. Upon receipt of a Punch Command, Punch Ready will go false for two seconds while the AC motor comes up to full speed. The unit will then receive data at 75 c/s. The two second delay may be eliminated by using Option D, Data Buffer.

3.3 C OPTION - UNIVERSAL POWER INTERFACE

If specified, the unit will come wired with a European cord (see Figure 3-1 for cord terminations) and set for the voltage and frequency specified by the customer. The unit is capable of being field changed to 110V, 115V, 200V, 215V or 230VAC at either 50 or 60 HZ. A label denoting the set voltage, frequency and fuse rating is prominently located on the rear of the unit. If field changes are required, the label should be remarked to show the new line voltage and frequency settings. In order to accomplish any field changes, gain access to the inside by removing the transport cover assembly.



Power Cord Terminations

Figure 3-1

3.3.1 VOLTAGE CHANGE

There are two fuses supplied with the Universal Power Supply, a 4 amp (DSI P/N 8314) and 2 amp (DSI P/N 7779). One fuse will be installed in the line fuseholder and the other fuse in a fuse clip on the power supply printed circuit board marked "FUSE STORAGE". The 4 amp fuse is to be used in 100V and 115V installations. The 2 amp is used in 200V, 215V, and 230V installations. The unused fuse should be placed in the "FUSE STORAGE" clip.

Wire the Terminal Block per the chart in Table 3-1. TB-1 is on the power supply printed circuit board and can be accessed by removing the protective cover over the power supply.

TABLE 3-1, POWER SUPPLY VOLTAGE CHANGES

WIRE FUNCTION AND COLOR	TB-1 TERMINAL BLOCK POSITION				
	NOMINAL AC INPUT VOLTAGE				
	100V	115V	200V	215V	230V
PUNCH MOTOR BLACK	5	5	8	8	8
PUNCH MOTOR WHITE	7	7	7	7	7
PUNCH MOTOR RED	8	8	2	1	1
RED JUMPER FROM PCB	2	1	2	1	1
BLUE JUMPER	3to6	1to4	3to5	3to5	3to4
ORANGE JUMPER	2to5	3to6	3to5	3to5	3to4

3.3.2 FREQUENCY CHANGE

There are two pulleys installed on the Punch Drive motor shaft. One is driving the timing belt and the other is attached to the motor shaft to allow retrofit for line frequency installation.

- A. For 60 Hz installation, use the smaller 60 Hz (44 teeth) pulley.
- B. For 50 Hz installation, use the larger 50 Hz (54 teeth) pulley.

Pulley change procedure.

- A. Loosen the four 11/32" nuts holding the Punch Drive motor and slide the motor towards the punch.
- B. Remove the timing belt.
- C. Loosen the set screws on the pulleys with a 1/16" allen wrench and remove the pulleys.
- D. Place the desired pulley on the motor shaft.

- E. Install the timing belt and align the two pulleys while adjusting the tension per Moduperf Maintenance Manual Specification No. 3103, 5.4.8, ($\frac{1}{4}$ " to $\frac{5}{16}$ " deflection with a force of 4 oz. applied). Tighten motor nuts to 22 in. lbs. maximum.
- F. Tighten set screw on driving pulley.
- G. Place unused pulley on motor shaft and tighten.

3.4 G OPTION - TAPE SENSOR PACKAGE

Switches to sense the status of the tape supply are included in the option. The switches are Low Tape, Tight Tape, and Tape Out. The Tight Tape and Low Tape switches are inoperative when folded tape is used. A Low Tape condition will generate a Low Tape signal (parallel or serial interface) while either a Tape Out or Tight Tape condition will generate a Tape Error (parallel interface) or will cause the DTR (Data Terminal Ready) flag to go Off (serial interface). See Sections 4 & 5 for Interface Signal Descriptions.

4. SP75 PUNCH

The model SP-75 is a table top tape punch system with a parallel DTL/TTL compatible interface. The punch operates asynchronously at speeds up to 75 c/s.

The Model SP-75SD is similar to the SP-75 but it is provided with an RS-232 compatible serial interface. The punch receives data at the following switch selectable rates: 300, 600, and 750 baud (10 unit code).

4.1 SYSTEM SPECIFICATIONS

4.1.1 TAPE CHARACTERISTICS

MATERIAL	Paper - Unoiled or Oiled MYLAR Paper/MYLAR/Paper Metalized MYLAR MYLAR/Foil/MYLAR
TAPE FORM	Roll or Folded, Interchangeable
TAPE WIDTH	1 inch
HOLE DIAMETER	Code - 0.072", Feed - 0.047"
ALIGNMENT	9 hole centers in - line
CHANNELS	Eight

4.1.2 TAPE SUPPLY

8" Diameter roll with 2" core, 1000' or 8.6 wide x 7.5 deep folded pack, 1000'.

4.1.3 ELECTRICAL

VOLTAGE 115VAC \pm 10%, (3 wire grounded) (See Option C-Section 3.3).

FREQUENCY 60HZ± 2HZ (See Option C-Section 3.3)
 POWER Idle - 20 watts, Max. - 200 watts
 TERMINATION DB-25S connector

4.1.4 ENVIRONMENTAL

TEMPERATURE Operating: +5°C to +40°C (+41°F to +104°F)
 Storage : -40°C to +66°C (-40°F to +151°F)
 HUMIDITY 0 to 95%, Non-Condensing

4.1.5 PHYSICAL

SIZE 12" wide x 19.8" deep x 7.5" high
 WEIGHT 49 lbs., net, 57 lbs., shipping
 COLOR Off white exterior shell with charcoal front and rear covers. Charcoal dust cover (plastic) and chad box window.

4.2 INTERFACE SIGNAL DESCRIPTION

Normally, an SP75 has a parallel interface where all signals are DTL/TTL compatible. If the machine is specified with the serial interface (RS-232), parallel interface and connection is unavailable and only the RS-232 serial connector is available to system interconnection. See Section 4.2.1 for parallel interface and Section 4.2.2 for Serial (RS-232) interface.

4.2.1 SP75 PUNCH - PARALLEL INTERFACE

- A. Connector Type - DB25S
- B. Pin out and loading $V_H \geq +2.7VDC$, $V_L \leq +.8VDC$

<u>Pin No.</u>	<u>Signal</u>	<u>TTL Loading</u>
1	Data In 1	.5 UL Hi (H = Hole Punched) .25 UL Lo (L = No Hole Punched)
2	Data In 2	
3	Data In 3	
4	Data in 4	
5	Data In 5	
6	Data In 6	
7	Data in 7	
8	Data in 8	
9-10	-	
11	Punch Command (H)	2 UL Hi - 3.5 UL Lo
12	Punch Ready (H)	10 UL Hi & 5 UL Lo
13	System Ready (L)	20 UL Hi - 10 UL Lo
14	Motor On (L)	2 UL Hi & Lo
15	Feed (L)	2 UL Hi & Lo
16	Chassis Ground	
17	Chassis Ground	
18	-	
19	Remote Control (L)	25 UL Lo - Open Circuit
20	*Tape Error (Opt.G) (H)	10 UL Hi - 5 UL Lo

<u>Pin No.</u>	<u>Signal</u>	<u>TTL Loading</u>
21	Tape Low (Opt. G) (H)	10 UL Hi - 5 UL Lo
22	+24VDC @ 1A Fused	
23	-	
24	+5VDC @ 1A Fused	
25	DC Ground	

* When Option G is specified, this output monitors tight tape, tape out and punch run/load. When supplied without Option G, only punch run/load is monitored.

C. Signal Definitions

Data In 1 - Data In 8

The positive true condition causes a hole to be punched in the corresponding track when a true PUNCH COMMAND (PC) is given. The data signals must transition coincident with or must be earlier than the leading edge of PC and remain stable until PUNCH READY (PR) goes false. When PR goes false, the data has been stored in the input buffer (See Figure 4-1).

Punch Command (H)

This signal in its positive true state (10 usec. min.) initiates a punching cycle. The true state also is used to automatically turn on the AC motor. If the AC motor is already on, the PC will refresh the motor control circuitry. The motor will automatically turn off 2.5 secs. after the last PC if the MOTOR ON signal is false.

Under normal operation, PC should remain true until PUNCH READY goes false and then it should go false awaiting PUNCH READY to come true again.

Punch Ready (H)

The positive true state of this signal indicates that a PC can be honored. The PR signal will go false under any of the following conditions:

1. for 12 ms (1 machine cycle) after a PC
2. for 1.6 sec. (max.) after the first PC received when the AC motor is off.
3. when the TAPE ERROR signal is true
4. when the FEED switch is depressed

For the first cycle of a string of characters (when the AC motor is on), PR may turn on sooner than 12 ms. This rapid response is due to the double buffered data input and will occur only once for each string of successive characters.

System Ready (L)

This lead is a negative true signal. The true state indicates that the internal logic supply has attained the proper level.

Motor On (L)

This is a negative true signal that can be used to turn on the AC motor of the punch ahead of actual data reception. It takes a maximum of 1.6

seconds from the time this lead is brought low until the motor is up to speed.

Feed (L)

This is a negative true signal that will cause the unit to punch feed holes only. While this lead is true, PUNCH READY is false and data punching is inhibited.

Chassis Ground

These two pins are connected to earth ground.

Remote Control Output (L)

This lead is a negative true signal that is true when the REMOTE CONTROL switch is in the ON position. This is a transistor generated output that can sink 25 ma when on and can withstand +25VDC when it is off.

Tape Error (H)

The TAPE ERROR (TE) signal is positive true whenever the punch RUN/LOAD switch is in the LOAD position and the REM CTL switch is off. Whenever the tape sensor package (Option G) is used, a TAPE OUT or TIGHT TAPE condition will also generate a TAPE ERROR signal (irregardless of the REM CTL switch position). When TE is in its true state, PR is held false and the PC signal is ignored.

Tape Low (H)

The TAPE LOW signal is positive true whenever the low tape sensing arm (Option G) has detected the low tape condition (min. of 6000 characters left).

+5VDC @ 1A Fused

This lead is connected through a fuse to the internal +5VDC supply of the unit.

+24VDC @ 1A Fused

This lead is connected through a fuse to the internal +24VDC supply of the unit.

DC Ground

This lead is used as the DC voltage and interface signal reference.

4.2.2 SP75-SD SERIAL INTERFACE (RS-232)

- A. Connector Type - DB25S
- B. Pin Out (as follows):

<u>Pin No.</u>	<u>Description of Signal</u>
1	Unterminated
2	This pin is held at an EIA Off Condition (-12VDC)
3	Receive Data (Input to System)
4	This pin is held at an EIA off condition (-12VDC)
5	This pin is held at an EIA on condition (+12VDC)
6	Unterminated
7	DC ground
8-19	Unterminated
20	Data Terminal Ready
21-23	Unterminated
24	Low Tape (Option G)
25	Unterminated

C. Signal Definitions

Received Data

Serial Data input to unit. Data received on this lead is fed to the punch and character detection logic. Mark = hole = -3VDC to -25VDC. Space = no hole = +3VDC to +25VDC.

DC Ground

This lead serves as the voltage reference between the interfaced devices.

Data Terminal Ready

This lead indicates the status of the unit as concerns the reception of data. When this lead is at -12VDC, the unit is not capable of receiving, and any data presented at pin 3 will be ignored. When this lead is at +12VDC the unit is able to receive data. The data will then be punched or ignored under the control of the character detection logic if the unit has been so conditioned. DTR will normally be at +12VDC but will be driven to -12VDC under any of the following conditions: tight tape or tape out sensed, low tape sensed and approximately 100 ms of inactivity on the Received Data Lead, REMOTE switch OFF AND PUNCH RUN/LOAD in LOAD position. The low tape control of DTR can be inhibited, (Consult the factory for information).

Low Tape

This non-standard signal can be used to monitor the low tape condition independent of the DTR lead. When there is adequate tape this lead will be at -12VDC. When low tape has been sensed (minimum of 6000 characters left) this lead will go to +12VDC.

4.3 OPERATIONAL DESCRIPTION

A brief description of the operating controls is contained in Section 2.8.1. The following explanation provides the necessary data to utilize the controls and corresponding interface signals in order to achieve a working system interconnection.

Punch Load/Run Switch

When the unit is a parallel interface, the punch LOAD/RUN switch works in conjunction with an external punch command and internal punch ready (PR) flags; refer to Figure 4-1 for the timing diagram. When in the LOAD position, the unit signals that it isn't ready by a low on the PR line; a punch command will not start a punch cycle. In the RUN position, PR goes high until a punch command is received, then goes low while the data is being punched. Input data must be present and stable prior to or at the time the PC goes high. When the unit has a serial interface (SD Option), the switch provides a manual turn on of the punch when switched to the RUN position. Actual control of the punch is accomplished by the reception of serial data stored in the data buffer. As soon as data is received, the first character will start the punch motor and data will be stored until the motor is up to speed when stored data will be punched. The buffer will empty itself and the punch will stop punching but the motor will stay on for approximately 2.5 seconds, allowing for breaks in data reception.

REM CTL (Remote Control)

For a parallel interface machine, an open collector transistor is biased on when the switch is in the REM CTL position. The emitter of this transistor is at DC Ground, it can sink 25mA when on and withstand +25VDC when off. For a serial interface (SD Option), the REM CTL switch enables detection of ASCII control characters DC2 & DC4 for use in controlling the punch. In REM CTL, control codes will not be punched.

Feed

Pressing the FEED switch will turn on the punch and advance the tape at approximately 75cps with only feed holes punched.

If this switch is actuated in a parallel machine without data buffers, data will be lost. If data buffers (D Option) are included, no data will be lost if the switch is actuated during the punching sequence, however, when the data buffers are full, the punch ready signal will go low and disable further reception of data until the data buffers can be emptied.

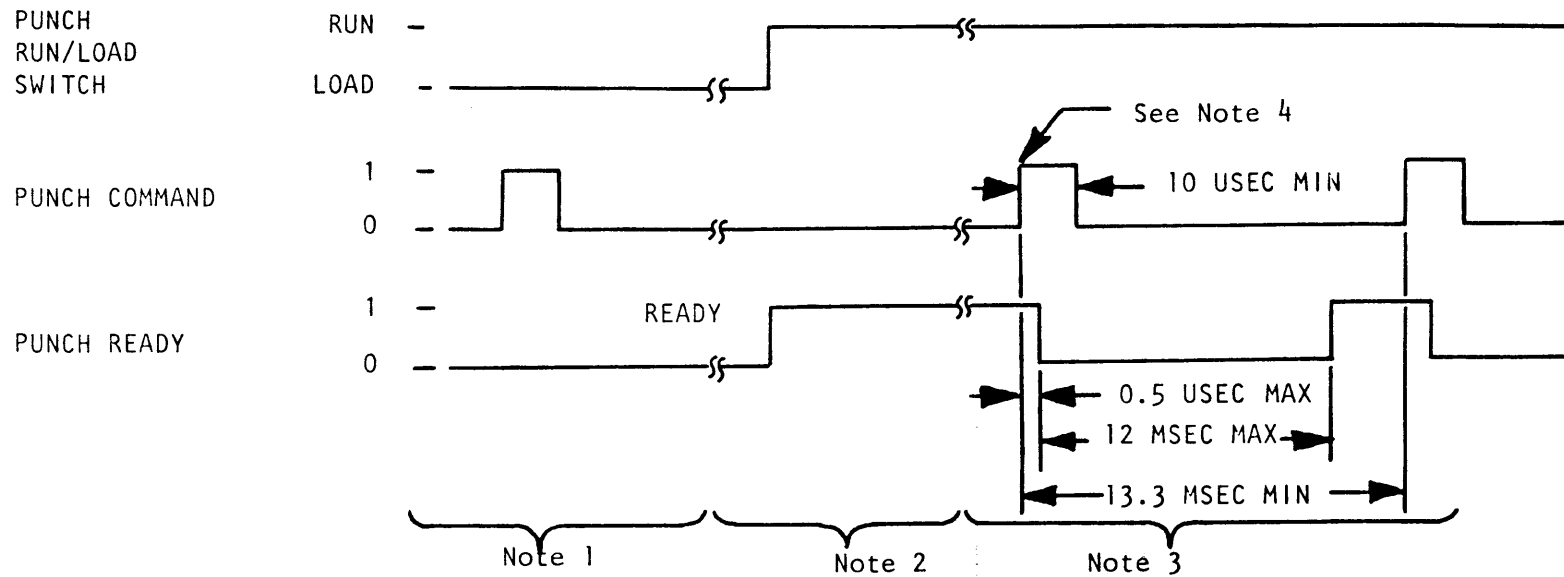
Since a serial interface machine (SD Option) includes data buffers, no data will be lost due to use of the FEED switch as noted above.

Reader Load/Run

This switch is not functional in an SP 75 unit.

Punch Status Indicator

The green LED indicates the status of the punch, whether it can or can't receive data. A tape error condition may be a Tape Out or Tight Tape Condition (Option G), or the punch switch in the LOAD position. If the Remote Control switch is in the REM CTL position, then the punch LOAD position will not generate a Tape Error.



NOTES:

1. Punch RUN/LOAD switch in LOAD position will cause Punch Ready output to be a low state. A Punch Command will not initiate a punch cycle.
2. Punch RUN/LOAD switch is placed in RUN position. The Punch Ready output goes to a high state.
3. Punch RUN/LOAD switch in RUN position. A Punch Command on the input should be a minimum of 10.0 microsec. The Punch Ready will go to a low state a maximum of 0.5 microsec after the leading edge of the Punch Command. The Punch Ready will go to a low state for a maximum of 12.0 millisc. Maximum Punch Command rate of 75C/S, (13.3 MSEC/CYCLE).
4. The input data must be present and stable preceding or coincidental to the leading edge of the Punch Command.

For a parallel interface machine, whenever a Tape Error Condition exists, the LED will be out, Punch Ready will be low and Punch Commands into the unit are ignored.

For a serial interface machine (SD Option), a Tape Error condition will cause the Data Terminal Ready flag to go to the OFF condition.

Power Indicator

The red LED indicates that the power switch is in the On position. Should a logic or control voltage fail, then the LED will be extinguished.

OFF/POWER Switch

Controls AC power input to the unit.

5. SRP3075 READER/PUNCH COMBO

The model SRP-3075 is a table top reader/punch combo with a parallel DTL/TTL compatible interface. The punch operates asynchronously at speeds up to 75 c/s. The reader will send data at speeds up to 300 c/s.

The Model SRP-3075SD is a table top reader/punch combo with a RS-232 compatible serial interface. The punch receives data at the following switch selectable rates: 300, 600, and 750 baud. The reader transmits data at the following switch selectable rates: 300, 600, 750, 1200, 1500, 2400, and 3000 baud (10 unit code).

5.1 SYSTEM SPECIFICATIONS

5.1.1 TAPE CHARACTERISTICS

MATERIAL	Paper - Unoled or Oiled (See Section 2.9) MYLAR Paper/MYLAR/Paper Metalized MYLAR MYLAR/Foil/MYLAR
TAPE FORM	Roll or Folded, interchangeable
TAPE WIDTH	1 inch
HOLE DIAMETER	Code - 0.072", Feed - 0.047"
ALIGNMENT	9 hole centers in-line
CHANNELS	Eight

5.1.2 TAPE SUPPLY-PUNCH

8" Diameter roll with 2" core, 1000' or 8.6 wide x 7.5 deep folded pack, 1000'.

5.1.3 TAPE SUPPLY - READER

200 feet of roll form or 150 feet of folded.

5.1.4 ELECTRICAL

VOLTAGE 115 VAC \pm 10%. 3 wire grounded (See Option C - Section 3.3).

FREQUENCY: 60Hz + 2 Hz (See Option C - Section 3.3).
 POWER Idle - 70 watts, Max. - 230 watts
 TERMINATION Model SRP-3075 DB-25S (punch), DB-25P (reader)
 Model SRP-3075SD DB-25S

5.1.5 ENVIRONMENTAL

TEMPERATURE 5°C to 40°C (41°F to 104°F) (operating)
 -40°C to 66°C (-40°F to 151°F) (storage)
 HUMIDITY 5% to 95%, non-condensing

5.1.6 PHYSICAL

SIZE 12" wide x 22" deep x 7.5 high
 WEIGHT 51 lbs., net, 59 lbs., shipping
 COLOR Off white exterior shell with charcoal front and rear covers. Charcoal dust cover (Plastic) and chad box window.

5.2 INTERFACE SIGNAL DEFINITIONS

Normally, an SRP 3075 has a parallel interface where all signals are DTL/TTL compatible. If the machine is specified with the serial interface (RS-232), parallel interface connection is unavailable and only the RS-232 serial connector is available to system interconnection. See Section 4.2.1 for parallel punch interface, Section 5.2.2 for parallel reader interface, and Section 5.2.3 for serial interface.

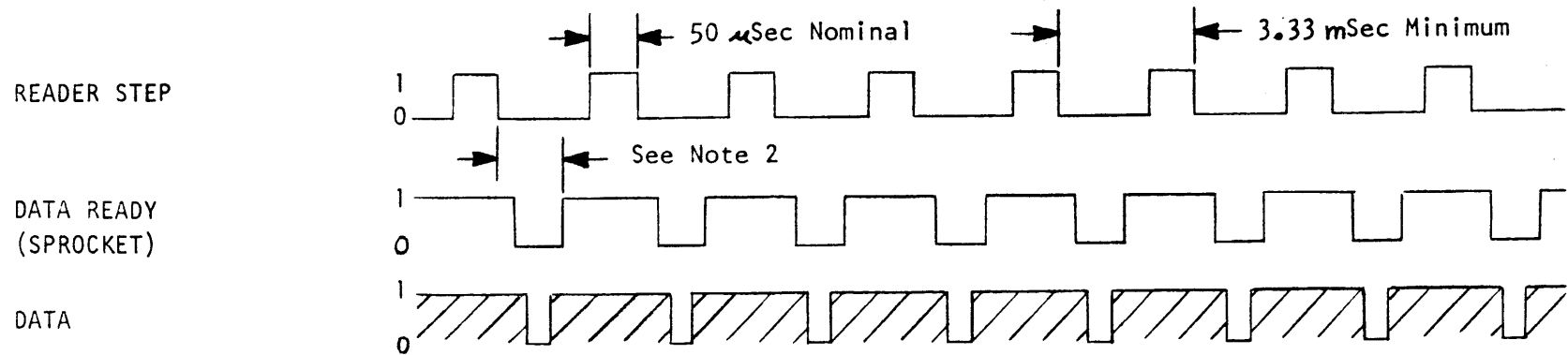
5.2.1 SRP3075 READER/PUNCH - PARALLEL PUNCH INTERFACE

Refer to section 4.2.1 (SP75 Punch - Parallel Interface) for a description of the interface connections and definitions. The parallel punch interface is identical for both the SP75 and SRP3075.

5.2.2 SRP3075 READER/PUNCH - PARALLEL READER INTERFACE

- A. Connector Type - DB25P
- B. Pin out and loading $V_H \geq +2.7VDC$, $V_L \leq +.8VDC$

<u>Pin No.</u>	<u>Signal</u>	<u>TTL Loading</u>
1	Data Out 1	20 UL Hi 10 UL Lo
2	Data Out 2	
3	Data Out 3	
4	Data Out 4	
5	Data Out 5	
6	Data Out 6	
7	Data Out 7	
8	Data Out 8	
9	Data Ready (H)	20 UL Hi - 10 UL Lo
10	Data Positive True (H)	2 UL Hi & Lo
11	DC Ground	
12	DC Ground	
13	DC Ground	
14	Reader Run Switch (L)	
16	Reader Step (L)	1 UL Hi - 2.5 UL Lo
18	Read Right (H)	1 UL Hi - 2.5 UL Lo
24	DC Ground	
25	Chassis Ground	



NOTES:

1. Actual stepping of the motor occurs on the negative going edge of the Reader Step pulse.
2. The time from the trailing edge of Reader Step to Data Ready true is variable according to reader speed.
3. Data may be sampled anytime during Data Ready.

C. Signal Definitions

Data Out 1 - Data Out 8

This signal represents the outputs of the data channels. The polarity of these outputs are selectable to be either positive or negative true via the DATA POSITIVE TRUE lead, pin 10.

Data Ready (H)

This signal is the output of the feed hole in the tape. When this signal is in its true state, the data will be stable and can be sampled.

Data Positive True (H)

This signal input can be used to control the polarity of DATA OUT signals. If left unwired or driven to V_H , the DATA OUT will be positive true (HOLE = 1 = V_H). If grounded or driven V_L , the data will be negative true (Hole = 0 = V_L).

Reader Run Switch (L)

This signal output is derived from the front panel switch "READER RUN/LOAD". When the switch is in the "RUN" position, this lead is a closure to DC ground. When the switch is in the "LOAD" position, this lead is an open circuit.

Reader Step (L)

This input signal is used to advance the tape one character in the direction selected. The period of the true state should be 50 usec. min. and the repetition rate must not be less than 3.33ms (300 cps).

Read Right (H)

This input signal is used to control the direction of reader tape movement. If left unwired or driven V_H , the tape will move from left to right as observed from the front of the unit. If this input is grounded or driven V_L , the tape will move from right to left.

DC Ground

This lead is used as the DC voltage and signal interface reference.

Chassis Ground

This lead is connected to earth ground.

5.2.3 SRP3075SD READER/PUNCH - SERIAL INTERFACE (RS232)

A. Connector Type - DB25S

B. Pin Out

<u>Pin No.</u>	<u>Description of Signal</u>
1	Unterminated
2	Transmitted Data (Output from Reader)
3	Receive Data (Input to System)

<u>Pin No.</u>	<u>Description of Signal</u>
4	Request to Send
5	Clear to Send
6	Unterminated
7	DC ground
8-19	Unterminated
20	Data Terminal Ready
21-23	Unterminated
24	Low Tape (Option G)
25	Unterminated

C. Signal Definitions

Transmitted Data

Serial Data output of unit. Mark = hole = -12VDC. Space = no hole = +12VDC. In SP-75SD the lead is held at -12VDC.

Received Data

Serial Data input to unit. Data received on this lead is fed to the punch and character detection logic. Mark = hole = -3VDC to -25VDC. Space = no hole = +3VDC to +25VDC.

Request to Send

This output indicates the status of the reader. When the reader has been conditioned to transmit, this lead will be at +12VDC. When the reader has been deselected, this lead will be at -12VDC. The reader can be conditioned to transmit by moving the reader RUN/LOAD switch from LOAD to RUN or by the reception and detection of the DC1 character. The reader will be deselected by any of the following: reader RUN/LOAD switch moved from RUN to LOAD, reception and detection of the DC3 character, detection by the reader of a tight tape or no tape condition.

Clear to Send

This input is used to control the reader. When the lead is at -3VDC to -25VDC, the reader will be inhibited from running. When the lead is at +3VDC to +25VDC, the reader will be enabled. This lead is only recognized when the RTS (pin 4) is at +12VDC.

DC Ground

This lead serves as the voltage reference between the interfaced devices.

Data Terminal Ready

This lead indicates the status of the unit as concerns the reception of data. When this lead is at -12VDC, the unit is not capable of receiving, and any data presented at pin 3 will be ignored. When this lead is at +12VDC the unit is able to receive data. The data will then be punched

or ignored under the control of the character detection logic if the unit has been so conditioned. DTR will normally be at +12VDC but will be driven to -12VDC under any of the following conditions: tight tape or tape out sensed, low tape sensed and approximately 100 ms of inactivity on the Received Data lead, REMOTE switch OFF and PUNCH RUN/LOAD in LOAD position. As an option the low tape control of DTR can be inhibited.

Low Tape (Option G)

This non-standard signal can be used to monitor the low tape condition independent of the DTR lead. When there is adequate tape this lead will be at -12VDC. When low tape has been sensed (minimum of 6000 characters left) this lead will go to +12VDC.

5.3 OPERATING DESCRIPTION

A brief description of the operating controls is contained in Section 2.8.1. The following explanation provides the necessary data to utilize the controls and corresponding interface signals in order to achieve a working system inter-connection. Refer to Figure 5-1 for parallel reader timing.

Punch LOAD/RUN Switch

When the unit is a parallel interface, the punch LOAD/RUN switch works in conjunction with an external punch command and internal punch ready (PR) flag, refer to Figure 4-1 for the timing diagram. When in the LOAD position, the unit signals that it isn't ready by a low on the punch ready line; a punch command will not start the punch cycle. In the RUN position, Punch Ready goes high until a punch command is received, then goes low while the data is being punched. Input data must be present and stable prior to or at the time the Punch Command goes high.

When the unit has a serial interface (SD Option), the switch provides a manual turn on of the punch when switched to the RUN position. Actual control of the punch is accomplished by the reception of serial data stored in the data buffer. As soon as data is received, the first character will start the punch motor and data will be stored until the motor is up to speed, when stored data will be punched. The buffer will empty itself and the punch will stop punching but the motor will stay on for approximately 2.5 seconds, allowing for breaks in data reception.

REM CTL (Remote Control)

For a parallel interface machine, an open collector transistor is biased ON when the switch is in the REM CTL position. The emitter is at DC Ground and the transistor can sink 25mA when ON and withstand +25VDC when OFF.

For a serial interface machine (SD Option), with the switch in the REM CTL position, received ASCII control characters DC1-DC4 will be detected and will not be punched. When the switch is in the OFF position, all received control characters will be punched. DC1 will start the reader while DC3 will stop the reader. DC2 will start the punch motor and DC4 will stop the punch motor.

Feed

Pressing the FEED switch will turn on the punch and advance the tape at approximately 75 cps with only feed holes punched. If this switch is actuated in a parallel machine without data buffers, data will be lost. If data buffers (D Option) are included, no data will be lost if the switch is actuated during the punching sequence, however, when the data buffers are full, the punch ready signal will go low and disable further reception of data until the data buffers can be emptied.

Since a serial interface machine (SD Option) included data buffers, no data will be lost due to use of the FEED switch as noted above.

Reader LOAD/RUN

For a parallel interface machine, when the switch is in the RUN position, it provides a DC Ground closure at the reader interface connector (Reader Run Switch). Voltages applied to this output should not exceed +25VDC and 100mA. When the switch is in the LOAD position, the switch is open circuited.

For a serial interface machine (SD Option), the Request to Send flag will be low (OFF) when the switch is in the LOAD position and high (ON) when the switch is in the RUN position. If the remote control switch is in the REM CTL position, reception of control characters DC1 and DC3 will start and stop the reader irrespective of the Reader LOAD/RUN switch position.

Punch Status Indicator

The green LED indicates the status of the punch, whether it can or can't receive data. A Tape Error condition may be a Tape Out or Tight Tape condition (Option G), or the punch switch in the LOAD position. If the remote control switch is in the REM CTL position, then the punch LOAD position will not generate a Tape Error.

For a serial interface machine (SD Option), a Tape Error condition will cause the Data Terminal Ready flag to go to the OFF condition.

For a parallel interface machine, whenever a Tape Error Condition exists, the LED will be out, Punch Ready will be low and Punch Commands into the unit be ignored.

Power Indicator

The red LED indicates that the power switch is in the ON position. Should a logic or control voltage fail, then the LED will be extinguished.

OFF/POWER Switch

Controls AC power input to the unit.

6. MAINTENANCE

Specification 3103 - Moduperf Tape Perforator Mechanism Maintenance Manual

Documentation Package 8766 - SP75/SRP3075

6.1 FACTORY ASSISTANCE.

Should any problem be encountered which cannot be corrected, the Factory Service group of Data Specialties, Inc. should be contacted immediately to minimize or avoid downtime and/or returning of the equipment. Contact:

Factory Service
Data Specialties, Inc.
3455 Commercial Avenue
Northbrook, Illinois

Phone: (312) 564-1800

6.2 RETURNING EQUIPMENT

Should it become necessary to ship the unit, carefully pack the equipment in a suitable container to avoid damage during transit. A note describing the fault should be enclosed with the unit. Whenever possible, the original shipping container from the factory should be used. If other containers are utilized, a procedure similar to the original factory packaging should be followed:

Enclose the unit in a protective, dust-proof plastic bag, surrounded by a tight fitting cardboard sleeve and carton, this inner carton should float in an outer carton by means of 8 shock absorbing plastic foam corners.

CAUTION

DO NOT package the equipment in a rigid container without utilizing shockmounts of shock absorbant packing material. A rigid container will allow shock on the outside to be transmitted undamped to the unit which may cause damage.

Empty Chad container before the unit is packed for shipment. Also empty the chad chute and close its opening with masking tape (or equivalent). This will prevent chad from spreading throughout the equipment during shipment.