

Data General Corporation

Technical Manual

Paper Tape Reader

DATA GENERAL TECHNICAL MANUAL

PAPER TAPE READER

MODEL 6013

Ordering No. 015-000017
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SECTION O INTRODUCTION

THE READER

Data General's high speed paper tape reader, model 6013, reads one inch wide, eight channel, fanfold mylar or paper tape at speeds up to 400 frames per second. The reader, shown in Figure O-2, is interfaced to any Nova computer by the reader I/O control, model 4011, a part of the basic I/O control board shown in Figure O-1.

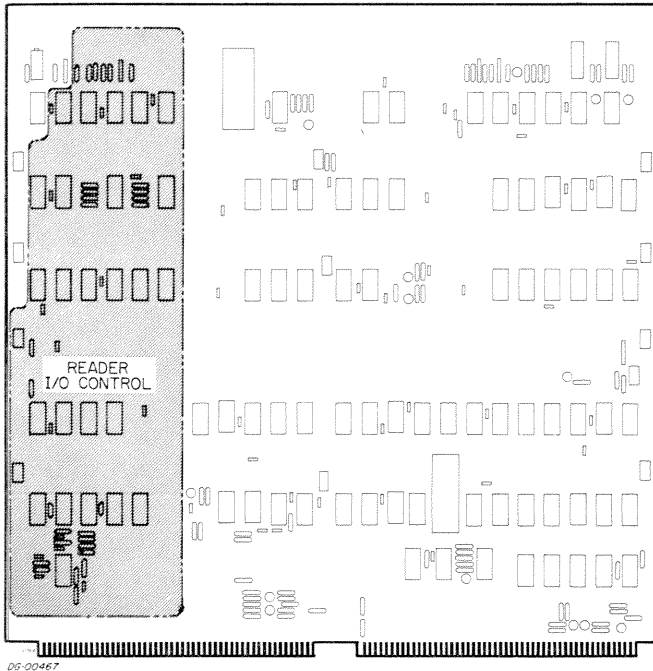


Figure O-1 The Basic I/O Control Board

The reader has two mechanical assemblies, called the drive assembly and the optic/brake assembly, and a single printed circuit board. The drive assembly pulls the tape through the combined optic/brake assembly, where phototransistors read each frame on the tape. The printed circuit board con-

tains the power supply and drives for the two mechanical assemblies.

The reader I/O control contains logic to determine the drive and brake states of the reader, an 8-bit data buffer and program interrupt logic.

THIS MANUAL

This manual discusses the logic, maintenance and the installation of the high speed paper tape reader. Below is a list of the sections in this manual, and a description of each section.

- | | |
|-----------|---|
| Section O | introduces both the device and the technical manual and gives a list of references. |
| Section S | explains both manual and software operation of the paper tape reader. |
| Section M | describes the reader's drive and optic/brake systems. |
| Section L | explains the logic of the reader and the control with a flowchart and a block diagram. |
| Section P | explains the power supply. |
| Section I | shows how to unpack, rack mount and cable the reader and the reader-punch. |
| Section N | explains preventive maintenance procedures which the user should follow, and introduces the training and the field service organizations which Data General makes available to its customers. |
| Section T | lists the logic signal names and their positions on the paper tape electronics engineering drawings. |

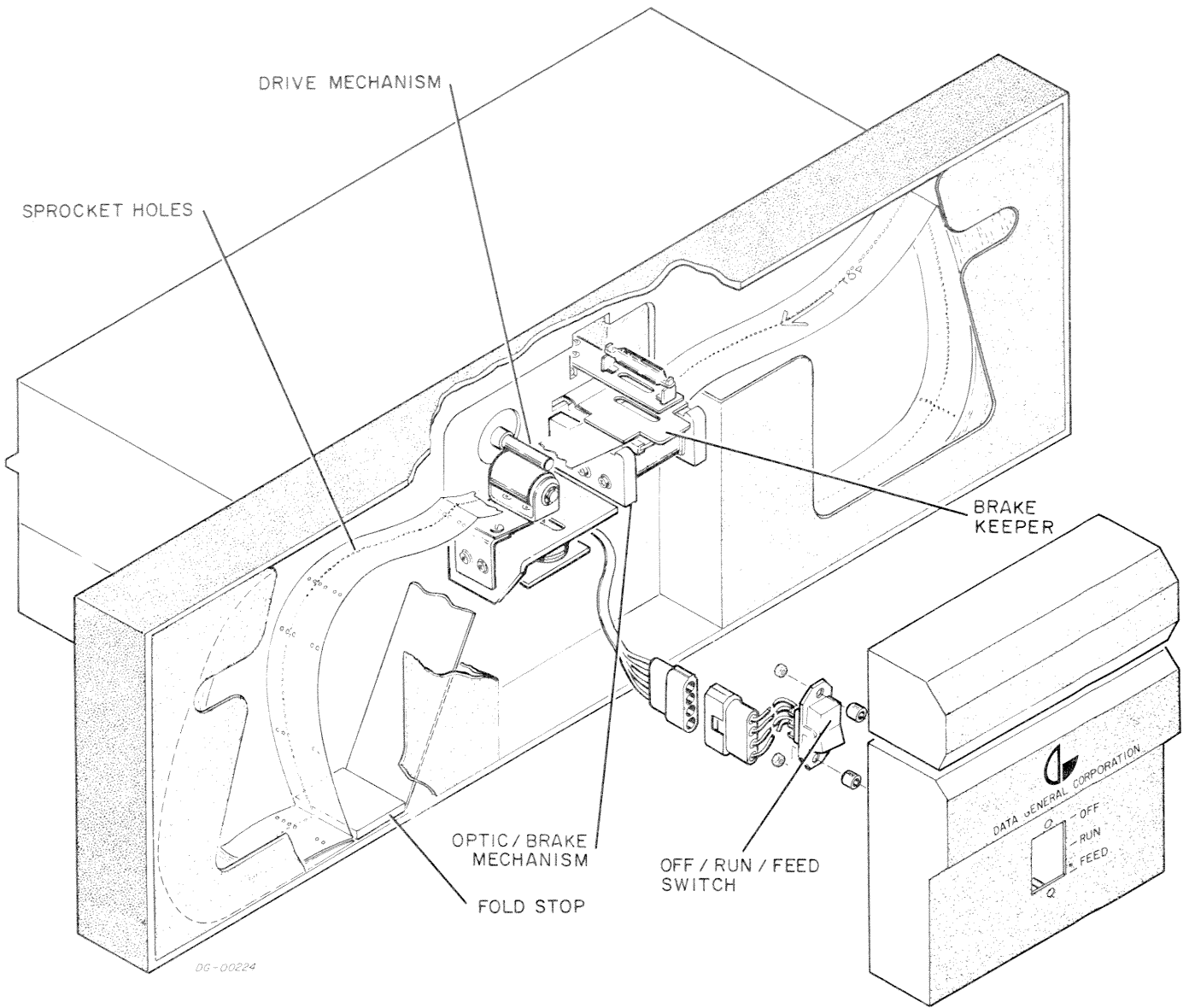


Figure O-2 The Paper Tape Reader

RELATED DOCUMENTS

Figure O-3 is a list of the engineering documents and the technical manuals which relate to the paper tape reader. Supplied with each title is the Data General ordering number for that document.

The manual "How to Use the Nova Computers" explains in detail the programming of Nova computers. The technical manual "Integrated Circuit User's Guide" has logic diagrams and truth tables for the integrated circuits used in Data General equipment.

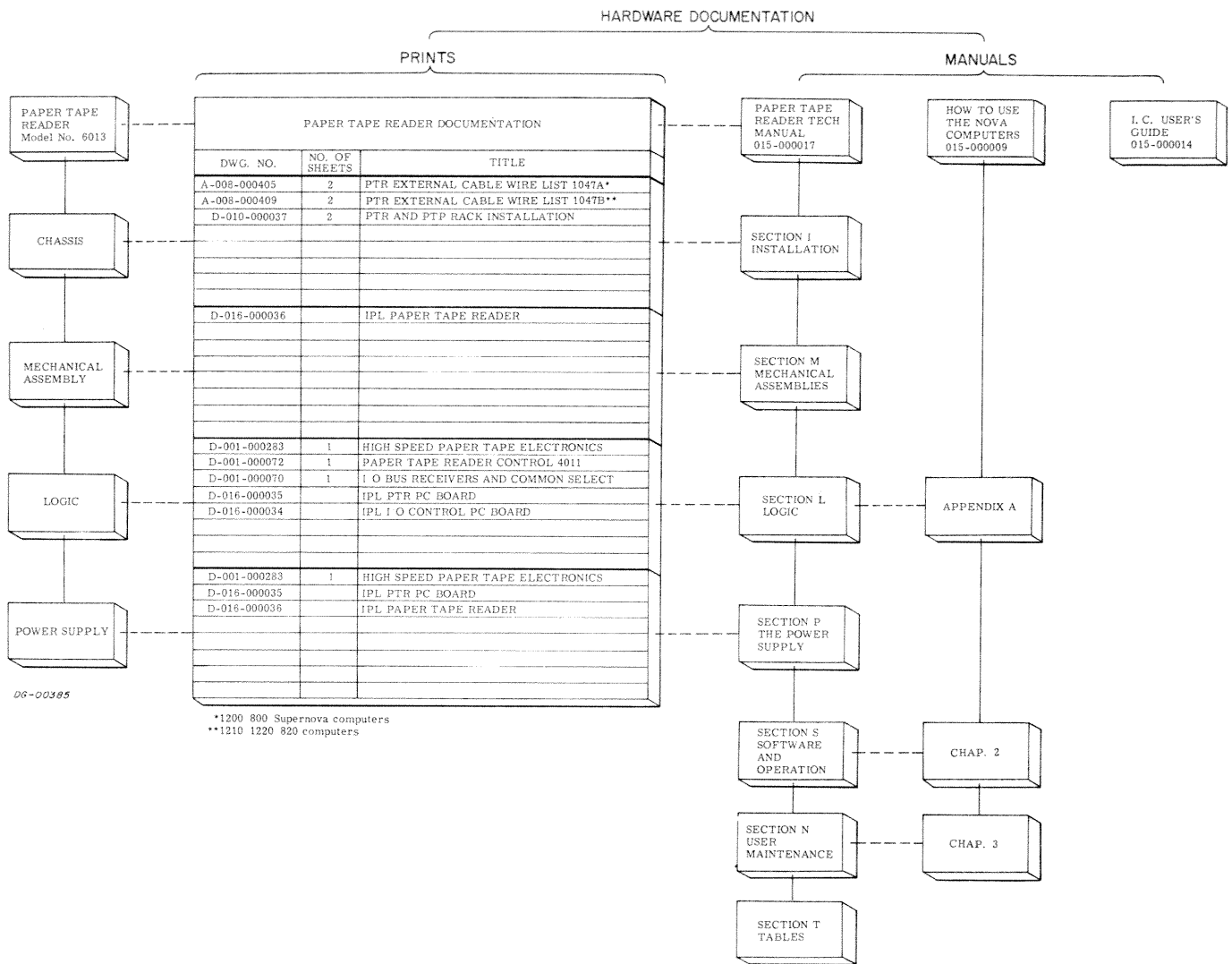


Figure O-3 Paper Tape Reader Hardware Documentation

SECTION 5 OPERATION

INTRODUCTION

This section is comprised of two segments: programming information and operating instructions for the paper tape reader.

PROGRAMMING

Data is retrieved from the paper tape reader by programmed I/O; the paper tape reader is not a data channel device. The reader has a Busy flag and a Done flag which control its operation. The device code for the reader is 12, and the standard DGC mnemonic is PTR. The interrupt priority mask bit for the reader is bit 11.

When the Busy flag is set, the reader reads the eight channels of the next frame on the tape into the data buffer in the interface. Tape channel 1 corresponds to data buffer bit 7 as shown in Figure S-1. After the reader fills the data buffer, it sets the Done flag and requests an interrupt if interrupt priority mask bit 11 is 0.

Coding Aids

The symbols $\langle \rangle$ and $\underline{\quad}$ are used in this manual to aid in defining the instructions. These symbols are not coded; they act only to indicate how an assembly language instruction may be written. Their general definition is given below:

- $\langle \rangle$ Indicates optional operands. The operand enclosed in brackets (e.g. $\langle \# \rangle$) may be coded or not, depending on whether the associated option is desired.
- $\underline{\quad}$ Indicates specific substitution is required. Substitute the desired accumulator, address, name, number or mnemonic.

The set of I/O instructions has options that can be obtained by appending mnemonics to the standard mnemonic. These optional mnemonics and their results are given below.

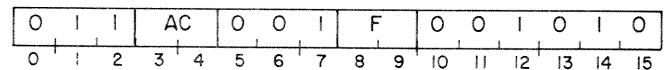
CLASS ABBREVIATION	CODED CHARACTER	RESULTS IN BITS 8,9	OPERATION
f	(omitted)	00	Does not affect the Busy and Done flags
	S	01	Start the device by setting Busy to 1 and Done to 0.
	C	10	Idle the device by setting both Busy and Done to 0.

The character under "CLASS ABBREVIATION" refers to the character enclosed in brackets in the general form of the instruction. The other three columns of the table give the characters that may be substituted and their results.

Paper Tape Reader I/O Instruction

READ CHARACTER

DIA $\langle \underline{f} \rangle$ \underline{ac} , PTR



The contents of the paper tape reader data buffer are placed in bits 8-15 of the specified AC. Data buffer bit 7 corresponds to bit 15 of the specified AC. AC bits 0-7 are set to 0. After the data transfer, the Busy and Done flags are set according to the function specified by f.

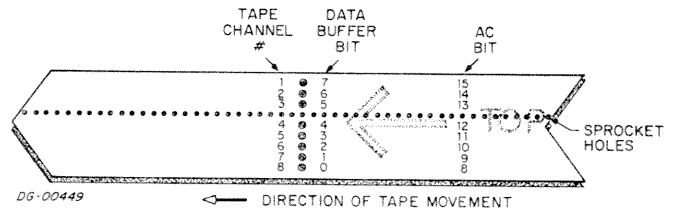


Figure S-1 Format of a Paper Tape Frame

Programming Considerations

At the maximum paper tape reader speed of 400 frames per second, the reader takes 2.5 milliseconds to fill the data buffer with the next tape frame. After Done is set, the program has 100 microseconds in which to retrieve the character and set Busy in order to keep the tape in continuous motion. Waiting longer than 100 microseconds to set Busy forces the reader to stop and then restart the tape. The programmer should not attempt to operate the reader in this "stop/start" manner at speeds in excess of 150 frames per second. Faster stop/start rates produce chatter and may lead to unreliable reader operation.

When power is first turned on, the contents of the data buffer are unpredictable. It is recommended that the first instruction to the paper tape reader be an NIOS instruction, so that the first character read from the buffer by a DIA instruction will be meaningful.

OPERATION

To load the reader, follow the procedure below:

1. Press the switch located in the center of the front of the reader to the OFF position.
2. Raise the brake keeper to its upper position.
3. Place the stack of fanfold tape vertically in the right-hand tape bin. Make sure that the sprocket holes on the tape are to the rear of the stack and the beginning of the tape is on the top.
4. Pull three or four folds of tape from the

left side of the stack and place these folds vertically in the left-hand tape bin. Make sure that the folds of tape in the left-hand bin are placed to correspond with those shown in Figure O-1.

5. Slip the length of tape connecting the two bins into the reader by placing it between the brake keeper and the optic assembly on the printed circuit board, and between the drive shaft and the pinch roller. Make sure the tape is pushed firmly against the back plate.
6. Lower the brake keeper to its lower position.
7. Press the switch located in the center of the reader to the RUN position.

After the tape has been read, unload the reader by following the procedure below:

1. Feed the trailer portion of the tape through the reader by pressing and holding the switch located in the center of the front of the reader in the FEED position.
2. Remove the stack of tape from the left-hand tape bin.
3. Press the switch located in the center of the front of the reader to the OFF position.

Operating Considerations

To insure correct stacking of tape in the left-hand tape bin, do not try to read a stack of tape longer than 150 feet in length. Under high humidity conditions, this requirement should be reduced to 100 feet in length.

SECTION M

MECHANICAL ASSEMBLIES

INTRODUCTION

This section deals with the device's two mechanical assemblies: the drive mechanism and the optic/brake mechanism.

THE DRIVE MECHANISM

The paper tape is driven through the reader by a drive mechanism consisting of a pinch roller and a drive shaft assembly, shown in Figure M-1. The drive shaft operates directly from a 3200 rpm shaded pole motor; there are no reduction gears. When the forward solenoid is energized, it moves the leaf spring until the pinch roller pushes the paper tape into contact with the drive shaft. The rotating drive shaft moves the paper tape forward.

The forward solenoid is operated by the Go flip-flop on the control board, described in Section L.

The cooling fan is mounted on the shaft of the motor.

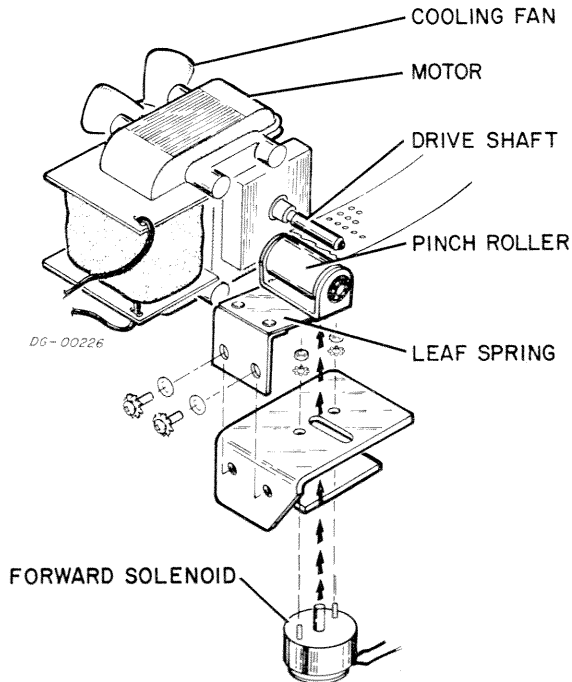


Figure M-1 The Drive Mechanism

THE OPTIC/BRAKE MECHANISM

The reader's optic/brake mechanism in Figure M-2 stops tape motion by clamping the tape between its brake keeper and its brake pole electromagnet. At the same time, the drive mechanism's forward solenoid releases the leaf spring, and the drive shaft no longer moves the tape.

The brake pole electromagnet is operated by the reader control's Go flip-flop.

When the OFF/RUN/FEED switch is in the spring-loaded FEED position, the brake keeper is released, the forward solenoid is energized and tape is automatically driven through the reader.

REFERENCES

1. IPL Paper Tape Reader D-016-000036.

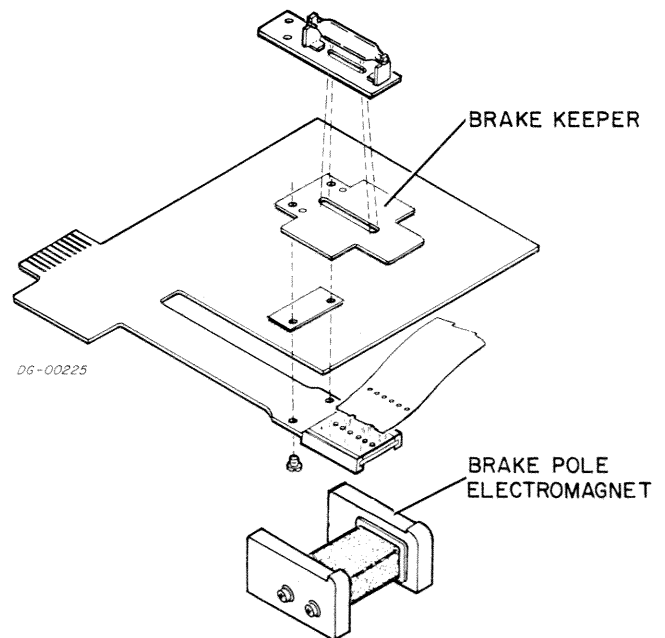


Figure M-2 The Optic/Brake Mechanism

SECTION L LOGIC

INTRODUCTION

Section L covers logic on both the printed circuit board in the reader and the reader control on the basic I/O control board in the Nova computer. The board in the paper tape reader contains the optical unit's phototransistors, the power supply, and drivers for the drive and brake states. The I/O control board contains logic for interfacing with a Nova computer.

Figure L-1 is a block diagram showing the logic of the reader and the control, and relating the logic to the mechanical assemblies.

LOGIC

Nine photosensitive transistors are mounted on the arm of the reader's printed circuit board extending into the optic/brake mechanism; eight read the 8-bit character and one reads the sprocket hole of each frame. Light from the long filament bulb passes through the slot in the brake keeper and through holes in the paper tape, and causes conduction in the phototransistors. Conduction causes a logical 1 for that channel position in the bus CH <1,8>.

The reader logic uses SPKT, the sprocket hole signal, to determine when the tape frame is centered above the phototransistors. SPKT produces

RD STROBE, the signal which controls the Busy, Done and Go flip-flops and clocks CH<1,8> into the data buffer. The Go flip-flop determines the brake and drive states of the reader's mechanical assemblies and controls the drivers.

FLOW DIAGRAM

The flow diagram shown in Figure L-2 follows the steps in the logic as the paper tape reader puts a character into the data buffer. The source of each signal produced by the logic is given in the form RD SELECT = H 72-D6. This indicates that the signal RD SELECT is at +3Vdc and that it is shown on engineering print 001-000072-03 in the grid D6.

REFERENCES

1. High Speed Paper Tape Reader Electronics 001-000283-02.
2. 4011 Paper Tape Reader Control 001-000072-03.
3. I/O Bus Receivers and Common Select 001-000070-03.
4. Integrated Circuit User's Guide 015-000014-00.
5. IPL PTR PC Board D-001-000035.
6. IPL I/O Control PC Board D-001-000034.

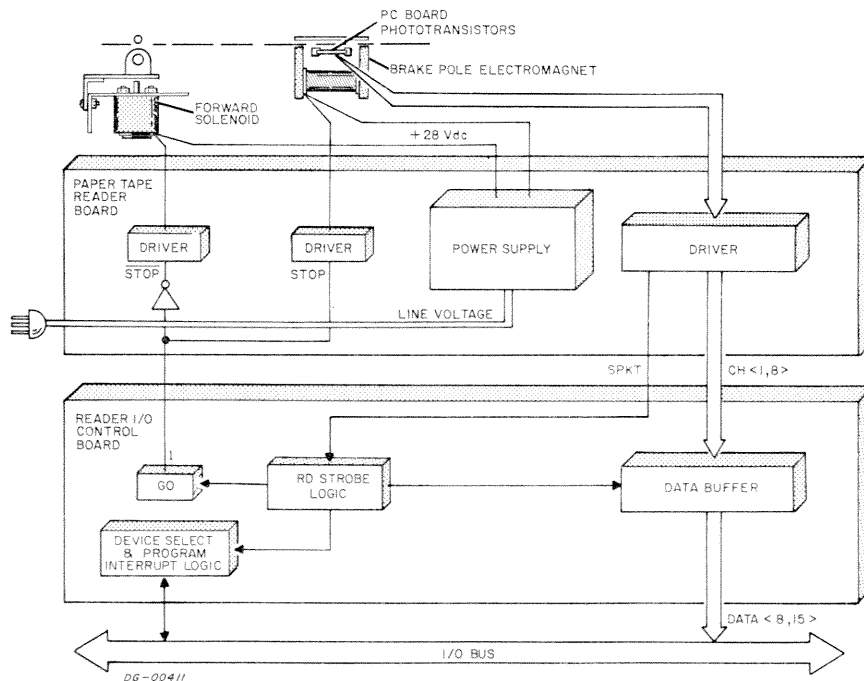


Figure L-1 Block Diagram of the Paper Tape Reader

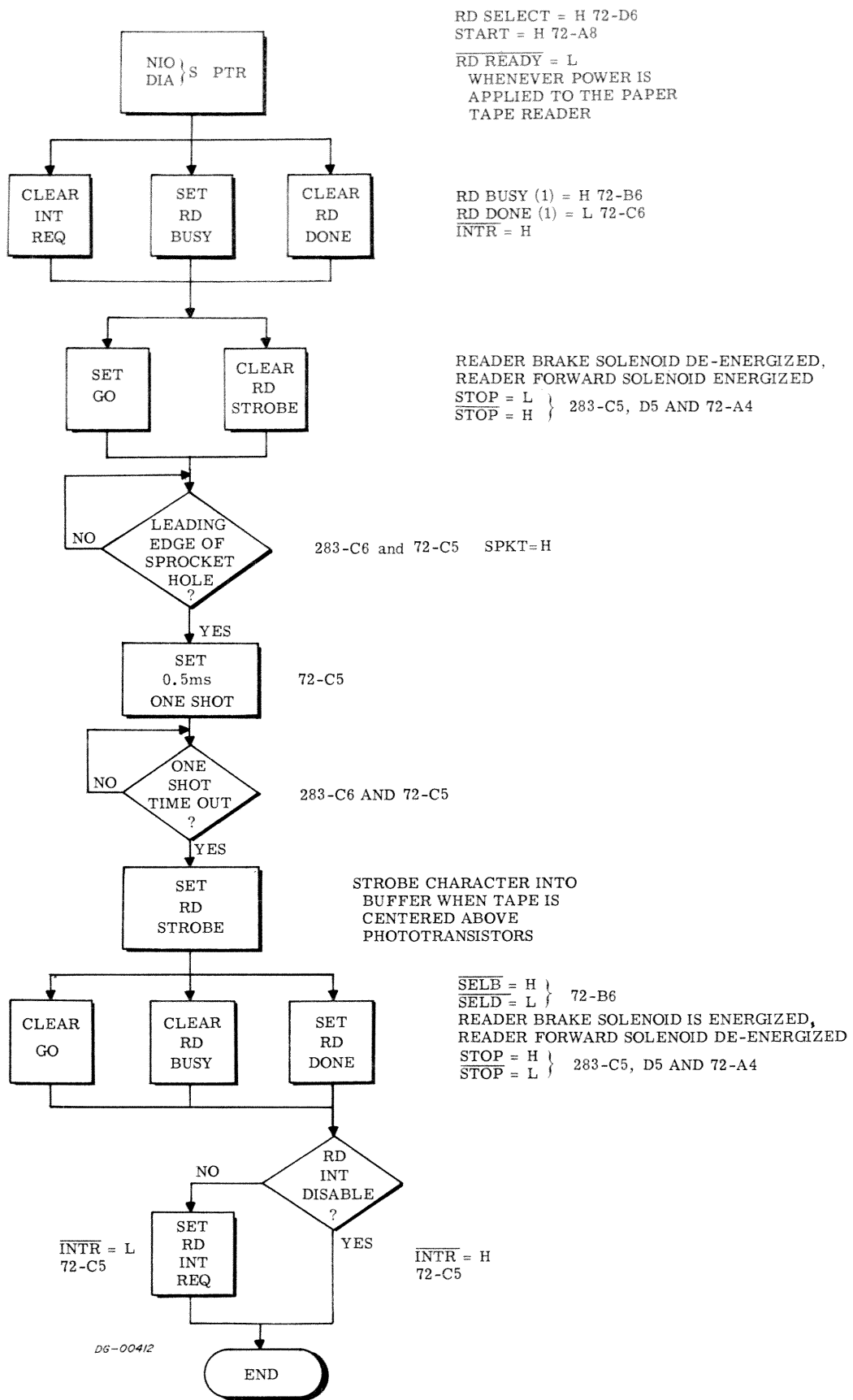


Figure L-2 Logic Sequence During Read

SECTION P POWER SUPPLY

INTRODUCTION

The paper tape reader's power supply is mounted on its single printed circuit board, the transformer is mounted on the device's chassis. The power supply converts 115Vac or 220Vac, 50 to 60Hz, to +28Vdc or to +5Vdc for use in logic and terminators or to drive the brake and the forward solenoids.

POWER SUPPLY CIRCUIT

The line voltage is input through the power cord to the OFF/RUN/FEED switch on the front panel and then to the power transformer which is mounted on the base panel. The two primaries are wired in series for 220Vac and in parallel for 115Vac. Table P-1 shows specifications for the power supply; Figure P-1 is a schematic of the power supply circuit.

The transformer drives a full wave bridge rectifier which outputs 28Vdc. The ripple is smoothed by a

13,000 microfarad capacitor which is mounted on the chassis.

The +5Vdc supply is driven off the +28V supply by a resistor and a zener diode and is filtered by capacitors.

Chassis ground is isolated from common ground by resistance, as a safety precaution.

There is one fuse in the paper tape reader. The 2A fuse is between the power plug and the OFF/RUN/FEED switch. It is located to the lower left of the rear panel and is easily replaced if necessary.

REFERENCES

1. High Speed Paper Tape Reader Electronics D-001-000283-02.
2. Integrated Circuit User's Guide 015-000014-00.
3. IPL PTR PC Board D-016-000035.
4. IPL Paper Tape Reader D-016-000036.

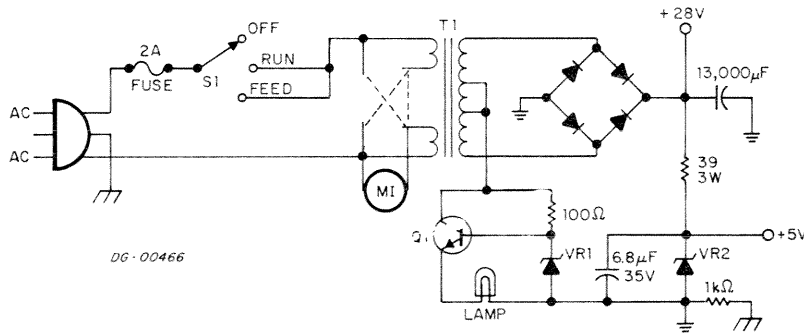


Figure P-1 The Power Supply Circuit

Table P-1
Power Supply Specifications

Output Voltage	Operating Output Voltage		Operating Current		Used On
	STOP	FORWARD	STOP	FORWARD	
+28V	28.5V	29.5V	1.1A	0.9A	Solenoids for Electromagnet 125mV ripple
+ 5V	5.4V	5.4V	32mA	32mA	
	10mV ripple				Logic and Terminators

SECTION I INSTALLATION

Table I-1

Paper Tape Reader Specifications

GENERAL	
Operating Speed	Nominally 400 char/sec at 115Vac, 60Hz, input voltage. Speeds vary proportionally with line frequency and percentage of line voltage change.
Type of Tape	Paper, paper-mylar, metallized mylar; 0.002 to 0.005 inch thick (butt or lapped splices to 0.010 inch). Transmissivity not to exceed 60%.
Tape Width	1-inch 8-channel tape.
Input Tape Form	18-inch leader, fanfold.
Lamp Life	Projected life 12,000 hours with operating voltage of 10Vdc.
DATA AMPLIFIER OUTPUTS	
Type	Low Power TTL.
Hole	+2.4Vdc minimum at 0.1ma.
No Hole	+0.3Vdc maximum at 2ma.
CONTROL INPUTS	
Asynchronous	+2.4Vdc minimum for 50 to 100 microseconds (maximum repetition rate of 300 pulses/second). (TTL)
DATA STROBE OUTPUT (Sprocket Hole)	
True	+2.4Vdc minimum at 0.1ma.
Not True	+0.3Vdc maximum at 2ma.
POWER and ENVIRONMENTAL	
Input Power	117Vac \pm 20%, 47-63Hz, single phase, ac power at 2 amperes. (220 Volts Optional)
Temperature	Operating 0° to 85°C.
Humidity	Operating 90%. Non-Operating 100% without condensation.
Altitude	Operating/Non-Operating 0 to 10,000 ft.
PHYSICAL CHARACTERISTICS	
Width	19 inches (Standard RETMA)
Height	7 inches
Depth behind front panel	8-1/2 inches
Protrusion from front panel	2 inches
Overall depth	10-1/2 inches
Weight	19 pounds

INTRODUCTION

This section discusses the installation of the paper tape reader both when it is used alone and when it is used with the paper tape punch. Directions for unpacking and repacking, rack mounting, and cabling the reader are included.

Data General's paper tape reader operates on 110Vac 60Hz, or on 220Vac 50Hz. The power, physical and environmental specifications are shown in Table I-1.

UNPACKING THE READER

The paper tape reader is shipped in the kit shown in Figure I-1. The unpacking procedure follows:

1. Cut the straps on the cardboard carton.
2. Remove the styrofoam container from the cardboard carton.
3. Cut the nylon straps on the styrofoam container.
4. Remove the styrofoam top and spacers.
5. Remove the reader, or the reader and punch assembly. **DO NOT USE THE STRAIN RELIEF BRACKET AS A HANDLE.**
6. Remove the wrapping on the reader cable.
7. Store the cartons and the wrappings for future use.

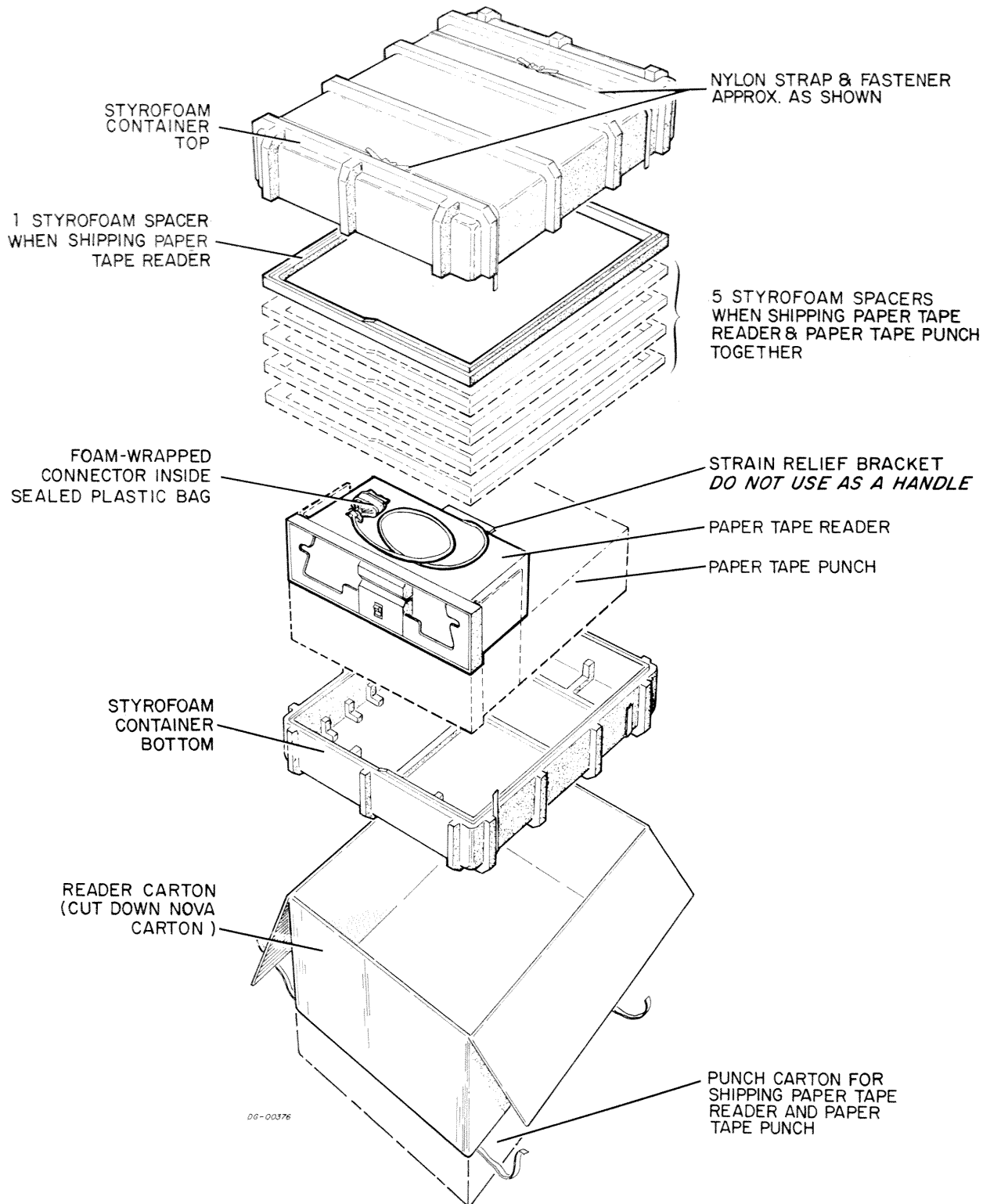


Figure I-1 The Shipping Kit

PACKING THE READER

The paper tape reader should always be shipped in its original packing kit shown in Figure I-1. If the original kit cannot be located, a reader shipping kit should be ordered from Data General Corporation.

1. Protect all cable connectors by wrapping them in foam and placing them in plastic bags.
2. Place the reader in the bottom of the styrofoam container.
3. Place the necessary number of styrofoam spacers around the reader. Check to see that they are stable and do not rock in place.

4. Place the top of the styrofoam container on the assembly and strap the container and spacers.
5. Place the strapped styrofoam container inside the cardboard carton.
6. Close, seal and strap the outside carton.

RACK MOUNTING THE READER

The Reader

The reader should be mounted in a standard 19-inch rack, as shown in Figure I-2. The reader is attached to the front vertical rails of the cabinet by four flat head screws placed in the four outside mounting holes in the reader's panel, with the fan-fold boxes removed.

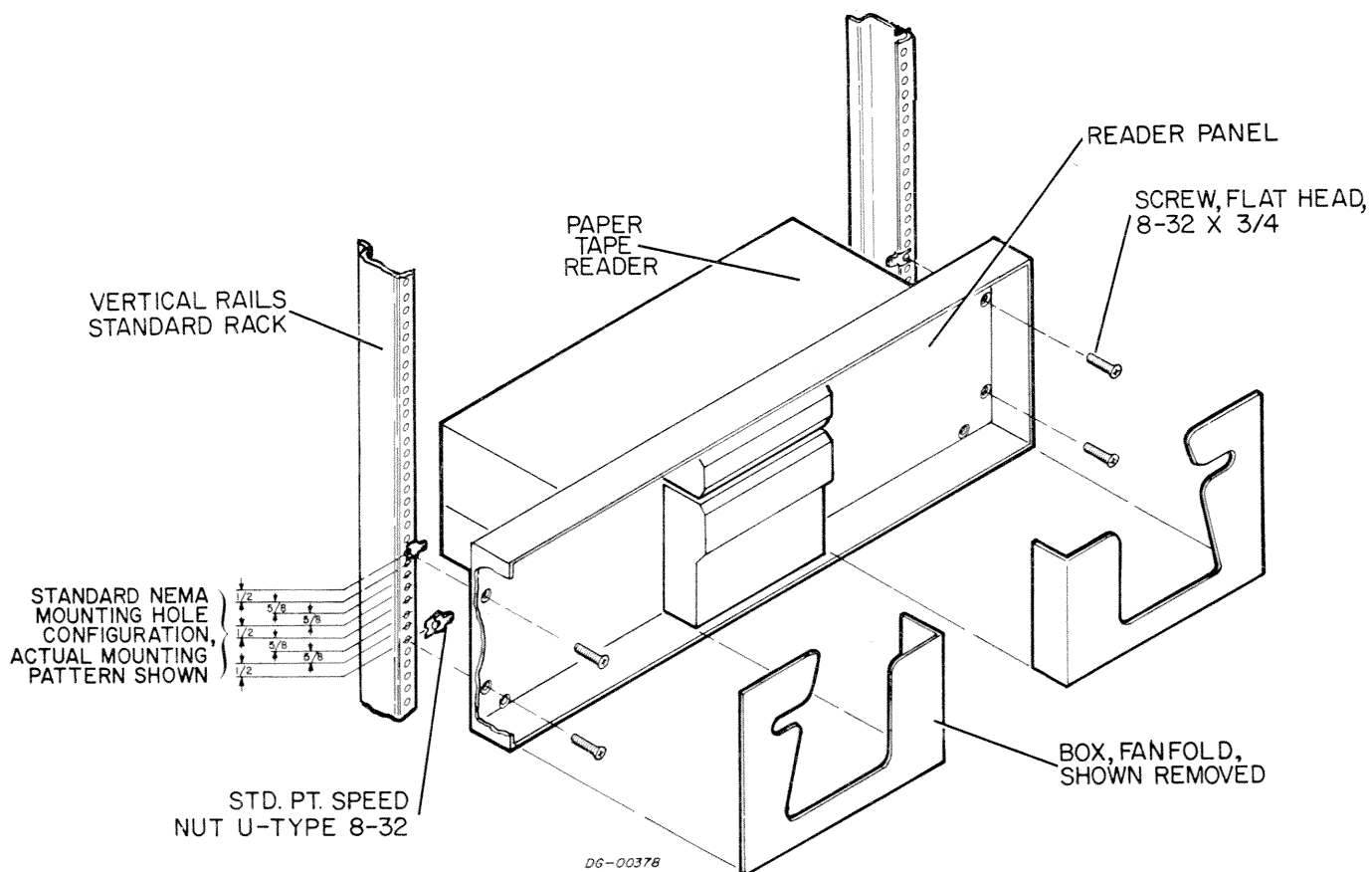


Figure I-2 Rack Mounting the Paper Tape Reader

The Reader and the Punch

Before the reader and punch combination is placed in a standard 19-inch cabinet, the reader must be mounted on the punch. Four flat head screws attach the reader to a bracket on the punch. These screws go through the four inner holes on the reader's front panel, with fanfold boxes removed, as shown in Figure I-3.

The punch is then mounted in the cabinet. The punch is shipped with the rack slides necessary for mounting it in a standard 19-inch rack. The right-hand slide should be assembled in the cabinet as shown in Figure I-4. The left-hand slide is mounted similarly.

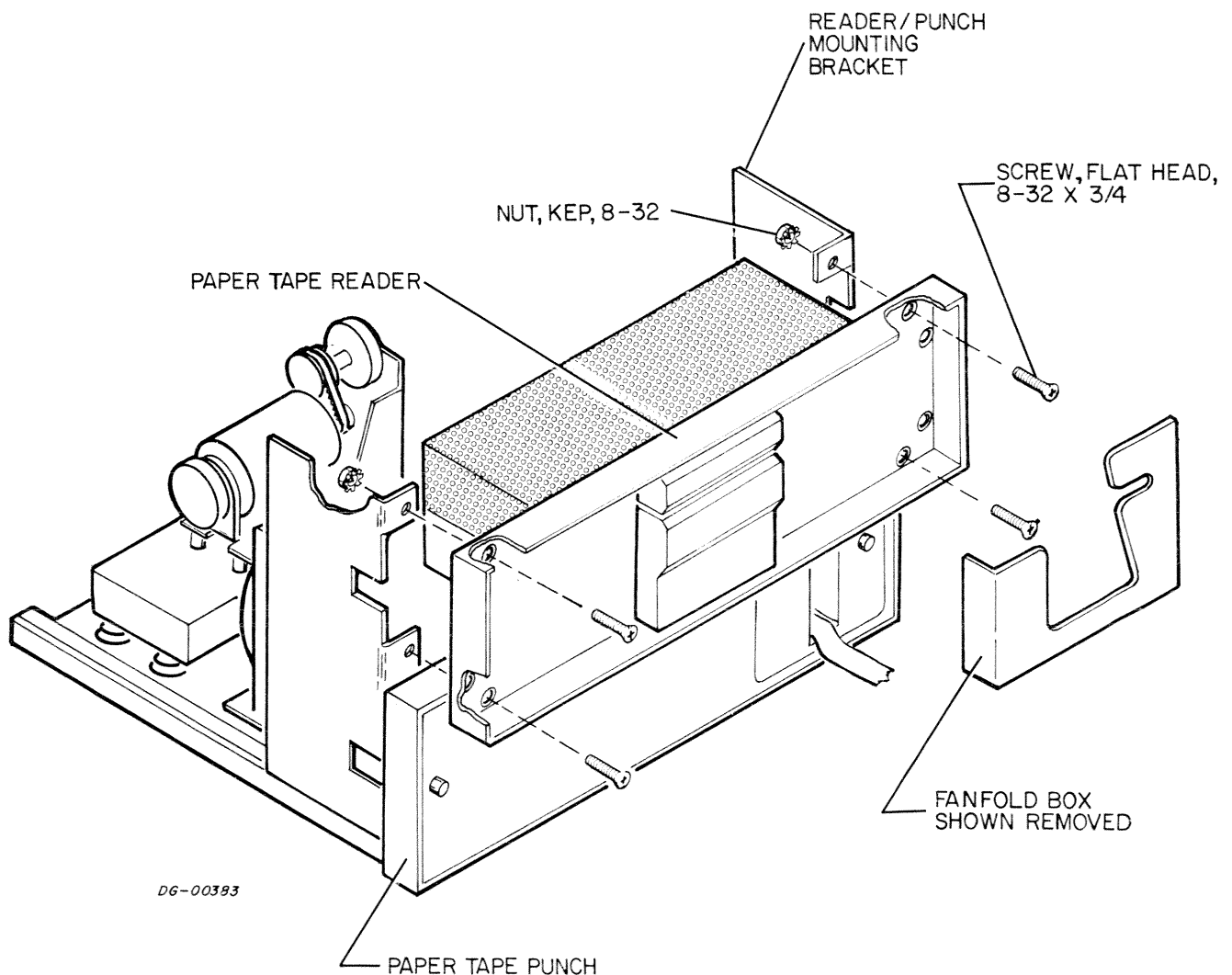


Figure I-3 Mounting the Paper Tape Reader on the Paper Tape Punch

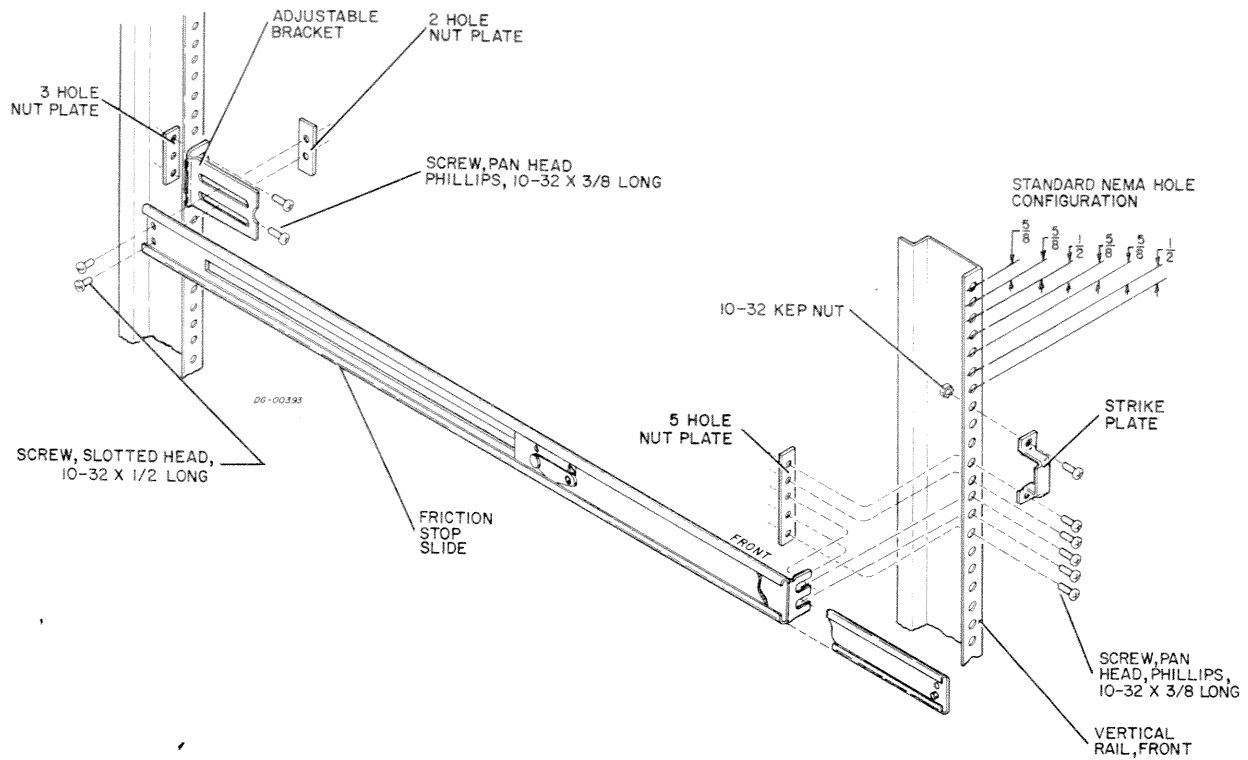


Figure I-4 Rack Mounting the Punch

CABLING THE READER

The paper tape reader has one I/O cable connector mounted on the back of its logic board, as shown in Figure I-5. The paper tape punch has a separate I/O cable.

Each keyed cable should be plugged into the designated pins on the back panel of the Nova computer. The cable should be selected as shown in Table I-2.

Table I-2

Cables for the Paper Tape Reader and the Paper Tape Punch

CPU	Reader Cable	Punch Cable
1200/1230/800/840	1047A	1031A
Nova/Supernova	1047A	1031A
1210/1220/820/Nova 2	1047B	1031B

TURNING ON THE READER

The reader or the reader and the punch assembly should be correctly rack mounted, as shown in Figure I-5, before the reader is turned on and tested.

1. Check to see that all cables are properly connected and that none are strained.
2. Measure the line voltage at the outlet to make sure that it meets the reader's power specifications.
3. Replace the fanfold boxes, the light cover and the brake cover. Turn the OFF/RUN/FEED switch to OFF.
4. Plug in the paper tape reader.

Operation of the paper tape reader is explained in Section S.

REFERENCES

1. PTR Rack Installation D-001-000037-00.

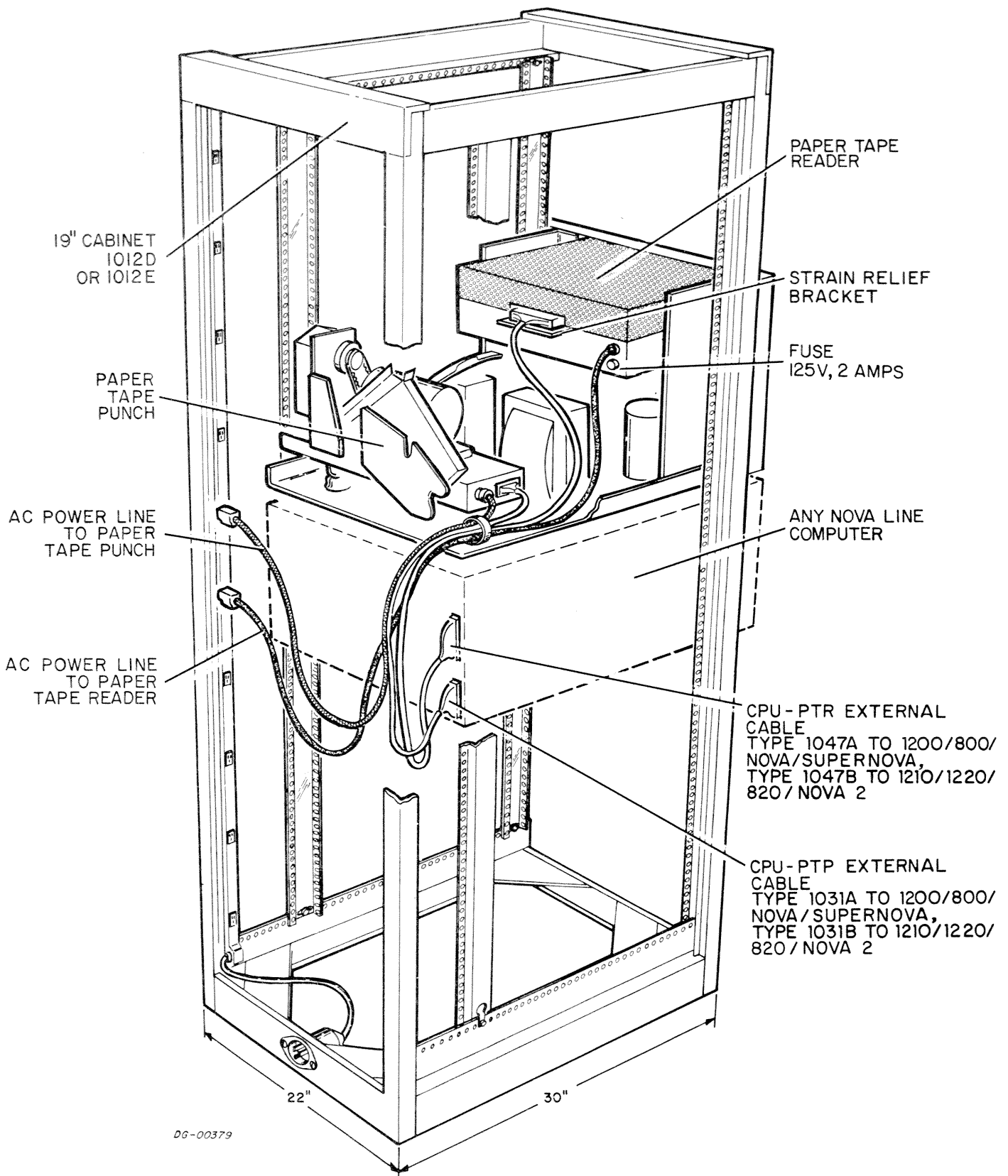


Figure I-5 Cabling the Paper Tape Reader and the Paper Tape Punch

SECTION N

USER MAINTENANCE

INTRODUCTION

Data General Corporation supports its equipment with a large field service organization, customer training programs and technical documentation. This section summarizes these services and indicates the use of software diagnostics.

FIELD SERVICE PROGRAMS

Data General prefers to maintain its own equipment; its field service organization offers users a choice of several maintenance services, which are subject to change without notice.

1. **On Call Service Contract** under which Data General Corporation will repair equipment at the installation when Data General is notified of a problem by the user. Data General Corporation also provides preventive maintenance on a regular schedule under this contract. Parts, labor and travel are included in the monthly payment schedule which is determined by the prevailing minimum rate, the type and amount of equipment to be serviced and the distance between the installation and the nearest DGC service center.
2. **Factory Service Contract** under which Data General will repair equipment when it is returned to the Data General factory in Southboro, Mass. The user assumes full responsibility for freight and insurance charges to and from the point of repair. Parts and labor are included in the monthly payment schedule.
3. **Hourly Service** under which parts, labor and travel are charged as needed at prevailing rates. No contract is signed for this service.

Field Service will also generate on request a complete spare parts list for any installation, and rent or sell replacement and loaner boards. For more information, please call or write:

Field Service Department
Data General Corporation
Southboro, MA. 01772

Telephone 617-485-9100

TRAINING PROGRAMS

For those who maintain their own equipment, Data General recommends that they take Data General's training courses. These courses are subject to change without notice.

The composite peripheral course includes operation of the paper tape reader, its power supply and electronics. Students must have experience with digital logic, integrated circuits and computer principles.

Courses are scheduled regularly in the training department at Data General's Southboro, Massachusetts, headquarters. Special courses can be arranged. For more information, please call or write:

Training Department
Data General Corporation
Southboro, MA. 01772

Telephone 617-485-9100

PREVENTIVE MAINTENANCE

Daily Maintenance

Tape dust should be removed from the optic/brake mechanism daily with a small, soft brush. Particular care should be taken to keep the brake keeper dust-free, as this may be a cause of irregular character reading.

Lubrication

The paper tape reader does not need any lubrication; all mechanical units requiring lubrication are oiled for life.

CORRECTIVE MAINTENANCE

Cleaning the Glass Cover

If the device has incorrectly read a character from punched tape, the user should visually inspect the brake keeper for dust accumulation. The brake keeper should be brushed free of dust. Should the glass cover over the phototransistors also require cleaning, this cleaning procedure should be followed:

1. Grasp the rubber edge of the glass cover, shown in Figure N-1, with the thumb and forefinger. Gently pull out the cover.
2. Wash the cover with soap and water or with an ammonia-based glass cleaning solution by immersion. Do not apply pressure to the glass.
3. Return the glass cover to its position in the brake keeper.

The user should now use the reader to read the punched tape. Should the reader continue to read incorrectly, a more serious condition is indicated. The user should not attempt to perform any repairs, but should contact Data General's field repair service.

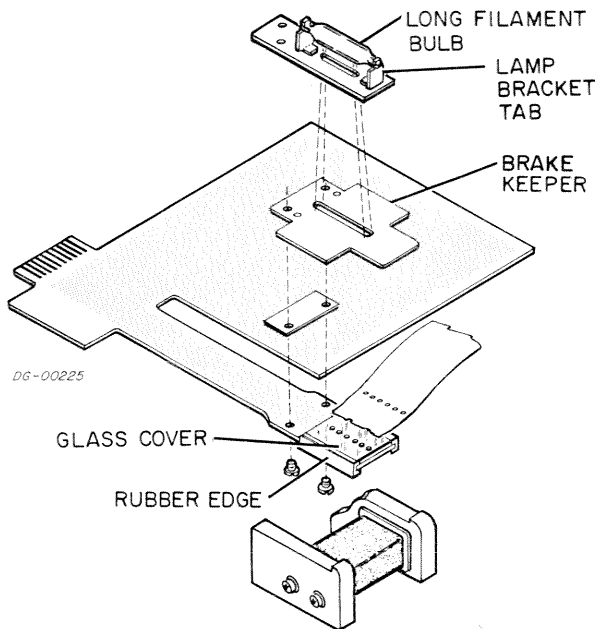


Figure N-1 The Optic/Brake Mechanism

Replacing the Lightbulb

Data General supplies replacement bulbs; they can be ordered as part number 114-000008. The bulb should be replaced as follows:

1. Press the OFF/RUN/FEED switch into the OFF position. Remove the snap-on lamp cover.
2. Using the eraser end of a pencil, press the brass tab of the lamp bracket back just far enough to release the bulb. Pull the bulb up and out.
3. Install the replacement bulb by hooking one lead of the bulb over the brass tab to the rear of the reader and pressing the other tab until the second lead will fit over it.
4. Press the OFF/RUN/FEED switch into the RUN position and check that the slot in the brake keeper is evenly illuminated over its entire length.

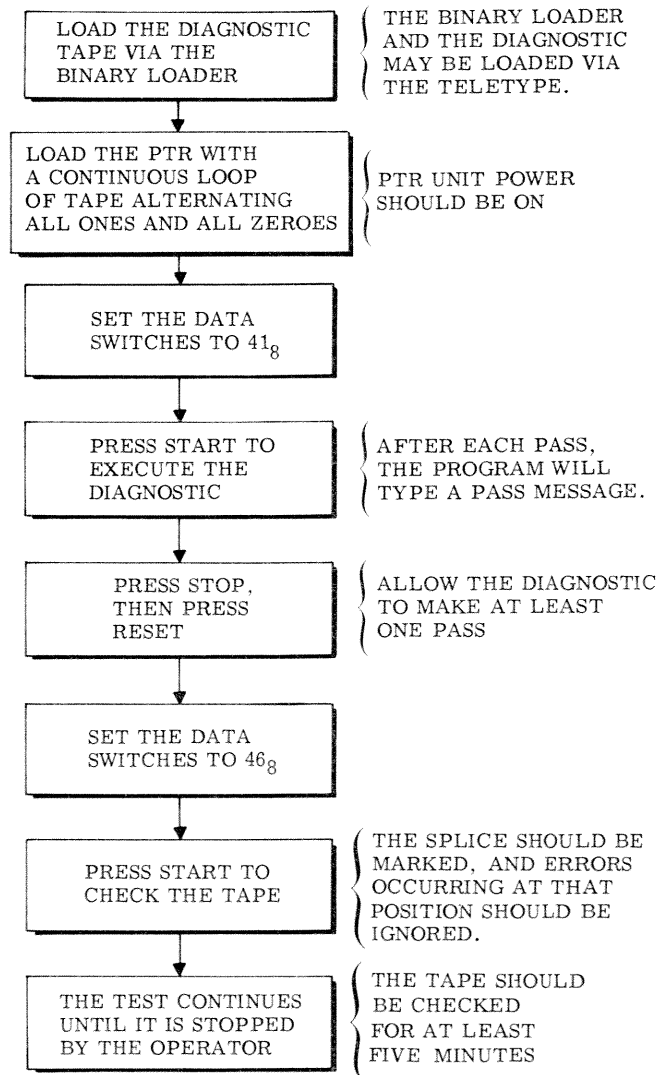
The operator should now run the diagnostics to verify the alignment of the lightbulb. A badly aligned lightbulb, caused by a bent bracket tab, will produce errors in tape channels one and eight.

THE DIAGNOSTICS

Data General supplies a computer program to test the reliability of the high speed paper tape reader. This diagnostic program is a maintenance program to test both the high speed readers and the punch. Figure N-2 is a flowchart of the procedure for testing the paper tape reader with the diagnostic.

References

1. Manual for the High Speed Reader/Punch Test 097-000008-04.
2. Punched Tape for Reader/Punch Test 095-000014-04.



DG-00373

Figure N-2 How to Test the Paper Tape Reader

SECTION T REFERENCE TABLE

Table T-1

Signal Names and Grid References

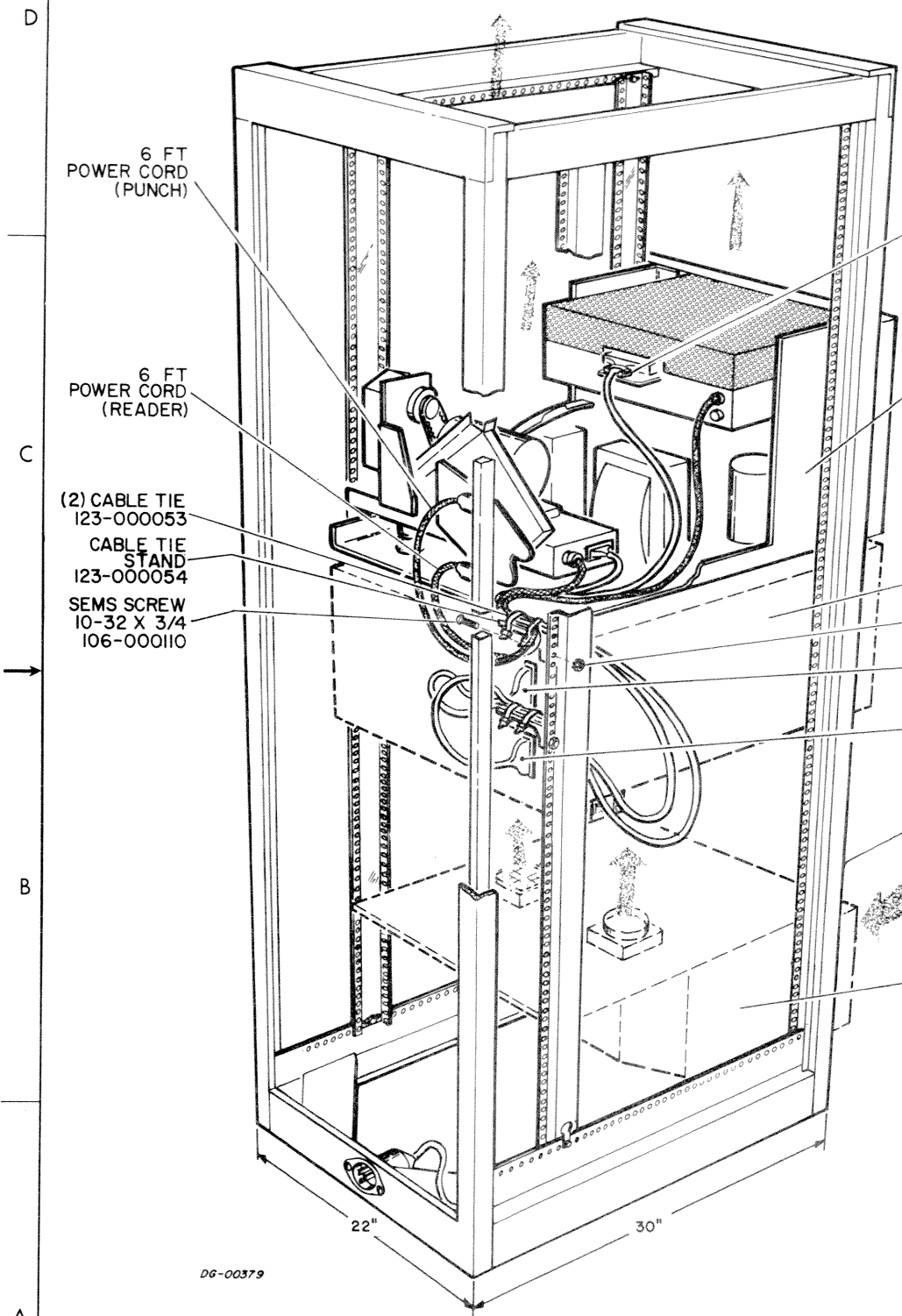
Signal	Page	Grid
BDS3'	1	D7
BDS5'	1	D7
CH1	1	C3
CH2	1	C4
CH3	1	C4
CH4	1	C4
CH5	1	C5
CH6	1	C5
CH7	1	C5
CH8	1	C5
CLEAR	1	A8
COMMON SELECT	1	D7
DATA8'	1	D6
DATA9'	1	D5
DATA10'	1	D5
DATA11	1	B7
DATA11'	1	D5
DATA12'	1	D4
DATA13'	1	D4
DATA14'	1	B4, D4
DATA15'	1	D3
DATA IN A	1	D7
DS4	1	D7
FWD	1	A4
GO(0)	1	A5
GO(1)	1	A5
INT ACK	1	B5
INTR'	1	C6
IO RESET	1	A8
MSKO	1	B7
RD ACK	1	B5
RD BUSY(1)	1	B5
RD CLEAR'	1	A6, B4
RD DONE(1)	1	C6, C7
RD INT DISABLE(0)	1	C7
RD IN REQ(1)	1	B5
RD READY'	1	C6
RD SELECT	1	A6, A8, D6
RD STROBE(1)	1	A7, B4
RQENB	1	C7
SELB'	1	A6
SELD'	1	B6
SPKT	1	C5
START	1	B8
STOP	1	A4

Drawing No. 001-000072

' Indicates "NOT"

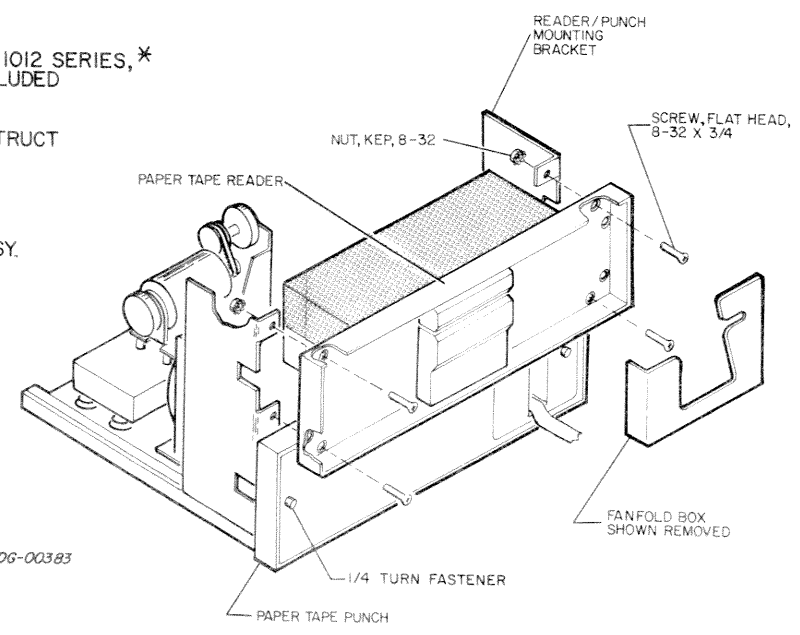
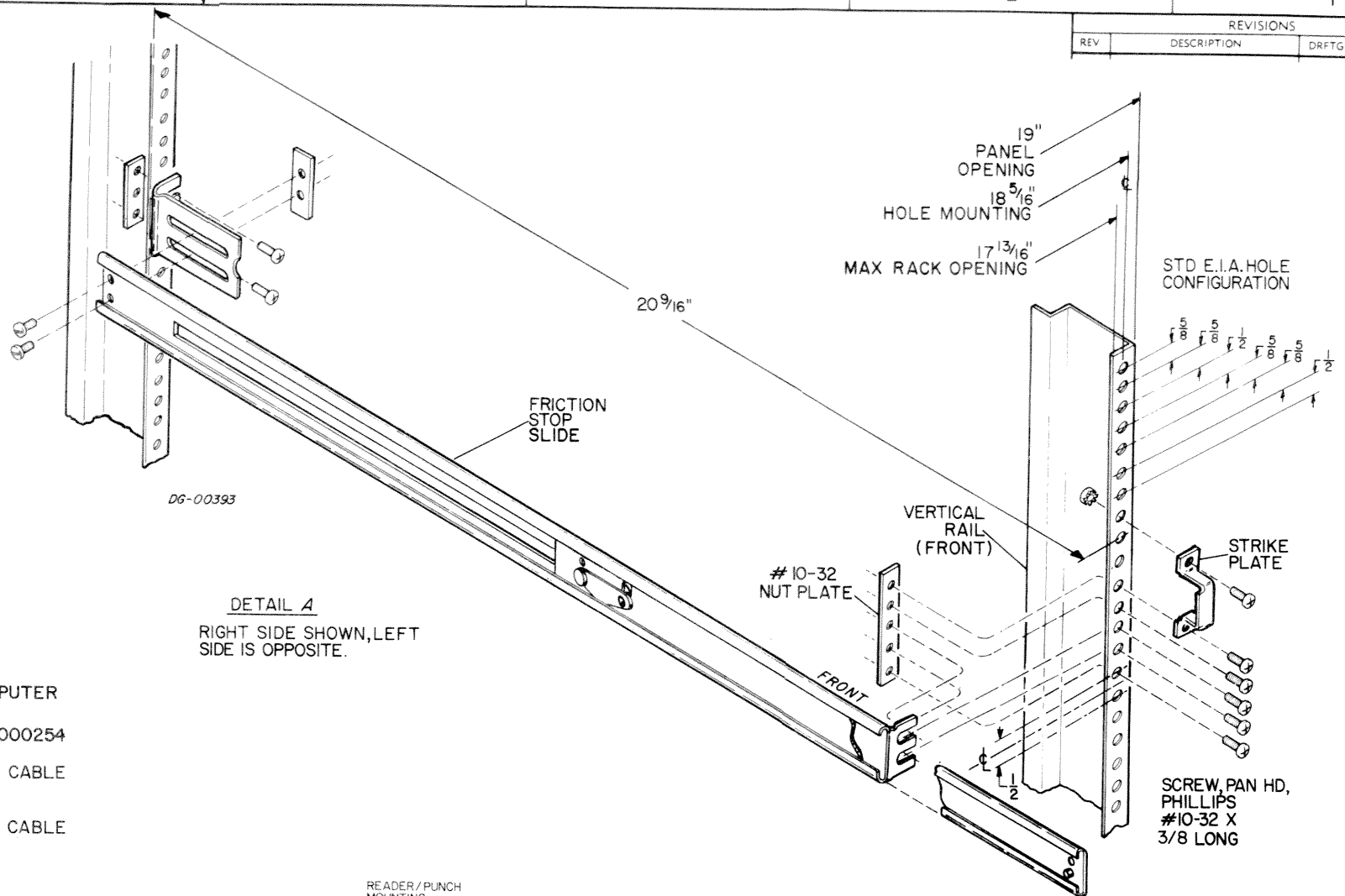
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DO NOT BLOCK LOUVERS ON TOP OF CABINET



- CABLE TIE MOUNT, 123-000067
- PAPER TAPE READER MODEL 6013 AND PAPER TAPE PUNCH MODEL 4012-A
- ANY NOVA LINE COMPUTER
- 10-32 KEP NUT 106-000254
- 6013-PTR EXTERNAL CABLE 1047A & B
- CPU-PTP EXTERNAL CABLE 1031A & B

19" CABINET, 1012 SERIES, * BLOWER INCLUDED
CAUTION
DO NOT OBSTRUCT AIR FLOW
BLOWER ASSY.



RACK MOUNTING PROCEDURE:

1. INSTALL SLIDE ASSEMBLY AS SHOWN IN DETAIL A.
2. MOUNT THE READER ON THE PUNCH AS SHOWN IN DETAIL B.
3. GUIDE THE RAILS ON BOTH SIDES OF THE PUNCH INTO THE CHASSIS.
4. ENGAGE THE STRIKE PLATES WITH THE QUARTER-TURN FASTENERS ON THE FRONT PANEL OF THE PUNCH TO LOCK PUNCH & READER IN PLACE (SEE DETAIL B).
5. CABLE FROM THE REAR AS SHOWN IN FIG. 1 MAKING SURE TO ALLOW SUFFICIENT SLACK TO ALLOW THE CHASSIS TO BE PULLED FORWARD WITHOUT STRAIN ON THE CABLES.

*FOR STABILITY CABINETS 1012D, (74 1/2" HT) — 1012E (41 1/2" HT) ARE MOUNTED ON BASE (DGC 112-000038), CABINETS 1012F, SINGLE BAY, 1012G 2 BAY, 1012H 3 BAY, 1012I 4 BAY AND 1012J ARE EQUIPPED WITH ANTI-TIP LEGS (DGC 112-000045) AND LEVELOR LEGS (DGC 123-000138), (F, G, H AND I ARE 70 9/16" HIGH — 1012J IS 37 5/16" HIGH).

(FOR INSTALLATION OF READER WITHOUT PUNCH SEE SHEET 2)

FIGURE 1

DETAIL B
READER ON PUNCH

QTY	DESCRIPTION	PART NO

UNLESS OTHERWISE SPECIFIED— DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES XX ± PARTS TO BE FREE FROM BURRS BREAK ALL EDGES 010	DRAWN <i>Paul P. Ryan</i> 9/27/73	DATA GENERAL CORPORATION SOUTHBORO, MASSACHUSETTS 01772
APPROVED <i>[Signature]</i> 12-4-73	ENGINEER	TITLE PAPER TAPE READER & PAPER TAPE PUNCH RACK INSTALLATION
MATERIAL	FIRST USED ON 6-01-73	SIZE CODE D 010
FINISH	SCALE	DRAWING NUMBER 000037
		REV 00

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REVISIONS				
REV	DESCRIPTION	DRFTG	APP BY	DATE

DO NOT BLOCK LOUVERS ON TOP OF CABINET

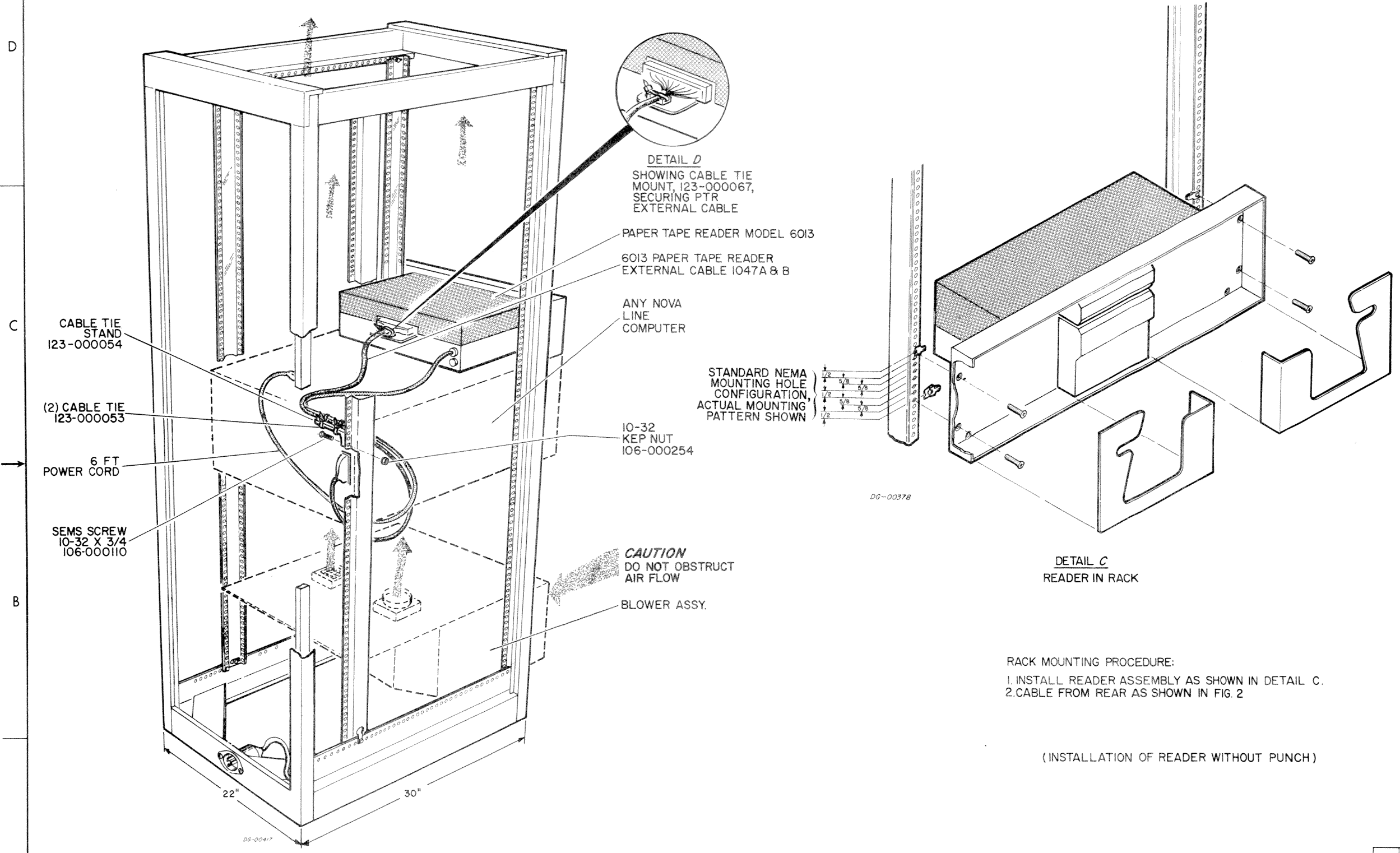


FIGURE 2

RACK MOUNTING PROCEDURE:
 1. INSTALL READER ASSEMBLY AS SHOWN IN DETAIL C.
 2. CABLE FROM REAR AS SHOWN IN FIG. 2

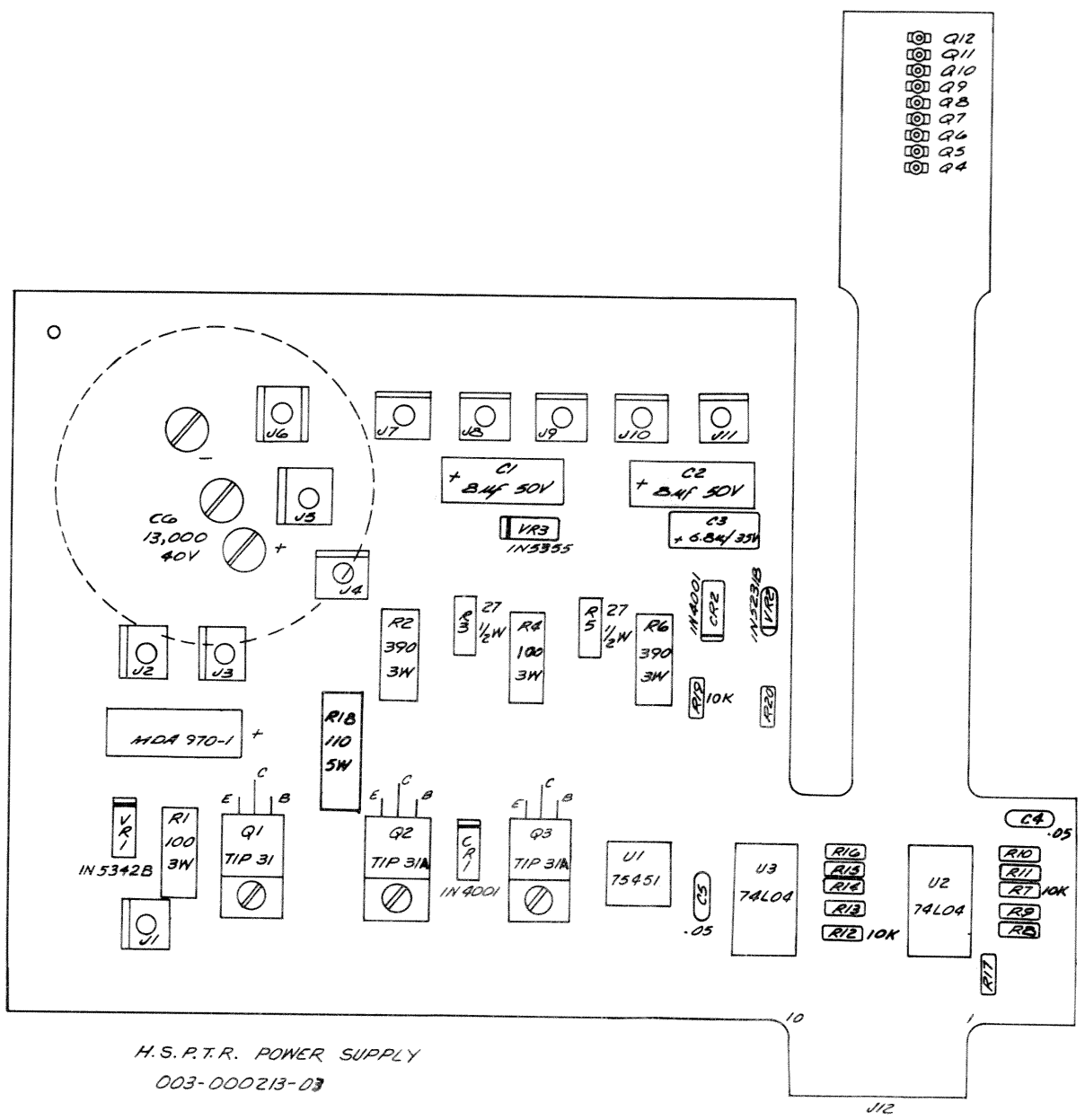
(INSTALLATION OF READER WITHOUT PUNCH)

UNLESS OTHERWISE SPECIFIED— DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES = .015 = .005 = .015 PARTS TO BE FREE FROM BURRS BREAK ALL EDGES 010	QTY	DESCRIPTION	PART NO
	DRAWN	<i>Paul P...</i> 8/27/73	DATA GENERAL CORPORATION SOUTH BORO, MASSACHUSETTS 01772
	CHECKED		TITLE
	ENGINEER		PAPER TAPE READER & PAPER TAPE PUNCH RACK INSTALLATION
UNLESS OTHERWISE SPECIFIED— ALL MACH SURFACES	APPROVED		
MATERIAL	FIRST USED ON		
FINISH	SCALE		
	SIZE	CODE	DRAWING NUMBER
	D	OIO	000037
			REV
			00

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003-000213-03
107-000213-02

REVISIONS				
REV	DESCRIPTION	DRFTG	APP BY	DATE



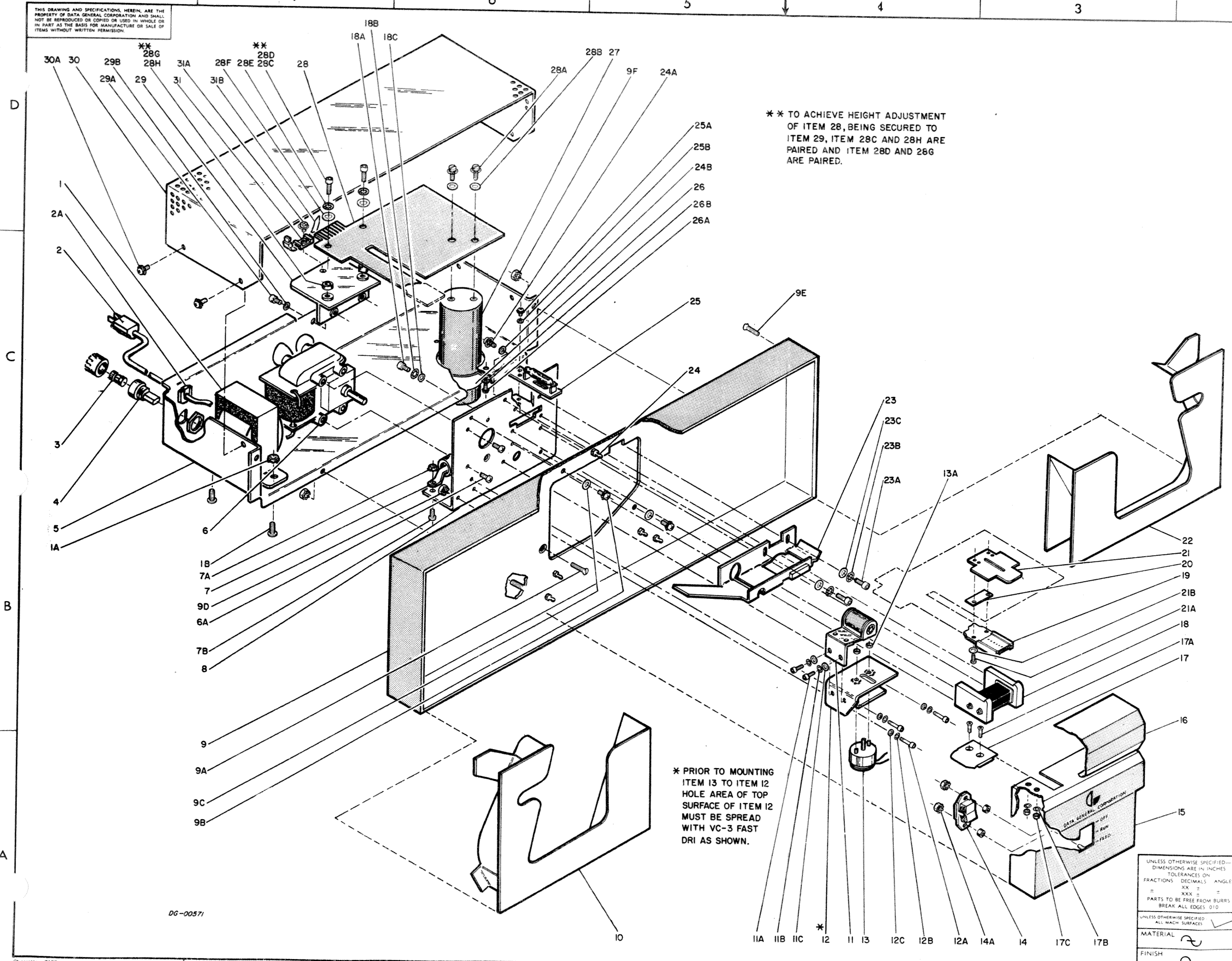
H.S.P.T.R. POWER SUPPLY
003-000213-03

QTY	DESCRIPTION	PART NO

UNLESS OTHERWISE SPECIFIED— DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES = .015 = .005 = .010 PARTS TO BE FREE FROM BURRS BREAK ALL EDGES 010	DRAWN <i>Las...</i> 11/18/73	DATA GENERAL CORPORATION SOUTHBORO, MASSACHUSETTS 01772 TITLE IPL, H.S.P.T.R. POWER SUPPLY MODEL 6013
UNLESS OTHERWISE SPECIFIED— ALL MACH SURFACES	CHECKED <i>...</i>	
MATERIAL \varnothing	ENGINEER	DRAWING NUMBER 000035
FINISH \varnothing	APPROVED <i>...</i>	
	FIRST USED ON 6013	REV 00
	SCALE \varnothing	SIZE CODE D 016

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REV	DESCRIPTION	DRFTG	APP BY	DATE



ITEM	QTY	DESCRIPTION	PART NO
31	1	CABLE MOUNT	123 000067
31A	1	SEMS SCREW 10-32 x 3/8	106 000106
31B	1	STA STRAP	123 000025
30	1	COVER CHASSIS	002 000759
30A	4	SEMS SCREW 4-40 x 1/4	106 000060
29	1	BRACKET ADJUSTABLE	002 000861
29A	2	SCREW, SOC. HD. CAP 4-40 x 5/16	106 000524
29B	2	WASH. FLAT #4	106 000285
28	1	P.C. BRD./P.C. BRD. I.P.L.	005 001236/016 000035
28A	2	SEMS SCREW 10-32 x 3/8	106 000106
28B	2	WASH. FLAT #10	106 000284
28C	2	SCREW SOC. HD. 4-40 x 1/2	106 000482
28D	2	SCREW SOC. HD. 4-40 x 5/16	106 000524
28E	2	WASH. LK. INT. TOOTH #4	106 000350
28F	2	WASH. FLAT #6	106 000461
28G	2	SPACER NYLON 3/16 HIGH	123 000237
28H	2	SPACER NYLON 5/16 HIGH	123 000237
27	1	CAPACITOR, 13K MFD, 50Vdc	103 000107
26	1	BRACKET CAPACITOR	123 000154
26A	2	SEMS SCREW 4-40 x 1/4	106 000060
26B	2	WASHER FLAT #4	106 000285
25	1	LAMP ASS'Y.	005 001241
25A	2	SEMS SCREW 4-40 x 1/4	106 000060
25B	2	WASHER FLAT #4	106 000285
24	7	BALL STUD	123 000158
24A	5	SEMS SCREW 6-32 x 3/8	106 000078
24B	5	WASH. FLAT #6	106 000461
23	1	BRACKET, CATCH	002 000859
23A	2	SCREW, SOC. HD. #4-40 x 5/16	106 000524
23B	2	WASH. LK. INT. TOOTH #4	106 000350
23C	2	WASH. FLAT #4	106 000285
22	1	FAN FOLD BOX, RIGHT	005 001420
21	1	KEEPER BRAKE	002 000667
21A	2	SCREW, PAN HD. 4-40 x 1/4	106 000478
21B	2	WASHER NYLON #4	106 000508
20	1	GUIDE EDGE	002 000739
19	1	COVER GLASS	005 001416
18	1	BRAKE	005 001238
18A	2	SCREW, SOCKET HD. 4-40 x 5/16	106 000524
18B	2	WASH. LK. INT. TOOTH #4	106 000350
18C	2	WASH. FLAT #4	106 000285
17	1	DIRECTOR, PAPER	002 001255
17A	2	SCREW, FL. HD. 2-56 x 3/16	106 000119
17B	2	WASHER LK. INT. TOOTH #2	106 000287
17C	2	NUT, 2-56	106 000258
16	1	COVER, LAMP	005 001239
15	1	COVER, BRAKE	005 001425
14	1	SWITCH ROCKER DP3P	110 000059
14A	2	KEPS NUT, 4-40	106 000257
13	1	SOLENOID	124 000001
13A	2	NUT, 3-48	106 000484
12	1	BRACKET, SOLENOID	002 000740
12A	3	ALLEN SCREW 6-32 x 5/16	106 000454
12B	3	WASHER, LK. INT. TOOTH #6	106 000455
12C	3	WASHER, FLAT #6	106 000461
11	1	ROLLER PINCH ASS'Y.	005 001237
11A	2	ALLEN SCREW 4-40 x 5/16	106 000524
11B	2	WASHER, LK. INT. TOOTH #4	106 000350
11C	2	WASHER, FLAT #4	106 000285
10	1	FAN FOLD BOX, LEFT	005 001419
9	1	PANEL, FRONT	002 000728
9A	1	SCREW, FL. HD. 6-32 x 7/16	006 000147
9B	2	SCREW, SEMS 6-32 x 5/16	106 000078
9C	2	WASHER, FLAT #6	106 000461
9D	1	KEPS NUT 6-32	106 000261
9E	2	SCREW, FLAT NO. 6-32 x 3/16	106 000012
9F	4	KEPS NUT #8	006 000255
8	1	BRACKET, P.T.R.	002 000862
7	1	RESISTOR, 50Ω	102 000296
7A	2	KEPS NUT #6	106 000256
7B	2	SCREW, PAN HD. 6-32 x 3/8	106 000296
6	1	MOTOR, DRIVE	005 001303
6A	2	SCREW, PAN HD. 8-32 x 1/2	106 000319
5	1	CHASSIS, P.T.R.	002 000750
4	1	FUSE HOLDER	113 000018
3	1	FUSE, 2 AMP BUSS	103 000009
2	1	CABLE, POWER	109 000035
2A	1	STRAIN RELIEF	123 000048
1	1	TRANSFORMER	104 000037
1A	2	KEPS NUT 3-32	106 000261
1B	2	SCREW, PAN HD. 3-32 x 3/8	106 000296

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MATERIAL	ENGINEER
FINISH	APPROVED 9/11/73
	FIRST USED ON 6013
	SCALE

DATA GENERAL CORPORATION
SOUTHBORO, MASSACHUSETTS 01772

TITLE
**IPL,
MECHANICAL,
PAPER TAPE READER
MODEL 6013**

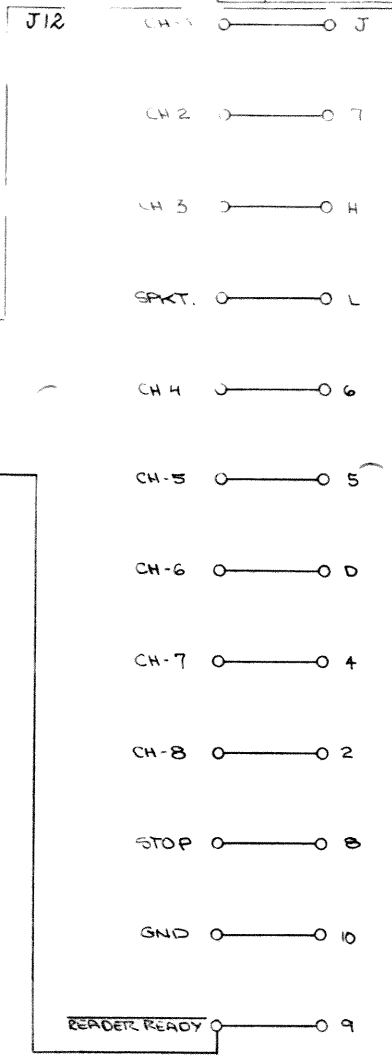
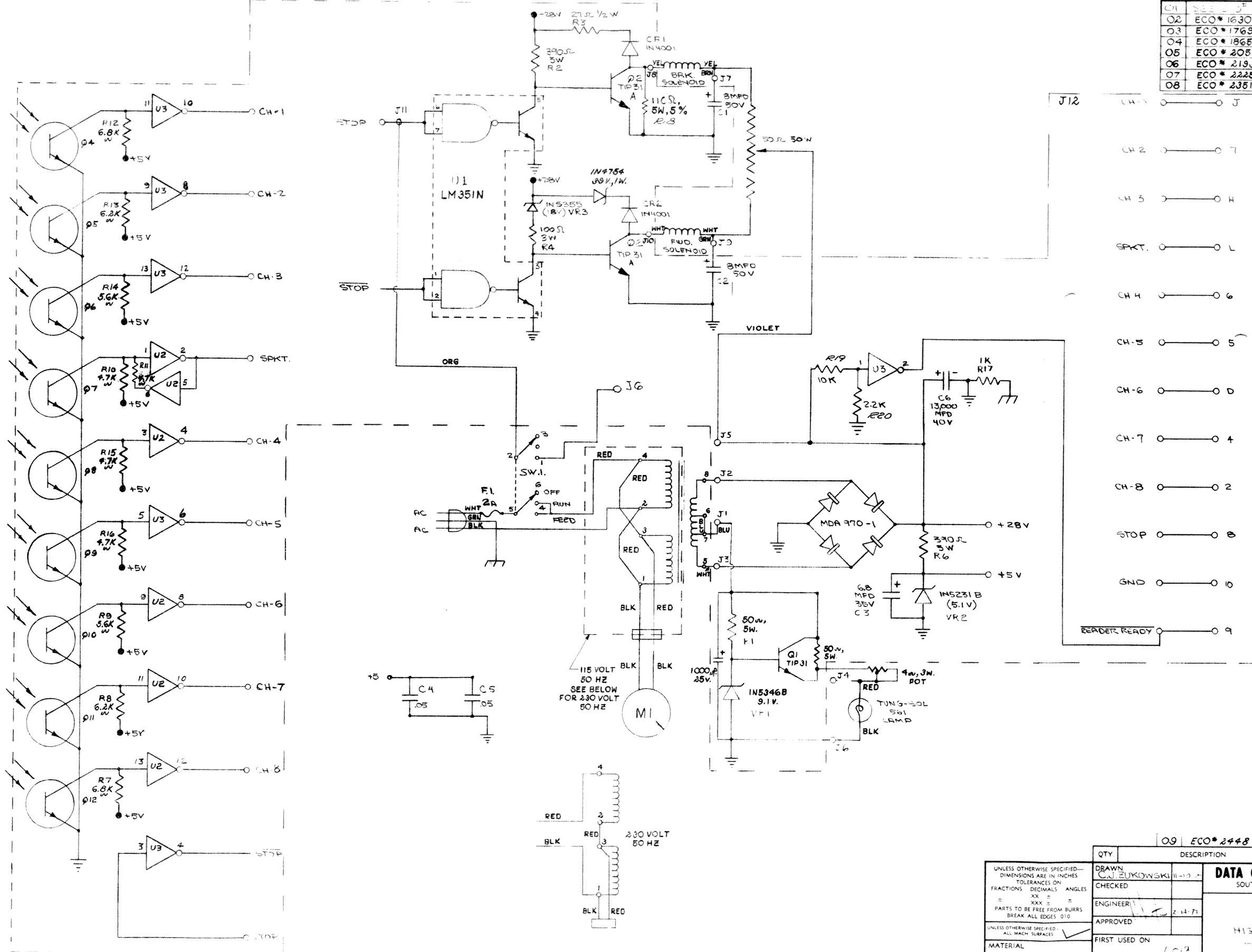
SIZE CODE
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DRAWING NUMBER
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01	SEE LIST OF BIDS	R.W.C.	JSA	4-23-74
02	ECO* 1630	R.W.C.		6-4-74
03	ECO* 1769	R.W.C.		8-2-74
04	ECO* 1865	R.W.C.		8-2-74
05	ECO* 2058	R.W.C.		1-2-75
06	ECO* 2193	R.W.C.		1-2-75
07	ECO* 2225	R.W.C.		1-2-75
08	ECO* 2351	R.W.C.		3-2-75



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ENGINEER		FIRST USED ON		SCALE	
FINISH		SIZE		CODE	
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UNLESS OTHERWISE SPECIFIED— ALL MACH SURFACES		D		09	

DATA GENERAL CORPORATION
SOUTHBORO, MASSACHUSETTS 01772

TITLE
READER
HIGH SPEED PAPER
TAPE ELECTRONICS

09 ECO* 2448 R.W.C. 4-23-74

