Model DPS-1

Dual Peripheral Switch

Technical Manual

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REVISION HISTORY

ECO No.	Date	Description	Pages
0603	5/9/86	Correct paddleboard misrepresentation	2-6
0626	5/29/86	Add Appendix B; Building Your Own Cable	
0668	9/17/86	Remove Content of Appendix A, Change all reference of Appx. B to Appx. A.	2-6

UNPACKING AND INSPECTION

Upon receipt of the DPS-1 from the carrier, inspect the shipping carton immediately for any evidence of damage or mishandling in transit.

If the shipping carton is water stained or damaged, contact the carrier and shipper immediately, specify the nature and extent of the damage and request that the carrier's agent be present when the carton is opened.

ZETACO's warranty does not cover shipping damage.

Check the contents of the container against the packing list to ensure that all items to be shipped were received.

For repair or replacement of any ZETACO product damaged in shipment, call ZETACO to obtain return authorization instructions.

PREFACE

This manual contains information regarding the installation and operation of the ZETACO Model DPS-1 Dual Peripheral Switch. Please read the entire manual BEFORE you install the unit.

The technical contents of the manual have been written based on the assumptions that the reader 1) has a working knowledge of Data General's (DG) Nova, Eclipse, or MV computers and their associated operating systems; 2) is familiar with standard installation, power, grounding, and peripheral cabling procedures; and 3) has access to technical information describing the magnetic tape drive and printer to be used with this device.

The information in this manual is organized into three major sections:

SECTION 1	PRODUCT OVERVIEW - Fully describes the DPS-1 features, capabilities, specifications, power and interface requirements.
SECTION 2	INSTALLATION - Describes and illustrates the procedures required to install the DPS-1. WARNING: DO NOT ATTEMPT TO SLIDE THE DPS-1 LOGIC BOARD INTO A DATA GENERAL COMPUTER CHASSIS.
SECTION 3	TROUBLE-SHOOTING AND CUSTOMER SERVICE - Contains information useful in analyzing faults, and how to get help.
APPENDIX A	BUILDING YOUR OWN CABLING

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1.0 PRODUCT OVERVIEW

1.1 GENERAL DESCRIPTION

The Model DPS-1 Dual Peripheral Switch is a multiplexor that allows two CPUs to share a tape drive and/or a line printer. The DPS-1 is designed to work with ZETACO's DG-emulating tape couplers, and with ZETACO's LP-370 DMA Line Printer Controller. The tape drive must have a standard Pertec interface; the printer must have either a standard Data Products or Centronics interface.

1.1.1 LOGIC

The CPU that first attempts to contact either peripheral gains control of the DPS-1 for that peripheral. The logic for the tape and printer are completely separate from each other.

In the case of the tape drive, the DPS-1 then makes the drive appear off-line to the other CPU until the tape side of the DPS-1 is released. In the case of the printer, the other CPU will be delayed in its use of the printer (no DEMAND signal will be sent) until the printer side of the DPS-1 is released. After the "release", either CPU is free again to gain control of the DPS-1 for that peripheral.

1.1.2 RACK-MOUNT ENCLOSURE

The DPS-1 rack-mount enclosure fits into a standard 19" rack with standard RETMA/EIA spacing on the mounting rails. The enclosure is 3.5" high and 23" deep. The DPS-1 logic board lies horizontally in the enclosure. A perforated metal cover is fitted on top of the enclosure. This permits air convection and provides protection to the board and power supply.

A vertically-mounted printed circuit board at the rear of the enclosure (the distribution panel) brings the signals to the DPS-1 from the cables that go to the CPUs and the peripherals. The connection from the distribution panel to the DPS-1 logic board is made with two 100-pin board-edge connectors. Cabling from the CPUs and peripherals attaches to the distribution panel via nine 50-pin D connectors.

The front panel of the enclosure contains display LEDs, a power switch, and a Tape Select switch. The LEDs indicate which CPU has control over each peripheral.

1.2 OPERATION AND FEATURES

1.2.1 GENERAL OPERATION

The following discussion assumes that the Tape Select switch on the front panel is in the Auto Mode. Use of this switch is described in Section 1.2.4.

Upon power up, the DPS-1 is in a neutral state. When in the neutral state, either of the two CPUs (CPU A or CPU B) can gain access to either of the two peripherals (tape drive or line printer). Once access occurs, the DPS-1 leaves the neutral state for that peripheral. It then effectively blocks the other CPU from gaining access to the peripheral by making it appear off-line (in the case of the tape side) or by not releasing any DEMAND signals (in the case of the printer side). Also, any signals coming from the other CPU are logically blocked, so that it cannot gain access to the DPS-1 or contact the peripheral.

When in the neutral state, the DPS-1 allows the following signals to pass from the peripherals to each of the CPUs:

FROM TAPE DRIVE: ON LINE, READY, FORMATTER BUSY, HARD ERROR, FILE MARK, DATA BUSY, CORRECTED ERROR, REWINDING.

FROM PRINTER: ON LINE, DEMAND, READY.

As soon as a CPU tries to send a command or data to one of the peripherals, it gains control of the DPS-1 for that peripheral by setting a flip-flop. The signals shown above are then made to appear inactive to the CPU that does not have control of the peripheral in question. Note that all other signals passing from the tape drive to the CPUs are allowed through at all times.

Once the DPS-1 has left the neutral state for a peripheral, it may be returned to its neutral state in these ways:

TAPE DRIVE:
1. The DPS-1 is powered down and then up.
2. The CPU in control is powered down.
3. The tape drive is taken off-line.

PRINTER:
1. The DPS-1 is powered down and then up.
2. The CPU in control is powered down.
3. Approximately 30 seconds elapse from the last time data was strobed by the CPU in control.
4. A 27 (octal) code is transmitted on the data lines. This code is not passed to the printer; however, it is acknowledged by a toggling of the DEMAND signal to the CPU that originated it.

1.2.2 SINGLE CPU POWER-DOWN

The DPS-1 monitors the +5 volt power supply pins from each of the CPU backplanes via lines in the printer and tape cables in order to determine if one of the CPUs is being powered down. If a CPU has control of either the tape or printer side of the DPS-1 when it is powered down, the DPS-1 will automatically return to the neutral state for that particular peripheral. It will then automatically lock out the signals from that CPU so that any errant signals coming from it can not gain control of either the tape or printer side of the DPS-1 If, however, the CPU that was not powered down had control of the tape or printer side of the DPS-1 at the time of the power-down of the other CPU, it will continue operation as normal.

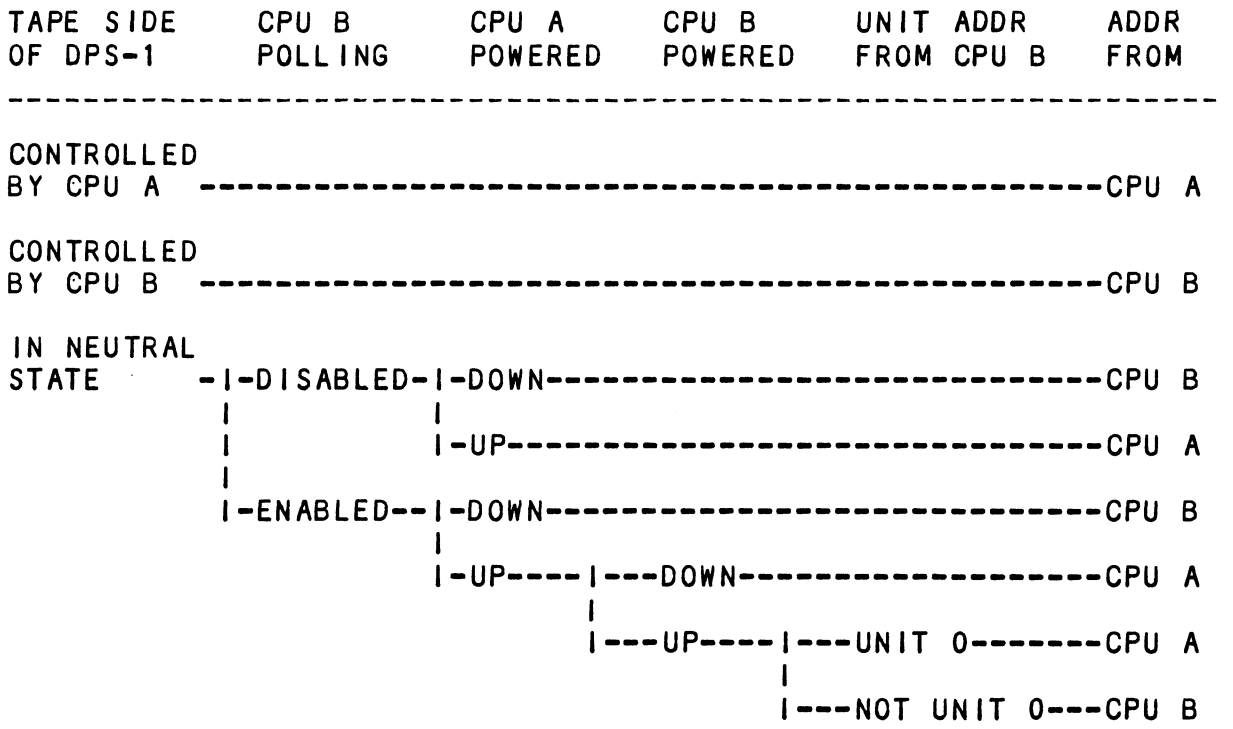
1.2.3 TAPE DRIVE UNIT ADDRESS SELECT

Three signals from the CPU (TRANSPORT ADDRESS 0 [TAD 0], TRANSPORT ADDRESS 1 [TAD 1], and FORMATTER ADDRESS [FAD]) are used to select one of up to eight daisy-chained tape drives. These signals must be stable before any commands or data can be sent.

Some programs (e.g. ZETACO's Universal Mag Tape Rell - not supplied) poll to determine which drives are ON-LINE (unit 0-7) before actually sending any commands. Since these lines are static and are not strobed, the DPS-1, while in its neutral state, cannot be sure which computer's address lines to pass through. To get around this problem, the assumption is made that when CPU B is powered up and its tape coupler is not in use, it outputs the address for unit 0. Therefore, if CPU B is powered up while the DPS-1 is in the neutral state, it is assumed that any address other than unit 0 coming from CPU B means it is polling the units on the tape drive daisy-chain.

CPU B's tape address signals are then allowed through. Otherwise, when the DPS-1 is in the neutral state only CPU A's tape address signals are allowed through. This feature can be disabled via the configuration switches. (See Section 2.2.)

The following graph shows which CPU's tape unit addresses are allowed through depending on the various conditions present. As the graph is followed from left to right, more conditions are added. The right-most column indicates which CPU has control of the three address lines for the various conditions present.



1.2.4 MANUAL CPU SELECT FOR TAPE SIDE

Manual selection of a particular CPU's access to the tape drive can be done by flipping the Tape Select switch on the front panel to either CPU A or CPU B. The appropriate LED on the front panel will then light up.

If the switch is in the Auto Mode and it is desired to manually select one CPU when the other one has control (its LED is lit), do the following:

A. Flip the switch to the desired CPU.
B. Flip the switch back to the Auto Mode which should then clear out the other CPU's LED.
C. Flip the switch back to the desired CPU.

Do not alter the switch setting during interaction of one of the CPUs with the tape drive or errors may occur.

1.2.5 PRINTER STROBE CAPTURE

The DPS-1 logic is set up so that if one of the CPUs is using the printer and the other CPU attempts to send a character, the strobe for that character will be "captured". When the first CPU is done using the printer and the DPS-1 returns to the neutral state, the DPS-1 will automatically send the "captured" strobe over for the second CPU. Since the data on the printer controller's data lines remains valid, the "lost" character will now be sent over. The second CPU will then have control of the printer side of the DPS-1, and will have 30 seconds to start sending out the remainder of the information it previously attempted to print.

1.2.6 INHIBIT OF 27 (OCTAL) CODE TO PRINTER

Whenever a 27 (octal) code is sent by the CPU in control of the printer side of the DPS-1, it is prevented from going to the printer. The printer side of the DPS-1 will then revert to the neutral state, and there will be no characters in the printer's line buffer (provided the 27 code was preceeded by a paper movement code). Upon reception of the 27 code, a DEMAND signal is generated by the DPS-1 and sent to the CPU that sent the 27 code. This allows the CPU to send out more data if required.

1.3 SPECIFICATIONS

1.3.1 TAPE DRIVE INTERFACE

Tape Format:	Specified by Drive Formatter; PE, NRZI or GCR
Interface Standard:	Standard Pertec, Embedded Formatter
Electrical:	Open Collector, Active Low, Standard TTL
Driver:	Standard Open Collector TTL: Logic Low = 0.4V Maximum Logic High = 2.4V Minimum
Receiver:	Schmitt Trigger: 220/330 ohm voltage divider network; VIH=3V

1.3.2 PRINTER INTERFACE

Interface Standard:	Standard Data Products or Centronics Interface
Electrical:	Open Collector and Totem Pole, Active High and Low, Standard TTL
Driver:	Standard TTL with 22 ohms in Series: Logic Low = 0.4V Maximum Logic High = 2.4V Minimum
Receiver:	Schmitt Trigger: 330/390 ohm voltage divider network from printer; VIH=2.7V

1.3.3 CABLING

There are nine 50-pin, round, twisted pair, shielded FCC cables that connect to the distribution panel at the rear of the DPS-1 enclosure. All connectors on the distribution panel are 50-pin D connectors. Descriptions of the cables are:

1. Six tape cables (two to CPU A, two to CPU B and two to the tape drive).

2. Three printer cables (one to CPU A, one to CPU B and one to the printer).

1.3.4 MECHANICAL

Dimensions:

DPS-1 Logic Board:	1/2" x 15" x 17" (H x W x D) (1.3 cm x 38.1 cm x 43.2 cm)
DPS-1 Enclosure:	3.5" x 17" x 23" (H x W x D) (8.9 cm x 43.2 cm x 58.4 cm) (rack-mount tabs extend an additional 1" (2.5 cm) beyond the 17" width)

Shipping Weight: 19 pounds

1.3.5 POWER REQUIREMENTS

.5A at 120 VAC, 60 Hz
-or-
.25A at 240 VAC, 50 Hz

1.3.6 ENVIRONMENTAL REQUIREMENTS

Operating Temperature: 0° to 55°C

Relative Humidity: 10% to 90% (non-condensing)

2.0 INSTALLATION

2.1 INSPECTION OF THE LOGIC BOARD

Remove the top of the unit to expose the DPS-1 Logic Board (see Figure 2.1). Verify that the board has not been dislodged from its nylon rails and connectors during shipping.

If it has, slide the board back into the nylon rails. Push the board gently in until it meets the connectors. Then use the extractor handles on the two outside corners to provide leverage for final insertion into the connectors. Apply equal pressure on both handles until the board is firmly seated.

WARNING: DO NOT ATTEMPT TO SLIDE THE LOGIC BOARD INTO DG COMPUTER CHASSIS.

2.2 CONFIGURATION OF DIP SWITCHES

There are four 8-switch DIP packs on the logic board that are used to configure the DPS-1. The switch packs are labeled SW1, SW2, SW3, and SW4 (see Figure 2.1). Numbers 1-8 are assigned to the 8 switches in each pack.

A description of the various configuration options is given beginning on page 2-2. All switches must be set up according to these configurations. If settings other than those shown are used, the DPS-1 will not operate properly. The underlined configurations are the way the units are shipped.

You may find it necessary to examine or change the switch configuration after the DPS-1 has been installed in its system rack. To do so, TURN THE POWER OFF and remove the front panel completely by unbolting it and disconnecting the internal cable. Grasp the extraction handles on the logic board and carefully pull it out of the enclosure.

To re-install the board, follow the procedure described in Section 2.1 above.

1. Use of the REWIND signal to obtain control of the tape side of the DPS-1. Note that this is in addition to the GO pulse which is always used for this purpose. SEE LOGIC PAGE 3.

   ENABLED: SW1 - Switch 1 closed
   SW1 - Switch 2 open
   SW1 - Switch 3 closed
   SW1 - Switch 4 open

   DISABLED: SW1 - Switch 1 open
   SW1 - Switch 2 closed
   SW1 - Switch 3 open
   SW1 - Switch 4 closed

2. Select polarity of data to printer. This is active high for Dataproducts and Centronics interfaced models. SEE LOGIC PAGE 6.

   ACTIVE HIGH: SW1 - Switch 6 open

   ACTIVE LOW: SW1 - Switch 6 closed

3. Examine the VFU bit in addition to the 7 data bits when determining if a return to neutral code (27 octal) for the printer side of the DPS-1 has been transmitted. This should be enabled if the system is using a VFU and disabled otherwise. SEE LOGIC PAGE 6.

   ENABLED: SW1 - Switch 7 closed
   SW1 - Switch 8 open

   DISABLED: SW1 - Switch 7 open
   SW1 - Switch 8 closed

4. Select polarity of STROBE signal to printer. This is active high if it is a Data Products interfaced model and active low if it is a Centronics interfaced model. SEE LOGIC PAGE 6.

   ACTIVE HIGH: SW2 - Switch 1 open
   SW2 - Switch 2 closed
   SW2 - Switch 3 open
   SW2 - Switch 4 closed
   SW2 - Switch 5 open
   SW2 - Switch 6 closed

ACTIVE LOW:
SW2 - Switch 1 closed
SW2 - Switch 2 open
SW2 - Switch 3 closed
SW2 - Switch 4 open
SW2 - Switch 5 closed
SW2 - Switch 6 open

NOTE: Your system configuration may require a shared tape drive but no shared printer. SET THE SWITCHES FOR ACTIVE LOW IF THERE ARE NO PRINTER CABLES CONNECTED TO THE DPS-1.

5. Select polarity of READY signal from the printer. This signal is active high for Data Products and Centronics interfaced models. SEE LOGIC PAGE 7.

DISABLED:
SW1 - Switch 5 closed
SW2 - Switch 7 closed
SW3 - Switch 2 closed
SW3 - Switch 3 open
SW4 - Switch 1 closed
SW4 - Switch 2 open

ACTIVE HIGH:
SW1 - Switch 5 open
SW2 - Switch 7 open
SW3 - Switch 2 closed
SW3 - Switch 3 open
SW4 - Switch 1 closed
SW4 - Switch 2 open

ACTIVE LOW:
SW1 - Switch 5 open
SW2 - Switch 7 closed
SW3 - Switch 2 open
SW3 - Switch 3 closed
SW4 - Switch 1 open
SW4 - Switch 2 closed

6. Select polarity of the ON LINE signal from the printer. This signal is active high for Data Products and Centronics interfaced models. SEE LOGIC PAGE 7.

ACTIVE HIGH:
SW2 - Switch 8 open
SW3 - Switch 4 closed
SW3 - Switch 5 open
SW4 - Switch 3 closed
SW4 - Switch 4 open

ACTIVE LOW:
SW2 - Switch 8 closed
SW3 - Switch 4 open
SW3 - Switch 5 closed
SW4 - Switch 3 open
SW4 - Switch 4 closed

7. Select polarity of the DEMAND signal from the printer. This signal is active low for Data Products and Centronics interfaced models. SEE LOGIC PAGE 7.

ACTIVE HIGH:
SW3, switch 1 open
SW3, switch 6 closed
SW3, switch 7 open
SW4, switch 5 closed
SW4, switch 6 open

ACTIVE LOW:
SW3, switch 1 closed
SW3, switch 6 open
SW3, switch 7 closed
SW4, switch 5 open
SW4, switch 6 closed

8. Allow polling of the tape unit address lines by CPU B while the DPS-1 is in the neutral state. This feature should be enabled if 1) the tape drives are daisy-chained, or 2) if a program is used that polls the unit address lines before sending any commands to the drive. It should be disabled otherwise. SEE LOGIC PAGE 4.

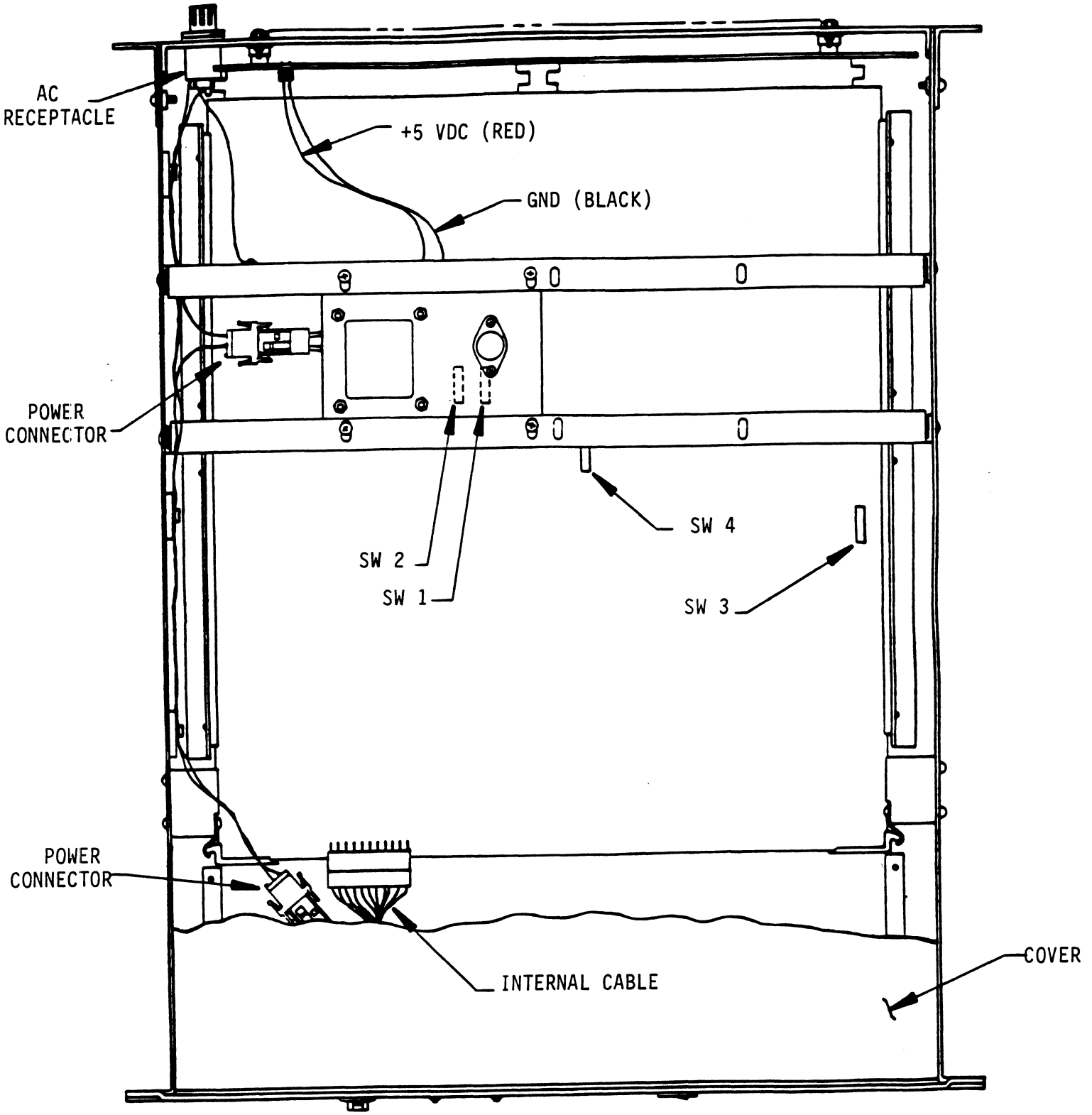
ENABLED:
SW4, switch 7 closed
SW4, switch 8 open

DISABLED:
SW4, switch 7 open
SW4, switch 8 closed

2.3 INSTALLATION OF THE RACK-MOUNT ENCLOSURE

The main body of the enclosure attaches to the standard 19" rack mount via slotted tabs in the front and slotted adjustable "L" brackets in the rear. Mounting hardware (bolts, nut plates, washers, etc.) must be supplied by the customer. Slide the enclosure body into its designated space on the rack. Bolt on the front of the enclosure using the two slots on each tab (note that the tabs should be on the outside of the rail, i.e., the cabinet door side). Adjust the fore-aft position of the slotted "L" brackets at the rear of the enclosure. When they are in the proper position, tighten them down to the enclosure and bolt them to the rack-mount rails.

FIGURE 2.1 Top View (Cover Removed)



2.4 INSTALLATION OF THE FRONT PANEL

WARNING: Ensure that the power cord is not yet connected to the AC receptacle on the rear panel of the DPS-1.

There are two cables attached to the front panel; one has two black wires, and the other has 10 wires, some of which are colored.

Attach the cable with the 10 wires to the connector on the logic board. Make sure the polarity is correct (the "teeth" face upwards on the connector that is on the cable). Attach the other cable to the two-wire connector inside the enclosure.

Bolt the front panel onto the cabinet's mounting rails.

2.5 CONNECTING ZETACO SUPPLIED CABLES TO ZETACO CONROLLERS

(See Appendix B for building your own cabling.)

At this point you must decide which CPU will be "A" and which will be "B". Make this decision simply on the basis of what will facilitate your operations. Once the determination has been made, label each CPU and its cables accordingly.

There are nine cables that attach to the DPS-1. Three of them go to CPU A, three to CPU B, two to the tape drive and one to the line printer. Refer to Figure 2.2 as you follow the procedure below.

1. Remove the B internal FCC tape coupler paddleboard presently installed in your system. In it's place, connect the DPS-1 internal FCC B paddleboard, following the installation instructions in your tape coupler manual.

2. Remove the B internal FCC paddleboard for the printer controller and install the DPS-1 internal FCC paddleboard in its place. The pins must correspond to the slot the printer controller is in. Install the paddleboard on the leftmost pins (looking at the backplane), B1 through B71.

3. Connect the external tape and printer cables between the CPU bulkheads and the DPS-1 for both CPU A and CPU B. Take care to connect all CPU A cables to the CPU you have designated as CPU A, and likewise for CPU B. Text on the backpanel of the DPS-1 indicates which cables go to which CPU.

4. Connect the external tape cables from the DPS-1 to the tape drive unit. The appropriate connectors on the DPS-1 are the ones labeled TAPE(P1) and TAPE(P2) that have the word "PERIPHERAL" underneath them.

5. Connect the external printer cable between the DPS-1 and the printer. The appropriate connector on the DPS-1 is the one labeled PRINTER that has the word "PERIPHERAL" underneath it.

6. Connect the power cord to the AC receptacle.

2.6 INITIAL POWER-UP AND CHECKOUT

```
**************************************************
*                                                *
*  IF AT ANY POINT IN THE FOLLOWING PROCEDURE    *
*  THE DPS-1 DOES NOT FUNCTION AS DESCRIBED,     *
*  REFER TO SECTION 3 (TROUBLE-SHOOTING) FOR HELP. *
*                                                *
**************************************************
```

Press the power switch on the front panel of the DPS-1. The LED, which is built into the switch, should now be lit. All four front panel indicator LEDs should be out and should remain out until one of the CPUs tries to strobe over a command or data to one of the peripherals.

To verify that the DPS-1 has been successfully installed and is in good working order, ZETACO recommends running the following reliability tests:

DEVICE	CONTROLLER	TEST
Printer	LP-370	DCHPTTST (DG DTOS)
Tape	TC-133	UMTR (ZETACO)
	ZDF-1	UMTR (ZETACO)
	BMX-2	ZMTRL (ZETACO)

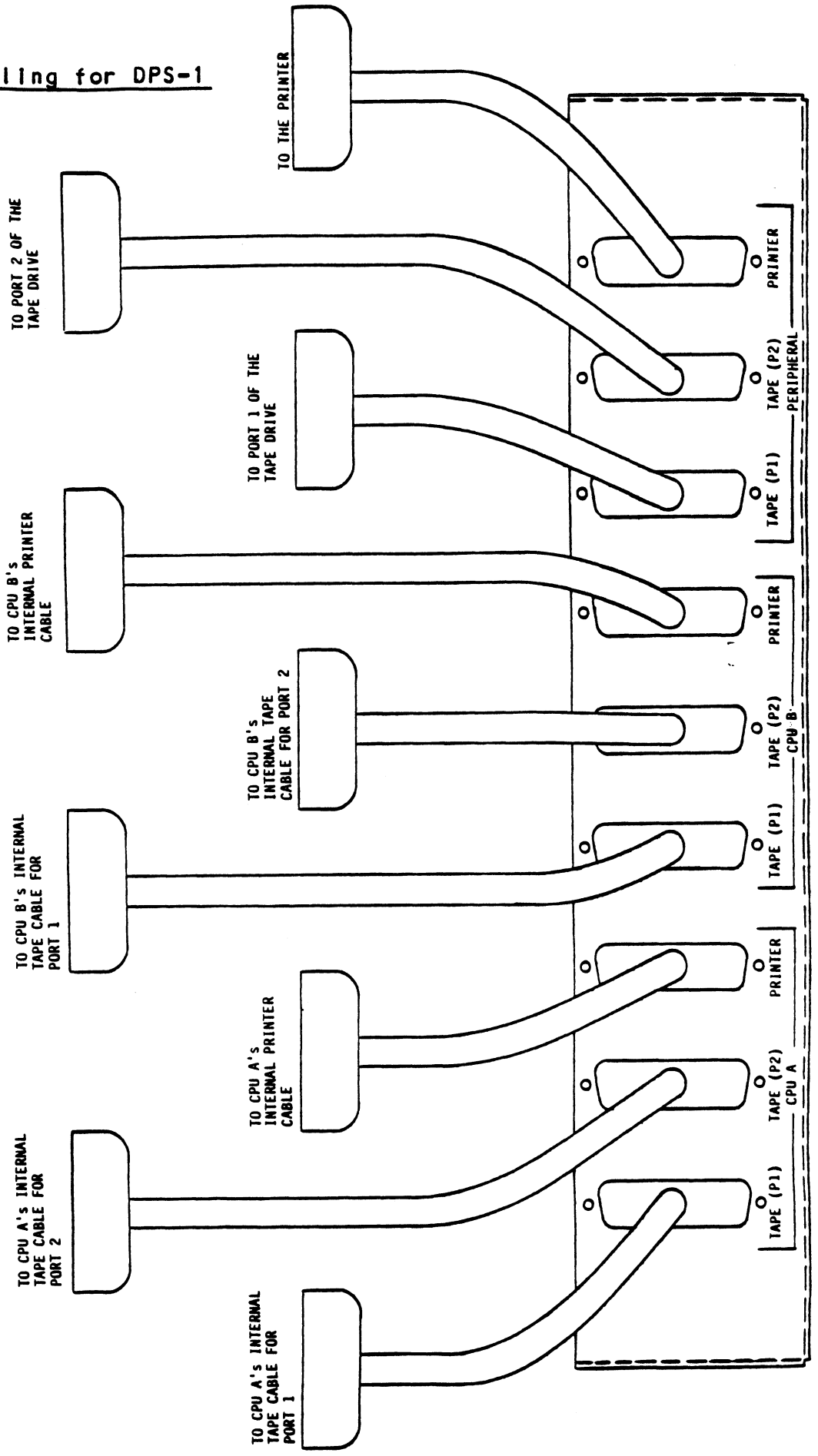
First, power-up CPU A and run the tape and printer tests. The LED for CPU A should light for each peripheral when it's test is run, and remain lit. When testing is complete, power-down CPU A and verify that both LEDs are no longer lit.

The DPS-1 has now been returned to the neutral state.

Repeat the testing procedure for CPU B. When testing is complete, again return the DPS-1 to the neutral state by powering CPU B down.

Next, power-up both CPUs. All LEDs should be out; both CPUs are idle, and therefore neither has control of the DPS-1 for any peripheral.

FIGURE 2.2 Cabling for DPS-1



3.0 TROUBLE-SHOOTING AND CUSTOMER SERVICE

3.1 POWER-UP PROBLEMS

Upon power-up of the DPS-1, the red LED built into the power switch should be lit. If it is not, try the following sequence of steps:

1. Be sure the AC power cord is securely plugged into both the AC wall receptacle and the DPS-1.

2. With the power switch in the OFF position, disconnect the power cord from the unit and remove the fuse. Examine the fuse for electrical continuity. If it is blown, go to Step 5 below. If it is intact, reinstall it, making sure that the fuse cap locks tightly in place. Re-connect the power cord and turn the unit back on.

3. If the LED is still not lit, turn the unit OFF and again disconnect the power cord from the DPS-1. Remove the top cover and, referring to Figure 2.1, verify that all power connections are made. Tug gently on the wires and connectors to ensure all connections are sound. Be sure the red and black wires are connected to the proper terminals, and that the connectors are pushed firmly onto the terminals. Finally, make sure the internal cable from the front panel is properly connected to the logic board (see Section 2.4). Replace the top of the enclosure, re-connect the power cord, and turn the unit ON.

4. If the LED is still not lit, contact ZETACO Customer Support (see Section 3.4) for assistance.

5. If the fuse is blown, first replace it.

   IMPORTANT: REPLACE ONLY WITH A 2A NORMAL-BLOW FUSE.

   Then, re-connect the power cord and turn the unit ON.

6. If the LED is still not lit, turn the unit OFF and check the fuse again. If it is intact, go back to Step 3 above. If it is blown, replace it. Next, take off the front panel and remove the logic board from the unit. Replace the front panel and turn the unit on. The LED will not light, since its power is derived from the circuit board, but leave the power switch in the ON position for several seconds.

Now turn power OFF and again check the fuse. If it is intact, a short on the logic board is indicated; if it is blown, the short is elsewhere in the unit. Provide this information to Customer Support for further assistance.

3.2 FRONT PANEL INDICATORS

Upon power-up of the DPS-1, none of the four indicator LEDs on the front panel should be lit (unless a CPU immediately strobes a command or data over to one of the peripherals). A feedback loop in the logic prevents both CPUs from having access to the same peripheral. If such an error did occur, it would be indicated by both the CPU A and CPU B LEDs for a single peripheral being lit simultaneously.

If one of the indicator LEDs lights up when it shouldn't, try the following sequence of steps to correct it:

1. Power the DPS-1 down, and then up again.

2. Double check that the proper DIP switch settings have been used (see Section 2.2).

3. Be sure the Tape Select switch is in the "AUTO" position.

4. If the problem is with the tape LEDs, disconnect the external cables from the DPS-1 for the CPU in question. For example, if the tape indicator for CPU B is lit, power the unit down and disconnect the tape cables from the CPU B section of the DPS-1 rear panel. Turn power back ON and observe whether the LED is still lit. If it is, a problem on the logic board is indicated. At this point, try re-seating the board. To do this, TURN THE POWER OFF and open the front panel. Grasp the extraction handles and pull the board out about two inches. Now re-install the board and press it firmly into place. Close the front panel after first making sure that the internal cable is properly connected to the logic board. Turn the unit ON and again observe the LED. If it is still lit, the problem is in the board circuitry. Contact ZETACO Customer Support (see Section 3.4) for further assistance.

If, after the cables were disconnected, the LED in question did NOT remain lit, this suggests a problem with the tape cables, the CPU B tape coupler or the CPU itself.

3.3 PERFORMANCE PROBLEMS

"Performance" here refers to the normal data-transfer operations of the peripheral subsystems in use. For example, an ending memory address error during a data transfer to or from tape is a problem related to the "performance" of the tape subsystem.

If only ONE CPU is reporting such errors, the problem is most likely in the CPU/coupler or in the cables from the CPU to the DPS-1. At this point you may ignore the DPS-1 in trouble-shooting your subsystem problems; however, ZETACO recommends that in doing so you temporarily bypass it. To do so:

1. Disconnect the cable(s) from the CPU A section of the DPS-1 for the peripheral in question.

2. Disconnect the corresponding cable(s) from the PERIPHERAL section of the DPS-1.

3. Connect the cables from the CPU A section to the cables from the PERIPHERAL section and resume operation.

If BOTH CPUs are reporting such errors, the problem may be with the DPS-1, the DPS-1-to-peripheral cables, or the peripheral itself. To determine whether the DPS-1 is the cause, again bypass it. If the errors are still reported, the problem lies with the DPS-1-to-peripheral cables or the peripheral itself.

NOTE: You may wish to try the same test with the CPU B section to eliminate any coincidental problems with CPU A.

If the errors disappear, a problem with the DPS-1 is indicated. Contact ZETACO Customer Support (see Section 3.4) for further assistance.

3.4 CUSTOMER SUPPORT HOTLINE

ZETACO, Inc. provides a Customer Support Hotline (612-890-5138) to answer technical questions and to assist with installation and trouble-shooting problems.

The Hotline is manned by a technical team from 8:00 a.m. to 5:00 p.m. (Central Time) Monday through Friday.

3.5 WARRANTY INFORMATION

The DPS-1 is warranted free from manufacturing and material defects for up to two years from date of shipment when used in a normal and proper manner. Except for the express warranties stated above, ZETACO disclaims all warranties including all implied warranties of merchantability and fitness. The stated express warranties are in lieu of all obligations of liabilities on the part of ZETACO for damages, including but not limited to, special, indirect or consequential damages arising out of or in connection with the use or performance of ZETACO's products.

MATERIAL RETURN INFORMATION

All possible effort to test a suspected malfunctioning DPS-1 should be made before returning it to ZETACO for repair. This will: 1) determine if the board is actually defective, and 2) increase the speed and accuracy of a product's repair, which is often dependent upon a complete understanding of the user's checkout test results, problem characteristics, and the user system configuration.

Please allow our service department to do the best job possible by answering the following questions thoroughly and returning this information with the malfunctioning unit.

1. Does the problem appear to be intermittent or heat sensitive? (If yes, explain.)

2. Describe the system configuration, (i.e., peripherals, controllers, model of computer, etc.)

3. Has the unit been returned before? Same problem?

To be filled out by CUSTOMER:

Model #:_____
Serial #:_____
Note: If returning logic board only, write the board serial number here. Otherwise, write the unit serial number.

RMA #:_____(Call ZETACO to obtain an RMA number.)

Returned by:

Your name:_____
Firm:_____
Address:_____
Phone:_____

APPENDIX A

BUILDING YOUR OWN CABLES

There are nine cables that attach to the DPS-1. Three of them go to CPU A, three go to CPU B, two to the tape drive, and one to the printer.

If you are manufacturing your own cables,reference the following, which documents the respective connector pin/signal nomenclature for the DPS-1 connectors. Pay special attention to the DPS-1 required +5 volt sense line(s).

Sections A, B, and C describe cabling from the DPS-1 to the respective tape and printer controllers. Sections D, E, and F describe cabling from the DPS-1 to the respective tape and printer peripherals. Section G describes the +5 volts sense requirements and list the mating connectors required to connect to the DPS-1.

Section 2.6 can be used for initial checkout if you are using Zetaco supplied controllers in a Data General mini-computer.

CABLING FOR THE DPS-1

A. From the DPS-1 to the Tape Controller

CPU-A or CPU-B Distribution Panel Connector P1 or P4

DPS-1 PIN	GND PIN	DESCRIPTION	TAPE CONTROLLER
Pin 2	Pin 1	Formatter Busy	User Specified
Pin 4	Pin 3	Last Word	User Specified
Pin 6	Pin 5	Write Data 4	User Specified
Pin 8	Pin 7	Initiate Command (GO)	User Specified
Pin 10	Pin 9	Write Data 0	User Specified
Pin 12	Pin 11	Write Data 1	User Specified
Pin 14	-----	+ 5 Volt Sense	User Specified
Pin 18	Pin 17	Reverse	User Specified
Pin 20	Pin 19	Rewind	User Specified
Pin 22	Pin 21	Write Data Parity	User Specified
Pin 24	Pin 23	Write Data 7	User Specified
Pin 26	Pin 25	Write Data 3	User Specified
Pin 28	Pin 27	Write Data 6	User Specified
Pin 30	Pin 29	Write Data 2	User Specified
Pin 32	Pin 31	Write Data 5	User Specified
Pin 34	Pin 33	Write	User Specified
Pin 38	Pin 37	Edit	User Specified
Pin 40	Pin 39	Erase	User Specified
Pin 42	Pin 41	Write File Mark	User Specified
Pin 46	Pin 45	Transport Address 0	User Specified
Pin 48	Pin 47	Read Data 2	User Specified
Pin 50	Pin 49	Read Data 3	User Specified

B. From the DPS-1 to the Tape Controller.

CPU-A or CPU-B Distribution Panel Connector P2 or P5

DPS-1 PIN	GND PIN	DESCRIPTION	TAPE CONTROLLER
Pin 1	-------	Read Parity	User Specified
Pin 2	-------	Read Data 0	User Specified
Pin 3	-------	Read Data 1	User Specified
Pin 4	-------	Load Point	User Specified
Pin 6	Pin 5	Read Data 4	User Specified
Pin 8	Pin 7	Read Data 7	User Specified
Pin 10	Pin 9	Read Data 6	User Specified
Pin 12	Pin 11	Hard Error	User Specified
Pin 14	Pin 13	File Mark	User Specified
Pin 16	Pin 15	Identification	User Specified
Pin 18	Pin 17	Formatter Enable	User Specified
Pin 20	Pin 19	Read Data 5	User Specified
Pin 22	Pin 21	End of Tape	User Specified
Pin 24	Pin 23	Rewind/Unload	User Specified
Pin 26	Pin 25	NRZ	User Specified
Pin 28	Pin 27	Ready	User Specified
Pin 30	Pin 29	Rewinding	User Specified
Pin 32	Pin 31	File Protect	User Specified
Pin 34	Pin 33	Read Strobe	User Specified
Pin 36	Pin 35	Write Strobe	User Specified
Pin 38	Pin 37	Data Busy	User Specified
Pin 40	Pin 39	High Speed Status	User Specified
Pin 42	Pin 41	Corrected Error	User Specified
Pin 44	Pin 43	On Line	User Specified
Pin 46	Pin 45	Transport Address 1	User Specified
Pin 48	Pin 47	Formatter Address	User Specified
Pin 50	Pin 49	High Speed Status	User Specified

C. From the DPS-1 to the Printer Controller.

CPU-A or CPU-B Distribution Panel Connector P3 or P6

DPS-1 PIN	GND PIN	DESCRIPTION	PRINTER CONTROLLE
Pin 8	Pin 7	Data 1	User Specified
Pin 10	Pin 9	Data 2	User Specified
Pin 12	Pin 11	Data 3	User Specified
Pin 14	------	+5 Volt Sense	User Specified
Pin 18	Pin 17	Data 4	User Specified
Pin 20	Pin 19	Data 5	User Specified
Pin 22	Pin 21	Data 6	User Specified
Pin 26	Pin 25	Vfu/Data 8	User Specified
Pin 28	Pin 27	Demand	User Specified
Pin 30	Pin 29	On Line	User Specified
Pin 34	Pin 33	Data 7	User Specified
Pin 42	Pin 41	Strobe	User Specified
Pin 46	------	Ready	User Specified

D. From the DPS-1 to the Tape Drive.

Distribution Panel Connector P7

DPS-1 PIN	GND PIN	DESCRIPTION	TAPE DRIVE
Pin 2	Pin 1	Formatter Busy	User Specified
Pin 4	Pin 3	Last Word	User Specified
Pin 6	Pin 5	Write Data 4	User Specified
Pin 8	Pin 7	Initiate Command (GO)	User Specified
Pin 10	Pin 9	Write Data 0	User Specified
Pin 12	Pin 11	Write Data 1	User Specified
Pin 18	Pin 17	Reverse	User Specified
Pin 20	Pin 19	Rewind	User Specified
Pin 22	Pin 21	Write Data Parity	User Specified
Pin 24	Pin 23	Write Data 7	User Specified
Pin 26	Pin 25	Write Data 3	User Specified
Pin 28	Pin 27	Write Data 6	User Specified
Pin 30	Pin 29	Write Data 2	User Specified
Pin 32	Pin 31	Write Data 5	User Specified
Pin 34	Pin 33	Write	User Specified
Pin 38	Pin 37	Edit	User Specified
Pin 40	Pin 39	Erase	User Specified
Pin 42	Pin 41	Write File Mark	User Specified
Pin 46	Pin 45	Transport Address 0	User Specified
Pin 48	Pin 47	Read Data 2	User Specified
Pin 50	Pin 49	Read Data 3	User Specified

E. From the DPS-1 to the Tape Drive.

Distribution panel connector P8

DPS-1 PIN	GND PIN	DESCRIPTION	TAPE DRIVE
Pin 1	-------	Read Parity	User Specified
Pin 2	-------	Read Data 0	User Specified
Pin 3	-------	Read Data 1	User Specified
Pin 4	-------	Load Point	User Specified
Pin 6	Pin 5	Read Data 4	User Specified
Pin 8	Pin 7	Read Data 7	User Specified
Pin 10	Pin 9	Read Data 6	User Specified
Pin 12	Pin 11	Hard Error	User Specified
Pin 14	Pin 13	File Mark	User Specified
Pin 16	Pin 15	Identification	User Specified
Pin 18	Pin 17	Formatter Enable	User Specified
Pin 20	Pin 19	Read Data 5	User Specified
Pin 22	Pin 21	End of Tape	User Specified
Pin 24	Pin 23	Rewind/Unload	User Specified
Pin 26	Pin 25	NRZ	User Specified
Pin 28	Pin 27	Ready	User Specified
Pin 30	Pin 29	Rewinding	User Specified
Pin 32	Pin 31	File Protect	User Specified
Pin 34	Pin 33	Read Strobe	User Specified
Pin 36	Pin 35	Write Strobe	User Specified
Pin 38	Pin 37	Data Busy	User Specified
Pin 40	Pin 39	High Speed Status	User Specified
Pin 42	Pin 41	Corrected error	User Specified
Pin 44	Pin 43	On Line	User Specified
Pin 46	Pin 45	Transport Address 1	User Specified
Pin 48	Pin 47	Formatter Address	User Specified
Pin 50	Pin 49	High Speed Status	User Specified

C. From the DPS-1 to the Printer Controller.

CPU-A or CPU-B Distribution Panel Connector P3 or P6

DPS-1 PIN	GND PIN	DESCRIPTION	PRINTER CONTROLLE
Pin 8	Pin 7	Data 1	User Specified
Pin 10	Pin 9	Data 2	User Specified
Pin 12	Pin 11	Data 3	User Specified
Pin 14	-------	+5 Volt Sense	User Specified
Pin 18	Pin 17	Data 4	User Specified
Pin 20	Pin 19	Data 5	User Specified
Pin 22	Pin 21	Data 6	User Specified
Pin 26	Pin 25	Vfu/Data 8	User Specified
Pin 28	Pin 27	Demand	User Specified
Pin 30	Pin 29	On Line	User Specified
Pin 34	Pin 33	Data 7	User Specified
Pin 42	Pin 41	Strobe	User Specified
Pin 46	------	Ready	User Specified

F. From the DPS-1 to the Printer.

Distribution Panel Connector P9

DPS-1 PIN	GND PIN	DESCRIPTION	PRINTER
Pin 8	Pin 7	Data 1	User Specified
Pin 10	Pin 9	Data 2	User Specified
Pin 12	Pin 11	Data 3	User Specified
Pin 18	Pin 17	Data 4	User Specified
Pin 20	Pin 19	Data 5	User Specified
Pin 22	Pin 21	Data 6	User Specified
Pin 26	Pin 25	Vfu/Data 8	User Specified
Pin 28	Pin 27	Demand	User Specified
Pin 30	Pin 29	On Line	User Specified
Pin 34	Pin 33	Data 7	User Specified
Pin 42	Pin 41	Strobe	User Specified
Pin 46	------	Ready	User Specified

G. Cabling notes for the DPS-1

The DPS-1 requires +5 volt sense from each CPU. (The +5 volt sense line detects when one cpu is powered down, so that if it is the CPU in control of the DPS-1 when power is removed, the +5 volt sense logic will automatically put the DPS-1 back into the neutral state. This allows the other CPU to gain control of the DPS-1.) A +5 volt sense line is in both the magnetic tape and printer cabling to each CPU. It is required that only one of the +5 volt sense lines be connected to each CPU.

The mating connectors required to connect to the DPS-1 are

- CPU-A and CPU-B Connectors
  Amp 50s Recpt. 205211-2 Connectors
  Amp Pins 66505-8 Pins

- Peripheral Connectors
  Amp 50p Plug 205212-3 Connectors
  Amp Pins 66507-2 Pins