INSTALLATION AND SERVICE MANUAL

26069A

HPIB-to-Differential
Translator Kit

Part No. 26069-90901

Microfiche No. 26069-90801

HEWLETT PACKARD

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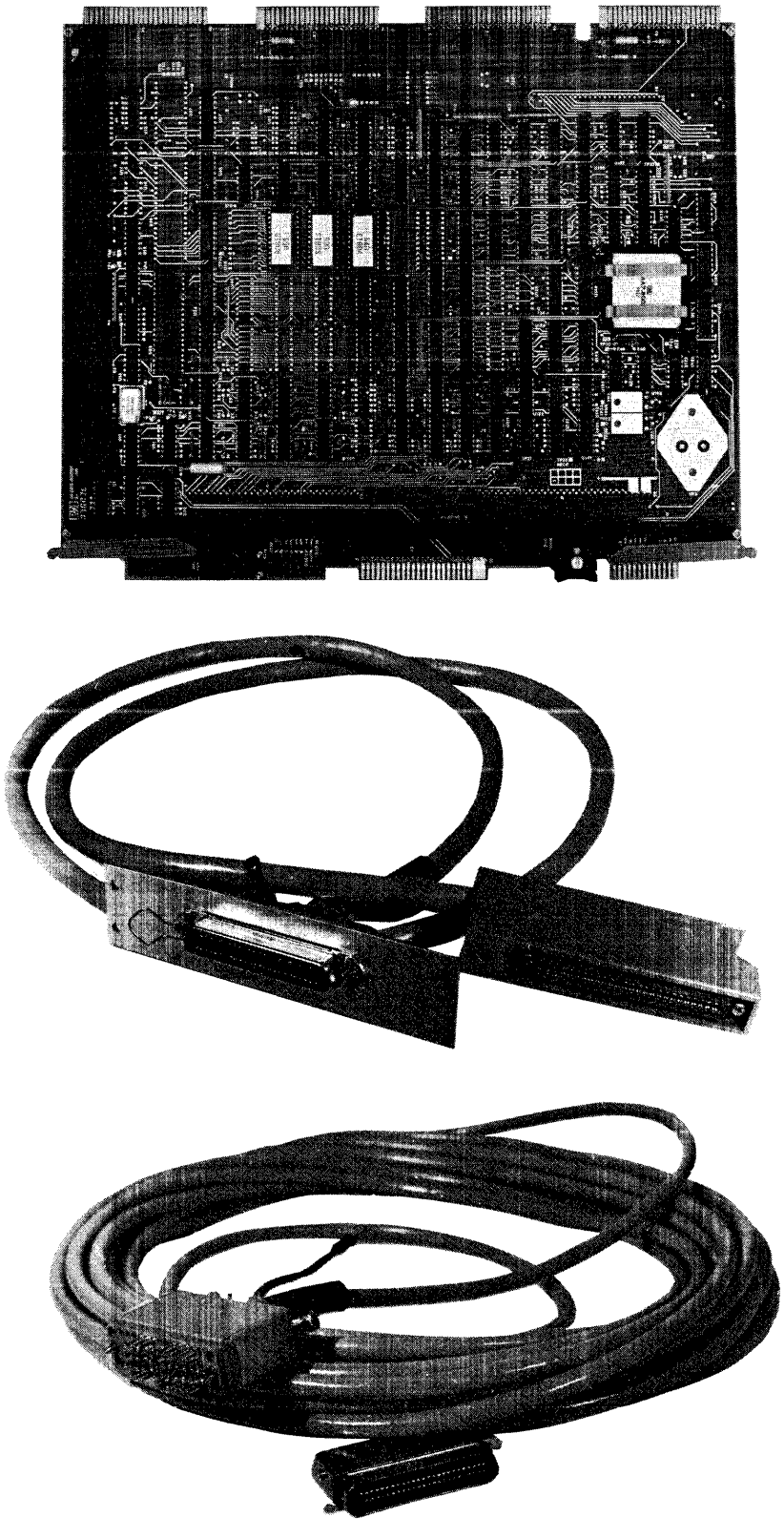

HP 26069A HPIB-to-Differential Translator Kit (Opt. 344)

SECTION I.
GENERAL INFORMATION

1-1. INTRODUCTION

This manual covers general information, installation, maintenance, and replaceable parts for the HP 26069A HPIB-to-Differential Translator Kit.

This section includes a general description, identification, and specification information.

1-2. GENERAL DESCRIPTION

The HP 26069A HPIB-to-Differential Translator Kit makes possible, the connection of an HP 2619A, HP 2618A, HP 2617A, or HP 2613A with a differential interface, to an HP 3000 Series 30, HP 3000 Series 33, or HP 3000 Series 44, System with HP-IB interface protocol.

The following options designate the type of cabling furnished with the HP 26069A for connecting the line printer to the various HP systems:

HP 26069A Kit	HP 3000 System
Opt. 301	Series 30
Opt. 302	Series 33
Opt. 344	Series 44

The HP 26069A HPIB-to-Differential Translator Kit contains the following parts:

SYSTEM 3000 Series 30

Translator PCA	26069-60001
HP-IB Ribbon Cable	30090-60051
Translator Cable	26069-60005
HP 26069A Installation and Service Manual	26069-90901

SYSTEM 3000 Series 33

Translator PCA	26069-60001
HP-IB Ribbon Cable	30090-60051
Printer Cable	26069-60003
Interconnect Cable	26069-60004
HP 26069A Installation and Service Manual	26069-90901

SYSTEM 3000 Series 44

Translator PCA	26069-60001
Printer Cable	26069-60003
Interconnect Cable	26069-60002
HP 26069A Installation and Service Manual	26069-90901

Programs used in conjunction with the HP 26069A Kit include a driver (HIOLPRT2) for operation of the printer and a diagnostic (PD466A) to verify printer operation. This diagnostic is an on-line verifier that checks the printer, the Translator PCA, and the cabling, by running the 26069A Self Test program (refer to Self Test in section III).

1-3. IDENTIFICATION

Hewlett-Packard utilizes five digits and a letter (00000A) to identify standard Hewlett-Packard interface kits. This designation appears on the title page of this manual and is used as the first five numbers of the part number to identify that item as a part of this product.

Printed circuit assembly (PCA) revisions are identified by a letter, a series code, and a division code marked beneath the part number on the card.

Example: A-1435-46

The letter identifies the etched trace pattern on the unloaded board. The four-digit series code identifies a particular configuration of the loaded PCA. The two-digit division code identifies the Hewlett-Packard division that manufactured the assembly.

1-4. ENVIRONMENTAL SPECIFICATIONS

The HP 26069A Translator PCA has been designed for operation in a System 3000 Series 30, 33, or 44. Refer to the system environmental specification in which the translator interface will be operating for this information.

1-5. POWER REQUIREMENTS

2.25 Amps @ 5V ± .1V
150 mAmp @ +12V ± .1V
100 mAmp @ −12V ± .1V

SECTION II. INSTALLATION AND CONFIGURATION

2-1. INTRODUCTION

This section provides information for installation of the HP 26069A Translator Kit and configuration requirements for operation.

2-2. INSTALLATION

To install the HP 26069A HPIB-to-Differential Translator Kit, proceed as follows:

WARNING

Installation of this assembly requires removal of protective covers and should be performed by qualified service personnel only.

a. Set both the system controller and the printer main power switches to OFF.

b. Ensure that the configuration of the Translator PCA is at the desired settings (refer to 2-3 CONFIGURATION).

c. Open the system controller back cover.

d. Insert the HP 26069A into the device slot as close as possible to the General Interface Controller (GIC) it will be using. The address priority of the Translator PCA is determined by the HP-IB Address switch setting on the PCA. This PCA may be installed in any (the next available slot) device slot.

e. Connect the HP-IB Ribbon Cable to the GIC and the HP 26069A. Translator Kit options 301 and 302 furnish this cable as part of the kit. Any unused ribbon cable should be left intact and positioned such that it will cause no problems.

f. Connect the translator/printer I/O cable(s) from the HP 26069A PCA to the printer as indicated for either HP 3000 Systems Series 30 or Series 33/44 listed below:

HP 3000 Series 30

NOTE

The HP 3000 Series 30 will support a maximum of two line printers.

1. Connect the hooded edge connector of the Translator Cable (26069-60005) to the Translator PCA and route this cable out the bottom of the cabinet (refer to figure 2-1).

2. Attach the Winchester Connector, at the other end of the Translator Cable, to the Printer I/O Connector located on the back panel of the printer. Also, secure the ground wire to the grounding screw next to the connector.

HP 3000 Series 33/44

NOTE

The HP System 3000 Series 33 will support a maximum of two line printers; and, the Series 44 will support a maximum of four line printers.

1. Connect the hooded edge connector of the Interconnect cable (26069-60002 for Series 44 or 26069-60004 for Series 33) to the Translator PCA. Route this cable through the plastic strap cable guides over to the Terminal/Communication Data Panel on the Series 33 or to the Side Junction Panel on the Series 44 panel (refer to figure 2-2).

2. Connect the 50 pin Blue Ribbon Connector, on the Interconnect Cable, to the Terminal/Communication Data Panel (Series 33) or the Side Junction Panel (Series 44) by first removing the cover plate at the desired connector location and then attaching the connector to that location.

3. Connect the 50 pin Blue Ribbon Connector of the Printer I/O Cable to the Blue Ribbon Connector just installed on the Terminal/Data Communication-Side Junction Panel.

4. Attach the Winchester Connector of the Printer I/O cable to the Printer I/O Connector located on the back panel of the printer. Also, secure the ground wire to the printer grounding screw (two grounding screws have been provided with the kit for use with the various printers a third, sheet metal screw is also provided for use if no threaded hole is provided) next to the connector. All printers should be grounded in this manner; if the 2619A Printer is not grounded errors will result.

g. Close all covers for operation.

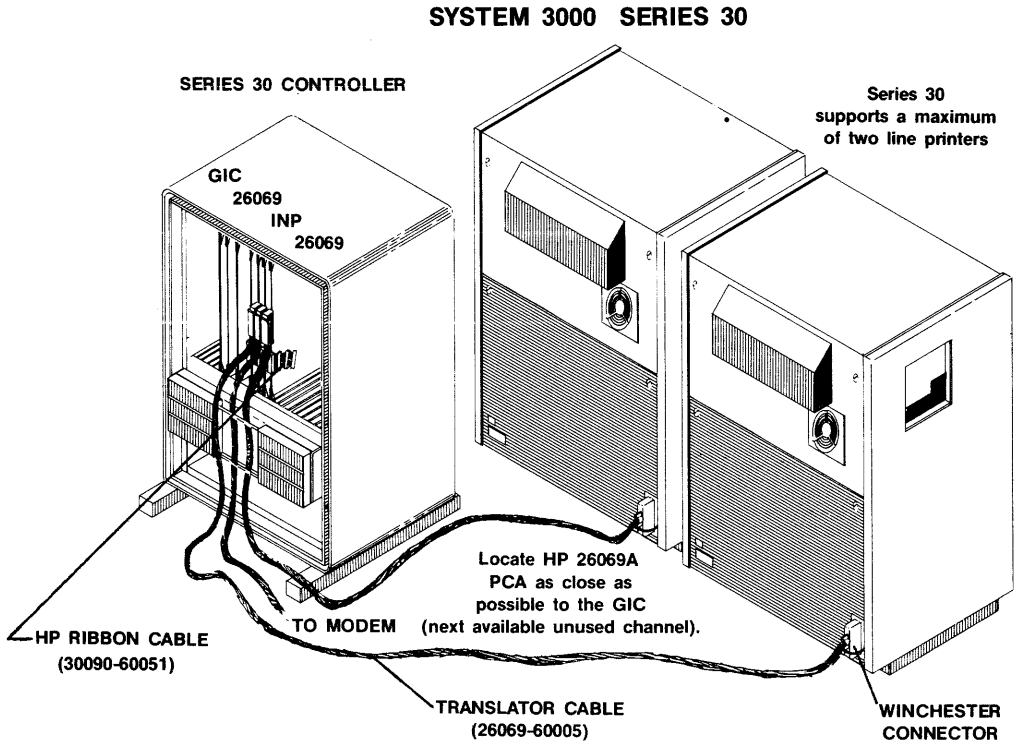

Figure 2-1. HP 26069A Cable Configuration For Series 30

2-3. CONFIGURATION

The HP 26069A includes two features which have selectable values: HP-IB Address, and 132/136 Column Print. Table 2-1 lists the switch and jumper setting required to obtain the various configurations and figure 2-3 shows their location. These functions are explained in more detail in the following paragraphs.

TABLE 2-1. HP 26069A CONFIGURATION SETTINGS.

SELECTION	FUNCTION	SETTING
Switch S40	**HP-IB Address**	
	0	0
	7	7
Jumpers E45-E46	**132/136 Print Columns**	
	*132 Columns	OUT
	136 Columns	IN

* Factory configuration setting.

HP-IB Address

The HP-IB Address for the HP 26069A is selected using an eight-position thumb switch (S40) located on the outer plane of the PCA. This switch selects addresses 0 through 7. HP-IB address selection determines (during power-up) the data line on which responses to parallel polls will occur; address 0 sets DIO Line 8, address 1 sets DIO Line 7, and-so-forth to address 7, which sets DIO Line 1. It is possible to programmatically change the response line for a given address without changing the HP-IB address setting.

132/136 Column Printers

The 132/136 column strap (E45-E46) configures the HP 26069A for operation with either 132 column printers or 136 column printers. If the interface column configuration does not match that of the printer, some of the printed characters can be lost.

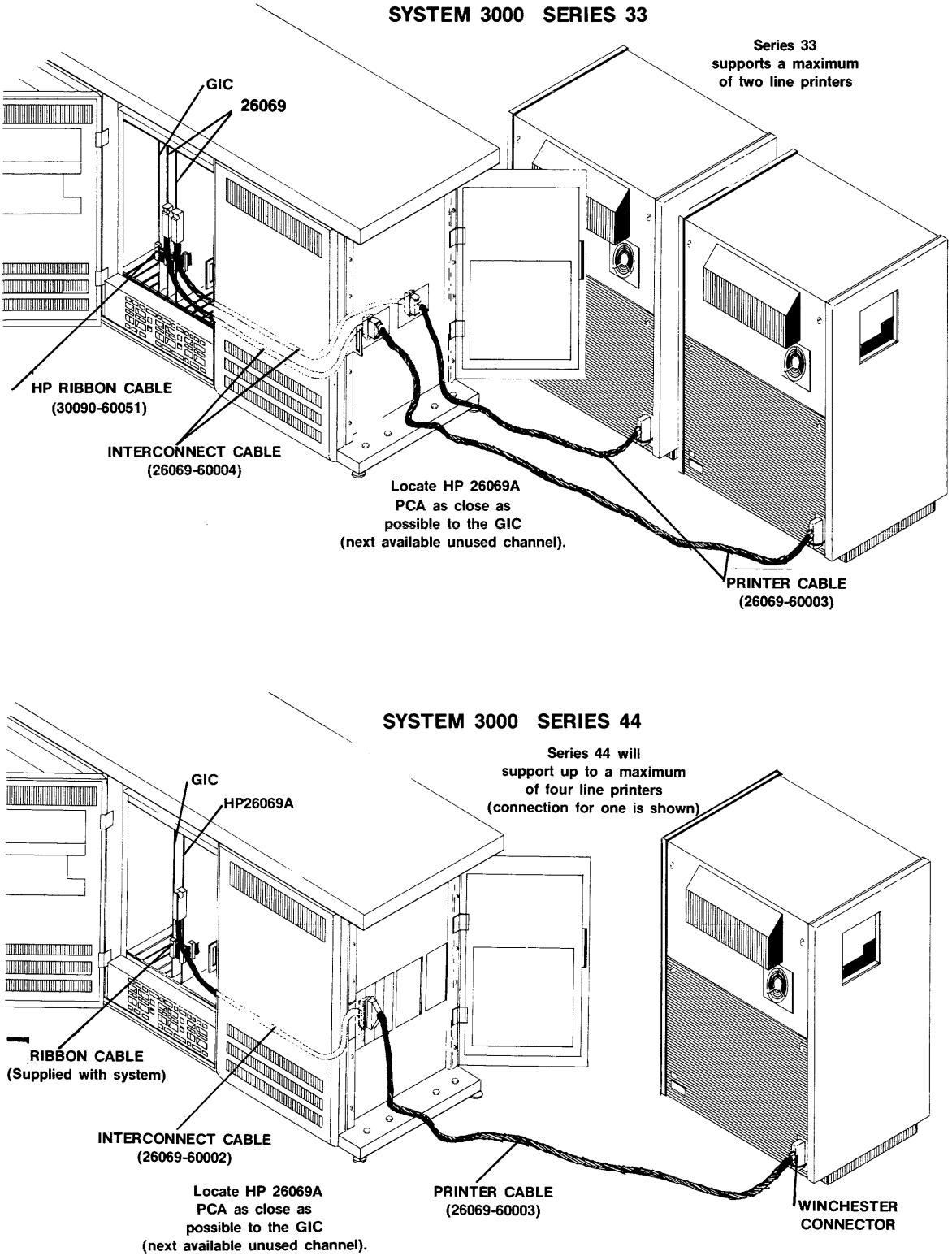

Figure 2-2. HP 26069A Cable Configuration For Series 33 And 44.

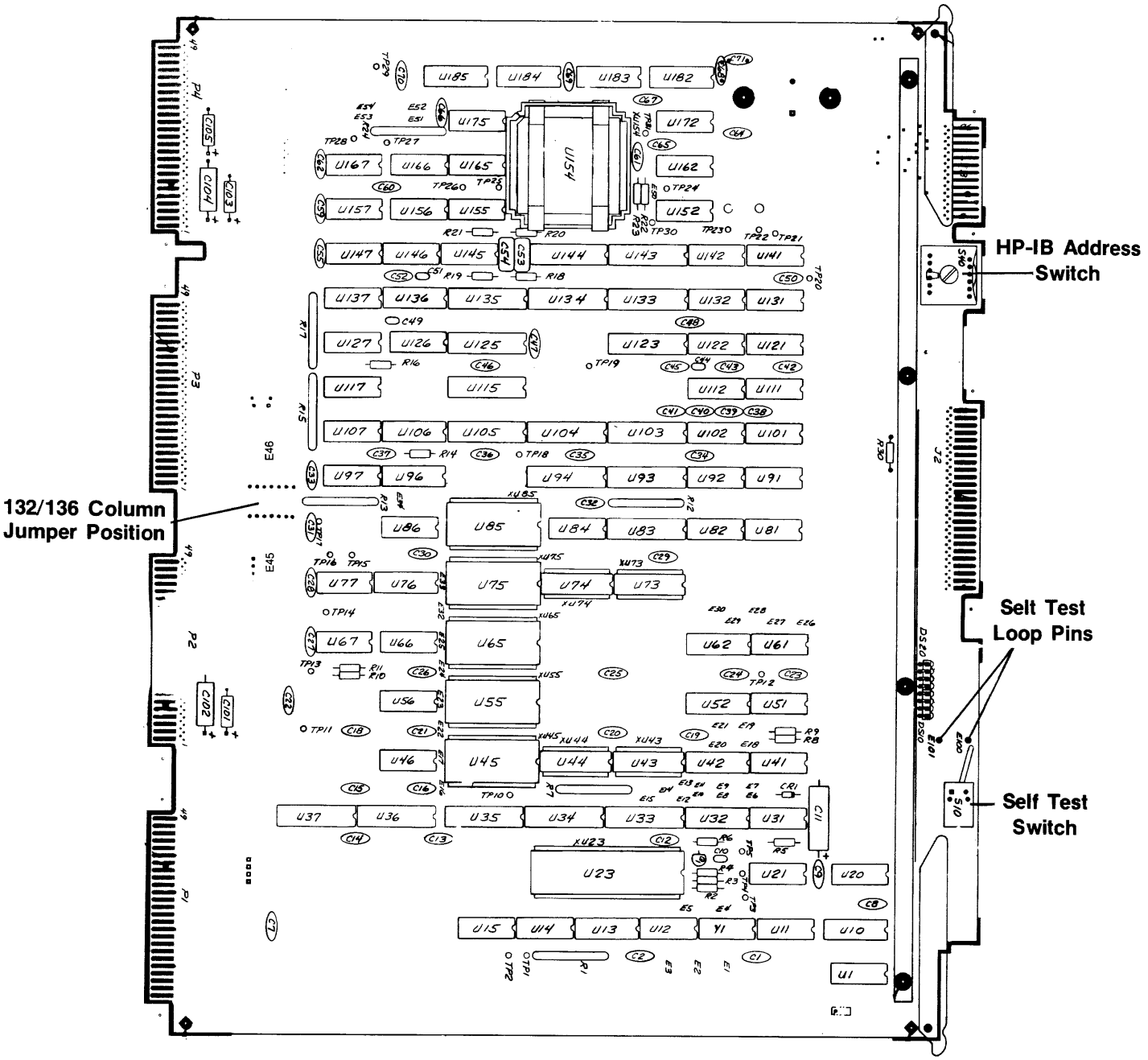

Figure 2-3. Configuration Locations

2-4. CONTROL CODES

The translator PCA will pass all control codes to the printer without change. The 2619, 2617, and 2613 will convert these control codes to blanks. The most significant bit of each character is used for character set selection which these printers do not support. The standard cables do not pass this bit. These features, in configuration with the standard HP driver, allow identical operation as the printers on the HP 3000 Series II or III. In particular, user application programs which pass binary or packed decimal data fields to the printer work the same as they would on an HP 3000 Series II or III.

■

SECTION III. MAINTENANCE

3-1. INTRODUCTION

This section provides information on the operation and interpretation of the Self Test diagnostic.

3-2. PREVENTIVE MAINTENANCE

Detailed preventive maintenance procedures and schedules are provided in the Hewlett-Packard System documentation for the controller. There are no separate preventive maintenance procedures for the translator kit.

3-3. TROUBLESHOOTING

Troubleshooting for the HP 26069A Translator Assembly is accomplished by performing the On-Line Line Printer Verification Test and examining any resulting errors or by running the HP 26069A Self Test as explained under Self Test below.

3-4. SELF TEST

Self Test is a diagnostic program contained in the HP 26069A ROM memory, used to check the translator circuits and cabling, and inform the operator of any resulting errors. It also performs several printing tests which require visual inspection (refer to Appendix B for sample subtest printouts). This test is not a 100% check of the circuits, but is a good indication as to the operation of a major portion of the Translator PCA. It can also be used to locate possible malfunctions in certain functional areas of the interface or, in some cases, the actual component (ROM or RAM) in error.

Running Self Test

Self Test may be initiated by either the System Line Printer Diagnostic or the Self Test service switch (S10). This test performs a series of seven subtests which check various functional areas of the HP 26069A PCA and its cabling.

Subtest 1 ROM CHECKSUM — This subtest performs a checksum on each ROM installed on the HP 26069A PCA. Each ROM is programmed with its checksum byte as the last byte of the ROM. If any ROM fails, the subtest halts and the ROM causing the test failure is reported with the status byte.

Subtest 2 CYCLIC RAM TEST — This subtest performs a cyclic bit pattern test of all RAM installed on the PCA. The test includes patterns to test individual cells within a given RAM, interactions between cells, and the addressing/selection mechanism. If any RAM fails, the subtest stops and the IC in error is reported with the status byte.

Subtest 3 DATA BUS TEST — This subtest tests the data bus which connects the processor and the majority of the I/O ports. It checks for any bits held high or low by a faulty tri-state driver. If any failure occurs, testing stops and the faulty bus line will be reported with the status byte.

Subtest 4 CHARACTER SET RIPPLE PRINT TEST — This printing test verifies that all character codes sent to the printer are properly decoded and printed in the correct position. It also verifies that the printer is capable of printing all characters in all columns. Handshake timing is also checked. Visual inspection of the printout is necessary to verify the character set pattern.

Subtest 5 DATA LINES (SENSITIVE BIT) TEST —This subtest checks the printer's receivers, cabling, and the PCA drivers for capacitive charging effects. A repeating pattern of ten identical characters followed by one character of a complementary bit pattern is sent to the printer. The ten characters of the same bit pattern allow the cables to charge to a near final state. The complementary pattern will cause the cables to discharge rapidly enough to settle the data before being accepted by the printer. Visual inspection of the printout is necessary to verify the results of the test.

Subtest 6 MODULE ALIGNMENT TEST — This printing subtest is useful only when the HP 26069A PCA is connected to an HP 2619A Printer. The printed pattern can show errors in the adjustment of the hammer flight timing, or point out a faulty hammer module. Visual inspection of the printer is necessary to verify the results of the test.

Subtest 7 VFU TEST — This subtest checks the printer's VFU print control. Each of the twelve channels is exercised four times. At each channel stop, the feedback channels (CH 9 and 12) are checked for a positive response. The appropriate line slew messages are printed on the corresponding line. In addition, channels 9 and 12 must have had a positive feedback at some point during the test. The feedback will be reported with the status byte. Visual inspection of the printout is necessary to verify the results of the test. For this test the user should have the diagnostic VFU tape (6 LPI, P/N 02618-80002 or 8 LPI P/N 02618-80004) installed in the unit; errors may result if the channels do not correspond to those expected by the test.

Self Test Switch and LED Indicators

If the system controller to which an HP 26069A Translator is connected is inoperative, it is possible to run the HP 26069A Self Test using the self test toggle switch located on the front plane of the HP 26069A PCA. When running Self Test in this manner, test result information will be displayed on six (of eight) LEDs located next to the Self Test switch. The information displayed by the LEDs is not as comprehensive as that contained in the status byte returned to the controller, but it does indicate the occurrence of errors.

When Self Test is initiated (by pressing the Self Test switch [S10]): LED A will begin flashing (see figure 3-1), indicating that Self Test is running; LED * also comes on at the same time, indicating that LEDs C, D, and E represent, in binary, the number of the subtest currently being run. When testing stops, because testing has completed or an error has occurred, LED A will go out and LED * will remain lit indicating that LEDs C, D, and E are displaying the test results. If no errors occurred during testing, LEDs C, D, and E will be extinguished; these results will be displayed for five seconds (i.e., LED * will remain lit for approximately five seconds). If an error occurs in any subtest, testing will stop at that point, LED A will stop flashing, and LED * will remain lit (for approximately 25 seconds) indicating that LEDs C, D, and E represent the number of the subtest in which the error was detected.

If an error in the Self Test feature prevents Self Test from being run, LED B will light (along with LED *) indicating this condition.

If Self Test has stopped testing because a subtest error was detected, re-initializing Self Test will enable it from the beginning again (running subtest 1 through the subtest where the error was detected).

A provision for looping Self Test has been included on the 26069A Self Test hardware. When the two self test loop pins (E100 and E101), located below the Self Test switch, are connected together and the Self Test switch is held ON, Self Test will loop on itself. If Self Test had previously stopped on some subtest with an error, then looping will be performed on the erroring subtest only.

The two other LEDs, ADDR (addressed) and PARITY, are not used for Self Test information but furnish operating information. When the ADDR LED is lit, it indicates that the HP 26069A is addressed by the HP-IB controller; when the PARITY LED lights, it indicates that a command parity error has occurred on the HP-IB.

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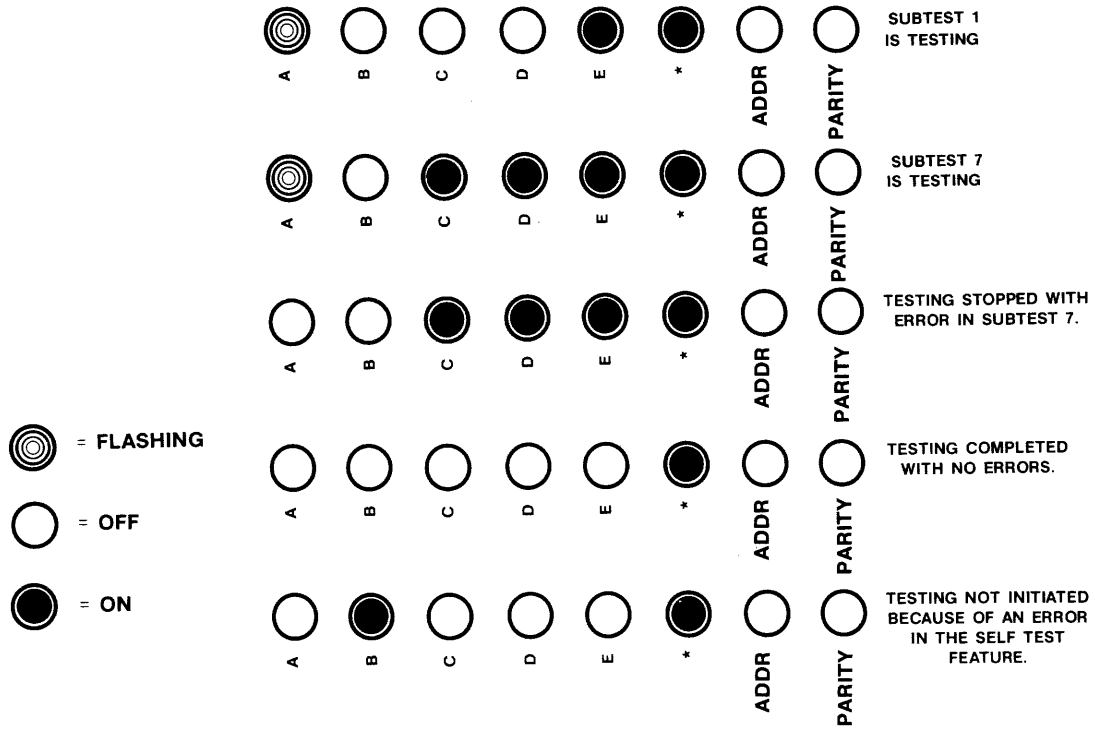

Figure 3-1. Self Test LED Indications.

SECTION IV. REPLACEMENT PARTS

4-1. INTRODUCTION

This section contains information on ordering replacement parts, a list of replacement parts, and schematics for the HP 26069A HPIB-to-Differential Kit.

4-2. ORDERING PARTS

To order parts from Hewlett-Packard or to obtain further information about parts, address the order or inquiry to the nearest Hewlett-Packard Sales and Service Office. When ordering, give the following information on each part:

a. Model and Revision/Series.

b. Hewlett-Packard part number.

c. Description of the part.

d. Circuit reference designator or index number, if applicable.

e. If the part is installed on a PCA, give the series code of the PCA which is stamped or etched on the PCA.

4-3. REPLACEMENT PARTS AND DIAGRAMS

The remaining portion of this section contains replacement parts lists, diagrams, and schematics.

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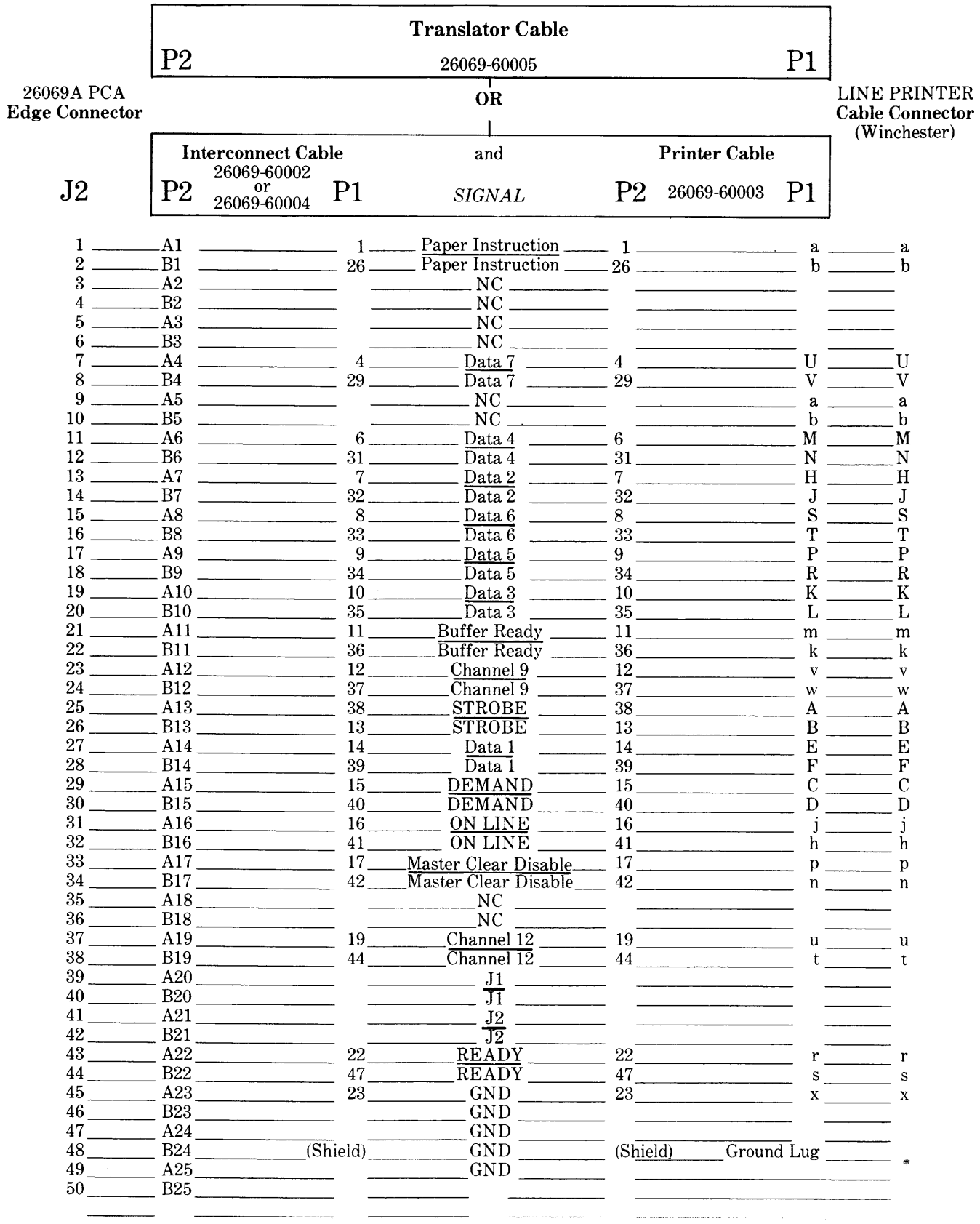


Figure 4-1. Cable Pin Connection Diagram

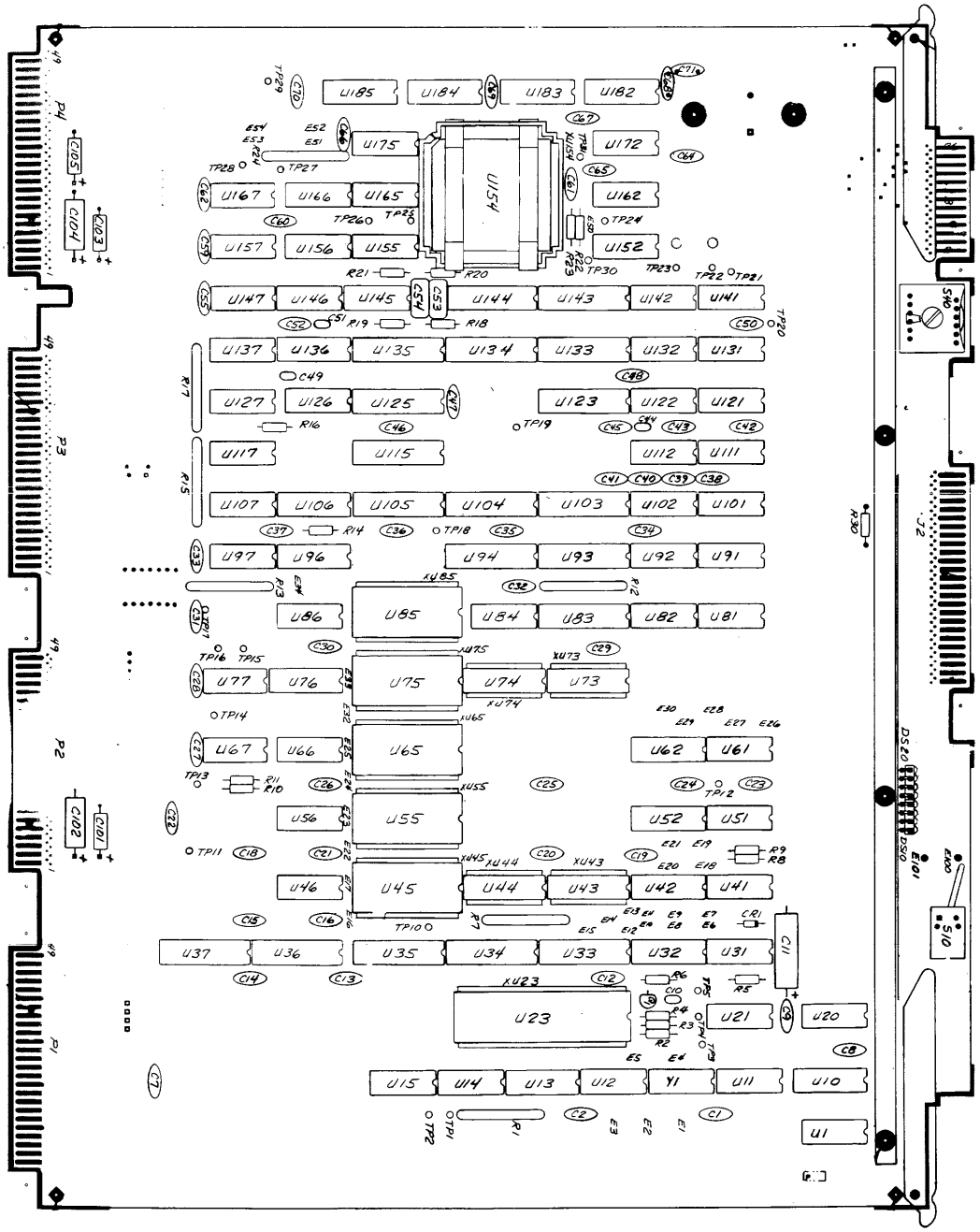


Figure 4-2. 26029A Parts Location Diagram

TABLE 4-1. HP26069A REPLACEMENT PARTS LIST

Reference Designator/Index No.	Description	HP Part No.
C1,2,7,8,9,12-16, 18-43,45-48,50,52, 55,59-62,64-71	C:F .01UF 100V	0160-2055
C10	CAP:33PF 200V	0160-4386
C11	C:F 68 15VDC	0180-2692
C44,49,51	C:F 100PF 5%	0160-4389
C53,54	CAPACITOR-FIXED	0160-3535
C101,103,105	C:F 2.2UF 10%	0180-0197
C102,104	C:F 15UF 10% 20V	0180-1746
DS10/DS20	LED-VISIBLE	1990-0662
E100,101	PINS: Test	0360-1682
CR1	DIO:50V 1N4150	1901-1098
Q1	XSTR:2N3906 PL18	1853-0036
R1,12	NET RES:9X4.7K	1810-0279
R2	R:F 22 5% .25	0683-2205
R3	R:F 220 5% .25W	0683-2215
R4	R:F 1.2K5% .25W	0683-1225
R5,8,9,10,11,22	R:F 10K5% .25W	0683-1035
R6	R:F 1K5% .25W CC	0683-1025
R7,13,15,17,24	NTWK-RES SIP 10K	1810-0280
R14,16	R:F 100 5% .25W	0683-1015
R18,20	R:F 3.83K 1%.125	0698-3153
R19,21	RES:42.2 1% .125	0757-0316
R23	R:F 26.1K	0608-3159
R30	R:F 2.2K5% .25W	0683-2225
S10	SWITCH:TGL DPST	3101-1675
S40	SW:THWHL 8 POS	3100-3395
TP1-5,10	TEST PINS	0360-1682
U10	IC:SN74LS175	1820-1195
U12	IC:SN74S74N	1820-0693
U13	IC:SN74LS109	1820-1282
U21	IC:SN74LS33N	1820-1272
U23	IC-MPU	1820-2298
U41	IC:SN74LS14N	1820-1416
U67	IC:DIGSN74LS125N	1820-1568
U84	IC SN74LS393N	1820-2096
U96	IC:SN74LS157	1820-1470
U97	IC-DIGITAL	1820-1243
U73,74	IC:RAM 2114-3	1818-0443
U20,81,82,91,92,101,	IC:DGTL DM8830N	1820-0720
U102,111,112	IC:DGTL DM8820AN	1820-0721
U121,127,132,137, 142,152,157,56	IC:SN74LS74N	1820-1112
U15,167	IC:SN74LS00N	1820-1197
U11,14,117,146,162	IC:SN74LS04N	1820-1199
U31,51,77,122, 141,66,46	IC:SN74LS08N	1820-1201

TABLE 4-1. HP 26069A REPLACEMENT PARTS LIST (Continued)

Reference Designator/Index No.	Description	HP Part No.
U61,86,107,131,147	IC:SN74LS32	1820-1208
U32,42,52,62	IC SN74LS138N	1820-1216
U76,136	IC:74LS139	1820-1281
U105,135,93	IC:SN74LS273N	1820-1730
U37,134	IC:74LS240N	1820-1917
U104,123,133,94	IC SN74LS374PC	1820-1997
U33,34,83, 115,125,103,143	IC:SN74LS244N	1820-2024
U182,183,184,185	IC-HPIB TRANSCVE	1820-2058
U106	IC-DIGITAL	1820-1491
U126	IC:SN74LS02	1820-1144
U144	IC:SN74LS640	1820-2206
U145	IC: SN74LS132	1820-1425
U154	CHIP CHI	1AA7-6002
U155	IC:SN7417N TTL	1820-0618
U156	IC-DIGITAL	1820-1124
U165	IC:74LS126	1820-1645
U166	IC:SN74LS27N	1820-1206
U172	IC:SN74LS11	1820-1203
U175	IC:SN74LS280N	1820-1859
U35,36	IC:SN74LS245N	1820-2075
XU23	SOCKET-IC	1200-0654
XU43,44,73,74	SOCKET:18PIN IC	1200-0539
XU65,75,85	SOCKET:24PIN IC	1200-0541
XU154	SOCKET-SUBSTRATE	1200-0847
Y1	XTAL CLOCK OSC	1813-0130
U75	E PROM	26069-60010
U65	E PROM	26069-60011
U55	E PROM	26069-60012
ITEM 1	PCB	26069-80001
ITEM 2	SCR TAP 4-40	0624-0077
ITEM 3	EXTRACTOR:PC	5040-6009
ITEM 4	EXTR PIN:GRV.062	1480-0116
ITEM 5	BRACE:PC BOARD	5040-6058
	RTNR:SPRING CLIP	1200-0844
	LABEL:HPIB TRANS	26069-00001

Figure 4-3. HP 26069A Translator Schematic (1 of 4)

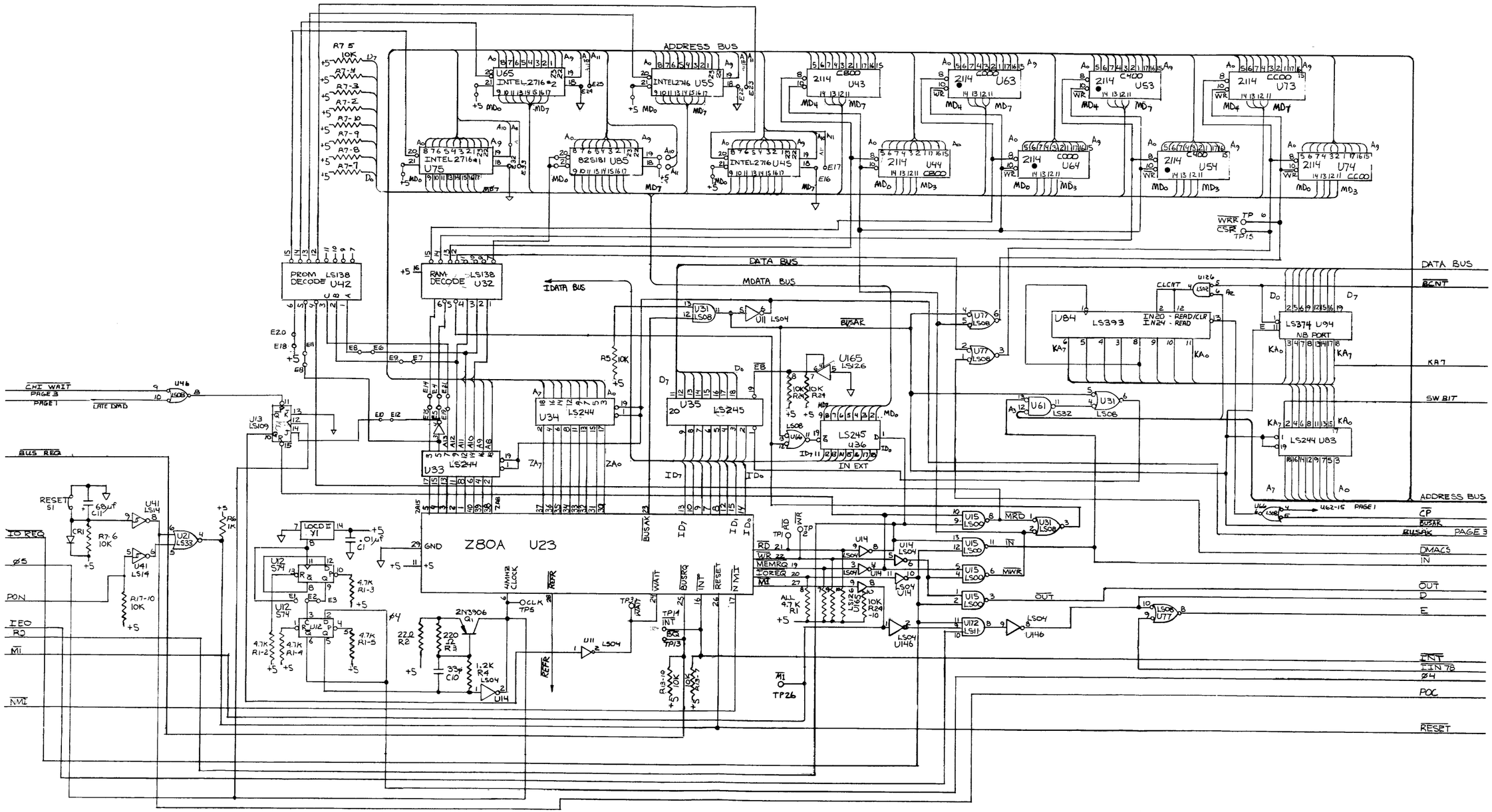


Figure 4-3. HP 26069A Translator Schematic (2 of 4)

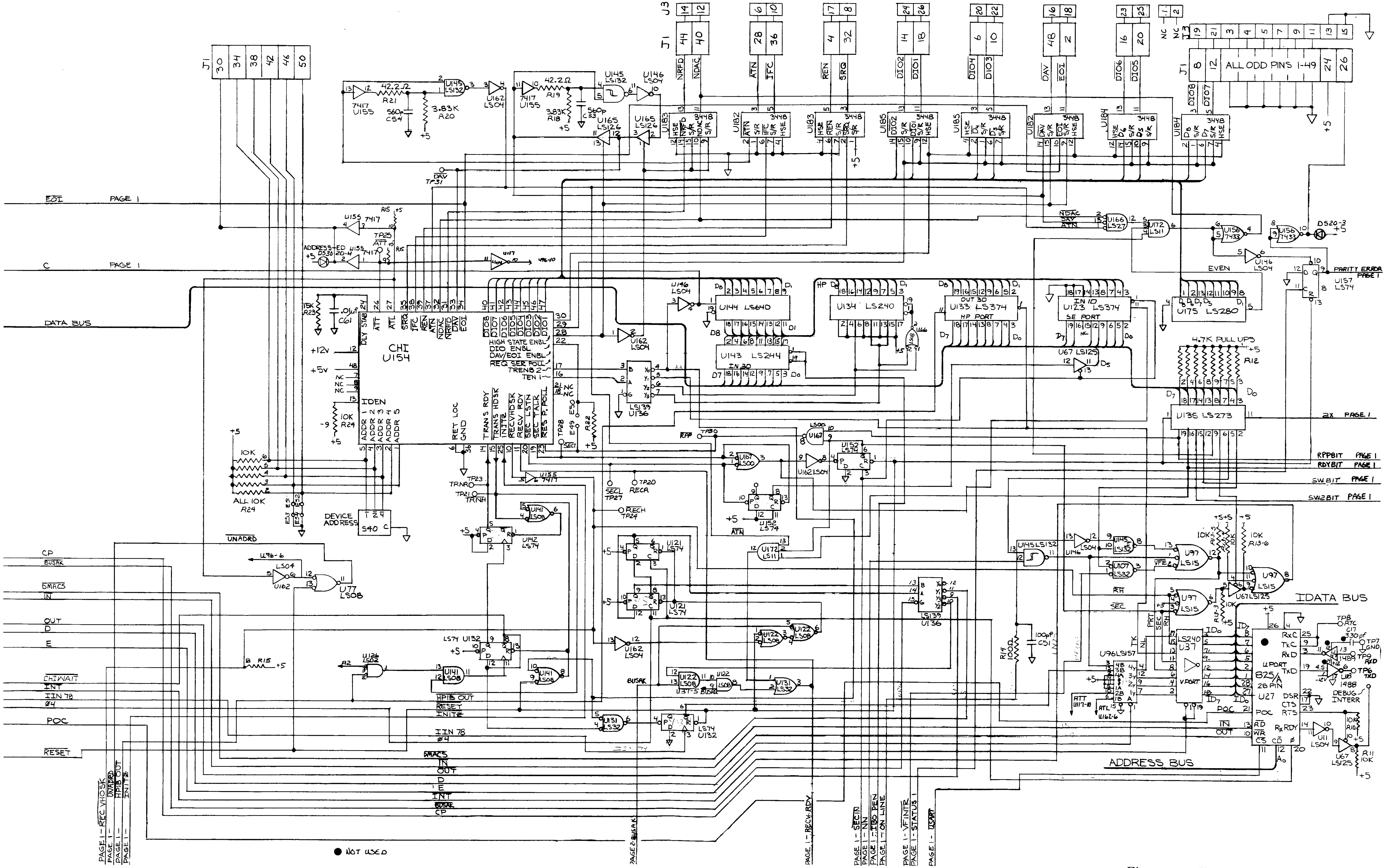


Figure 4-3. HP 26069A Translator Schematic (3 of 4)

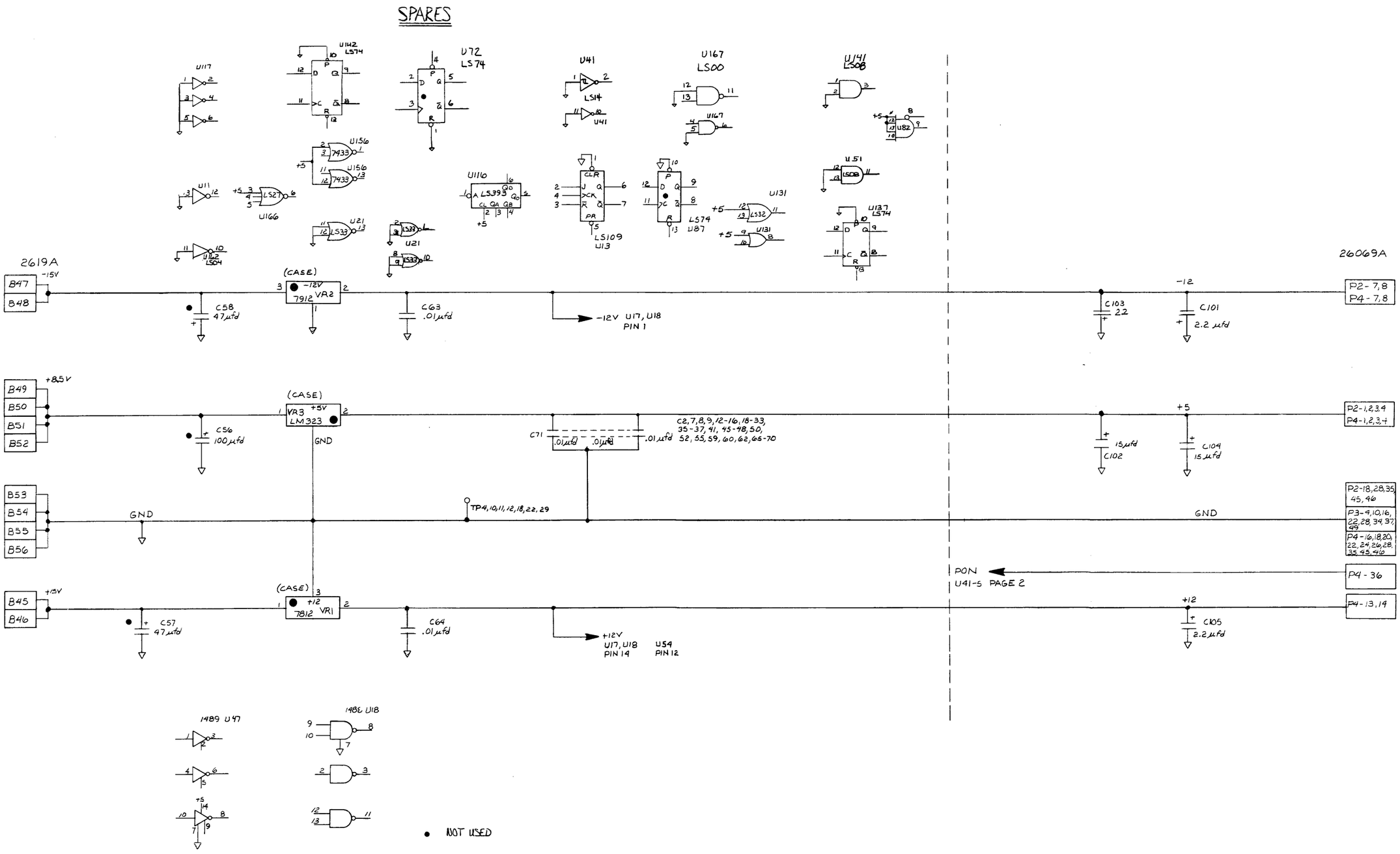
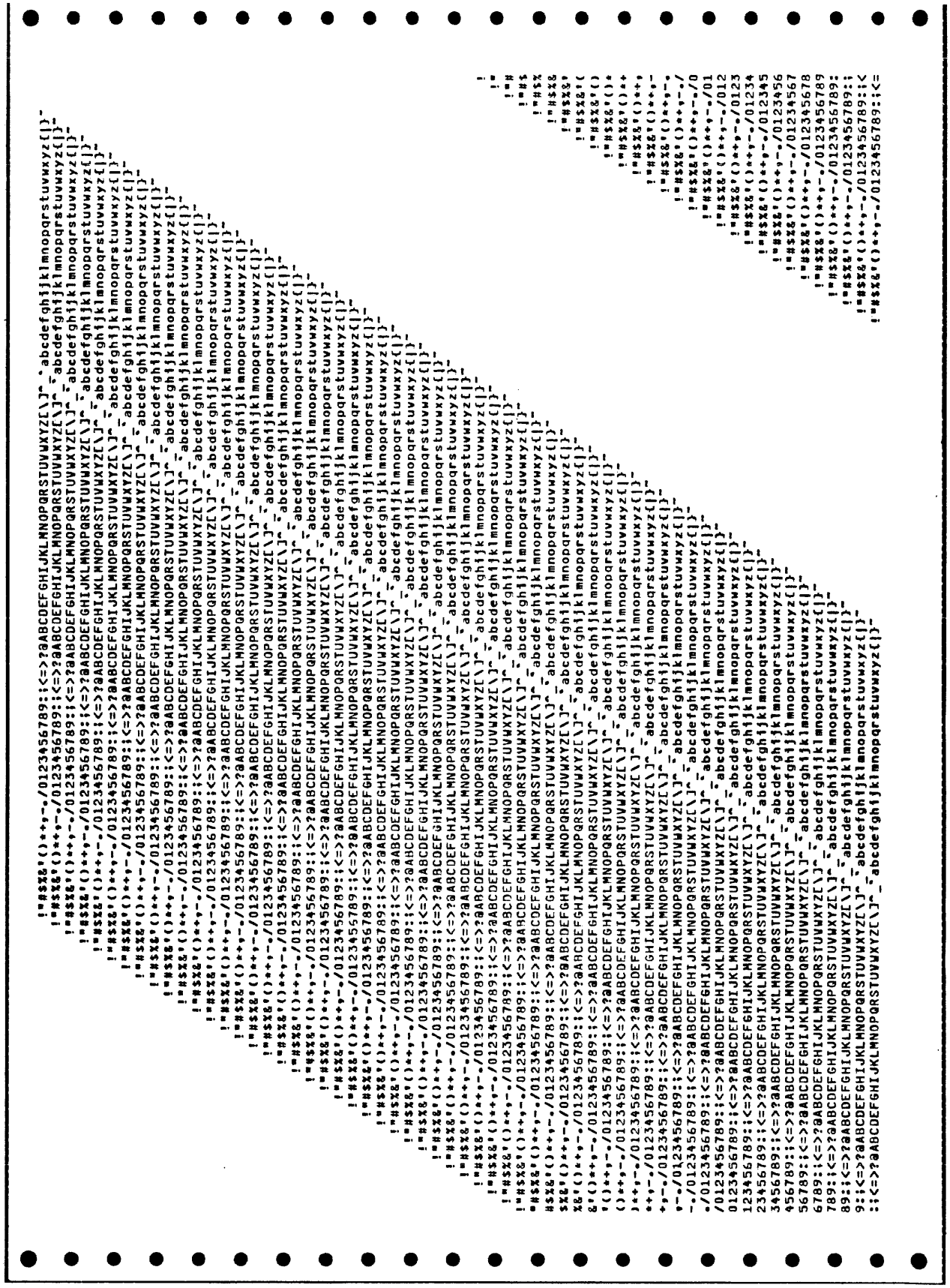


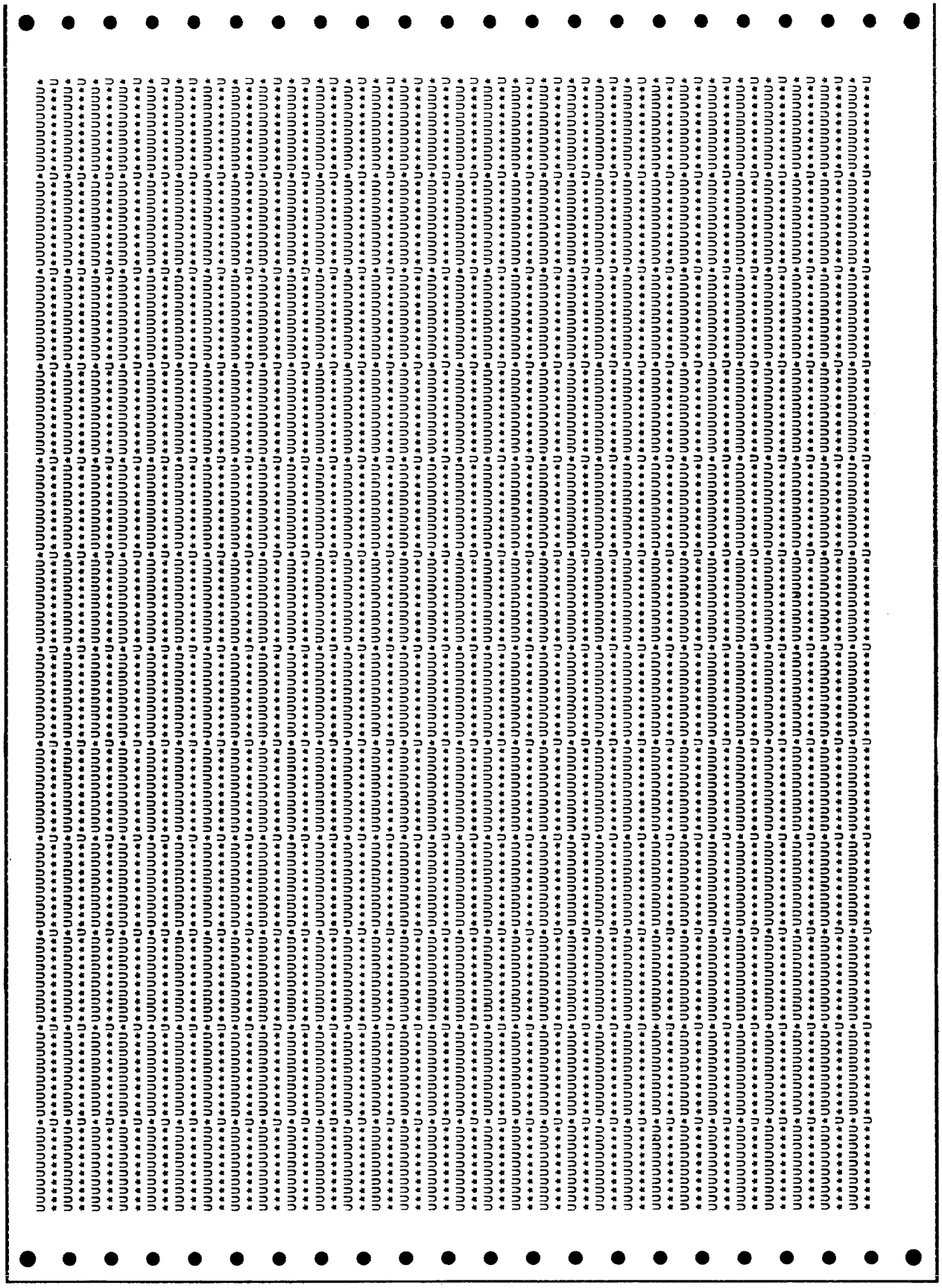
Figure 4-3. HP 26069A Translator Schematic (4 of 4)

APPENDIX A.
SELF TEST PRINTOUTS

Appendix A contains reduced sample printouts from subtests 4, 5, 6 and 7.



SUBTEST 4



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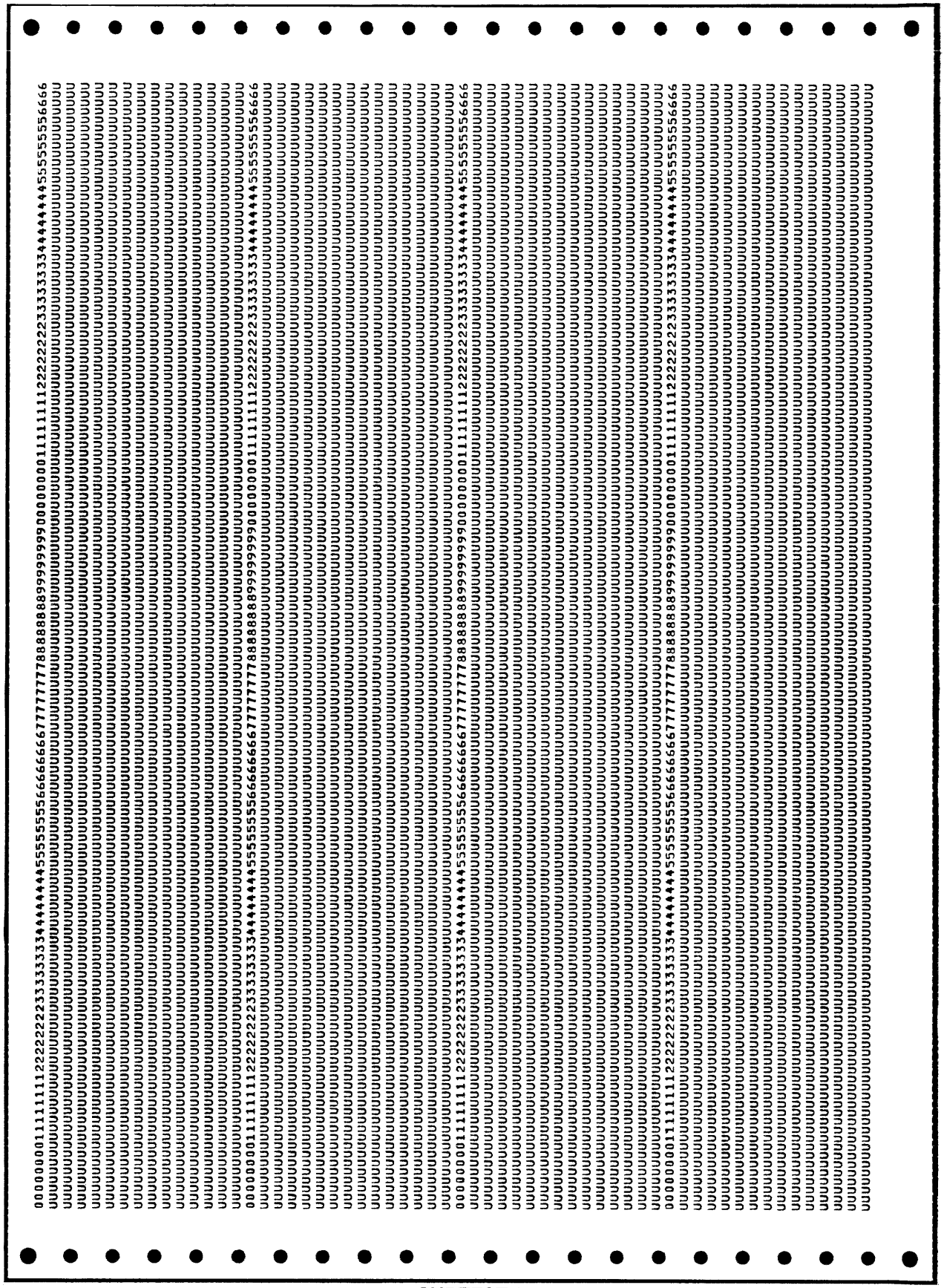
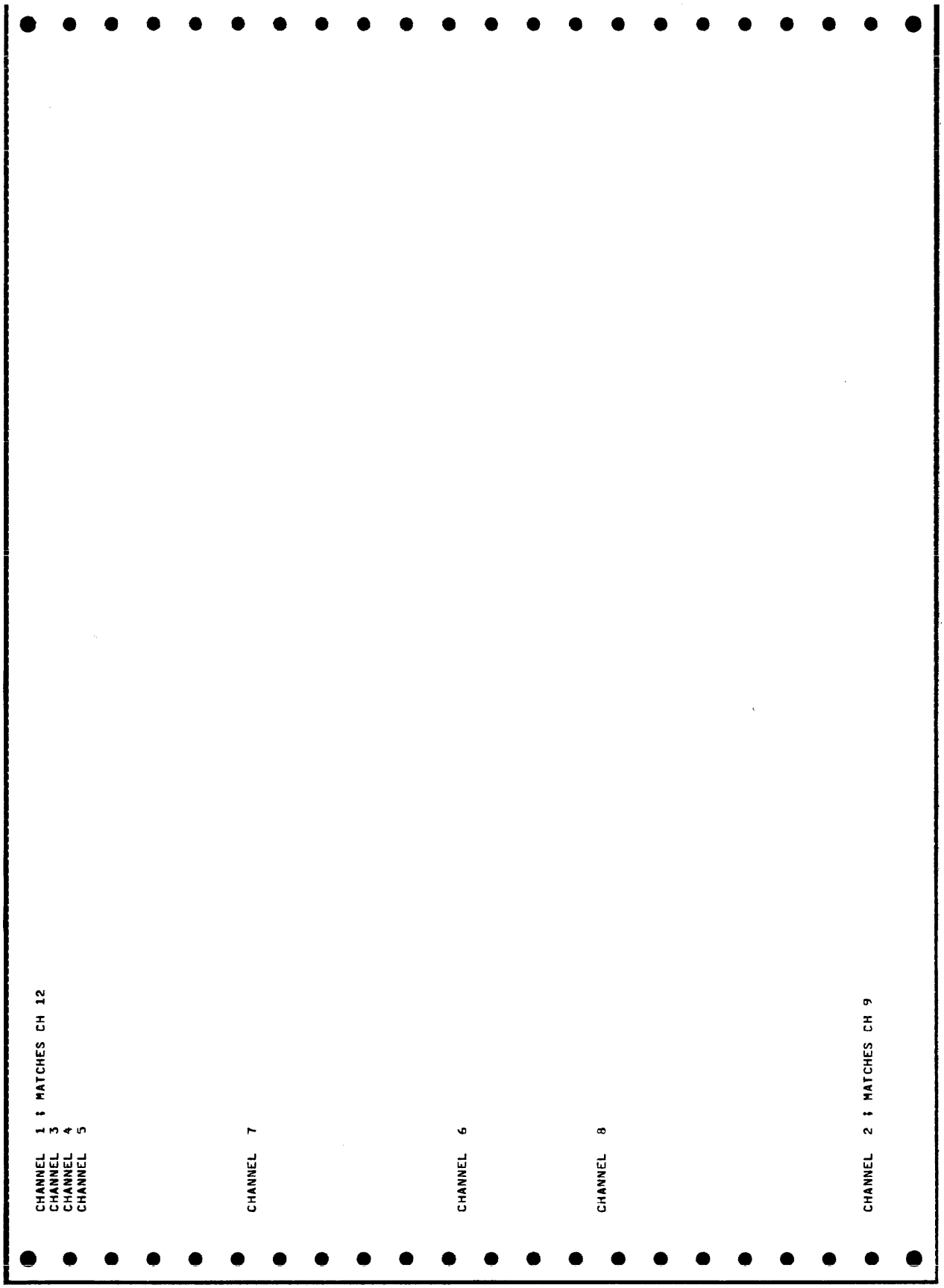
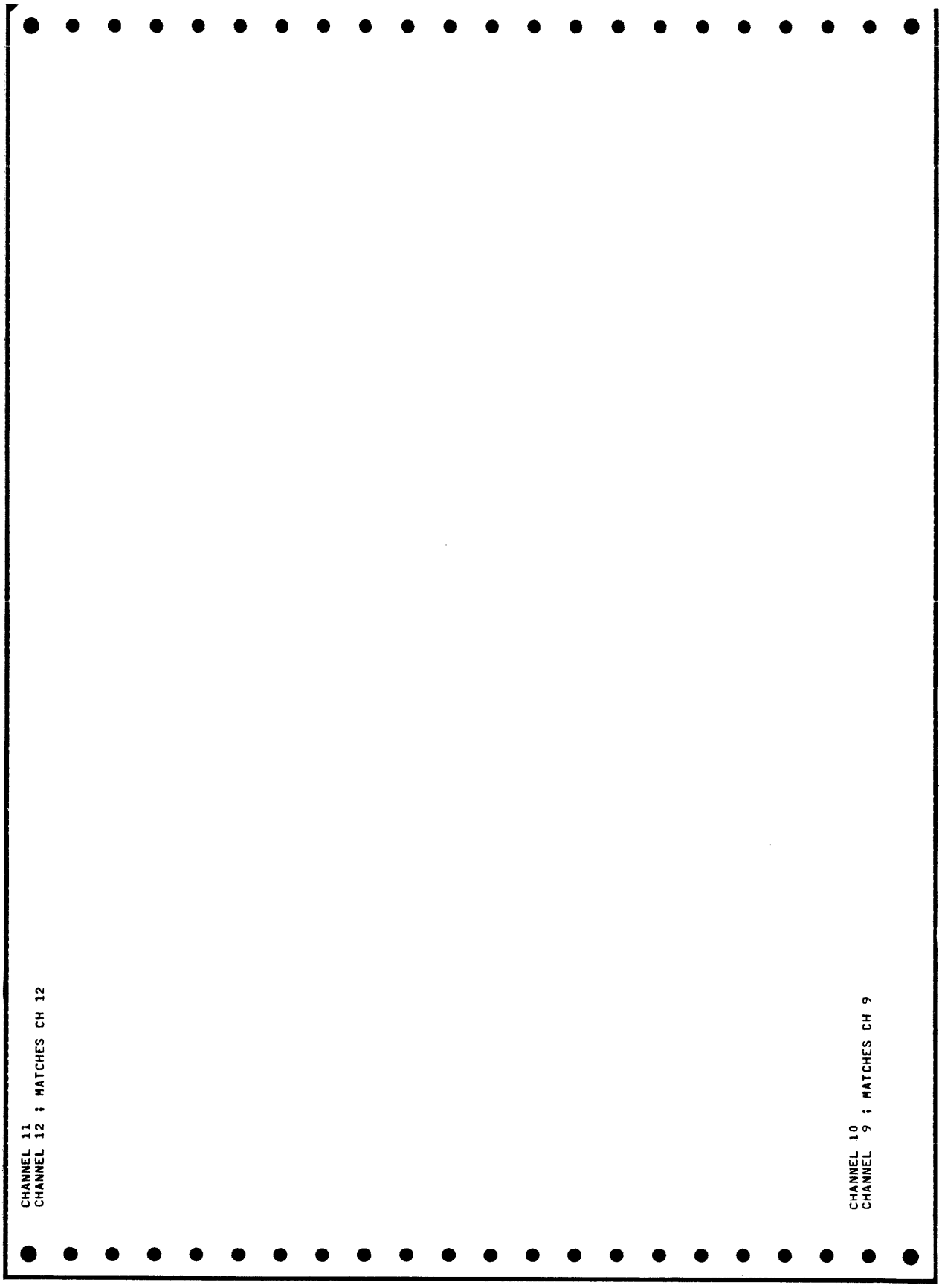


SUBTEST 6


CHANNEL 1 & MATCHES CH 12
CHANNEL 3
CHANNEL 4
CHANNEL 5
CHANNEL 7
CHANNEL 6
CHANNEL 8
CHANNEL 2 & MATCHES CH 9

SUBTEST 7


CHANNEL 11
CHANNEL 12 ; MATCHES CH 12
CHANNEL 10
CHANNEL 9 ; MATCHES CH 9

SUBTEST 7

PART NO. 26069-90901
MICROFICHE NO. 26069-90801

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