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**VX4332**  
**Scanner Module**  
**Service Manual**

**Tektronix**

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# Table of Contents

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<b>Section 1</b>	
<b>Introduction</b> .....	<b>1</b>
<b>Section 2</b>	
<b>Performance Verification</b> .....	<b>7</b>
<b>Section 3</b>	
<b>Adjustment and Calibration</b> .....	<b>9</b>
<b>Section 4</b>	
<b>Assembly And Disassembly</b> .....	<b>11</b>
<b>Section 5</b>	
<b>Parts List</b> .....	<b>13</b>



# VX4332

## Scanner Module

### Section 1

### Introduction

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The VX4332 is a 2-wire scanner with 40 reed relays on a message based VXIbus C size module. In addition, it is designed to act as a scanner master that can control up to 11 slave scanners via the VXIbus local bus. The master/slaves system can be configured under program control into one or more scanner systems. The slaves are also C size modules, but connect only to the VXIbus local bus (plus power and ground), and are programmed by sending commands to the master.

Slave modules are added to a scanning system to increase the number of input channels in the system. They may all be joined together to form one large section with a common output, used separately with two sections per module, or almost any combination in between.

In a system with a master and slave modules, each slave module may have a different number of relays. Refer to the operating manual of each module to determine the number of relays.

The VX4332 allows programming the scanner system to:

- ▶ select a scanner channel
- ▶ reset the module to a power-up state
- ▶ assign symbolic names to relays
- ▶ switch the module between being a 1-of-40 or two 1-of-20 scanners
- ▶ adjust the length of the various delays
- ▶ enable or disable VXIbus interrupts for different events
- ▶ enable using a VXIbus TTL trigger line for the encode signal
- ▶ send a trigger on any of the eight VXIbus TTL trigger lines
- ▶ select information to be read back

The module can also store a program for a command sequence (also called a scan table) that can be executed multiple times with only one command. This command sequence can include triggers, interrupt generation for up to six different events, and commands to set different delays for each of its slave modules, as well as the Close Relay commands.

Refer to the Operating Manual for information on programming the module.

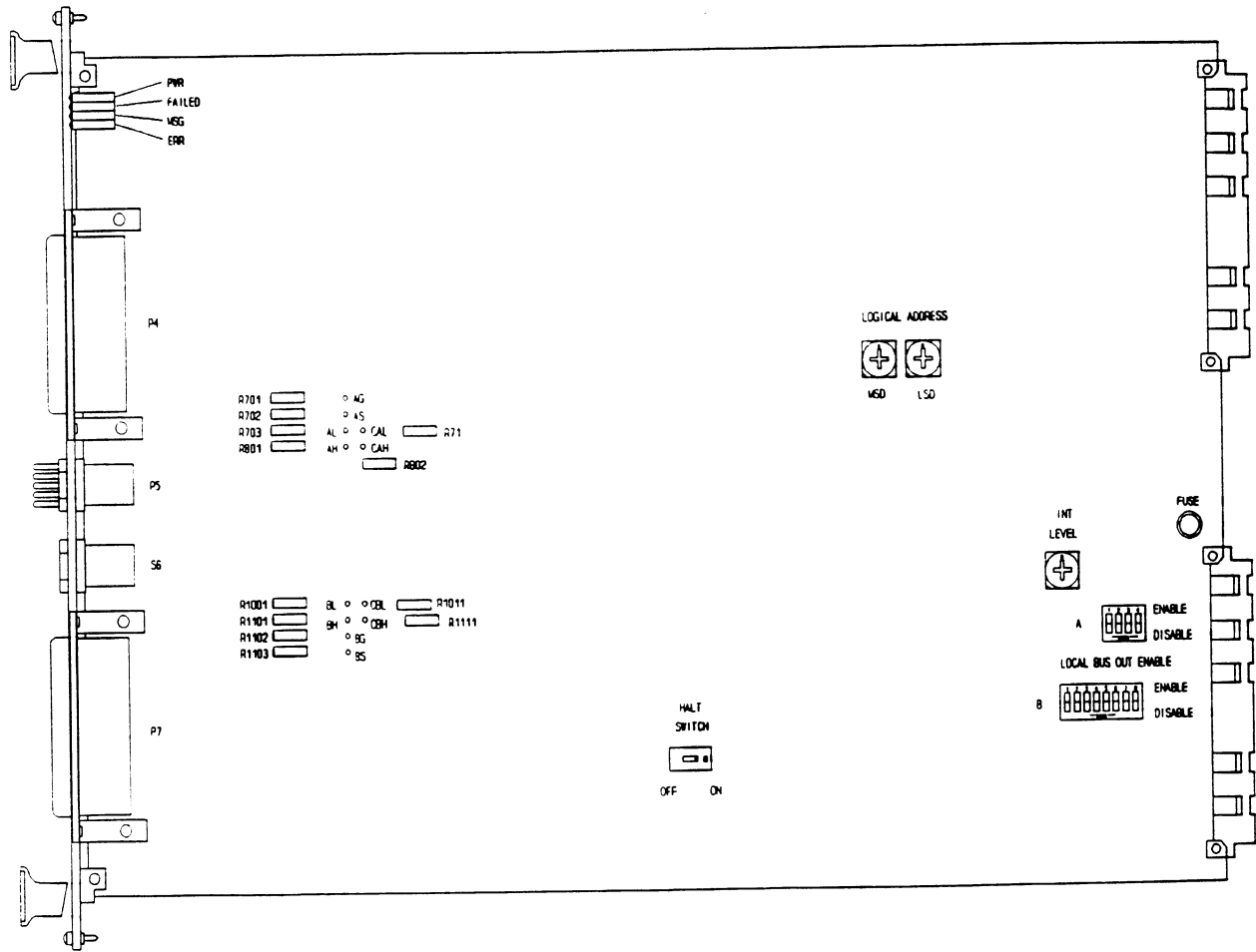


Figure 1: VX4332 Controls and Indicators

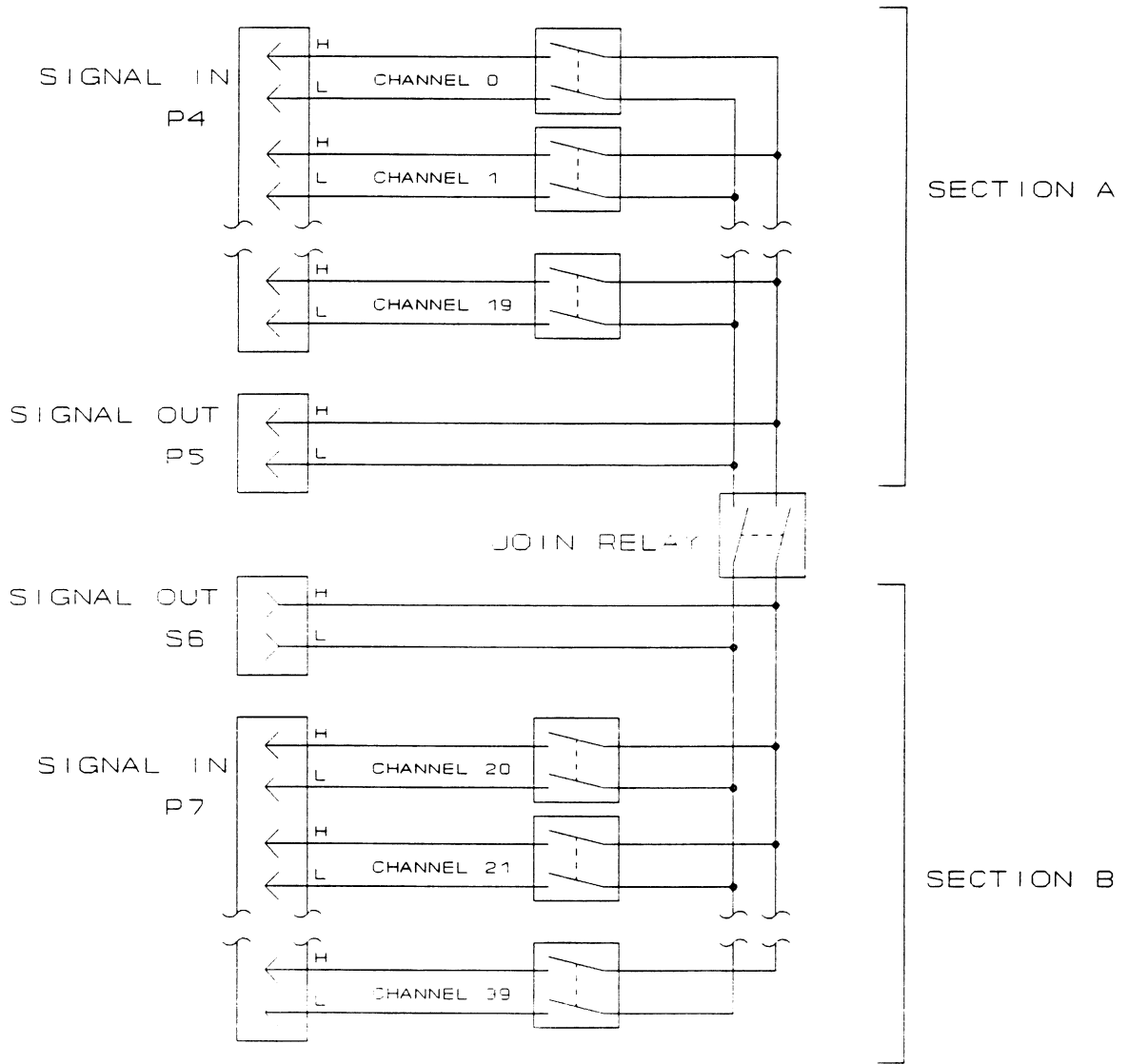


Figure 2: VX4332 Block Diagram (not all signals shown)

Section 1

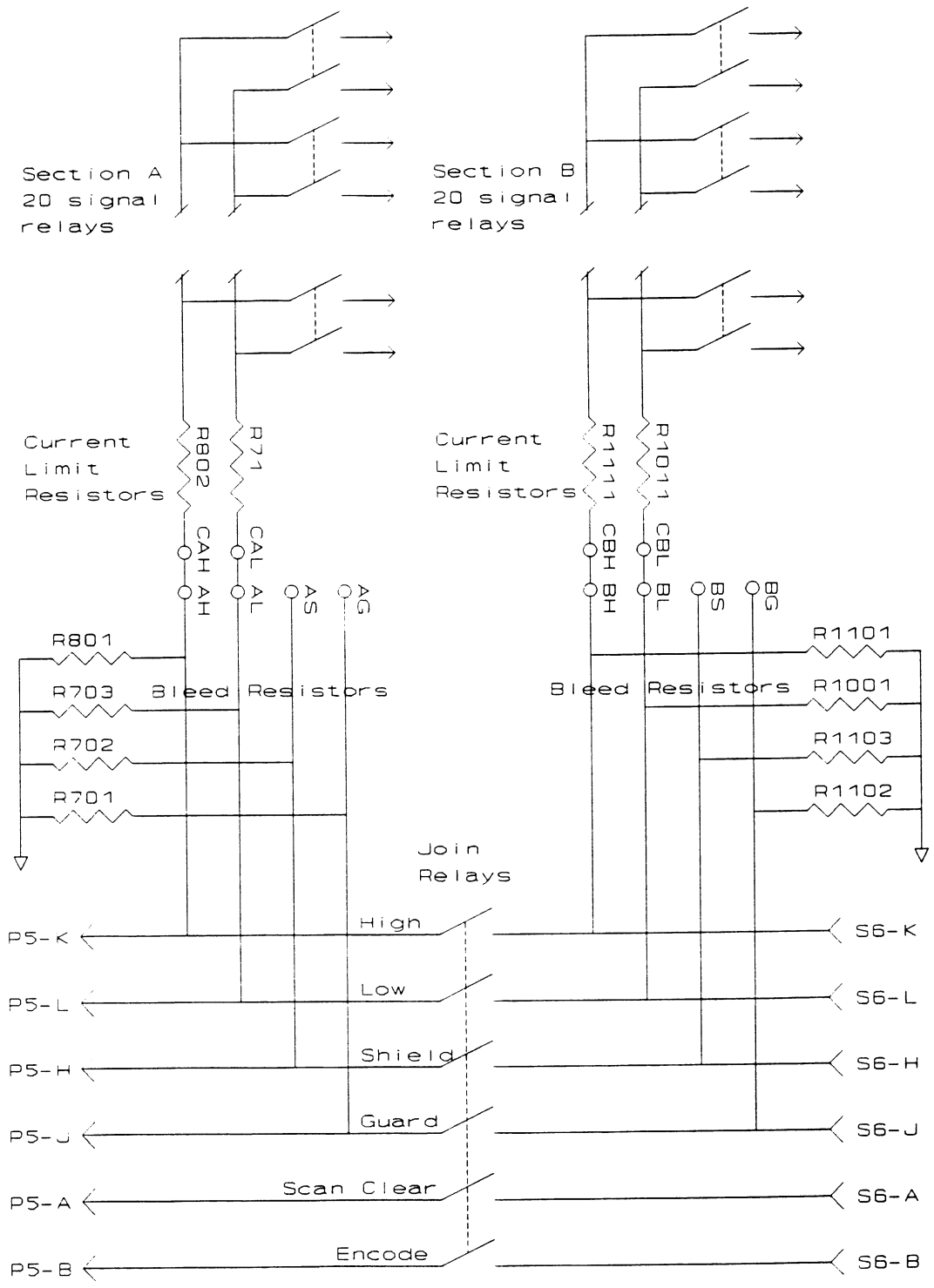


Figure 3: Jumpers and Optional Resistors



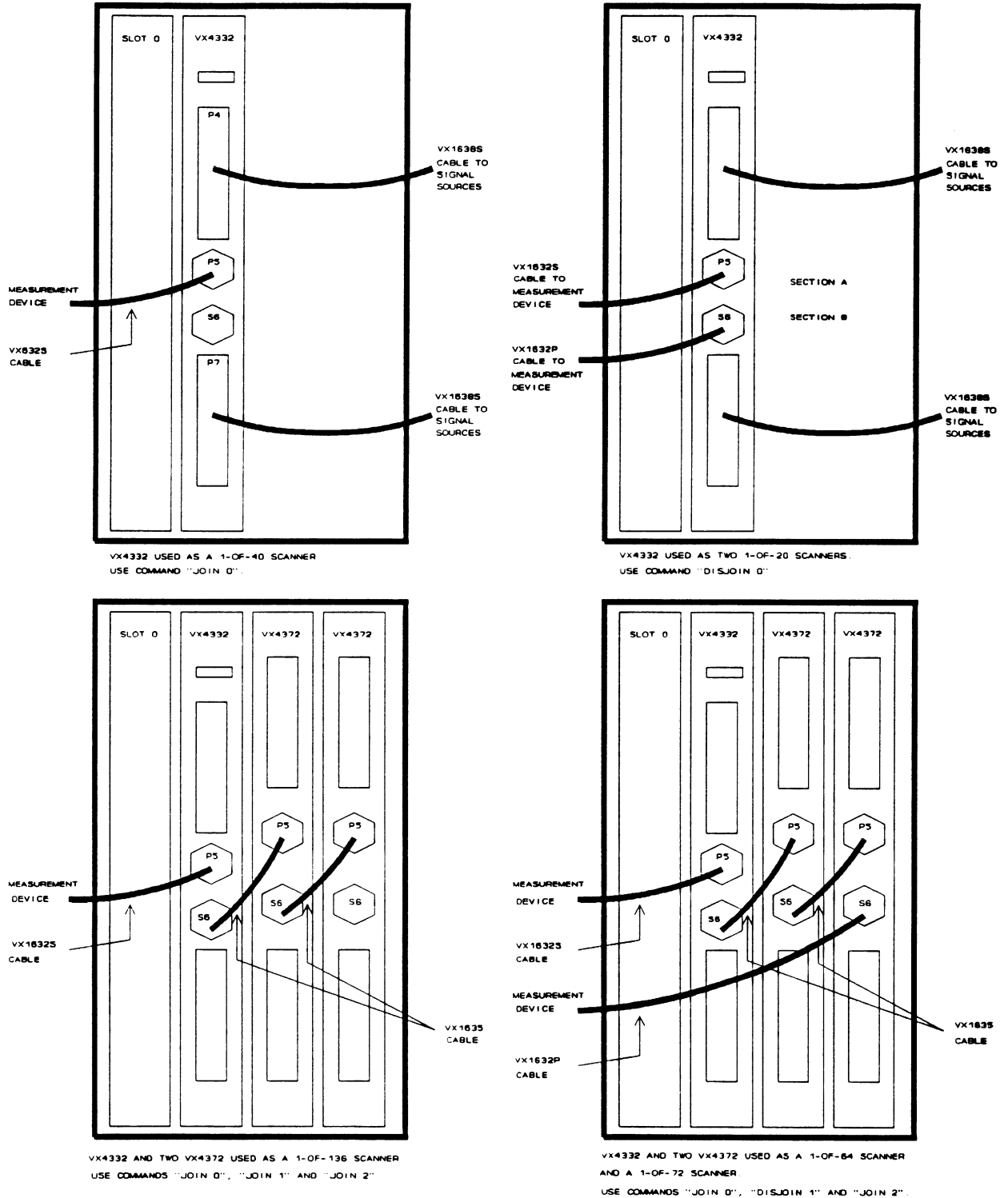


Figure 4: Cabling Examples

*Section 1*

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## Section 2

# Adjustment and Calibration

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No adjustment or calibration is required for this module. Refer to the Operating Manual for information on cabling and use of board options.

*Section 2*

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# Section 3

## Assembly And Disassembly

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The VX4332 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

*Section 3*

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# Section 4

## Parts List

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The following lists give the name and part number for all field replaceable parts of the VX4332. To order replacement parts, call your Tektronics representative.

SERVICE MANUAL

VX4332

40 CHAN SCANNER 2-WIRE SCANNER MASTER



REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
	96000-00015	1	1 IN WHT FRONT AND SPINE VXI BUS MANUAL	0546	96000-00015
FOR USE WITH KIT 4,7	45008-20418	4	SCREW LOCK ASSEMBLY FOR D CONNECTOR	0108	D-20418-2
C01,05,10,1061,1071,1091,1171 1251,1281,1361,1371,1391,1461 1551,1561,1571,1581,1591,17,19 27,28,46,48,65,67,69,85,89,91,97	20128-10006	31	CAP FXD CER .1UF 20% 50VDCW	0058	C322C104M5U5CA
C1012,1271,1462,1463,1562,98	22022-20008	6	CAP FXD TA 22UF 10-20% 20-25VDCW	0106	199D226X9025CA1
C13,14	20128-10004	2	CAP FXD CER .001UF 10% STABLE 100VDCW	0058	CK05BX102K
C1401	20128-10005	1	CAP FXD CER .01UF 20% 50VDCW	0106	1C25Z5U103M050B
C961,962	21528-10002	2	CAP FXD MICA 10PF 5% 100VDCW	0012	DM15-100D
CR1211,1212,1221,1231,1232,1241 1242,1411,1412,1421,1431,1432 1441,1442,1501,1571,1573,211,212 22,231,232,241,242,411,412,42 431,432,441,442,71,72,731,732 741,742,91,92,931,932,941,942,99	32000-04148	44	DIODE SILICON 75V 1A 5%	0078	1N4148
CR1271	32000-04001	1	DIODE SILICON 50V 1A 5%	0357	1N4001
CR1401	32000-05248	1	DIODE ZENER 18V .5W 5%	0107	1N5248B
CR1572,1581	32000-05225	2	DIODE ZENER 3.0V .5W 5%	0074	1N5225B
DCL1	40408-14332	1	LABEL VX4332 DRW-03250 REV 910	0026	40408-14332
DCL2	40409-14332	1	LABEL VX4332 DRW-03251 REV 910	0026	40409-14332
DS001,101,102	32000-02303	3	DIODE LIGHT EMITTING GREEN WITH RESISTOR	0039	547-2303
DS002	32000-02003	1	DIODE LIGHT EMITTING RED WITH RESISTOR 0	0039	547-2003
DS20	32050-01414	1	DISPLAY 4 CHAR LED WITH MEMORY GREEN	0101	DLG1414
E40,41,70,71	92301-00440	4	SCREW PHIL PNHD 4-40X5-16 BRITZINC	0137	4-40X5-16 PHIL PNH

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
E42,43,62,63,72,73	92302-00440	6	WASHER STAR NUMBER 4 INTERNAL ZINC	0137	4 IN STAR WASH ZIN
E44,45,64,74,75	92303-00440	5	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
E60	47000-74065	1	BRACKET 73A FRONT PANEL CENTER DRW 01676 REV 890	0026	47000-74065
E61	92301-10440	1	SCREW PHIL PNHD 4-40 X .1875 BRITE ZINC	0137	4-40X3-16 PHIL PNH
F99	42202-73040	1	FUSE MICRO 4AMP 125V FAST PLUG IN CLEAR CAP	0061	273 004
FP1	47006-14332	1	FACE PLATE VX4332 DRW-02330 9107	0026	47006-14332
FP10,11	92505-25005	2	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
FP18,20	92500-25011	2	COLLAR SCREW M 2.5 X 11 SL NICKEL	0266	21100-379
FP19,21	92510-00464	2	SLEEVE CAPTIVE SCREW GRAY	0266	21100-464
FP2,22,4,8	40406-00140	1	EJECTOR HANDLE C-TOP VX1400	0266	20817-328
FP23,3,5,9	40406-00141	1	EJECTOR HANDLE C-BOTTOM VX1400	0266	20817-327
FP30	47000-74103	1	KEY VXI TTL RIGHT 01670 REV 9003	0502	47000-74103
FP31,32,6,7	92500-25005	4	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
K1001,80	83500-20002	2	RELAY 4-A POLARIZED 130 OHM 5V .	0013	S4EB5V
K1211,1212,1221,1231,1232,1241 1242,1411,1412,1421,1431,1432 1441,1442,211,212,22,231,232,241 242,411,412,42,431,432,441,442 71,72,731,732,741,742,91,92,931 932,941,942	83000-00092	40	RELAY REED 3PST 350 OHMS 5V	0138	3600-0031
L79	27051-50007	1	INDUCTOR 5 UH 5A .015 OHMS 50MHZ FR	0000	
P1,2	45003-09600	2	CONNECTOR DIN 96 PIN MALE RT ANGLE SOLDER	0265	10-8457-096-002097

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
P4,7	45008-50003	2	RT ANGLE DD-50 PIN PC MOUNT	0193	147-1150P-02-D433B
P5	91100-10001	1	WIRE ASSY 10 PIN MALE	0000	
PCB1	41140-43320	1	P.C. BOARD VERSION 8L 9202	0498	41140-43320
Q00,1501,1502,29	51100-00300	4	TRANSISTOR VMOS N-FET	0102	VN0300L
Q041,042	51100-03904	2	TRANSISTOR NPN SWITCHING	0078	2N3904
Q1401	51100-04402	1	TRANSISTOR PNP SILICON GP	0107	2N4402
Q1551,1591,1592,89,99	51100-03906	5	TRANSISTOR PNP SWITCHING	0107	2N3906
R04,1291,1561,1581,995,996	10117-10005	6	10K RES COMP 1-4W 5%	0087	R25J-10K-5%
R07,281,29,30	12008-33004	4	3.3K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R3.3K
R10,11,1151,1551,1552,1553,1554 89,994	10117-33004	9	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%
R1001,1101,1102,1103,701,702,703 801	10000-00000	8	USER INSTALLED RESISTOR	0026	10000-00000
R1011,1111,71,802	10117-00000	4	0 OHM RESISTOR	0054	ZEROHM
R1051,1251,1451,35,55,75	12008-22003	6	220 OHM RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R220
R1161,1162,1261,13,1381,14,1472 1473,1474,21	10117-10004	10	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R1271,1361,1371,991,992,993	10117-47004	6	4.7K RES COMP 1-4W 5%	0087	R25J-4.7K-5%
R1292	12006-33003	1	330 OHM RES NETWORK SIP 5% .7W 7-PKG	0027	750-81-R330
R1471,1571,1582,282,67,681,682	10117-18005	7	18K RES COMP 1-4W 5%	0087	R25J-18K-5%
R1501	10117-39003	1	390 OHM RES COMP 1-4W 5%	0087	R25J-390-5%
R1583	10117-33003	1	330 OHM RES COMP 1-4W 5%	0087	R25J-330-5%
R1584	10117-20004	1	2K RES COMP 1-4W 5%	0087	R25J-2K-5%
R1591	14024-82503	1	825 OHM RES FILM 1-4W 1% 100PPM	0069	RN55D8250F
R86	10117-10007	1	1M RES COMP 1-4W 5%	0087	R25J-1M-5%

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
S1091	42050-10104	1	SWITCH DIP 4POS SPST	0048	76SB04S
S1291	42050-10108	1	SWITCH DIP 8POS SPST	0048	76SB08S
S1361	42050-10101	1	SWITCH DIP 1POS SPST	0093	JS-8794-01
S581,582	42050-10301	2	SWITCH DIP ROTARY HEX	0007	DRW-16C
S6	91100-10000	1	WIRE ASSY 10 PIN FEMALE	0000	
S99	42050-10300	1	SWITCH DIP ROTARY BCD ENCODED	0007	DRW-10C
SH1	47007-74332	1	SHIELD FRONT 332 CARD DRW 01820 REV 900	0026	47007-74332
SH10,11,13,14,16,17,19,2,20,30,4 5,7,8	92500-25010	14	SCREW M 2.5 X 10 CSK OVAL PHIL NIK PL	0266	21100-500
SH12,15,18,21,3,6,9	92519-25019	7	STANDOFF HEX M2.5 X 19.5MM DRW 01801 REV 900	0026	92519-25019
SH22	47007-75332	1	SHIELD BACK 332 DRW 01819 REV 900	0026	47007-75332
SH23,24,25,26,27,28,29	92519-25004	7	REAR SHIELD SPACER 73A DRW 01807 REV 890	0212	19501-A-0029
U00	79814-00348	1	PAL PROGRAMMED C16L8 REV B MASTER SCANNERS	0026	79814-00348
U01,03,26,27	73005-74273	4	IC HCT OCTAL D-TYPE FLIP FLOP W RESET	0088	74HCT273N
U02	73003-74573	1	IC TTL ALS OCTAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74ALS573
U04,1091	75401-74164	2	IC TTL LS 8-BIT SERIAL SHIFT REGISTER	0107	74LS164
U05,89	79008-74138	2	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	0107	74HCT138
U06,17,37	73309-74244	3	IC HCT OCTAL BUFFER NON-INVERTING	0107	74HCT244
U07,18	73005-74574	2	IC HCT OCTAL TRISTATE LATCH NON-INVERT	0107	74HCT574
U08,392	77203-07430	2	IC TTL ALS 8-INPUT NAND GATE	0107	74ALS30
U09,19	73308-74645	2	IC TTL ALS OCTAL BUS TRANSCIEVER	0107	74ALS645-1

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U10	73300-07407	1	IC TTL HEX BUFFER	0107	7407
U1051,1251,1451,20,35,55,75	79000-07445	7	IC TTL BCD-DEC DECODER DRIVER OC 30V 80 MA	0107	7445
U1061,1261,1281,1282	73005-07474	4	IC HCT DUAL D-TYPE FLIP FLOP	0092	74HCT74N
U1071,1371	73001-07431	2	IC LS DELAY ELEMENT	0107	74LS31
U1081	79814-00467	1	PAL PROGRAMMED EP1810 REV A	0000	
U1082	79814-00497	1	PAL PROGRAMMED 18CV8 REV A	0000	
U11	79814-00366	1	PAL PROGRAMMED C16L8 REV A 73A SCANNERS	0000	
U1151,1351,25,45,65,95	79814-00342	6	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U1191	79814-00340	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U12	73308-74246	1	IC TTL ALS OCTAL BUFFER NON INV 48MA IOL	0107	SN74ALS244A-N
U1271,1591	78403-07414	2	IC HCT HEX SCHMITT INVERTING BUFFER	0088	74HCT14
U13	79008-74238	1	IC HCT 3-TO-8 LINE DECDR DEMULTIPLEXER	0107	74HCT238
U1381	73006-07474	1	IC TTL AS DUAL D-TYPE FLIP-FLOP	0107	74AS74
U1391	79010-74151	1	IC TTL AS 1-OF-8 DIGITAL MUX	0107	74AS151
U14	79814-00341	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
U1461	76606-07400	1	IC HCT QUAD 2-INPUT NAND GATE	0088	74HCT00
U1471	74200-09602	1	IC TTL DUAL RETRIGGERABLE MONOSTABLE	0078	9602
U1481	73300-07406	1	IC TTL HEX INVERTER BUFFER-DRIVER	0107	7406
U1482	77203-07408	1	IC TTL ALS QUAD 2-INPUT AND GATE	0107	74ALS08
U1491	73313-74756	1	IC TTL AS OCTAL BUFFER INVT OC	0107	74AS756

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U15	73006-74573	1	IC TTL AS OCTAL D-TYPE LATCH	0107	74AS573
U1551	75401-74165	1	IC TTL LS 8-BIT SHIFT REGISTER	0078	74LS165
U1561	71210-04040	1	IC HCT 12-STAGE BINARY RIPPLE COUNTER	0088	CD74HCT4040
U1571	79814-00367	1	PAL PROGRAMMED C16L8 REV A 73A-332	0000	
U1581	76510-07410	1	IC TTL ALS TRIPLE 3-INPUT NAND GATE	0107	74ALS10
U16	76603-74645	1	IC TTL AS OCTAL BUS TRANSCEIVER	0107	74AS645
U28	73003-74574	1	IC TTL ALS OC TRI LATCH NON INV TI ONLY	0107	74ALS574
U29,57,79	73308-74244	3	IC TTL ALS OCTAL BUFFER NON-INVERTING	0107	74ALS1244
U38	79814-00498	1	PAL PROGRAMMED 18CV8 REV A	0000	
U391	76602-07438	1	IC TTL S QUAD 2-INPUT NAND BUFFER W-OC	0107	74S38
U46	79825-88002	1	IC SUPER 8 CPU ROMLESS 20 MHZ	0117	Z08800A20PSC
U47	79814-00186	1	PAL PROGRAMMED 18P8L REV B 73A-256 AND 342	0000	
U48	79814-00374	1	PAL PROGRAMMED C16L8 REV A 73A-332	0000	
U49	79814-00468	1	PAL PROGRAMMED 20L8 REV C 73A-SUPER 8	0000	
U59	71701-74682	1	IC TTL LS 8-BIT COMPARATOR	0107	74LS682
U67	77825-07432	1	IC TTL ALS QUAD 2-INPUT OR GATE	0107	74ALS32
U69	73313-74760	1	IC TTL AS OCTAL BUFFER NON-INV	0107	74AS760
U771	73308-74245	1	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS245
U772	79813-00272	1	PROGRAMMED PROM	0000	
U78	79805-58256	1	IC CMOS 32K X 8 SRAM 120NS	0052	HM62256P-12

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U85	79814-00343	1	PAL PROGRAMMED C16L8 REV B 73A SCANNERS	0000	
X1081	45010-80186	1	SOCKET 68 PIN PLCC	0243	QILE68P-410T
X20	45014-00000	1	SOCKET VERTICAL 14 PIN DIP	0268	14-6810-90C
X46	45010-48100	1	SOCKET 48-PIN DIP	0089	ICN-486-S5-G
X772	45012-28100	1	SOCKET 28-PIN DIP LOW PRO	0089	ICO-286-S8A-TG
X99	42300-28105	1	FUSE SOCKET MICRO VERTICAL .025 LEADS .1 CNT	0061	281 005
Y96	89500-20000	1	CRYSTAL 20.000 MHZ 50 PPM	0062	MP-1 20.000