



VX4520
Resource Manager Module
Service Manual

08/20/92

9103-01-D
through
9208-01-E

Tektronix

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VX4520

Resource Manager Module

Section 1

Introduction

The VX4520 Resource Manager Module is a printed circuit board assembly for use in the slot 0 position of a mainframe conforming to the VXIbus Specification, such as the VX1400 C size mainframe used in the Tektronix/CDS IAC System. It conforms to the VXIbus System Specification for a Resource Manager, Slot 0 Device, and IEEE-488 Interface Device for a C size module.

The VX4520 performs three functions critical to the proper operation of a VXIbus system:

- 1) it is the VMEbus system controller required by the VMEbus Specification;
- 2) it provides both the VXIbus Resource Manager and Slot 0 functions required by the VXIbus Specification;
- 3) it acts as the communications interface between the station computer and the VXIbus chassis (VX1400 Mainframe) using the IEEE-488 General Purpose Interface Bus (GPIB).

The scope of the error messages has been extended to include all aspects of its operation as a Resource Manager, an IEEE-488 interface, a VMEbus controller, and a slot 0 device. When the VX4520 detects the occurrence of an operational error, it invokes an error message format routine that generates an appropriate ASCII message for retrieval by the system controller when the Resource Manager is addressed to talk on the IEEE-488 bus.

An error message will overwrite any message that may already be in the Resource Manager output buffer, except for another error message. Successive error messages are appended onto one another until the buffer becomes full, thus building an error history. This can be extremely useful in tracking complex or elusive faults.

The VX4520 can be programmed to generate IEEE-488 Service Requests whenever an error occurs, which also helps in the detection of intermittent errors.

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

Section 1

Section 2

Adjustment and Calibration

No adjustment or calibration is required for this module.

Section 2

Section 3

Assembly And Disassembly

The VX4520 is shipped fully assembled. A schematic diagram that may also be used as a reference is included with this manual.

Section 3

Section 4

Parts List

The following lists give the name and part number for all field replaceable parts of the VX4520. To order replacement parts, call your Tektronix representative.

SERVICE MANUAL

VX4520

SLOT 0 - RESOURCE MANAGER

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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
	46100-45718	1	DATA CABLE IEEE-488 2 METER	0000	
FOR USE W/ S80	42050-12671	1	SWITCH CAP WHITE FOR 8125A	0024	8018-1
C00,01,10,1061,1071,1111,1191 1261,1271,1311,1341,1372,14,16 19,21,30,34,39,49,54,58,71,80,86 88,90,94,991	20128-10006	29	CAP FXD CER .1UF 20% 50VDCW	0058	C322C104M5U5CA
C061,1361,1371,1392,1393,203,204 60,891	20128-10005	9	CAP FXD CER .01UF 20% 50VDCW	0106	1C25Z5U103M050B
C062,1362,70,892,992	22020-10009	5	CAP FXD TA 100UF 20% 6-10VDCW	0106	199D107X96R3DA1
C1381	20128-47006	1	CAP FXD CER .47UF 20% 50VDCW	0075	RPE123Z5U474M50V
C202,201	22022-10007	2	CAP FXD TA 1UF 10-20% 16-35DWC	0106	199D105X0025AA1
C652,651	21528-20002	2	CAP FXD MICA 20PF 5% 500VDCW	0025	CD6ED200J03
CR1361,691,692,693	32000-04148	4	DIODE SILICON 75V 1A 5%	0078	1N4148
DCL1	40408-14520	1	LABEL VX4520 DRW 03212 REV 910	0026	40408-14520
DCL2	40409-14520	1	LABEL VX4520 -03213 REV 9106	0026	40409-14520
DS001,107,105,106,103,104,102 101	32000-02303	8	DIODE LIGHT EMITTING GREEN WITH RESISTOR	0039	547-2303
DS002	32000-02003	1	DIODE LIGHT EMITTING RED WITH RESISTOR 0	0039	547-2003
E40,43	92300-75440	2	SCREW PHIL PNHD 4-40X.25 ZINC	0137	4-40X.25 PHIL PNHD
E41,44	92300-00440	2	WASHER SPLITRING 4-40 3-16 OD	0137	4R
E42,45	92303-00440	2	HEX MACHINE NUT 4-40 ZINC	0137	HEX MACH NUT 4-40
F891	42202-52004	2	FUSE SUB-MIN 4 AMP OR 5 AMP	0061	251004 OR 251005

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
F892	42202-52101	2	FUSE SUB-MIN 1AMP	0061	251001
FP1	47006-14520	1	FACE PLATE VX4520 DRW 02237 REV 910	0026	47006-14520
FP10,11	92505-25005	2	WASHER WAVY 2.7MM	0026	92505-25005
FP12,13	92501-25010	2	SCREW M2.5X10 CHEESEHEAD	0026	92501-25010
FP14	92502-25008	1	SCREW PHIL M 2.5 X 8 CSK BRITE ZINC	0137	PHIL M 2.5 X 8 CSK
FP15	92500-25008	1	SCREW M 2.5 X 8 SELF TAP	0266	21100-710
FP16	92520-00183	1	VME PCB-FRONT PANEL HOLDER	0266	60807-183
FP17	92500-25025	1	HEX NUT M2.5 ZINC	0266	21100-144
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
FP22,4	40406-00140	1	EJECTOR HANDLE C-TOP VX1400	0266	20817-328
FP23,5	40406-00141	1	EJECTOR HANDLE C-BOTTOM VX1400	0266	20817-327
FP30	47000-74100	1	KEY PLATE 151 ALUMINUM 01639 REV 9003	0026	47000-74100
FP31,32,6,7	92500-25005	4	SCREW 2.5MM PHIL CSK 5MM	0026	92500-25005
K136	83500-20012	1	RELAY SPDT 5VDC 125 OHM	0013	DS1E-S-DC5V
KIT4	45008-20418	2	SCREW LOCK ASSEMBLY FOR D CONNECTOR	0108	D-20418-2
L79	27051-50007	1	INDUCTOR 5 UH 5A .015 OHMS 50MHZ FR	0000	
L99	27051-00200	1	INDUCTOR WIDE-BAND FERRITE CHOKE	0042	VK 200 10-3B
P1,2	45003-09600	2	CONNECTOR DIN 96 PIN MALE RT ANGLE SOLDER	0265	10-8457-096-002097
P4	45008-25009	1	RT ANGLE DB-25 SOCKET PC MOUNT	0108	DBL-25S-2
PCB1	41140-45200	1	P.C. BOARD VERSION 8L 9208	0498	41140-45200

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
Q101,11,1361	51100-03646	3	TRANSISTOR NPN HIGH SPEED SWITCH	0074	MPS3646
Q102	51100-02222	1	TRANSISTOR NPN SILICON GP	0107	2N2222
Q103	51100-00300	1	TRANSISTOR VMOS N-FET	0102	VN0300L
R001,002,003,01,05,07,1061,1062 1121,1122,1171,1172,1201,1211 1231,1232,1251,1262,1311,1312 1321,1371,1383,14,21,38,50,531 532,55,60,68,70,87,90,971,972,99	10117-33004	38	3.3K RES COMP 1-4W 5%	0087	R25J-3.3K-5%
R004,112,1261,1373,1382,1391 1392,1394,26,35	10117-10004	10	1K RES COMP 1-4W 5%	0087	R25J-1K-5%
R005	10117-20005	1	20K RES COMP 1-4W 5%	0087	R25J-20K-5%
R1071,1072	10117-51002	2	51 OHM RES COMP 1-4W 5%	0087	R25J-51-5%
R111	10117-33003	1	330 OHM RES COMP 1-4W 5%	0087	R25J-330-5%
R1372	10117-51006	1	510K RES COMP 1-4W 5%	0087	R25J-510K-5%
R1384	10117-15004	1	1.5K RES COMP 1-4W 5%	0087	R25J-1.5K-5%
R1393	10117-22004	1	2.2K RES COMP 1-4W 5%	0087	R25J-2.2K-5%
R1395,203,40	10117-12005	3	12K RES COMP 1-4W 5%	0087	R25J-12K-5%
R1396,202	10117-47004	2	4.7K RES COMP 1-4W 5%	0087	R25J-4.7K-5%
R1397	10117-68004	1	6.8K RES COMP 1-4W 5%	0087	R25J-6.8K-5%
R18	12004-10004	1	1K OHM RES NETWORK SIP 5% .9W 5-PKG	0027	750-61-R1K
R204,201	10117-18006	2	180K RES COMP 1-4W 5%	0087	R25J-180K-5%
R61,58,59,69,16,17	12008-33004	6	3.3K RES NETWORK SIP 5% 1.5W 9-PKG	0027	750-101-R3.3K
R80,1381	10117-10007	2	1M RES COMP 1-4W 5%	0087	R25J-1M-5%
R91	12004-33004	1	3.3K RES NETWORK SIP 5% .9W 5-PKG	0027	750-61-R3.3K
R994,1091,993,1191,992,991,1192 1193,1194,1291,1092,1093,1094	14024-16905	13	16.9K RESISTOR FILM 1-4W 1% 100 PPM	0069	RN55D1692F
S10	42050-10101	1	SWITCH DIP 1POS SPST	0093	JS-8794-01

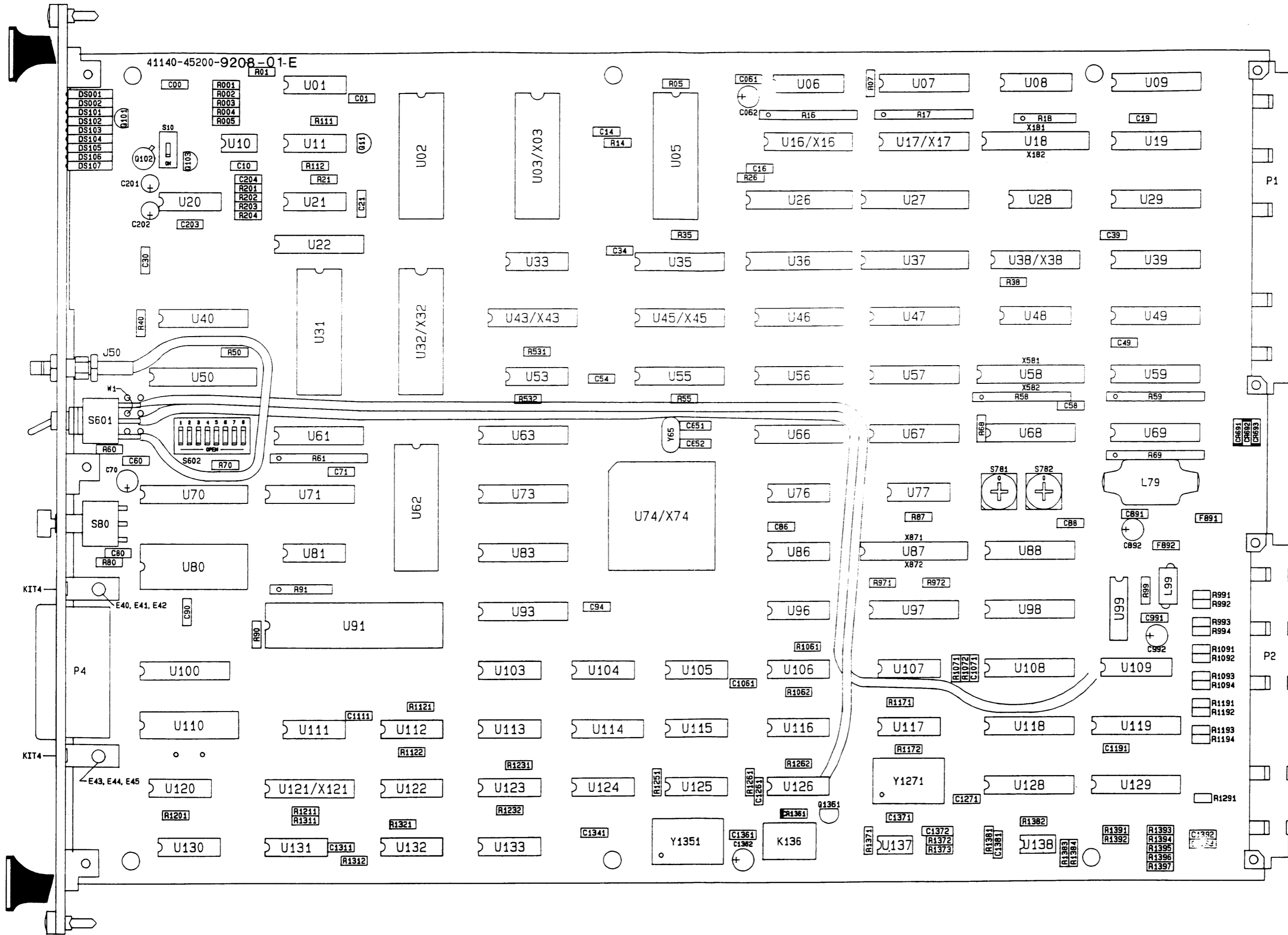
REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
S601	41550-45200	1	EXT CLOCK SWITCH ASSY	0000	
S602	42050-10108	1	SWITCH DIP 8POS SPST	0048	76SB08S
S781,782	42050-10301	2	SWITCH DIP ROTARY HEX	0007	DRW-16C
S80	42050-12670	1	SWITCH MOM SPDT PC BRD MNT	0024	8125A
SH1	47007-74151	1	SHIELD FRONT 151 CARD DRW 01800 REV 900	0026	47007-74151
SH10,11,13,14,16,17,19,2,4,5,7,8	92500-25010	12	SCREW M 2.5 X 10 CSK OVAL PHIL NIK PL	0266	21100-500
SH12,3,6,9	92519-25019	4	STANDOFF HEX M2.5 X 19.5MM DRW 01801 REV 900	0026	92519-25019
SH15,18,21,33	92201-19451	4	STANDOFF HEX M2.5 THRU X .538L DRW 01673 REV 920	0026	92201-19451
SH16,19,30,34	92500-25017	4	SCREW 2.5MM X 16MM 90 DEG CSK FLHD PHIL STAINLS	0420	DIN965M2.5X16
SH22	47007-74002	1	SHIELD BACK CONN MTG CONFIG DRW 01816 REV 920	0026	47007-74002
SH23,24,25,26,27,28,29,32	92519-25004	8	REAR SHIELD SPACER 73A DRW 01807 REV 890	0212	19501-A-0029
U02,31	79805-06264	2	IC CMOS 8K X 8 SRAM 150NS	0401	HY6264LP-10
U03	79813-00194	1	PROGRAMMED PROM U03 VX4520	0000	
U05	79800-68172	1	IC VMEBUS CONTROLLER	0092	SCB-68172C2N28
U06	73001-07431	1	IC LS DELAY ELEMENT	0107	74LS31
U07	73311-74241	1	IC TTL S OCTAL BUFFER NONINVERT OUTPUT	0107	74S241
U08	73011-74174	1	IC TTL FAST HEX D FLIP-FLOP	0078	74F174PC
U100	73406-00160	1	IC TTL OCTAL BUS TRANSCEIVER	0107	75160
U103,106,112,117,126,131,132,99	73001-07474	8	IC TTL LS DUAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74LS74A
U105	76500-07410	1	IC TTL LS TRIPLE 3-INPUT NAND GATE	0107	74LS10
U107,130,116,33	73301-07404	4	IC TTL LS HEX INVERTER	0107	74LS04

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U108,128	73309-74244	2	IC HCT OCTAL BUFFER NON-INVERTING	0107	74HCT244
U109	73315-10124	1	IC ECL QUAD TTT TO ECL TRANSLATOR	0074	MC10124
U11,01	73300-07407	2	IC TTL HEX BUFFER	0107	7407
U110	73406-00162	1	IC TTL OCTAL INTERFACE BUS TRANSCIVER	0107	75162
U111,125	75401-74164	2	IC TTL LS 8-BIT SERIAL SHIFT REGISTER	0107	74LS164
U113,124,104,86	77815-07432	4	IC TTL LS QUAD 2-INPUT OR GATE	0107	74LS32
U114	79006-74138	1	IC TTL LS 3-TO-8 LINE DECODER-MUX	0107	74LS138
U118,22	73005-74374	2	IC HCT OCTAL D-TYPE FLIP-FLOP	0107	74HCT374
U119,129,46,47	73003-74373	4	IC TTL ALS OCTAL D-TYPE LATCH	0107	74ALS373
U120,123,76	73300-74125	3	IC TTL QUAD BUFFER TRI-STATE OUTPUTS	0107	74125
U121	79814-00175	1	PAL PROGRAMMED EP310 REV E 73A-151	0000	
U122,96,115	76901-07402	3	IC TTL LS QUAD 2-INPUT NOR GATE	0107	74LS02
U133	77203-07408	1	IC TTL ALS QUAD 2-INPUT AND GATE	0107	74ALS08
U138,137,10	79606-00555	3	IC TTL TIMER	0092	NE555
U16	79814-00174	1	PAL PROGRAMMED 16L8 REV A 73A-151	0000	
U17	79814-00176	1	PAL PROGRAMMED 16L8 REV A 73A-151	0000	
U18	79814-00179	1	PAL PROGRAMMED 20L8 REV B 73A-151	0000	
U20	79606-00556	1	IC TTL DUAL TIMER	0107	NE556A
U21	76602-07438	1	IC TTL S QUAD 2-INPUT NAND BUFFER W-OC	0107	74S38

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U26,27,37,36	73001-74652	4	IC HCT TRANSCEIVER WITH LATCHES	0107	74HCT652
U28	76601-07438	1	IC TTL QUAD 2-INPUT NAND BUFFER W-OC	0107	7438
U29	73312-74240	1	IC TTL AS OCTAL BUFFER	0107	74AS240
U32	79813-00195	1	PROGRAMMED PROM U32 VX4520	0000	
U38	79814-00173	1	PAL PROGRAMMED 16L8 REV D 73A-151	0000	
U40,56	73005-74574	2	IC HCT OCTAL TRISTATE LATCH NON-INVERT	0107	74HCT574
U43	79814-00178	1	PAL PROGRAMMED 16L8 REV C 73A-151	0000	
U45	79814-00177	1	PAL PROGRAMMED EP310 REV D 73A-151	0000	
U48	79005-74151	1	IC TTL LS 1-OF-8 DIGITAL DATA SELECTOR	0107	74LS151
U49,39,59,69	73006-74573	4	IC TTL AS OCTAL D-TYPE LATCH	0107	74AS573
U50	73003-74841	1	IC TTL ALS 10-BIT PARALLEL LATCH	0107	74ALS841
U53,77	76500-07430	2	IC TTL LS 8-INPUT NAND GATE	0107	74LS30
U55,73,83	73003-74573	3	IC TTL ALS OCTAL D-TYPE EDGE TRIG FLIP-FLOP	0107	74ALS573
U57,68	73309-74245	2	IC HCT OCTAL BUS TRANSCEIVER	0107	74HCT245
U58	79814-00180	1	PAL PROGRAMMED 20L8 REV A 73A-151	0000	
U61,98,35	73310-74244	3	IC TTL LS OCTAL BUFFER NON-INVERTING	0107	74LS244N
U62	79807-08259	1	IC NMOS PIC 8MHZ	0118	P8259A-2
U63,93,71,09,19	73308-74245	5	IC TTL ALS OCTAL BUS TRANSCEIVER	0107	74ALS245
U66,67	73001-74374	2	IC TTL LS OCTAL D-TYPE FLIP-FLOP	0107	74LS374N

REFERENCE DESIGNATOR	CDS PART NUMBER	QTY.	PART DESCRIPTION	MFG. NUM.	MFG. PART NUMBER
U70	73309-74842	1	IC TTL ALS 10-BIT BUS REGISTER TRANSCIVER	0107	74ALS842
U74	79801-80190	1	IC CMOS 80186 CPU 12MHZ PLCC	0118	N80C186-12
U80	79805-06116	1	IC CMOS 2K X 8 SRAM 120NS	0387	UMC6116-3L 90NS
U81	76500-07400	1	IC TTL LS QUAD 2-INPUT NAND GATE	0107	74LS00
U87	79814-00181	1	PAL PROGRAMMED 20L8 REV D 73A-151	0000	
U88	73310-74240	1	IC TTL LS OCTAL BUFFER	0107	74LS240
U91	79800-09914	1	IC MOS IEEE-488 BUS I F	0107	TMS9914ANL
U97	73305-74244	1	IC TTL F OCTAL BUFFER 74F244	0074	74F244
W1	90000-06022		WIRE 22 GA UNINSULATED	0017	QQ-W-343D
X03,32	45012-28128	2	SOCKET 28-PIN DIP MACHINED	0089	ICA-286-S-TG30
X121,16,17,38,43,45	45012-20128	6	SOCKET 20-PIN DIP NO SUB	0089	ICA-203-S-TG30
X181,182,581,582,871,872	45010-12112	6	CONNECTOR SIP 12 PIN NO SUB	0089	SBE-12-S-TG30
X74	45010-80186	1	SOCKET 68 PIN PLCC	0243	QILE68P-410T
Y1271	89499-20000	1	CRYSTAL OSC 20.000MHZ 50 PPM	0037	X0-43A-20.000
Y1351	89499-16000	1	CRYSTAL OSC 16.000MHZ 50PPM	0037	X0-43A-16.000
Y65	89500-25000	1	CRYSTAL OSC 25.000MHZ 25 PPM	0062	MP-1 25.0000

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P1

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