

Agilent Technologies

HP 8590 Series Analyzers

Component-Level Information

HP Part Number 5963-2951

Table of Contents

Reference Designator	Description	HP Part Number
N/A	General CLIP Information	5958-7060
A1A1	Keyboard	08590-60201
A3A1A1	Comb Generator	08569-60026
A5A1	Second Converter Tripler	08590-60155
A7	Analog Interface	08590-60197
A7	Analog Interface	08591-60072
A7	Analog Interface	08592-60108
A7	Analog Interface	08594-60030
A7	Analog Interface	08595-60022
A7A1	Tracking Generator Control	08590-60196
A9	3RD Converter	08590-60344
A9	3RD Converter	08591-60081
A9	3RD Converter	08593-60062
A10	Tracking Generator Control	5063-0635
A10	L.O.D.A. Control	5062-8232
A11/A13	Bandwidth Filter	08590-60407
A12	Amplitude Control	08590-60105
A14	Log Amplifier	08590-60386
A15	Motherboard	08590-60218
A15	Motherboard	08591-60062
A16	Processor/Video	08590-60365
A16A1	2X Memory	08590-60399
A17	Memory Card Reader	08590-60396
A22	10 MHz TCXO	08591-60048
A25	Counterlock	08591-60098
A41/A43	Dual I/O	08590-60366
A101	Fast ADC	5062-7079
A102	Demod/TV SYNC	5062-1982
A103	Demod/QPD	5062-1983
A103	Demod/QPD	85462-60042
A110	Cellular Demod/TV	5063-0234
A180	TV Display	08590-60374

Printed July 1997

Component-Level Information Packet

General CLIP Information



HP Part No. 5958-7060
Printed in USA November 1992

Notice. The information contained in this document is subject to change without notice.

Hewlett-Packard makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

General CLIP Information

Component-Level Information Packets (CLIPs) provide information for selected, repairable instrument assemblies. Each CLIP contains a parts list, component-location diagram, and schematic diagram. Each CLIP has an HP part number, which is changed whenever the HP part number for its related instrument assembly is changed.

Updated or replacement CLIPs may be ordered through your local Hewlett-Packard Sales or Service office. Use the CLIP part number provided in Table A-1 of the Service Manual for the instrument documented by this CLIP set.

The information included in this “General CLIP Information” packet is listed below.

- Table 1 provides a guide to reference designations, abbreviations, and multipliers used in the “Description” column of the parts lists.
- Table 2 lists manufacturer codes used in the “Mfr Code” column of the parts lists, along with the names of the manufacturers they represent.
- Figure 1 provides a guide to graphics symbols used on schematic and block diagrams.
- Foldout 1 is an illustration of the general layout of schematic and block diagrams.

Table 1. Reference Designations, Abbreviations, and Multipliers (1 of 4)

REFERENCE DESIGNATIONS					
A	Assembly	F	Fuse	RT	Thermistor
AT	Attenuator, Isolator, Limiter, Termination	FL	Filter	S	Switch
B	Fan, Motor	HY	Circulator	T	Transformer
BT	Battery	J	Electrical Connector (Stationary Portion), Jack	TB	Terminal Board
C	Capacitor	K	Relay	TC	Thermocouple
CP	Coupler	L	Coil, Inductor	TP	Test Point
CR	Diode, Diode Thyristor, Step Recovery Diode, Varactor	M	Meter	U	Integrated Circuit, Microcircuit
DC	Directional Coupler	MP	Miscellaneous Mechanical Part	V	Electron Tube
DL	Delay Line	P	Electrical Connector (Movable Portion), Plug	VR	Breakdown Diode (Zener), Voltage Regulator
DS	Annunciator, Lamp, Light Emitting Diode (LED), Signaling Device (Visible)	Q	Silicon Controlled Rectifier (SCR), Transistor, Triode Thyristor	W	Cable, Wire, Jumper
E	Miscellaneous Electrical Part	R	Resistor	X	Socket
				Y	Crystal Unit (Piezoelectric, Quartz)
				Z	Tuned Cavity, Tuned Circuit
ABBREVIATIONS					
A		BSC	Basic	CNDCT	Conducting, Conductive, Conductivity, Conductor
A	Across Flats, Acrylic, Air (Dry Method), Ampere	BTN	Button	CONT	Contact, Continuous, Control, Controller
ADJ	Adjust, Adjustment	C		CONV	Converter
ANSI	American National Standards Institute (formerly USASI-ASA)	C	Capacitance, Capacitor, Center Tapped, Cermet, Cold, Compression	CPRSN	Co mpression
ASSY	Assembly	CCP	Carbon Composition Plastic	CUP-PT	Cup Point
AWG	American Wire Gage	CD	Cadmium, Card, Cord	CW	Clockwise, Continuous Wave
B		CER	Ceramic	D	
BCD	Binary Coded Decimal	CHAM	Chamfer	D	Deep, Depletion, Depth, Diameter, Direct Current
BD	Board, Bundle	CHAR	Character, Characteristic, Charcoal	DA	Darlington
BE-CU	Beryllium Copper	CMOS	Complementary Metal Oxide Semiconductor		
BNC	Type of Connector				
BRG	Bearing, Boring				
BRS	Brass				

Table 1. Reference Designations, Abbreviations, and Multipliers (2 of 4)

ABBREVIATIONS					
DAP-GL	Diallyl Phthalate Glass	FT	Current Gain Bandwidth Product (Transition Frequency), Feet, Foot	JFET	Junction Field Effect Transistor
DBL	Double			K	
DCDR	Decoder				
DEG	Degree				
D-HOLE	D-Shaped Hole	FXD	Fixed	K	Kelvin, Key, Kilo, Potassium
DIA	Diameter				
DIP	Dual In-Line Package		G	KNRLD	Knurled
DIP-SLDR	Dip Solder			KVDC	Kilovolts Direct Current
D-MODE	Depletion Mode	GEN	General, Generator		
DO	Package Type Designation	GND	Ground		
DP	Deep, Depth, Dia- metric Pitch, Dip	GP	General Purpose, Group	L	
DP3T	Double Pole Three Throw		H	LED	Light Emitting Diode
DPDT	Double Pole Double Throw	H	Henry, High	LG	Length, Long
DWL	Dowell	HDW	Hardware	LIN	Linear, Linearity
	E	HEX	Hexadecimal, Hexagon, Hexagonal	LK	Link, Lock
E-R	E-Ring	HLCL	Helical	LKG	Leakage, Locking
EXT	Extended, Extension, External, Extinguish	HP	Hewlett-Packard Company, High Pass	LUM	Luminous
	F		I		M
F	Fahrenheit, Farad, Female, Film (Resistor), Fixed, Flange, Frequency	IC	Collector Current, Integrated Circuit	M	Male, Maximum, Mega, Mil, Milli, Mode
FC	Carbon Film/ Composition, Edge of Cutoff Frequency, Face	ID	Identification, Inside Diameter	MA	Milliampere
FDTHRU	Feedthrough	IF	Forward Current, Intermediate Frequency	MACH	Machined
FEM	Female	IN	Inch	MAX	Maximum
FIL-HD	Fillister Head	INCL	Including	MC	Molded Carbon Composition
FL	Flash, Flat, Fluid	INT	Integral, Intensity, Internal	MET	Metal, Metallized
FLAT-PT	Flat Point		J	MHZ	Megahertz
FR	Front			MINTR	Miniature
FREQ	Frequency	J-FET	Junction Field Effect Transistor	MIT	Miter
				MLD	Mold, Molded
				MM	Magnetized Material, Millimeter
				MOM	Momentary
				MTG	Mounting
				MTLC	Metallic
				MW	Milliwatt

Table 1. Reference Designations, Abbreviations, and Multipliers (4 of 4)

ABBREVIATIONS					
	U		VAR Variable		Y
			VDC Volts—Direct Current		YIG Yttrium-Iron-Garnet
UCD	Microcandela				
UF	Microfarad				
UH	Microhenry		W		
UL	Microliter, Underwriters' Laboratories, Inc.	W	Watt, Wattage, White, Wide, Width		Z
UNHDND	Unhardened	W/SW	With Switch		ZNR Zener
		WW	Wire Wound		
	V				
V	Variable, Violet, Volt, Voltage		X		
VAC	Vacuum, Volts— Alternating Current	X	By (Used with Dimensions), Reactance		

MULTIPLIERS					
Abbreviation	Prefix	Multiple	Abbreviation	Prefix	Multiple
T	tera	10 ¹²	m	milli	10 ⁻³
G	giga	10 ⁹	μ	micro	10 ⁻⁶
M	mega	10 ⁶	n	nano	10 ⁻⁹
k	kilo	10 ³	p	pico	10 ⁻¹²
da	deka	10 ²	f	femto	10 ⁻¹⁵
d	deci	10 ⁻¹	a	atto	10 ⁻¹⁸
c	centi	10 ⁻²			

Table 2. Manufacturers Code List

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
00039	NEC ELECTRONICS INC	MTN VIEW, CA	US	94043
00046	UNITRODE CORP	LEXINGTON, MA	US	02173
00075	ARIZONA COIL INC	NOGALES, AZ	US	85621
00273	STILLWATER MFG CO	EAST FREEDOM, MA	US	02717
00278	MCCOY ELECTRONICS CO	HOLLY SPRINGS, PA	US	17065
00350	EXAR INTEGRATED SYSTEMS INC	SUNNYVALE, CA	US	94086
00466	NORELCO NORTH AMER PHILIPS LTG CORP	LOS ANGELES, CA	US	90021
00493	UNITED CHEMI-CON INC	COMPTON, CA	US	90220
00746	ROHM CORP	IRVINE, CA	US	92713
00779	NICHICON (AMERICA) CORP	SCHAUMBERG, IL	US	60195
00830	KYOCERA INTERNATIONAL INC	SAN DIEGO, CA	US	
00901	UNION CARBIDE CORP	DANBURY, CT	US	06810
01064	SCHAAL BROS INC	BERTHOUD, CO	US	80513
01074	HOLSWORTHY ELECTRONICS LTD	HOLSWORTHY	EG	
01128	RES-NET CORP	WHIPPANY, NJ	US	07981
01131	WESTERN THERMISTOR CORP	OCEANSIDE, CA	US	92054
01136	ELCO INDUSTRIES INC	ROCKFORD, IL	US	61125
01172	R C D COMPONENTS INC	BEDFORD, NH	US	03102
01185	MAGNET WIRE CORP	NEW YORK, NY	US	10013
01230	AEROVOX CORP	NEW BEDFORD, MA	US	02741
01250	GTE SYLVANIA ELEK COMPONENTS GROUP	WALTHAM, MA	US	02154
01339	GETTIG ENGRG & MFG CO INC	SPRING MILLS, PA	US	16875
01380	AMP INC	HARRISBURG, PA	US	17111
01409	CROVEN CRYSTALS	WHITBY	CN	Lin 5
01417	NEL FREQUENCY CONTROLS INC	BURLINGTON, WI	US	53105
01452	SANGAMO WESTON INC	NORCROSS, GA	US	30071
01461	GOE ENGINEERING CO INC	ONTARIO, CA	US	91761
01468	STETTNER & CO	LAUF	GM	D-856
01478	BOYD CORP	PLEASANTON, CA	US	94566
01542	HP DIV 01 SAN JOSE COMPONENTS	SAN JOSE, CA	US	95131
01590	PLESSEY SEMICONDUCTORS	SANTA ANA, CA	US	92705
01607	ALLEN-BRADLEY CO INC	EL PASO, TX	US	79935
01688	MURATA CORPORATION OF AMERICA	MARIETTA, GA	US	30067
01691	TRW INC SEMICONDUCTOR DIV	LAWNDALE, CA	US	90260
01698	TEXAS INSTRUMENTS INC	DALLAS, TX	US	75265
01708	JUBULATION	SANTA CRUZ, CA	US	95060
01736	ALLIED ELECTRONICS CORP	CHICAGO, IL	US	60612
01760	MATSUO ELECTRONICS OF AMERICA	HUNTINGTON BEACH, CA	US	90245
01795	SYNERTEK	SANTA CLARA, CA	US	95051
01850	AROMAT CORP	MOUNTAINSIDE, NJ	US	07092
01854	RCL ELECTRONICS INC	NORTHBROOK, IL	US	60062
01869	PULSE ENGINEERING INC	SAN DIEGO, CA	US	92111
01876	HP DIV 02 SCD IC'S	SANTA CLARA, CA	US	95050
01885	HAMILTON STANDARD CONTROLS INC	WINDWOR LOCKS, CT	US	06096
01886	COILCRAFT INC	CARY, IL	US	60013
01887	FERROXCUBE CORP	SAUGERTIES, NY	US	12477

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
01898	HI-G CO INC	HARTFORD, CT	US	06114
01916	BUNKER RAMO CORP AMPHENOL CONN DIV	BROADVILLE, IL	US	60153
01921	RCA CORP	NEW YORK, NY	US	10112
01923	NYLOGRIP PRODUCTS	WALTHAM, MA	US	02154
01924	ITW FASTEX	DES PLAINES, IL	US	60016
01939	ELPAC INC COMPONENTS DIV	IRVINE, CA	US	92664
01943	HP DIV 04 SPD CABLES 64	PALO ALTO, CA	US	94304
01953	HP DIV 04 SPD MOLDING 91	PALO ALTO, CA	US	94304
01973	GE CO SEMICONDUCTOR PROD DEPT	AUBURN, NY	US	13201
01991	TRANSITRON ELECTRONIC CORP	WAKEFIELD, MA	US	01880
01992	KDI PYROFILM CORP	WHIPPANY, NJ	US	07981
01993	MARKEL CORP	NORRISTOWN, PA	US	19404
02010	AVX CORP	GREAT NECK, NY	US	11021
02030	NATIONAL WIRE & CABLE CO INC	LOS ANGELES, CA	US	90031
02037	MOTOROLA INC	ROSELLE, IL	US	60195
02038	UNICORP	ORANGE, NJ	US	07050
02062	HP DIV 05 MSD	SAN JOSE, CA	US	94304
02086	WESTINGHOUSE ELEC CORP SEMICON DEPT	YOUNGWOOD, PA	US	15697
02091	ULTRONIX INC	GRAND JUNCTION, CO	US	81501
02123	EG & G INC	WELLESLEY, MA	US	02181
02139	MEPCO/ELECTRA INC	MORRISTOWN, NJ	US	07960
02145	RAYCHEM CORP	MENLO PARK, CA	US	94025
02160	PANDUIT CORP	TINLEY PARK, IL	US	60477
02170	AMATOM ELEK HARDWARE DIV OF MITE	NEW ROCHELLE, NY	US	06515
02172	JEFFERS ELECTRONICS INC	NOGALES, AZ	US	85621
02180	PRECISION MONOLITHICS INC	SANTA CLARA, CA	US	95054
02191	CORNING COMPONENTS INC	CORNING, NY	US	14830
02194	ROBINSON NUGENT INC	NEW ALBANY, IN	US	47150
02210	MILTON ROSS CO	SOUTHAMPTON, PA	US	18966
02215	KELVIN ELECTRIC CO	VAN NUYS, CA	US	91401
02236	SILICON TRANSISTOR CORP	CHELMSFORD, MA	US	11530
02237	FAIRCHILD SEMICONDUCTOR CORP	CUPERTINO, CA	US	95014
02273	TRW INC BURLINGTON DIV	BURLINGTON, IA	US	52601
02290	RAYTHEON CO SEMICONDUCTOR DIV HQ	MOUNTAIN VIEW, CA	US	94040
02296	HP DIV 08 COLO SPRGS	COLORADO SPRGS, CO	US	80907
02344	GE CO MINIATURE LAMP PROD DEPT	CLEVELAND, OH	US	44112
02362	HP DIV 09 LID COMPONENTS	LOVELAND, CO	US	80537
02363	HP DIV C5 COLORADO IC	FT COLLINS, CO	US	80525
02366	KOA SPEER ELECTRONICS INC	BRADFORD, PA	US	16701
02367	CORNELL-DUBILIER/SANGAMO	WAYNE, NJ	US	07470
02379	TEXAS CAPACITOR CO INC	HOUSTON, TX	US	77036
02392	C & K COMPONENTS INC	NEWTON, MA	US	02158
02408	DIXON INDUSTRIES CORPORATION	BRISTOL, RI	US	02809
02414	BURNDY CORP	NORWALK, CT	US	06856
02415	DALE ELECTRONICS INC	YANKTON, SD	US	57078
02440	THOMPSON BREMER DIV VARE	CHICAGO, IL	US	60622

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
02465	ANILLO INDUSTRIES INC	ORANGE, CA	US	92667
02483	CTS CORP	ELKHART, IN	US	46514
02484	CTS CORP PASO ROBLES	PASO ROBLES, CA	US	93446
02499	IRC INC	BOONE, NC	US	28607
02501	TELEDYNE INDUSTRIES INC	LOS ANGELES, CA	US	90067
02556	MONTROSE PRODUCTS CO	AUBURN, MA	US	01501
02567	OMTRONICS MFG INC	OMAHA, NE	US	68105
02569	CRYSTALONICS, DIV TELEDYNE	CAMBRIDGE, MA	US	02140
02572	TELEDYNE THERMATICS	ELM CITY, NC	US	27822
02574	RLC ELECTRONICS INS	MT KISCO, NY	US	10549
02577	HAMLIN INC	LAKE MILLS, WI	US	53551
02582	CLAROSTAT MFG CO INC	DOVER, NH	US	03820
02598	UNITRODE CORP	WATERTOWN, MA	US	02172
02603	NATIONAL WIRE & STAMPING INC	ENGLEWOOD, CO	US	80110
02608	THERMALLOY INC	DALLAS, TX	US	75234
02619	SOLITRON DEVICES INC (DIODES)	TAPPAN, NY	US	10983
02634	SPRAGUE ELECTRIC SEMICON DIV	CONCORD, NH	US	03301
02664	SEMTECH CORP	NEWBURY PARK, CA	US	91320
02668	EDISON ELEK DIV MCGRAW-EDISON	MANCHESTER, NH	US	03130
02675	AMERICAN COMPONENTS INC	CONSHOHOCKEN, PA	US	19428
02682	ITT SEMICONDUCTORS DIV	TUSTIN, CA	US	92680
02685	LOBAUGH ROLLIN J	SOUTH SAN FRANC, CA	US	94080
02686	WATKINS-JOHNSON CO	PALO ALTO, CA	US	94304
02688	MICROSEMI CORP	SCOTSDALE, AZ	US	85252
02696	CORNING GLASS WORKS ELEK PROD DIV	CORNING, NY	US	14830
02706	WARD LEONARD HAGERSTOWN DIV	HAGERSTOWN, MD	US	21740
02713	GENERAL INSTRUMENT CORP (DIODE)	HICKSVILLE, NY	US	11802
02718	VALOR ELECTRONICS INC	SANTA ANA, CA	US	92705
02734	AMETEK INC RODAN DIV	ANAHEIM, CA	US	92806
02739	MINI-CIRCUITS LAB	BROOKLYN, NY	US	11235
02744	ELEC-TROL INC	SAUGUS, CA	US	91350
02761	FENWAL ELECTRONICS INC	SADDLE BROOK, NJ	US	07662
02763	TELEDYNE SEMICONDUCTOR	MOUNTAIN VIEW, CA	US	94043
02771	ANSLEY ELECTRIC	LOS ANGELES, CA	US	90032
02788	M/A-COM INC	BURLINGTON, MA	US	01803
02798	CORNING ELECTRONICS	RALEIGH, NC	US	27604
02803	CODI SEMICONDUCTOR	LINDEN, NJ	US	07410
02805	COOPER INDUSTRIES INC	HOUSTON, TX	US	77210
02813	U S CAPACITOR CORP	BURBANK, CA	US	91504
02826	DENNISON MFG CO	FRAMINGHAM, MA	US	01701
02856	MOHAWK SPRING CO INC	ARLINGTON HEIGH, IL	US	60008
02865	ALPHA INDUSTRIES INC	WOBURN, MA	US	01801
02877	ANGSTROHM PRECISION INC	VAN NUYS, CA	US	91405
02883	SILICONIX INC	SANTA CLARA, CA	US	95054
02910	SIGNETICS CORP	SUNNYVALE, CA	US	94086
02923	CHOMERICS INC	WOBURN, MA	US	01801

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
02928	VISHAY INTERTECHNOLOGY INC	MALVERN, PA	US	19355
02937	VOLTRONICS CORP	HANOVER, NJ	US	07936
02946	DUPONT E I DE NEMOURS & CO	WILMINGTON, DE	US	19801
02995	MEPCO/CENTRALAB INC	RIVIERA, FL	US	33404
03038	INTL RECTIFIER CORP	LOS ANGELES, CA	US	90069
03122	EMCON DIV ITW	SAN DIEGO, CA	US	92129
03123	MICRO-OHM CORP	EL TORO, CA	US	92630
03171	SOLITRON DEVICES INC	PALM BEACH, FL	US	33404
03172	TRW MICROWAVE	SUNNYVALE, CA	US	94086
03174	ANZAC ELEK DIV ADAMS-RUSSEL CO INC	WALTHAM, MA	US	02154
03206	DUPONT CONNECTOR SYSTEMS	CAMP HILL, PA	US	17011
03232	PRODUCT COMPONENT CORP	MT VERNON, NY	US	10553
03239	WAVETEK	SAN DIEGO, CA	US	92111
03257	M-TRON INDUSTRIES INC	YANKTON, SD	US	57078
03259	STANFORD APPLIED ENGINEERING	SANTA CLARA, CA	US	95054
03263	ELECTRONIZED CHEMICALS CORP	BURLINGTON, MA	US	01803
03273	GOWANDA ELECTRONICS CORP	GOWANDA, NY	US	14070
03282	GENERAL CABLE CORP	NEW YORK, NY	US	10017
03285	ANALOG DEVICES INC	NORWOOD, MA	US	02062
03291	AVANTEK INC	SANTA CLARA, CA	US	95054
03292	CORNING GLASS WORKS	CORNING, NY	US	14830
03297	EMC TECHNOLOGY INC	CHERRY HILL, NJ	US	08034
03316	SPECIALTY CONNECTOR CO	FRANKLIN, IN	US	46131
03317	AEG-TELEFUNKEN CORP	ENGLEWOOD, NJ	US	07632
03334	NV PHILIPS ELCOMA	EINDHOVEN	NE	02876
03352	SWISS AUTOMATICS INC	COLUMBUS, NE	US	68601
03371	USM CORP NYLOK FASTENER DIV	TORRANCE, CA	US	90501
03380	GRIES/DYNACAST CO DIV COATES-CLARK	NEW ROCHELLE, NY	US	10802
03389	VARADYNE INC	SANTA MONICA, CA	US	90404
03394	METHODE ELECTRONICS INC	CHICAGO, IL	US	60656
03395	MEPCO/CENTRALAB INC	WEST PALM BEACH, FL	US	33407
03406	NATIONAL SEMICONDUCTOR CORP	SANTA CLARA, CA	US	95052
03412	CORNING GLASS WORKS (WILMINGTON)	WILMINGTON, NC	US	28401
03418	MOLEX INC	LISLE, IL	US	60532
03428	NONOTUCK MFG CO	HADLEY FALLS, MA	US	01075
03441	F-DYNE ELECTRONICS CO	BRIDGEPORT, CT	US	06605
03521	JOHANSON DIELECTRICS INC	BURBANK, CA	US	91510
03530	STACKPOLE COMPONENT CO	RALEIGH, NC	US	27620
03545	TELEDYNE PHILBRICK NEXUS	DEDHAM, MA	US	02026
03594	CARTER SEMICONDUCTORS	LOWELL, MA	US	01850
03621	M/A-COM CABLEWAVE MINI PROD	BURLINGTON, MA	US	01803
03627	SOLID STATE DEVICES INC	LA MIRADA, CA	US	90638
03647	INSTRUMENT SPECIALTIES CO INC	DEL WATER GAP, PA	US	07424
03651	MEPCO/ELECTRA CORP	SAN DIEGO, CA	US	92121
03658	ALPHA IND MICROELECTRONICS DIVISION	COLMAR, PA	US	18915
03706	WEST-CAP ARIZONA	SAN FERNANDO, CA	US	91340

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
03714	INTERSIL INC	CUPERTINO, CA	CA	95014
03724	BIVAR INC	SANTA ANA, CA	US	92705
03740	ERIE TECH PROD INC ERIE FREQ CONT	CARLISLE, PA	US	17013
03744	BOURNS INC	RIVERSIDE, CA	US	92507
03746	SPECTRUM CONTROL INC	ERIE, PA	US	16505
03747	COLORADO CRYSTAL CORP	LOVELAND, CO	US	80537
03762	TELE-TECH CORP	BOZEMAN, MT	US	59771
03793	SILICON GENERAL INC	SAN JOSE, CA	US	95134
03794	ADVANCED MICRO DEVICES INC	SUNNYVALE, CA	US	94086
03795	MOTOROLA INC	FRANKLIN PARK, IL	US	60131
03799	HARRIS CORP	MELBOURNE, FL	US	32901
03811	INTEL CORP	SANTA CLARA, CA	US	95054
03827	FAIR RITE PRODUCTS CORP	WALLKILL, NY	US	12589
03849	MICROSYSTEMS INTERNATIONAL LTD	OTTAWA	CN	
03910	GENERAL ELECTRIC CO	PHILADELPHIA, PA	US	19124
03923	SIEMENS CORP	ISELIN, NJ	US	08830
03938	MIDLAND-ROSS CORP	CLEVELAND, OH	US	44113
03972	OHMITE MFG CO	SKOKIE, IL	US	60076
03973	HP DIV 45 NMD	SANTA ROSA, CA	US	95401
04068	LABINAL COMPONENTS & SYSTEMS INC	ELK GROVE VILLA, IL	US	60007
04078	SGS-THOMSON MICROELECTRONICS INC	PHOENIX, AZ	US	85022
04092	MONOLITHIC MEMORIES INC	SANTA CLARA, CA	US	95054
04121	SEMICONDUCTOR CIRCUITS INC	HAVERHILL, MA	US	01830
04150	VICLAN INC	SAN DIEGO, CA	US	92138
04169	SANGAMO ELECTRIC CO	SPRINGFIELD, IL	US	62702
04181	AHAM-TOR	RANCHO, CA	US	91702
04182	SHALLCROSS INC	NORTHBROK, IL	US	60062
04200	SPRAGUE ELECTRIC CO	LEXINGTON, MA	US	02173
04204	SPS TECHNOLOGIES	NEWTOWN, PA	US	18940
04213	STIMPSON EDWIN B CO INC	BROOKLYN, NY	US	11705
04225	THOMAS & BETTS CORP	RARITAN, NJ	US	08869
04234	DELBERT BLINN CO	POMONA, CA	US	91766
04261	INSULECTRO CORP	BURLINGAME, CA	US	94010
04314	VLN CORP VICTOREEN INSTRUMENT DIV	CLEVELAND, OH	US	44103
04379	AMETEK INC	PAOLI, PA	US	19301
04393	CENTRE ENGINEERING INC	STATE COLLEGE, PA	US	16801
04418	ALLEN MFG CO	HARTFORD, CT	US	06101
04423	G.E. CERAMICS, INC.	CHATTANOOGA, TN	US	37405
04458	BLILEY ELECTRIC CO	ERIE, PA	US	16508
04464	BRAND REX CO	WILLIMANTIC, CT	US	06226
04475	CAMBRIDGE THERMIONIC CORP	CAMBRIDGE, MA	US	02138
04486	ITT CORP	NEW YORK, NY	US	10022
04492	CENTRALAB INC	MILWAUKEE, WI	US	53209
04504	GENERAL INSTRUMENT CORP	CLIFTON, NJ	US	07012
04507	TRW INC	CLEVELAND, OH	US	44124
04514	DOW CORNING CORP	MIDLAND, MI	US	48641

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
04522	ELECTRO MOTIVE CORP	FLORENCE, SC	US	06226
04550	GENERAL ELECTRIC CO	FAIRFIELD, CT	US	06430
04563	ERIE TECHNOLOGICAL PRODUCTS INC	ERIE, PA	US	16512
04564	ESSEX INTERNATIONAL INC	FORT WAYNE, IN	US	46804
04567	ITT HARPER DIV	CHICAGO, IL	US	60606
04568	BECKMAN INDUSTRIAL CORP	FULLERTON, CA	US	92635
04581	BARWOOD MFG CORP	EVERETT, MA	US	02149
04605	FISCHER SPECIAL MFG CO	CINCINNATI, OH	US	45206
04615	J F D ELECTRONICS CORP	BROOKLYN, NY	US	11219
04645	SIGNALITE DIV GENERAL INST CORP	NEPTUNE, NJ	US	07753
04648	PIEZO CRYSTAL CO	CARLSILE, PA	US	17013
04670	EF JOHNSON CO	WASECA, MN	US	56093
04672	TRW INC PHILADELPHIA DIV	PHILADELPHIA, PA	US	19108
04703	LITTELFUSE INC	DES PLAINES, IL	US	60016
04719	MARWEDEL C W	SAN FRANCISCO, CA	US	94103
04726	3M CO	ST PAUL, MN	US	55144
04733	BELL INDUSTRIES INC MILLER JW DIV	COMPTON, CA	US	90224
04757	OAK SWITCH SYSTEMS INC	CRYSTAL LAKE, IL	US	60014
04776	POTTER & BRUMFIELD INC	PRINCETON, IN	US	47671
04805	ILLINOIS TOOL WORKS INC SHAKEPROOF	ELGIN, IL	US	60126
04821	TILLEY MFG CO	MORGAN HILL, CA	US	94070
04822	STACKPOLE CARBON CO	ST MARYS, PA	US	15857
04828	TINNERMAN PRODUCTS INC	CLEVELAND, OH	US	44101
04830	STEWART STAMPING CORP	YONKERS, NY	US	10704
04853	VARFLEX CORP	ROME, NY	US	13440
04880	ZIERICK MFG CO	MT KISCO, NY	US	10549
04935	MEPCO ELECTRA CORP	MORRISTOWN, NJ	US	07960
04939	SCHNITZER ALLOY PRODUCTS CO	ELIZABETH, NJ	US	07206
04977	ITT CORP COMPONENTS DIV	NEW YORK, NY	US	10022
04990	GRAYHILL INC	LA GRANGE, IL	US	60525
05016	MONITOR PRODUCTS CO INC	OCEANSIDE, CA	US	92054
05065	TEXAS INSTRUMENTS INC	ATTLEBORO, MA	US	02703
05088	VARO INC	GARLAND, TX	US	75046
05098	VICTORY ENGINEERING CORP	SPRINGFIELD, NJ	US	07081
05108	KULKA-SMITH INC	MANASQUAN, NJ	US	08736
05131	ELECTRONIC DEVICES INC	YONKERS, NY	US	10710
05160	VRN INTERNATIONAL	ST PETERSBURG, FL	US	33710
05176	AMERICAN SHIZUKI CORP	CANOGA PARK, CA	US	91304
05232	BRADY W H CO	MILWAUKEE, WI	US	53209
05293	PRECISION METAL PRODUCT CO	STONEHAM, MA	US	02180
05347	UNIMICA	NEW YORK, NY	US	10013
05350	WILMINGTON FIBRE SPECIALTY CO	NEW CASTLE, DE	US	19720
05364	LITTON PRECISION PROD INC	VAN NUYS, CA	US	91409
05368	FCP INC	OLATHE, KS	US	66062
05400	REESE J RAMSEY INC	NEW YORK, NY	US	10007
05436	BURR-BROWN CORP	TUCSON, AZ	US	85706

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
05447	BERGQUIST CO	MINNEAPOLIS, MN	US	55420
05453	ICO-RALLY CORP	SUNNYVALE, CA	US	94303
05461	ITT HARPER INC	MORTON GROVE, IL	US	60053
05466	EMHART CORP	FARMINGTON, CT	US	06032
05507	MILLER DIAL & NAMEPLATE CO	EL MONTE, CA	US	91734
05518	AUGAT INC	MANSFIELD, MA	US	02048
05524	DALE ELECTRONICS INC	COLUMBUS, NE	US	68601
05535	KEYSTONE ELECTRONICS CORP	NEW YORK, NY	US	10012
05545	NATIONAL TEL TRONICS CORP	YONKERS, NY	US	10701
05559	ALPHA WIRE CORP	ELIZABETH, NJ	US	07207
05568	JACOBSON MFG CO INC	KENILWORTH, NJ	US	07033
05589	UNIFORM TUBES	COLLEGEVILLE, PA	US	19426
05623	CAMDEN WIRE CO INC	CAMDEN, NY	US	13316
05630	WESTON COMPONENTS	ARCHBALD, PA	US	18403
05648	MAGNECRAFT ELECTRIC CO	CHICAGO, IL	US	60630
05661	ALCO ELECTRONIC PRODUCTS INC	NORTH ANDOVER, MA	US	01845
05668	VITRAMON INC	MONROE, CT	US	06468
05683	WECKESSER CO INC	CHICAGO, IL	US	60641
05704	SAN FERNANDO ELECTRIC MFG CO	SAN FERNANDO, CA	US	91341
05742	P C A ELECTRONICS INC	SEPULVEDA, CA	US	91343
05768	MALCO-A MICRODOT CO	PASADENA, CA	US	91030
05769	ITT SEAELECTRO CORP	TRUMBULL, CT	US	06611
05792	INTL ELECTRONIC RESEARCH CORP	BURBANK, CA	US	91502
05809	MARSHALL IND CAPACITOR DIV	MONROVIA, CA	US	91016
05826	AMER PRCN IND INC DELEVAN DIV	AURORA, NY	US	14052
05879	AMPHENOL CORPORATION	DANBURY, CT	US	06810
05917	RIFA AB	STOCKHOLM	SW	S-163
05943	TEXAS INSTRUMENTS DEUTSCHLAND GMBH	FREISING	GM	8050
05946	VALVO GMBH	HAMBURG	GM	2000
05951	WICKMANN-WERKE A G	WITTEN-ANNEN	GM	5870
05959	MARQUARDT GMBH	RIETHEIM	GM	D-720
05967	VTM A/S	GLOSTRUP	DK	2080
05982	CELDUC CONSTR ELECTRIQUES DU CENTRE	SORBIERS	FR	42
05985	SESCOSEM	SAINT EGREVE	FR	75781
05992	EFCO COMPOSANTS	NANTERRE	FR	
05993	CORNING GLASS EUROPE SOVCOR	LE VESINET	FR	
06003	SESCOSEM (63)	PARIS	FR	75781
06032	STC/STANTEL	DEVON	EG	
06039	SEAELECTRO LTD	PORTSMOUTH	EG	
06058	BOURNS TRIMPOT LTD	MIDDLESEX	EG	
06118	ROEDERSTEIN/RESISTA GMBH	LANDSHUT	GM	8300
06121	SIEMENS AG	MUNICH	GM	8000
06127	WIMA	MANNHEIM	GM	6800
06252	AB ELEKTRONIK GMBH	SALZBURG	AU	A-501
06328	SCHURTER AG	LUZERN	SW	CH-60
06330	CONDENSATEURS FRIBOURG S A	FRIBOURG	SW	

Table 2. Manufacturers Code List (continued)

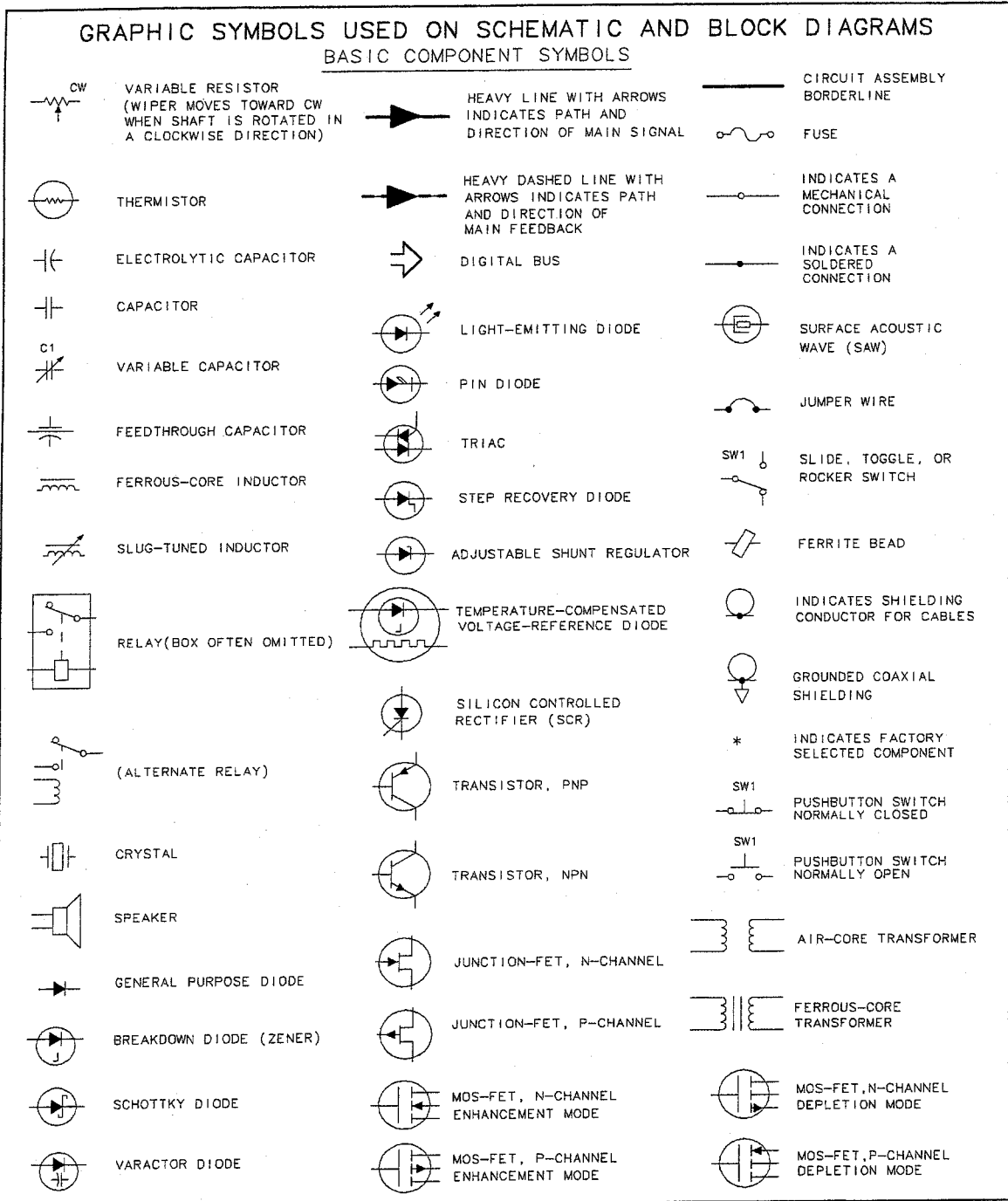
Mfr Code	Manufacturer Name	Address	Country	ZIP Code
06337	PHILLIPS GLOEILAMPENFABRIEKEN N V	EINDHOVEN	HL	
06344	FUJITSU MICROELECTRONICS INC	SANTA CLARA, CA	US	95054
06347	HITACHI AMERICA LTD	SUNNYVALE, CA	US	94086
06352	TDK CORPORATION OF AMERICA	SKOKIE, IL	US	60076
06354	TOSHIBA CORP	TOKYO	JP	
06424	E-SIL COMPONENTS LTD	SUNDERLAND	EG	SR4 6
06501	BARBER & COLEMAN LTD	SALE CHES	EG	
06563	SIEMENS CORP COMPONENTS GROUP	SCOTTSDALE, AZ	US	85252
06650	AEG-TELEFUNKEN	HEILBRONN	GM	7100
06665	SAMTEC	NEW ALBANY, IN	US	47150
06784	MIDWEST COMPONENTS	MUSKEGON, MI	US	49443
06857	TRAK MICROWAVE CORP	TAMPA, FL	US	33614
06860	HUBER & SUHNER AG	HERISAU	SW	
06900	JUDD WIRE	BURLINGTON, MA	US	01803
06916	SONY CORP	TOYKO	JP	141
06951	TRW RESISTIVE PRODUCTS DIV	CORPUS CHRISTI, TX	US	78411
07041	R.A.F. ELECTRONIC HARDWARE INC	STRATFORD, CT	US	06497
07050	MICRO POWER SYSTEMS	SANTA CLARA, CA	US	95050
07158	EATON CORP	CLEVELAND, OH	US	44144
07179	AAVID ENGINEERING INC	LACONIA, NH	US	03247
07221	SUPERTEX INC	SUNNYVALE, CA	US	94086
07284	PAKTRON DIV ITW	VIENNA, VA	US	22180
07338	J K L COMPONENTS CORP	LOS ANGELES, CA	US	90064
07379	SAN-O INDUSTRIAL CORP	BOHEMIA LI, NY	US	11716
07398	BEL FUSE INC	JERSEY CITY, NJ	US	07302
07477	AMERICAN OIL & SUPPLY CO	NEWARK, NJ	US	07105
07766	LA RADIOTECHNIQUE COMPELEC	VILLEVRBANNE	FR	
07798	REMTEK CORP	SUNNYVALE, CA	US	
08097	SPRAGUE-GOODMAN ELECTRONICS	NEW HYDE PARK, NY	US	11040
08113	KAHGAN ELECTRONICS CORP	HEMPSTEAD, NY	US	11550
08123	COIL-Q CORP	BRONXVILLE, NY	US	
08259	DALE ELECTRONICS INC	TEMPE, AZ	US	85252
08261	STAR MICRONICS INC	NEW YORK, NY	US	
08335	SOURIAU INC	SAUGUS, CA	US	95203
08369	FILECA	STE GENEVIEVE	FR	
08560	OXLEY DEV LTD	CUMBRIA	EG	
08666	PANEL COMPONENTS CORP	SANTA ROSA, CA	US	
08709	PANASONIC INDUSTRIAL CO	SECAUCUS, NJ	US	07094
08778	MADISON CABLE CORP	WORCHESTER, MA	US	01603
08779	MITSUBISHI ELECTRONICS AMERICA	SUNNYVALE, CA	US	94086
08781	CATALYST RESEARCH CORP	BALTIMORE, MD	US	
08810	ROCKWELL INTERNATIONAL	ANAHEIM, CA	US	
08838	AND (ALPHA NUMERIC DISPLAYS)	BURLINGAME, CA	US	
08852	METELICS CORP	SUNNYVALE, CA	US	
09043	GLOW-LITE DIV OF DUTCH BOY	PAULS VALLEY, OK	US	
09050	XENELL	WYNNEWOOD, OK	US	

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
09126	ASJ PTE LTD	JURONG TOWN	SG	
09171	RHOMBUS INDUSTRIES INC	HUNTINGTON BEACH, CA	US	92649
09226	NEC ELECTRONICS INC	SANTA CLARA, CA	US	
09235	FOX ELECTRONICS	FT MEYERS, FL	US	33910
09283	TOPAZ SEMICONDUCTOR	SAN JOSE, CA	US	95132
09441	APPLIED ENGINEERING PRODUCT CO	HAMDEM, CT	US	
09448	WAMCO INC	FOUNTAIN VALLEY, CA	US	
09454	PRECISION RESISTIVE PRODS INC	MEDIAPOLIS, IA	US	52637
09507	HEWLETT PACKARD CO, MID	SANTA ROSA, CA	US	95403
09538	TUSONIX	TUCSON, AZ	US	85740
09694	ELECTRONIC ESSENTIALS	WOODSIDE, NY	US	
09849	NDK AMERICA INC	CUPERTINO, CA	US	54014
09855	KOWASANGYO CORP	TOKYO	JP	
09859	CERA-MITE CORP	GRAFTON, WI	US	53024
09862	HITACHI CABLE LTD	TOKYO	JP	
09914	UNITRODE CORP	LEXINGTON, MA	US	
09939	MURATA ERIE NORTH AMERICA INC	SMYRNA, GA	US	30080
09955	BOYD CORP	DENVER, CO	US	
10183	TADIRAN	TEL-AVIV	IS	
10200	ELECTRONIC CONCEPTS INC	EATONTOWN, NJ	US	
10290	COMMODORE SEMICONDUCTOR GROUP	NORRISTOWN, PA	US	
10302	CENTENNIAL PLASTICS	YELLVILLE, AR	US	
10358	VOGT AG	LOSTORF	GM	
10401	NEW SYSTEMS MOLDING CORP	LOVELAND, CO	US	80537
10407	LSI LOGIC CORP	MILPITAS, CA	US	95035
10421	EPSON	TORRENCE, CA	US	
10443	HP DIV 64 NID	CORVALLIS, OR	US	
10456	PLASTEC PRODUCTS INC	FORT COLLINS, CO	US	
10457	JERMYN INDUSTRIES LTD (63)	KENT SEVENOAKS	EG	
10481	DALE ELECTRONICS INC	NORFOLK, NE	US	68701
10549	SCI MANUFACTURING INC	HUNTSVILLE, AL	US	35805
10572	XICOR, INC	MILPITAS, CA	US	
10631	GASKET SPECIALTIES	BRISBANE, CA	US	
10784	SHINNITOKU ELECTRIC CO LTD	MINATO-KU TOKYO	JP	145
10795	STANDEX - PAUL SMITH DIVISION	CINCINNATI, OH	US	
10858	LINEAR TECHNOLOGY CORP	MILPITAS, CA	US	95035
10881	THOMSON-CSF	COURBEVOIE	FR	
10905	FIRA	LYON	FR	
11047	TEKA PRODUCTS INC	WOODSIDE, NY	US	
11111	SEEQ TECHNOLOGY INC	SAN JOSE, CA	US	
11171	SYNERGY MICROWAVE CORP	FAIRFIELD, NJ	US	
11187	VLSI TECHNOLOGY INC	SAN JOSE, CA	US	95131
11212	INDUCTOR SUPPLY, INC.	HUNTINGTON BEACH, CA	US	
11248	MICRON DIV OF R G ALLEN CO INC	NORTH HOLLYWOOD, CA	US	
11263	W GUNTHER GMBH	NURNBERG	GM	
11298	AVEL-LINDBURG	DANBURY	CT	

Table 2. Manufacturers Code List (continued)

Mfr Code	Manufacturer Name	Address	Country	ZIP Code
11345	CYPRESS SEMICONDUCTOR CORP	SAN JOSE, CA	US	95134
11357	BRISTOL ROYAL WORKSHOP BLIND	BRISTOL	EG	
11412	ISOLANTITE MFG COMPANY INC	STIRLING, NJ	US	
11421	KYOCERA CORPORATION	KYOTO	JP	
11599	MICRO-COAX COMPONENTS, INC	COLLEGEVILLE, PA	US	19426
11677	SARONIX	PALO ALTO, CA	US	
11684	JOSLYN DEFENSE SYSTEMS INC	BURLINGTON, VT	US	05401
11686	KYUSHU DENTSU CO LTD	NAGASAKI	JP	
11699	CENTRAL SEMICONDUCTOR CORP	HAUPPAUGE, NY	US	11788
11703	POWER GENERAL	CANTON, MA	US	
11708	THOMSON SEMICONDUCTORS	VELIZY VILLACOU	FR	78140
11723	CTL COMPONENTS LTD	LONDON	EG	SW19
11781	MIDLAND-ROSS CORP	LIVINGSTON, NJ	US	07039
11844	ELECTREY S A	MONTERREY	MX	64000
11892	EVOX/RIFA INC	LINCOLNSHIRE, IL	US	60015
11920	MIYAMA DENSEN CO LTD	TOKYO	JP	
11946	BKC INTERNATIONAL ELECTRONICS	LAWRENCE, MA	US	01841
11961	ALEXCO ENGINEERING SUPPLIES	COWDENBEATH	EG	KY4 9
11981	POWEREX	YOUNGWOOD, PA	US	15697
12125	SAMSUNG SEMICONDUCTOR INC	SANTA CLARA, CA	US	95054
12127	RF MONOLITHICS INC	DALLAS, TX	US	75234
12131	PRESIDIO COMPONENTS INC	SAN DIEGO, CA	US	92121
12186	DALLAS SEMICONDUCTOR CORP	DALLAS, TX	US	75244
12213	STACKPOLE ELECTRONICS INC	RALEIGH, NC	US	27620
12261	ERIE SPECIALTY PRODUCTS INC	ERIE, PA	US	16512
12340	KEMET ELECTRONICS CORPORATION	GREENVILLE, SC	US	29606
12355	INTERCONNECTION PRODUCTS INC	SANTA ANA, CA	US	92707
12382	LATTICE SEMICONDUCTOR CORP	BEAVERTON, OR	US	97006
12395	FEI MICROWAVE, INC.	SUNNYVALE, CA	US	94086
12418	OWL WIRE AND CABLE	CANASTATA, NY	US	13032
12456	WIRE PRO INC	SALEM, NJ	US	08079
12465	INTERNATIONAL POWER DEVICES	BRIGHTON, MA	US	02135
12473	AVX-RALEIGH DIVISION	RALEIGH, NC	US	27604
12482	BRADFORD ELECTRONICS INC	BRADFORD, PA	US	16701
12513	BUNNELL PLASTICS, INC	MICKLETON, NJ	US	08056
12516	MICROTRONICS ASSOCIATES PTE LTD	SINGAPORE	SG	1334
12580	SOUTH AMERICAN DEVELOPMENT CO	HYDE PARK, NY	US	12538
12656	BEYSCHLAG GMBH	HEIDE	GM	
12703	CHAMPION TECHNOLOGIES INC	FRANKLIN PARK, IL	US	60131
12830	KETEMA	BENSALEM, PA	US	19020
12845	WARTH INTERNATIONAL LTD	EAST GRINSTEAD	EG	RH192
12896	DOWKEY MICROWAVE INC	VENTURA, CA	US	93003
28480	HEWLETT PACKARD CO	CUPERTINO, CA	US	95014



FORMATB1

Figure 1. Graphics Symbols (1 of 2)

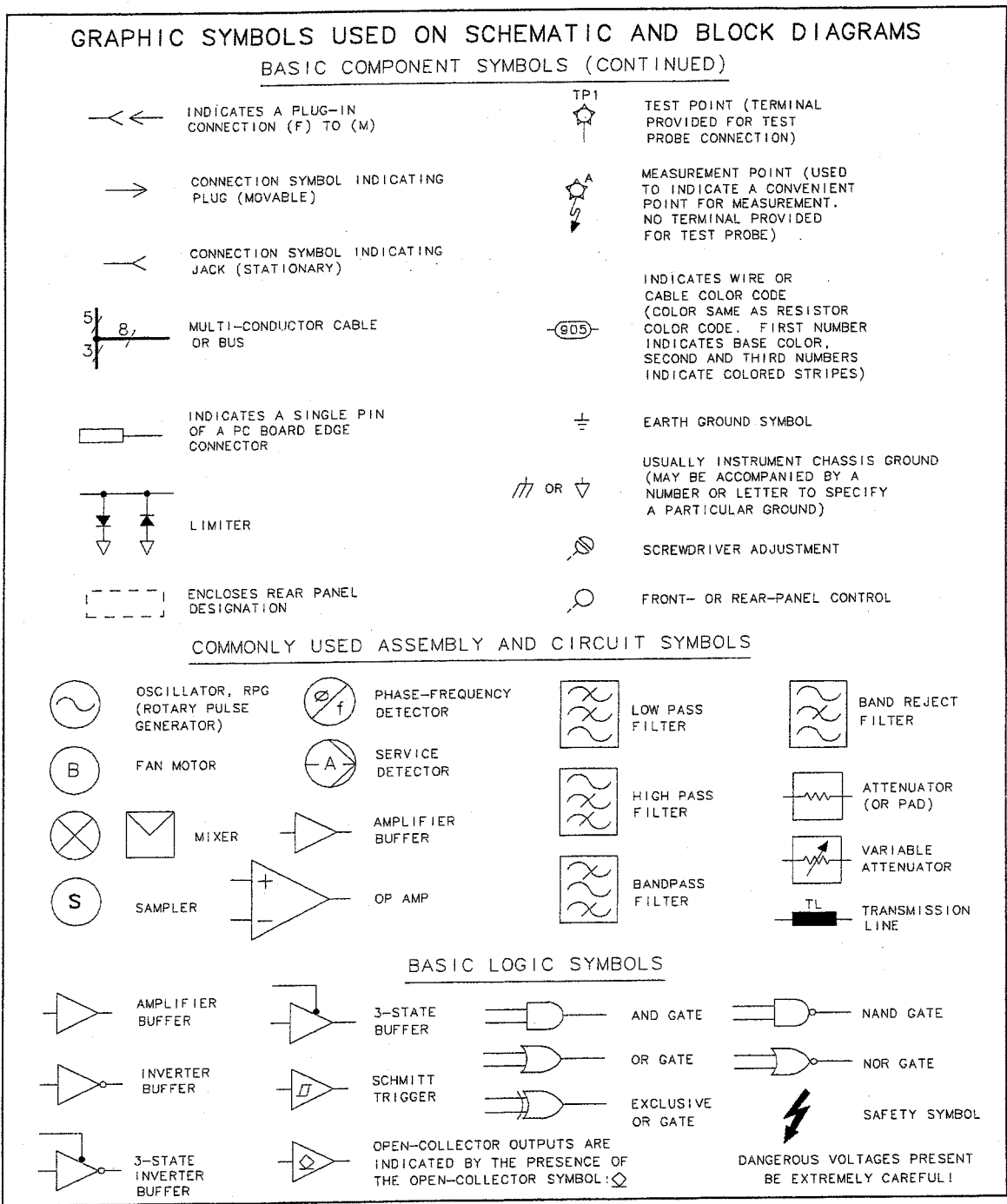
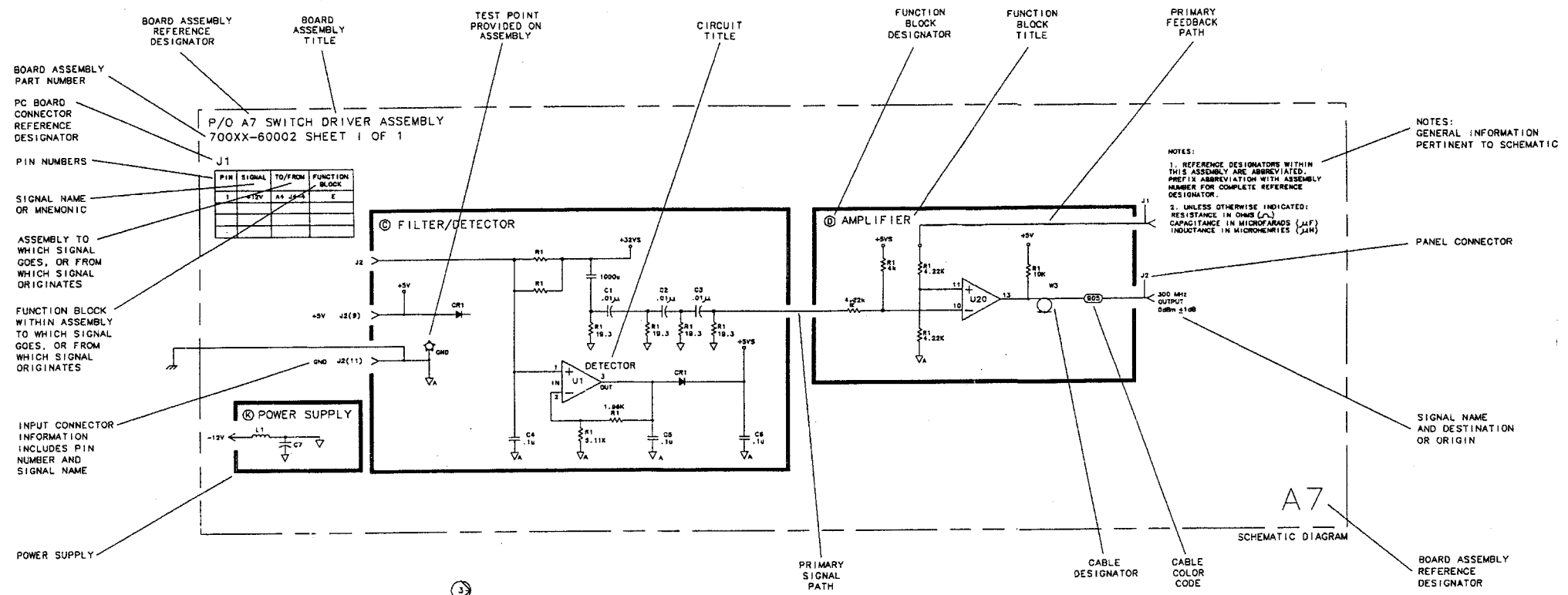


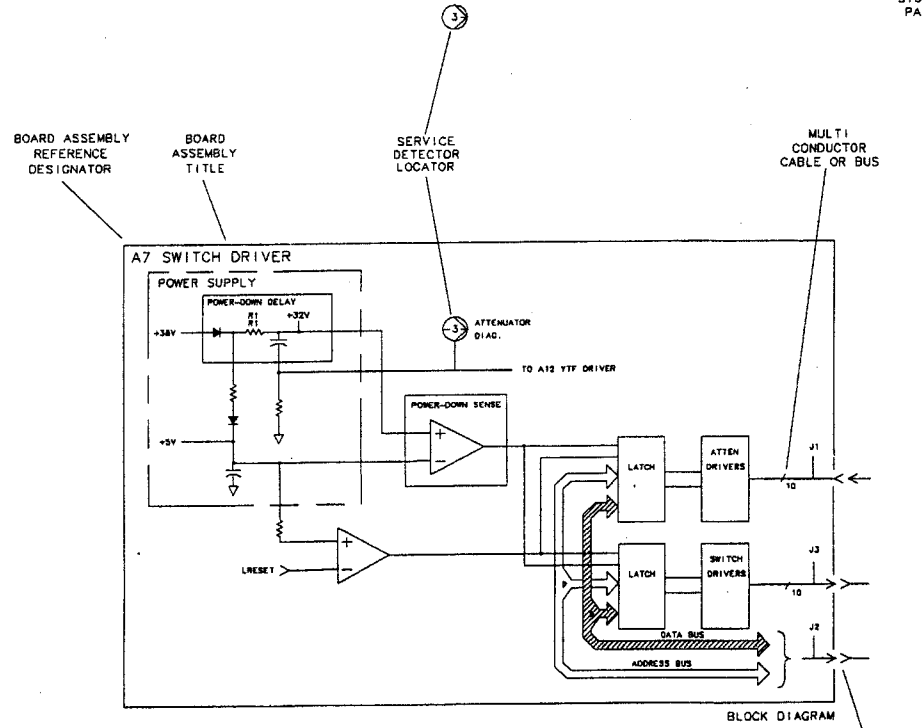
Figure 1. Graphics Symbols (2 of 2)

SYM	REVISIONS	APPROVED	DATE
	A AS ISSUED		

SCHEMATIC AND BLOCK DIAGRAM
FORMAT



FORMAT ONLY



HP PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL, PROPRIETARY INFORMATION THAT IS HEWLETT-PACKARD (HP) PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY HP.

ITEM	QTY.	PART/MATERIAL-DESCRIPTION	MAT'L-PART NO.	MAT'L-OWG. NO.	MAT'L-SPEC.
DRAWN BY		DATE	SCHEMATIC AND BLOCK DIAGRAM		
ENGINEER/CHECKER			FORMAT		
RELEASE TO PROD.			TITLE	PART NUMBER	form112
SUPERSEDES DWG.			SCALE	SHEET 1 OF 1	D - GENERAL DRAWING