



## TECHNICAL SERVICE MANUAL TRANSMITTER GENERAL INFORMATION

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## GENERAL INFORMATION

### 1 INTRODUCTION

The transmitter technical details are described in this manual. The Manual is provided on this CD-ROM in PDF format. The complexity of the equipment and the amount of information requires this information to be presented in several publications. These publications are gathered into a single Volume to comprise the transmitter manual. The list of publications and their revision numbers is provided in separate PDF file TSM20-xxxG1 file. Mechanical assemblies are documented in this manual only as far as necessary to describe access to electronic subassemblies, such as circuit boards, thus, some mechanical items might be found only in a parts list. Those having assembly drawings in this manual also have a corresponding parts list. Numbers in circles on the assembly drawings refer to items identified as the parts list line or item number.

#### 1.1 PRODUCTION CHANGES

From time to time, it becomes necessary to make changes to the equipment described in this manual. Such changes are usually made either to provide improved performance or to accommodate component substitutions necessitated by vendor product availability. A revision number might follow the model or group number marked on the nameplate, chassis, or circuit board; or on a parts list. In a parts list, an "R" a number indicates the parts list revision status. This revision number should be quoted whenever contacting LARCAN Customer Service, especially if renewal parts are needed.

#### 1.2 DISCLAIMER

All material in this manual is copyright © LARCAN INC. as of the date of publication. Reproduction in whole or in part in any form for any purpose other than the exclusive use of the equipment owner without prior written authorization from LARCAN INC. is prohibited.

Trademarks are the property of their respective owners and are mentioned in the text for discussion purposes only; any such mention is not an endorsement of the trademark or its owner. Parts lists may also contain trademarked vendor names as an aid in the procurement of spare parts.

Every effort has been made to provide as much information about the equipment as possible and to ensure accuracy, however, LARCAN INC. assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions. These instructions do not assume to cover all possible details or variations in equipment nor to provide for every possible contingency to be met in connection with its installation, operation, or maintenance. It is assumed that fully competent technical personnel will be responsible for the installation, operation, maintenance and repair of the equipment.

#### 1.3 CONTACT INFORMATION

If you need further information or if you require replacement parts, please contact us.

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### 2 PREFIX NUMBERS

Prefix Numbers assist in identifying assemblies and subassemblies by their physical location in the overall transmitter model assembly. Each transmitter model has an associated Prefix List, which provides an index of Prefix Numbers identifying the Sub-Assemblies in each Cabinet and in large assemblies.

Every sub-assembly of the transmitter on its own is identified by a nine-digit assembly number (e.g., 21B1234G1). This assembly number accurately identifies the item, but bears no information on its own regarding its place in the transmitter and can be cumbersome when identifying functional blocks for documenting the transmitter. To assist in this matter, the Prefix Numbering of subassemblies indexes the major components into their related cabinets and into groups of related assemblies. The following paragraphs are adapted from LARCAN Document Number 11A1886, which outlines the basic system of Prefix Identification

**A label attached in the most visible location identifies large Assemblies.** Cabinets have labels attached to the rear, top of cabinet frame. Other Large Assemblies have labels attached in the front.

Cx	Control Cabinet # x
Ax	Amplifier Cabinet # x
Tx	Traplexer # x
Fx	Filter # x
Px	Patch Panel # x
Ox	Optional Assembly # x
Ex	Exciter # x
Mx	Modulator # x
Ux	Upconverter # x
Sx	Switch (coaxial, contactless etc.) # x
Lx	Load RF # x
CRx	Combiner # x
Dx	Directional Coupler/Probe Section # x
Xx	External components (heat exchanger, power supply, AC distribution panel) # x

**Major Subassemblies** inside cabinets or on other large assemblies are identified by numbers only, which are multiples of 10. For example:

10	Contactactor Panel
20	AC Distribution Panel
30	Power Amplifier Housing
40	Control Unit

**Small Subassemblies** inside a major subassembly are identified by integer numbers other than multiples of 10. For example:

21	PC Board # 1 in AC Distribution Panel
22	PC Board # 2 in AC Distribution Panel

**Individual component identification** is possible at every level. Labeling clearly with a single label does physical identification. Only Large Assemblies will have label "Xn" (X=Letter, n=number) or "X". All other assemblies and components shall have label "n" (n is a number). Each "Xn" or "X" has a square frame outline to denote that it is a prefix number. No "PFX" or "PREFIX" indication is required in front of the x or xnn. For a PC Board having an overall prefix number of A2-11 (as indicated on a Running List or Wiring Diagram), the label on the PC Board need only say 11 since the large assembly is to be clearly labeled as A2.

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### Use of Prefix Numbers in Documentation

a) Interconnect Diagrams or Running Lists, in which only one Large Assembly is detailed (e.g., Cabinet Assembly). Prefix numbers are used as follows;

For example: 11-J1 (Subassembly #11- Connector J1)

b) Interconnect Diagrams or Running Lists for a Transmitter indicating interconnections between Large Assemblies (Cabinet-to-Cabinet or Cabinet-to-External Components). Prefix numbers are preceded by Major Assembly prefix and “\_”.

For example: A2-11-J1 (Amplifier Cabinet #2 -Subassembly #11- Connector J1)

The system configuration publication for this transmitter will contain a prefix list specific to your transmitter.

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### 3 LARCAN PARTS, ASSEMBLIES, ASSEMBLY DRAWINGS AND SCHEMATIC NUMBERS

#### 3.1 VENDOR STANDARD PART NUMBERS

Vendor or original manufacturer part numbers are indicated for most components.

#### 3.2 LARCAN NUMBERS FOR PARTS, ASSEMBLIES AND DOCUMENTATION

An index of LARCAN specified number are used to define and specify the following;

- parts made by a manufacturer to LARCAN specification,
- an assembled unit or “group” such as a PC Board or completed cabinet.
- assembly drawings and schematics
- standards.

Depending on the application, Autocad drawing or Microsoft Word document format is used.

Document numbers have the format **YYZXXXXKn Rev m** where :

YYZ Prefix denoting drawing size and Product type. Can be 10A, 11A, 20B, 21B, 30C, 31C, 40D, 41D, 50E, 51E – describes drawing or document size, VHF or UHF application

XXXX Drawing Index number. Between 0000 to 9999.

K Refers to the type of drawing / document;

- “no suffix” for drawing of part (assembly or schematic),
- P = Part
- G = Group of parts
- A = Assembly drawing
- F = PC board fabrication films and
- S = Schematic

n Index number for drawing type. Part, group, assembly drawing or schematic next number and may be one or more digits

Rev Revision (sometimes denoted as R or R-)

m Revision number and may be one digit or more. May contain a decimal (e.g., Revision 3.2)

Drawings may consist of one or more sheets. Generally multiple sheets are used if one sheet is not enough to show all necessary information. Sometimes, especially with older drawings, multiple sheets are used to show more than one part or assembly.

#### 3.3 LEADED RESISTORS

Generic carbon composition resistors with leads are numbered as follows;



Power Rating

152 = 1/4W

Resistance Value \*

nn - first digits of

Tolerance

K =10%

## GENERAL INFORMATION

77 = 1/2W	resistance (5, 10% tol.)	J =5%
78 = 1W	nnn - first digits of	H =1%
79 = 2W	resistance (1% tol.)	
	x - x10 multiplier	

For values between 1Ω and 10Ω, a letter “R” will appear in the resistance value to indicate the decimal place.

For vendor leaded resistors a generic drawing describing basic specifications, but having many “parts”, will often be used.

“3R152P5R6J” is 5.6Ω, 1/4W, ±5%

“3R152P470K” is 47Ω, 1/4W, ±10%

“3R152P1022H” is 10.2kΩ, 1/4W, ±1%

“3R152P102J” is 1kΩ, 1/4W, ±5%

### 3.4 SURFACE MOUNT RESISTORS 1/4W AND LESS

There is no specified recommended supplier of these parts. The Philips numbering system is employed with the following parameters/designations (example follows):

9C			A	nnnx		
----	--	--	---	------	--	--

<u>SIZE LxW</u>	<u>POWER RATING</u>	<u>RESISTANCE VALUE</u>	<u>TOLERANCE</u>	<u>TEMP COEF</u>
<b>0603</b> =1.6x08mm	<b>1</b> = 1/16W	nnx    tolerance>=5% nn=first 2 digits x=multiplier	<b>D</b> =0.5%	<b>C</b> =50ppm/°C
<b>0805</b> =2x1.25mm	<b>2</b> = 1/10W		<b>F</b> =1%	<b>K</b> =100ppm/°C
<b>1206</b> =3.2x1.6mm	<b>2</b> = 1/8W (1% tol.)	nnnx    tolerance<5% nnn=first 3 digits x=multiplier	<b>J</b> =5%	<b>L</b> =200ppm/°C
	<b>3</b> =1/4W (5% tol.)			<b>M</b> =300ppm/°C

nRnx or nnRnx or nRnnx  
R inserted as decimal point  
where required

0000 - four zeros for jumper

The pairs of parameters enclosed in boxes are normally mutually selected; for example, a resistor having 1% tolerance normally is selected as having a temperature coefficient of 100ppm/°C.

Example:        **9C08052A1001FK**  
  
                   **(Size 0805, Power Rating 1/10W, Resistance 1kohm, Tolerance 1%, Temperature Coefficient 100ppm/°C)**

### 3.5 SURFACE MOUNT CAPCITORS

There is no specifically recommended supplier of these parts. The part numbering system being used is based on a Philips (now Yageo/Phycomp) numbering system with the following parameters/designations (example follows):

		Nnx			
--	--	-----	--	--	--

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<u>SIZE LxW</u>	<u>DIELECTRIC MATERIAL</u>	<u>CAPACITANCE VALUE</u> (in picofarads)	<u>TOLERANCE</u>	<u>VOLTAGE RATING</u>	<u>TERMINATION</u>
<b>0603</b> =1.6x08mm	<b>CG</b> = NPO	<b>nn</b> =first 2 digits	<b>B</b> =0.10pF	<b>7</b> =16VDC	<b>B</b> =Ni/Sn
<b>0805</b> =2x1.25mm	<b>2R</b> = X7R		<b>C</b> =0.25pF	<b>8</b> =25VDC	A=Ag/Pd
<b>1206</b> =3.2x1.6mm	<b>2F</b> = Y5V *	<b>x</b> =multiplier as shown below	<b>D</b> =0.50pF	<b>9</b> =50 VDC	C=Ni/Sn-Pb
	<b>2E</b> = Z5U *	8=x0.01	<b>F</b> =1%	<b>0</b> =100VDC	
		9=x0.1	<b>G</b> =2%	<b>B</b> =200VDC	
		0=x1	<b>J</b> =5%	<b>D</b> =500VDC	
		1=x10	<b>K</b> =10%		
		2=x100	<b>M</b> =20%		
		3=x1000			
		4=x10000			
		5=x100000			

\* (infrequent use)

e.g., 0805CG102J9B

SIZE	=0805
DIELECTRIC MATERIAL	=NPO
VALUE	=1000pF
TOLERANCE	=5%
VOLTAGE RATING	=50V
TERMINATION	=Ni/Sn
PACKAGING	=Not Specified
MARKING	=None

Note that "u" appears in most cases instead of the correct symbol "μ" whenever a "micro" is required. Electronic parts list data, when imported by our PC publication program, allows us to substitute the correct "μ" when checking and editing.

### 3.6 PARTS LISTS

Parts lists for all assemblies in the transmitter are provided on CD-ROM, in PDF format. The CD-ROM is packed inside the transmitter cabinet for shipping.

Parts lists are generated in a hierarchical structure, beginning with major assemblies, then the subassemblies of each major assembly, and so forth.



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### 4 SAFETY PRECAUTIONS

This section has been written to provide general guidance and information for the operation, maintenance, and service personnel who are familiar with the hazards of working with high-powered electronic circuits. This manual does not detail all of the safety precautions which should be observed when servicing this or any other electronic equipment. **Service by inadequately trained or inexperienced personnel can result in personal injury or death and/or damage to the equipment.**

**Important:** All personnel concerned with the servicing of this equipment should be thoroughly familiar with standard first aid procedures for the treatment of electrical burns and shock, including cardio-pulmonary resuscitation (CPR).

Use the “buddy” system, with one person performing the actual service and a colleague observing. The observer must be familiar with the work being performed and within sight and sound of the person doing the work. The observer should not be engaged in any other work or be otherwise distracted; he must be available **instantly** in case of accident.

Always have the observer with you when you work on the transmitter.

#### 4.1 BERYLLIUM OXIDE WARNING

Internal thermal management in certain RF devices in this equipment is accomplished through the use of Beryllium Oxide ceramic material. Beryllium Oxide is a hard white ceramic used as insulation for heatsinking of RF power semiconductors. It is used between the silicon die of the device and the case, or flange, to both insulate and to conduct heat to the heatsink through the flange of the transistor. Beryllium Oxide is a **poison**. Do not break open any RF power transistors or otherwise dismantle them. In case of accidental breakage of devices, **do not inhale the resulting beryllium dust and avoid getting beryllium dust in your mouth. Do not let beryllium into your blood stream through cuts or open wounds.** Seek **immediate** medical attention if the dust enters your body in any manner. Avoid cuts by wearing gloves while picking up the broken pieces. Be careful – do not inhale dust while replacing or emptying vacuum cleaner filter bags and wash your hands thoroughly afterward. Wash your hands thoroughly after replacing RF power devices. Dispose of defective RF power devices only through approved toxic waste facilities. Wear gloves when picking up the pieces. Wash your hands thoroughly after replacing devices. Dispose of defective devices only through approved toxic waste facilities.

**Note:** *the ceramic cap that makes up the visible part of an RF device is **not** made from Beryllium Oxide.* Beryllium Oxide is **only** used internally to the device. While a broken ceramic cap can be sharp and cause cuts and abrasions and it is therefore wise to handle it with care, the Beryllium Oxide is the substance used between the die of the device and the internal case or flange.

When cleaning up after an accidental breakage, remember to wear a respirator mask to avoid inhaling the dust while replacing or emptying vacuum cleaner filter bags, and to wash your hands well after servicing the vacuum cleaner. If possible, use a wet vacuum, in which the dust gets trapped in water.

#### 4.2 OTHER TOXIC MATERIALS

The non-metallic coverings of some coaxial cables used in this equipment are **flammable** and can transmit fire when ignited. Other wire coverings are not capable of supporting combustion but any non-metallic covering when heated sufficiently can emit dense smoke and acid gases, which can be highly toxic and often corrosive.

Solvents and glues can emit toxic vapors and can be flammable. Read and understand the directions on the containers and ensure that they are used only in well ventilated locations.

#### 4.3 DANGEROUS VOLTAGES

This equipment has been designed to protect operating personnel from accidental contact with dangerous voltages, by means of shields and covers. It is extremely important that any protective covering devices be kept in place at all times.

While all practical safety precautions have been adopted to safeguard personnel from possible injury, both supervisory and operating personnel are urged to ensure that the safety rules detailed below are followed as an established routine at all times. The following four Rules are the standard safety guidelines for working with and around transmitters:

**Rule #1 KILL THE AC POWER BEFORE IT KILLS YOU**

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Under no circumstances should any person reach within the cabinets for the purpose of servicing or adjusting the equipment without first disconnecting the AC power or without the immediate presence of another person capable of rendering aid. The “buddy” system is encouraged for transmitter work.

### **Rule #2 DO NOT TAMPER WITH INTERLOCKS OR SAFETY SHIELDS**

Under normal circumstances, no safety shield should be removed.

### **Rule #3 REMOVE PERSONAL JEWELRY WHEN WORKING ON THE EQUIPMENT**

The mains AC power to this transmitter can deliver high currents capable of melting metallic tools or personal jewelry, such as watch bands, bracelets, or rings. Accidental short circuits from such metallic objects can cause an explosive shower of molten metal which can result in serious personal injury.

### **Rule #4 KNOW FIRST AID AND KEEP FIRST AID SUPPLIES AVAILABLE**

Illustrated first aid instructions for the treatment of electrical shock and burns and CPR procedures should be displayed in a prominent location adjacent to the equipment. In rendering first aid, the timeliness and effectiveness of the treatment are vitally important to the recovery of the injured person.

*Always have a colleague with you when you work on the transmitter and make sure both of you know first aid, including cardio-pulmonary resuscitation (CPR). This is most important.*

Without exception, all personnel should thoroughly familiarize themselves with the procedures involved. One person, whose normal duties place him or her at the transmitter site often, should be given complete responsibility and authority to ensure that first aid supplies are kept on site and maintained. Prominently display a list of emergency phone numbers. This list should include the numbers of the nearest police, ambulance, hospital, doctor, fire department, paramedics, poison control center, public works (roads) department, and the utility (power and phone) companies.

Do not try to work on the transmitter if you are tired or drowsy; you could make a fatal error in judgement. Antihistamines and decongestants for colds or allergies, and some prescription medications, can make you drowsy; ask your pharmacist if you do not know for sure. Avoid alcohol, even in moderate amounts, before working on the transmitter.

## **4.4 SWITCH TO SAFETY**

MAKE SURE YOU HAVE IN PLACE A COMPREHENSIVE SAFETY PROGRAM AND HAVE DEFINED PROCEDURES FOR EVERY ACTIVITY IN IT. **KNOW FIRST AID AND CPR.**

Use the “buddy” system, with one person performing the actual service and a colleague observing. The observer must be familiar with the work being performed and within sight and sound of the person doing the work. The observer should not be engaged in any other work or be otherwise distracted; he must be available **instantly** in case of accident. *Always have the observer with you when you work on the transmitter.*

Pay attention to emergency communications requirements. This could even include a voice channel on the STL so that constant communication with the studio can be maintained. Headset-equipped phones connected on this voice channel should be installed in locations near hazardous areas or everyone on site should carry fully charged cell phones. When you are administering CPR, you might not be able to leave your patient for the length of time it could take to call paramedics, especially if phone service is poor, or lines are down, and/or you are in a rural area without 911 service.

Do not defeat the interlock switches on access doors unless it is absolutely necessary, and you know **exactly** what you are doing.

Keep your work area neat and tidy, free of any interfering conductive material and free of any sharp objects. Remember that reaction to a shock could cause you to strike nearby objects.

Avoid wearing loose clothing and personal jewelry such as rings, watches, and chains when working near energized circuits. Make a habit of removing all jewelry and stowing it in a safe place as soon as you enter the transmitter building.

Before beginning work, **shut off all AC to the transmitter power supplies. Tag and lockout the switches.** Your safety routine must ensure that the person placing the tag and locking the switch is be the only person who removes it and reactivates the switch. You might want to include the power to the remote control as well, if there is any possibility that a studio worker could unknowingly activate the transmitter while you are working on it. Implement and observe a

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lockout/tagout procedure.

You might want to include your tower contractor's rigging crew in the list of people who are allowed to use tags and padlocks. As an alternative, Dielectric™ makes a transmission line lockout switch that is intended for riggers to turn off and lock out any RF before climbing over the antenna to replace light bulbs, etc.

Proper grounding is **vital**. See the Installation section of this manual. Make ground inspection a part of your maintenance program; someone's life could depend on it!

### 4.5 DISCOURAGE PESTS

Transmitter sites, particularly unmanned locations, can become nesting grounds for rodents and other pests. These pests can damage equipment and create a serious health hazard.

Eliminate or minimize access for rodents and other pests. Seal all cracks that are ¼ inch or larger with steel wool, caulking, or metal flashing. Ensure that weather seals under doors are in good repair and fit tightly when the door is closed. Make certain that all cable and pipe entrances to the building are properly sealed. Keep spring traps set at all times and placed along the walls (rodents will travel along walls in preference to being out in the open). Clean up the area around the building(s), getting rid of all potential nesting material and cover such as crates, boxes, cans, etc. Ensure that all refuse, particularly foodstuffs, is immediately placed in sealed trash containers and is regularly taken away from the site.

Assume that any rodents or other pests seen carry disease, whether dead or alive. This also applies to any droppings found. Use a solution of household bleach (1½ cups of bleach to 1 gallon of water) to disinfect rodent carcasses and traps before handling. Spray the rodent and trap and allow to sit for 5 to 10 minutes. Wear rubber gloves when handling the trapped rodent. Dispose of the carcass in a sealed container, in accordance with local regulations. Disinfect the gloves and the trap afterward.

Air out any rodent infested building for at least 30 minutes before entering. Do not sweep or dry-vacuum rodent contaminated surfaces, as this can cause contaminants to become airborne. Spray contaminated materials with bleach solution and allow to soak 5 to 10 minutes before cleaning with a mop, sponge, or wet-vacuum. Wear rubber gloves. In heavily infested areas or in situations where ventilation is poor and wet clean up cannot be done, wear a face mask fitted with a high efficiency particulate arrester (HEPA) air filter.

Incidentally, snakes eat mice, but they like warmth as well, and the transmitter and outdoor power supply will be warm after running for a while. Seal all openings (cracks, cable, and pipe entrances), as mentioned above. Remember the power supply has a raised base for a fork lift, and snakes could be warming themselves under it. Contact the local wildlife or natural resources office for information on what species might be in the area and how best to avoid providing a habitat for them.

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### APPENDIX A

#### ABBREVIATIONS USED IN LARCAN INC. DOCUMENTS

Following is a list of abbreviations used on Larcán Inc. drawings, part lists, manuals etc.

## GENERAL INFORMATION

8VSB	8 LEVEL VSB
A	AMPERE, ASSEMBLY
AC	ALTERNATING CURRENT
AGC	AUTOMATIC GAIN CONTROL
ALC	AUTOMATIC LEVEL CONTROL
ALT	ALTERNATE, ALTITUDE
AMP	AMPLIFIER
ANT	ANTENNA
APL	AVERAGE PICTURE LEVEL
ASSY	ASSEMBLY
ASS'Y	ASSEMBLY
ASYN	ASYNCHRONOUS
ATT	ATTENUATOR
AUR	AURAL
AUTO	AUTOMATIC
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BAT	BATTERY
BER	BIT ERROR RATE
BLO	BLOWER
BLU	BLUE
BOM	BILL OF MATERIAL
BPF	BANDPASS FILTER
BTU	BRITISH THERMAL UNIT
BW	BANDWIDTH
C	DEGREE CELSIUS, CAPACITOR
C/N	CARRIER NOISE RATIO
CA	CABLE ASSEMBLY
CAB	CABINET
CAP	CAPACITOR
CATV	CABLE TV
CAV	CAVITY
CBL	CABLE
CCW	COUNTERCLOCKWISE
CHAM	CHAMFER
CHAN	CHANNEL
CMB	COMBINE
CMBNR	COMBINER
CMOS	COMPLIMENTARY METAL OXIDE SEMICONDUCTOR
CMRR	COMMON MODE REJECTION RATIO
COAX	COAXIAL
COMP	COMPOSITE
COND	CONDUCTOR
CONN	CONNECTOR
CORR	CORRECTION
CPLR	COUPLER
CPU	CENTRAL PROCESSING UNIT
CT	CENTER TAP
CTRL	CONTROL
CW	CLOCKWISE, CONTINUOUS WAVE
D/L	DUMMY LOAD

DAC	DIGITAL ANALOG CONVERTER
dB	DECIBEL
DC	DIRECT CURRENT
DDS	DIRECT DIGITAL SYNTHESIS
DEC	DECIMAL
DEG	DEGREE
DET	DETECTOR
DEV	DEVIATION
DG	DIFFERENTIAL GAIN
DIA	DIAGRAM
DIFF	DIFFERENTIAL
DIP	DUAL IN LINE PACKAGE
DIPL	DIPLEXED
DIR	DIRECTIONAL
DOC	DOCUMENT
DOS	DISK OPERATING SYSTEM
DP	DIFFERENTIAL PHASE
DRAM	DYNAMIC ACCESS RANDOM MEMORY
DVR	DRIVER
DWG	DRAWING
EMI	ELECTROMAGNETIC INTERFERENCE
ENV	ENVELOPE
ERP	EFFECTIVE RADIATED POWER
EXC	EXCITER
EXH	EXHAUST
EXT	EXTERNAL
F	DEGREE FAHRENHEIT, FARAD, FRONT
FET	FIELD EFFECT TRANSISTOR
FFT	FAST FOURIER TRANSFORM
FM	FREQUENCY MODULATION
FPGA	FIELD PROGRAMMABLE GATE ARRAY
FPT	FEMALE PIPE THREAD
FREQ	FREQUENCY
FSK	FREQUENCY SHIFT KEYING
FWD	FORWARD
Giga/ G	1.00E+09
GND	GROUND
GPIB	GENERAL PURPOSE INTERFACE BUS
GPS	GEOGRAPHIC POSITIONING SYSTEM
GRP DEL	GROUP DELAY
H	HENRY
h	HOUR
HCMOS	HIGH DENSITY CMOS
HCT	HIGH SPEED CMOS
HD	HIGH DENSITY, HIGH DEFINITION
HEPA	HIGH EFFICIENCY PARTICULATE AIR
HEX	HEXADECIMAL
HMOS	HIGH PERFORMANCE MOS
HORIZ	HORIZONTAL
HP	HEWLETT PACKARD, HIGH POWER, HORSE POWER
HPF	HIGHPASS FILTER

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HTTP	HYPERTEXT TRANSFER PROTOCOL
HV	HIGH VOLTAGE
Hz	HERTZ
I	CURRENT, INCIDENT, INDUCTOR
I/C	INTERCONNECTION
I/F	INTERFACE
I/FACE	INTERFACE
IC	INTEGRATED CIRCUIT
ICPM	INCIDENTAL CARRIER PHASE MODULATION
IF	INTERMEDIATE FREQUENCY
IMD	INTERMODULATION PRODUCTS
IN, I/P, INP	INPUT
IND	INDUCTOR
INT	INTERNAL
INTFC	INTERFACE
INTK	INTERLOCK
INTLK	INTERLOCK
IOT	INDUCTIVE OUTPUT TUBE
IPA	INTERMEDIATE POWER AMPLIFIER
IRQ	INTERRUPT REQUEST
JFET	JUNCTION FET
kilo/ k	1.00E+03
L/O	LOCKOUT
LAN	LOCAL AREA NETWORK
LCD	LIQUID CRYSTAL DISPLAY
LDMOS	LATTERALLY DIFFUSED MOS
LED	LIGHT EMITTING DIODE
LIN	LINEAR
LNA	LOW NOISE AMPLIFIER
LO	LOCAL OSCILLATOR
LOC	LOCAL
LPF	LOW PASS FILTER
LP	LOW POWER
LPTV	LOW POWER TELEVISION
LSB	LEAST SIGNIFICANT BIT
LV	LOW VOLTAGE
Mega/ M	1.00E+06
micro/ u	1.00E-06
mili/ m	1.00E-03
MIN	MINIMUM
MOD	MODIFICATION, MODULATION, MODEL
Mohm	MEGAOHM
MON	MONITOR
MONO	MONOPHONIC
MOS	METAL OXIDE SEMICONDUCTOR
MOSFET	METAL OXIDE SEMICONDUCTOR FET
MOV	METAL OXIDE VARISTOR
MPT	MALE PIPE THREAD
MPX	MULTIPLEXER
MSB	MOST SIGNIFICANT BIT

MTR	METER
MUX	MULTIPLEXER
MXR	MIXER
N	NEUTRAL
N/A	NOT APPLICABLE
nano/ n	1.00E-09
NEUT	NEUTRAL
NONLIN	NONLINEAR
NVM	NON-VOLATILE MEMORY
NVRAM	NON-VOLATILE RAM
O/I	OVERCURRENT
O/L	OVERLOAD
O/V	OVERVOLTAGE
OCT	OCTAL
OCXO	OVEN CONTROLLED CRYSTAL OSCILLATOR
OPAMP	OPERATIONAL AMPLIFIER
OPT	OPTIONAL, OPTION
ORN	ORANGE
OSC	OSCILLATOR
OUT	OUTPUT
P	POWER, PRIMARY, PLUG
P/S	POWER SUPPLY
PA	POWER AMPLIFIER, PURCHASED ASSEMBLY
PCB	PRINTED CIRCUIT BOARD
PF	POWER FACTOR
PFD	POWER FLUX DENSITY
PFX	PREFIX
PH	PHASE
pico/ p	1.00E-12
PL	PARTS LIST
PLL	PHASE LOCKED LOOP
PM	PHASE MODULATION
PMOS	P CHANNEL MOS
PNL	PANEL
POT	POTENTIOMETER
P-P	PEAK TO PEAK
PPS	PARTS PER MILLION
PRESS	PRESSURE
PROD	PRODUCTION
PS	POWER SUPPLY
psi	POUNDS PER SQUERE INCH
PWR	POWER
Q	QUADRATURE
QAM	QUADRATURE AMPLITUDE MODULATION
R	READ, RESISTOR, RIGHT, REVISION
R/W	READ/WRITE
RAM	RANDOM ACCESS MEMORY
RCVR	RECEIVER
REF	REFERENCE, REFURBISHED
REJ	REJECT

## GENERAL INFORMATION

REM	REMOTE
RES	RESISTOR
RES VAR	RESISTOR VARIABLE, POTENTIOMETER
REV	REVISION
RF	RADIO FREQUENCY
RFI	RADIO FREQUENCY INTERFERENCE
RFL	REFLECTED
RIBB	RIBBON
RLY	RELAY
RMS	ROOT MEAN SQUARE
ROM	READ ONLY MEMORY
RST	RESET
RU	RACK UNIT 1 3/4"
RX	RECEIVING
S	SCHEMATIC
S/N	SERIAL NUMBER
SAT	SATELLITE
SAW	SURFACE ACOUSTIC WAVE
SCH	SCHEMATIC
SCHEM	SCHEMATIC
SCLK	SERIAL CLOCK
SCR	SILICON CONTROLLED RECTIFIER
SEL	SELECT, SELECTION
SHT	SHEET
SMA	SURFACE MOUNT ASSEMBLY
SMT	SURFACE MOUNT TECHNOLOGY
SN	SIGNAL TO NOISE
SND	SOUND
SNR	SIGNAL TO NOISE RATIO
SOT	SMALL OUTLINE TRANSISTOR
SPDT	SINGLE POLE DOUBLE THROW
SPL	SPLITTER
SPST	SINGLE POLE SINGLE THROW
STBY	STANDBY
STD	STANDARD
STEREO	STEREOPHONIC
SUBCARR	SUBCARRIER
SW	SWITCH
SYNC	SYNCHRONIZATION, SYNCHRONOUS
SYS	SYSTEM
TEMP	TEMPERATURE, TEMPORARY

Tera/ T	1.00E+12
TERM	TERMINAL
TERMBLK	TERMINAL BLOCK
THD	TOTAL HARMONIC DISTORTION
TOL	TOLERANCE
TP	TEST POINT
TPO	TRANSMITTER POWER OUTOUT
TSM	TECHNICAL SERVICE MANUAL
TX	TRANSMITTER, TRANSMITTING
U	UHF
UART	UNIVERSAL ASYNCHRONOUS RECEIVER TRANSMITTER
UHF	ULTRA HIGH FREQUENCY
UNFL	UNFLANGED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UUT	UNIT UNDER TEST
V	VOLT, VOLTAGE, VHF
VA	VOLTAMPERE
VAR	VARIABLE
Vcc	MAIN POWER SUPPLY
VCO	VOLTAGE CONTROLLED OSCILLATOR
VCXO	VOLTAGE CONTROLLED CRYSTAL OSCILLATOR
VGA	VARIABLE GAIN AMPLIFIER
VHF	VERY HIGH FREQUENCY
VIO	VIOLET
VIS	VISUAL, VISION
VLSI	VERY LARGE SCALE INTEGRATION
VSF	VESTIGIAL SIDEBAND MODULATION
VSWR	VOLTAGE STANDING WAVE RATIO
W	WATT, WRITE, WITH
WHT	WHITE
WLAN	WIRELESS LOCAL AREA NETWORK
X	REACTANCE
XFMR	TRANSFORMER
XLTR	TRANSLATOR
XMTR	TRANSMITTER
YEL	YELLOW
YR	YEAR
Z	IMPEDANCE