



# **USER'S MANUAL**

## **UHF HIGH BAND CONTINUOUS DUTY RF POWER AMPLIFIER**

### **PA8 - 1AC**

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### I. PRODUCT DESCRIPTION

The **PA8-1AC** model is a UHF high band continuous duty RF power amplifier intended for use in repeater applications. This amplifier can deliver RF power from 5 to 45 watts when driven with 1.0 to 3.0 watts and it will cover the frequency range from 806 MHz to 869 MHz. These amplifiers are designed to be installed in a 19-inch rack.

The amplifier's dimensions are 19" W x 5 ¼" H x 4 ½" D and the weight is 8 lbs.



Figure 1.

## II. GENERAL SPECIFICATIONS

### ELECTRICAL SPECIFICATIONS @ $V_{DC} = 13.8$ VDC. Nom., $T = 25^{\circ}$ C;

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Frequency Range	BW	806.000		869.000	MHz	
Operating bandwidth within range	OBW			63.0	MHz	
Input Power	$P_{IN}$	1.0		3.0	Watt	
Output Power	$P_{OUT}$	5	45	50	Watt	
Output Flatness	$\Delta P_{OUT}$			$\pm 0.5$	dB	Within OBW
Small Signal Gain	G		9	10	dB	
Harmonic Emissions	Har			-60	dBc	$P_{OUT} = 45$ W
Spurious Emissions	Spur			-60	dBc	$P_{OUT} = 45$ W
Operating Voltage	$V_{DD}$	11	13.8	15	Volt DC	
Supply Current	$I_{DD}$		9	10	Amp DC	
Input VSWR	S11			2 : 1	VSWR	
Operating Mode	Mode		CW/FM			
Impedance, Input	$Z_{IN}$		50		$\Omega$	
Impedance, Output	$Z_{OUT}$		50		$\Omega$	
Duty Cycle	D		100		%	per EIA/TIA-603-C
Receive Bypass Relay						Not Included

### ENVIRONMENTAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Temperature	$T_O$	-30		+60	$^{\circ}$ C	
Storage Temperature	$T_S$	-30		+80	$^{\circ}$ C	
Operating Humidity	$H_O$	0		85	%	relative, non-condensing
Storage Humidity	$H_S$	0		95	%	relative, non-condensing

### MECHANICAL PROPERTIES

Parameter	Value	Units	Limits	Condition
Dimensions	19"W x 5 1/4"H x 4 1/2" D	inch	max	
Weight	8	lb	max	
RF Connectors, In/Out	Type "N"			
DC Connector	Terminal Block			
Cooling	Forced Air (Fan)			

### SPECIAL CHARACTERISTICS

End-user accessible thru-hole multi turn potentiometer for adjusting output power from 5 W to 45 W.

### III. OPTIONS

TPL Communication' UHF high band continuous duty RF Power Amplifiers are available with several options: input, output, frequency ranges and configurations, special logos, etc., when specified at the time of order. We work closely with you, our customer, to develop products that are in complete compliance with your needs and specifications.

NOTE: All TPL Standard UHF high band continuous duty RF power amplifiers are factory-tuned to the frequency specified at the time of order. Broader coverage is available. Contact TPL Communications for details.

### IV. CAUTION!

Inspect the amplifier thoroughly upon receipt for visible damage. If any is noticed, please call **TPL Communications** at **800 HI POWER / (800)447 - 6937** or e-mail to [tech.support@tplcom.com](mailto:tech.support@tplcom.com) to request an **RMA** (Return Material Authorization) number. If purchased through a dealer or distributor, ask them to follow this procedure for best results.

**EXPENSIVE COMPONENTS MAY BE DESTROYED IF THE AMPLIFIER IS TURNED ON IN A DAMAGE CONDITION.**

### FCC CERTIFICATION

**TPL Communications** commercial amplifiers are FCC certified for the use in Land and Marine mobile/fixed services. The technician installing this amplifier must hold a General Radio Telephone permit and be familiar with the pertinent FCC rules and regulations.

Harmonics and other spurious signals from this amplifier are attenuated according to the product specification or beyond FCC requirements. For further details consult the appropriate publications.

## V. OPERATING PRECAUTIONS

### CAUTION:

This amplifier produces RF voltages that can cause painful and dangerous burns. Use caution! **Connect and disconnect all RF connections with the drive power and DC power off.**

### DRIVE POWER:

RF power transistors, although quite rugged in most respects, are easily damaged by overdrive. Be careful not to overdrive the amplifier even momentarily (before applying any drive signal please check product specification for details). Higher-than-rated drive power may destroy transistors and **VOID ANY WARRANTY.**

### SUPPLY VOLTAGE:

The maximum operating voltage is 15.0VDC. When using a DC power supply make sure that it is not adjusted above 15 volts. If it is possible for the voltage to go above 15 Volts for any reason, including failure of the power supply, install a "crowbar" circuit to prevent damage to the amplifier in the event of excess voltage.

### CASE TEMPERATURE

High power can mean high temperatures. Mount the amplifier where air can freely circulate into the cooling fan and where clothing, blankets, etc. will not accidentally be placed over it.

### TERMINATIONS

The efficiency of this amplifier will degrade if it is operated into anything but a 50  $\Omega$  load. Lowered efficiency may mean any or all of the following: lower power output, increased current drain, higher operating temperature and reduced lifetime.

## VI. INSTALLATION

The **PA8-1AC** amplifiers are designed for mounting in a standard 19-inch rack. When picking a location in the rack, considerations must be given to RF cable lengths as well as cooling. Mount the amplifier away from the sources of heat where dust and other debris are not likely to clog the cooling fan and as close to the antenna as practical. Keep coaxial cable runs short, avoiding sharp bends and pinching. Avoid loose connectors at the ends of the coaxial cables. The antenna should be matched to a VSWR better than 1.5:1 for best results. Higher VSWR will degrade the performance of the amplifier.

1. Connect the DC power using #14 AWG wiring if possible and certainly no lighter than #16 AWG. To avoid a possible fire or other possible damage, make sure a fuse or circuit breaker is installed at the power supply end of the wires. Use the same size fuse as the amplifier's fuse.
2. Connect the antenna to the "**RF OUT**" terminal with a 50 $\Omega$  coaxial cable and type "N" male plug.
3. **Turn off** your radio transmitter. Connect it to the "**RF INPUT**" terminal with a 50 $\Omega$  coaxial cable and type "N" male plug.
4. For safety, ensure that the rack and all equipment connected to the amplifier, have proper ground connection. Do not rely on coaxial cable shielding. Assure the installation has proper lightning protection.

## **VII. WARRANTY**

**TPL COMMUNICATIONS** has tested and found this unit to function properly and to operate within the parameters of its stated specifications.

**TPL COMMUNICATIONS** warrants that this product is free from defects in material and workmanship. If found to be defective within two (2) years from the date of purchase, the factory will, at its discretion, either repair or replace the unit at no cost, provided the unit is delivered by the owner to the factory intact. The warranty does not apply to any product which has been subjected to misuse, neglect, accident, improper installation or used in violation of the instructions furnished by **TPL**, nor does it extend to units which have been repaired or altered outside our service department, nor where the serial number has been removed, defaced or changed.

## **VIII. SERVICE**

For service on this amplifier, contact:

**TPL COMMUNICATIONS**  
Customer service department  
Phone: (323) 256-3000  
(800) HI POWER  
FAX: (323) 254-3210  
EMAIL: [tech.support@tplcom.com](mailto:tech.support@tplcom.com)

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