Instruction Manual
PA-X 41128R 1 GHz

PA Series CATV Distribution Amplifiers

Model	Bandwidth	Powering
PA-X 4128R (42/54)	5-42 MHz / 54-1000 MHz	90-240 VAC
PA-X 4128R (65/85)	5-65 MHz / 85-1000 MHz	90-240 VAC

PA-X 41128R CATV Distribution Amplifiers with active return are broadband indoor GaAsFET Push Pull, high output level distribution amplifiers designed for RF distribution systems such as those in Cable Television Apartments, Hotels, Hospitals and other applications where a high quality low noise figure amplifier is necessary to amplify the signals in both the forward and return paths.

Designed with flat operational gain of 41 dB in the forward band and 18 dB in the reverse band. The PA-X41128R has sockets for JXP style plug-in controls, including input pad and equalizer and interstage equalizer for forward bandwidth for balancing, and input pad plus output pad and equalizer for reverse path balancing.

The amplifiers are self powered and compatible with 117 and 230V systems.

FEATURES

- GaAsFET Push Pull for high output levels with low distortions,
- Active reverse,
- JXP style plug-in controls,
- RFI housing,
- Surge protection on all ports,
- Diecast aluminum housing for heat dissipation,
- 117 / 230 volts powering.

SPECIFICATIONS (Typical)

Typical, for T = 20ºC, Zin = Zout = 75Ω

Parameter	Notes	Forward	Reverse	Units
Bandwidth		54/85-1000	5-42/65	MHz
Technology		GaAs	GaAs	
Min. Full Gain		41	18	dB
Flatness		±1	±1	"
Return Loss, IN/OUT		-16	-16	"
Test Points, IN/OUT	directional coupler	-20	-20	"
Gain Control	JXP plug-in	in	in / out	0 to 20 dB, 2 dB steps
Slope Control	JXP plug-in	in / mid	Out	Forward: 3 to 13 dB Reverse: 2 to 10 dB in 2 dB steps
Forward Distortions:	**40/50 dBmV (54/1000 MHz) output level, 79 NTSC channels, digital at –6 dB after 550 MHz**			
CTB	on ch78	-70		dBc
CSO	on ch78	-72		"
Xmod	on ch2	-73		"
Forward Distortions:	**36/46 dBmV (54/1000 MHz) output level, 79 NTSC channels, digital at -6 dB after 550 MHz**			
CTB	on ch78	-83		dBc
CSO	on ch78	-74		"
Xmod	on ch2	-80		"
Reverse Distortions:	**52 dBmV flat output, 4 ch**			
3rd on T10			-68	"
2nd on T9			-65	"
Xmod on T10			-64	"
Noise Figure	with 0 dB jumpers	6	7 (*)	dB
Group Delay	Ch2	< 40		Nsec
	41-42 MHz		< 35	"
	5-6 MHz		< 40	"
Hum Modulation		-80		dBc
RFI Isolation		-100		"
Surge Withstand	IN / OUT	IEEEC62.41 Cat.A3 (6kV, 200A)		
Powering		Mains, 90-240		VAC
Power Consumption		15		Watts
Temperature		-10 to +55		ºC
Enclosure		IP54 Category, Diecast Aluminum		
Weight		2.8 (6.2)		kgs (lb)
Dimensions		21 x 17 x 9 (7-5/8 x 5-3/8 x 3)		cms (in)

* Noise Figure at 5 MHz is max. 8 dB

English

The Lightning flash with arrowhead symbol within an equilateral triangle is intended to alert you to the presence of uninsulated "dangerous voltage" within the products supplementary external power supply enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.

CAUTION

Risk of Electric Shock
Do not Open

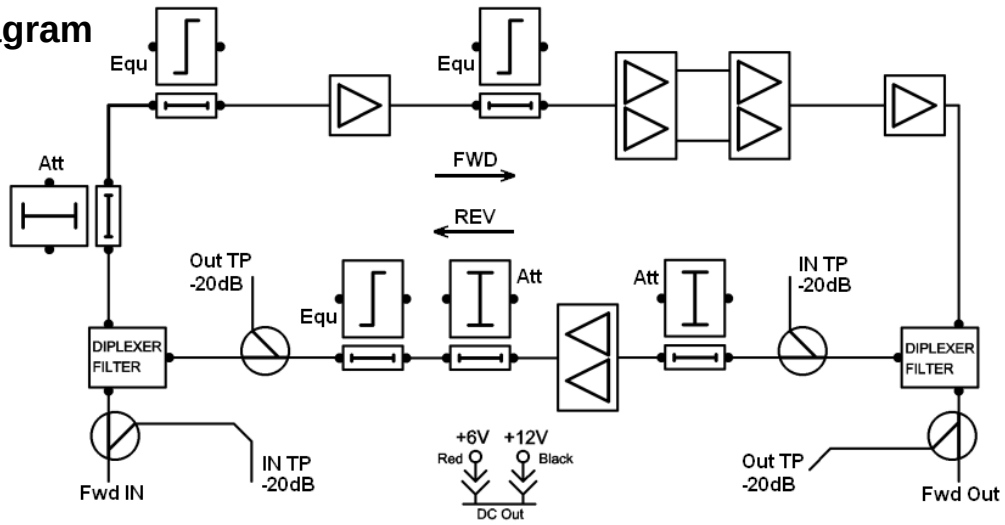
The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

REMEMBER TO REPLACE COVER AFTER ADJUSTING.
COVER MUST BE IN PLACE FOR CE, SAFETY AND PROTECTION.

NO SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: TO PREVENT SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
THIS APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING WATER AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.
WARNING: THIS PRODUCT IS A CLASS-I CONSTRUCTION. PLEASE ENSURE A CONNECTION TO MAINS SOCKET WITH A PROTECTIVE EARTHING CONNECTION.

Block Diagram



NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

INSTALLATION AND SETUP GUIDELINES

1. Gain & Cable Slope Controls are reachable under the cover. Refer to layout scheme for controls adjustment.
2. This product is shipped with default 0 dB pad for all plug-in attenuator and equalizers.
3. Before applying power to the amplifier make sure that the forward input level to the amplifier is not too high or damage to the amplifier might occur. To be on the safe side, you should select the input fixed attenuator to max. value (20 dB) before powering the PA.
4. Please check that the forward input and mid-stage fixed equalizers are set to 0 dB as factory default values.
5. Now apply power to the amplifier and measure the amplifier forward output level at the 20 dB output test point. If it is very low then adjust the value of input fixed attenuator until the desired output level is reached at the highest operating frequency. Remember that the level measured at the test point is 20 dB lower than the real signal level.
6. Set the forward input equalizer value to adjust the output level to be flat across the full bandwidth. The input signal level will now be flat too. Under this condition there will be best CNR across the full bandwidth.
7. Now install a plug-in equalizer into the forward mid-stage equalizer socket to get as close as possible to the desired output signal slope. The desired output slope is deteined by your system design. Consult your system planner or your system maps for this infoation. Equalizers are available in 2 dB steps from 3 to 13 dB at 1000 MHz.
8. If you are having trouble obtaining the expected output levels then check the input test point to verify that the levels are as expected at the input of the amplifier. The forward set up is complete.
9. For the reverse path, inject into the forward output test point test carriers with the system design input signal level +20 dB (because the test point has 20 dB loss) at each end of the upstream band.
10. Verify that the upstream reference test point (Note: this is commonly called the "X point" and it is measured at your node, or optical receiver, or at the 1st downstream amplifier. Consult with your system designer) has the proper upstream output signal levels. If it does not then select the appropriate fixed attenuator and equalizer and install them in the reverse amplifier output sockets.
11. Record the in/out operating levels and the pad and equalizers used in this station.

INSTALLATION PRECAUTIONS TABLE

PRECAUTIONS	REQUIREMENT
Facilitate service and maintenance	Allow a minimum of 35 in. (90 cm) clearance in front of the equipment rack(s).
Avoid direct heating or air conditioning	If unavoidable, use deflector plates.
AC Power source outlets	Locate equipment near sufficient outlets to provide power for test equipment and power tools.
Rack support	Make certain rack supports are sufficiently rigid to support rack(s).
Building leakage	Beware of dripping water onto equipment from leaky roofs, waveguide roof entries, and cold water pipe condensations.

English