

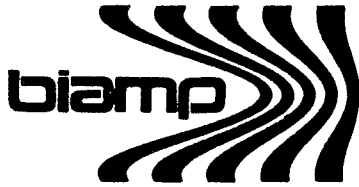
**TC/60**  
**Operation Manual**

**B I A M P<sup>®</sup>**  

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**S Y S T E M S**

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## model TC/60



## OPERATING INSTRUCTIONS

BIAMP's new generation professional stereo amplifiers have established a modern standard for high performance, durability, and reliability. These advances have been made through recently developed semiconductor devices and research into super fidelity amplifiers and the reasons they sound different. This has led to new methods for eliminating audible distortion; the reduction of transient inter-modulation distortion (TIM) and slewing-induced distortion (SID). You can hear a startling difference between BIAMP professional stereo amplifiers and the old industry stand-bys because BIAMP power amplifiers have been designed to have low TIM and SID, establishing new audible distortion performance that soon will be expected from all sonically superior power amplifiers. These new criteria have been met without sacrificing either reliability or stability.

The block diagram of the TC/60 professional stereo power amplifier reveals some of the reasons BIAMP has been able to achieve this performance. Both balanced and unbalanced inputs are provided; balanced operation provides superior noise, hum, and common mode rejection usually associated with transformer coupled inputs without paying the

performance price of using a transformer; restricted frequency response, and sensitivity to external magnetic fields. A single ended input is provided for systems requiring this option, and switching between the two input modes is made automatically.

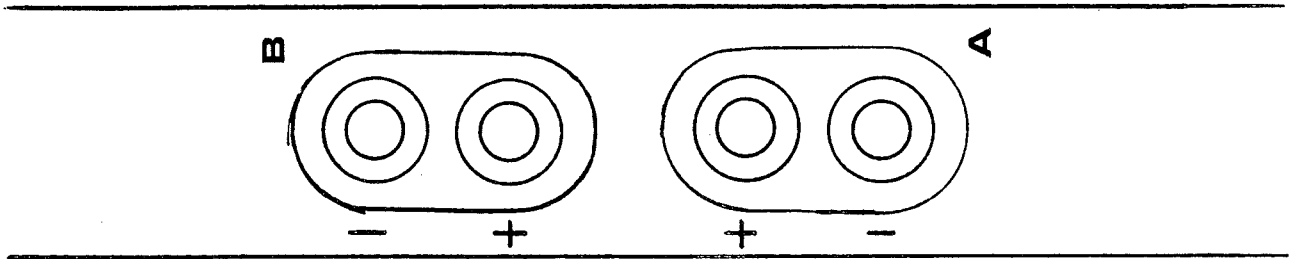
Provisions are made for simple change over from stereo to bridged/mono operation. There is no chassis wiring to change, just a switch on the rear panel and changing the output leads.

The BIAMP TC/60 is engineered with premium components selected for their ability to perform in a professional environment. Each channel has two BIFET operational amplifiers, fourteen transistors divided equally between PNP and NPN types. A mere parts count cannot convey how the TC/60 functions because we cannot describe the skill with which these components have been chosen and watched. All contribute to the whole of startling performance. Truly an optical design, the TC/60 sets new standards in professional amplifiers.

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## OUTPUTS



Each channel of the BIAMP TC/60 has two output connections. They are standard 5-way binding posts on 3/4 inch spacing. The red post is in phase with the input, that is a positive going signal on the input provides a positive going output. This standard BIAMP configuration simplifies system phasing. The black binding post is the system return and is referenced to chassis ground.

In stereo or two channel systems, connect the + speaker wire to the red post and the - speaker wire to the black post. Remember that speaker wire resistance will rob you of output power, so use the largest size and shortest length of wire possible. Standard SJ appliance cord is often useful in this application; check your local codes to be sure. To choose the best wire size for your installation, consult the wire loss table that has been calculated for the TC/60 in both stereo and mono operation.

### POWER LOSS TABLE

#16 Wire Pair (.008 ohms per foot)

System	Feet per 1 watt loss	Feet per 10% loss (1dB)
60 Watts/ 8 ohms	16	192 Ft. = ( 6 watts)
90 Watts/ 4 ohms	8	160 Ft. = ( 9 watts)
120 Watts/16 ohms	32	832 Ft. = (12 watts)
180 Watts/ 8 ohms	16	672 Ft. = (18 watts)

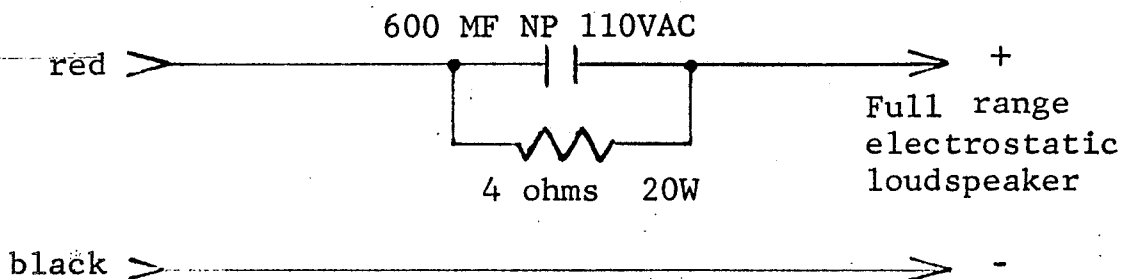
#14 Wire Pair (.005 ohms per foot)

System	Feet per 1 watt loss	Feet per 10% loss (1dB)
60 Watts/ 8 ohms	26	307 Ft. = ( 6 watts)
90 Watts/ 4 ohms	13	260 Ft. = ( 9 watts)
120 Watts/16 ohms	52	1352 Ft. = (12 watt)
180 Watts/ 8 ohms	26	1092 Ft. = (18 watt)

external loads such as speaker systems. Because of the high power developed by the TC/60, BIAMP cannot be responsible for damage to any external components. We suggest in line fuses be placed between the red output post and the + lead of the speaker. Consult the speaker manufacturer for their suggested proper fuse value. Littlefuse type 31000 in the range of 1 to 4 amps are usually appropriate. The equation  $\frac{10Z}{PP} = A$  may be used to find fuse rating. Where Z is the nominal speaker impedance, PP is the speaker rated peak power and A is the resultant fuse current.

### ELECTROSTATIC SPEAKERS

Although the TC/60 is stable under all load conditions, the performance of full range electrostatic may be optimized by using the following matching circuit.



### FUSES

There are five fuses in each TC/60 professional stereo amplifier. Four are located internally (two are on channel A etched circuit board and two are on channel B etched circuit board). CAUTION: REMOVE THE LINE PLUG FROM THE WALL SOCKET BEFORE SERVICE.

The internal fuses are serviced by removing the seven screws from the top panel. Removal of the top panel will reveal the channel A and channel B etched circuit boards. The fuse holders are located at the right and left hand of the board rear.

Repeated blowing of the primary line fuse may indicate high line voltage, an output short on one of the channels or a need for service.

Repeated blowing of the etched circuit board fuses indicates a need for professional service.

## SPECIFICATIONS

### BIAMP TC/60 Dual Channel Power Amplifier

#### PHYSICAL SPECIFICATIONS

Height	3.50(in)	130.2(mm)		
Width	19(in)	406.4(mm)		
Depth	9.5(in)	25.8(mm)	overall	
Mounting	EIA rack	2.25(in)	57.2(mm)	centers
Weight	19(lbs)	41.8(kg)	net	

#### ELECTRICAL SPECIFICATIONS

Line Voltage	120V AC	50-60 Hz		
Line Fuse	6 Amp	AGC		
Line Cord	3 wire	50(in)	147(mm)	
DC Supply Fuse	(4) 6 Amp	AGC		

#### ELECTRONIC SPECIFICATIONS

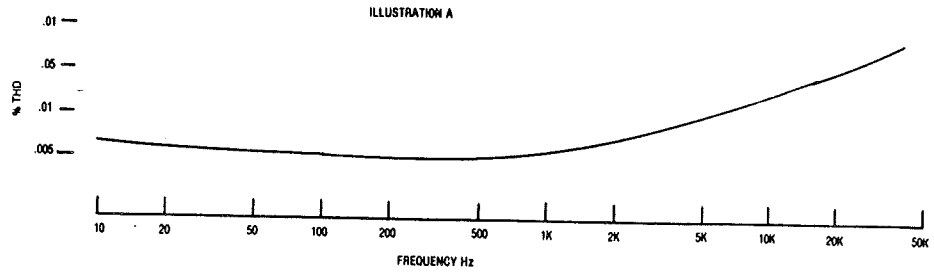
Power Output (per channel, 117V line, 20Hz to 20KHz)  
60 watts RMS into 8 ohms  
90 watts RMS into 4 ohms  
(Both channels driven)

Total Harmonic Distortion (80KHz lowpass) \*See Illustration A  
Less than .01% @ 1KHz, 60W, 8 ohms  
Less than .02% @ 1KHz, 90W, 4 ohms  
Less than .08% @ 20KHz, 60W, 8 ohms  
Less than .15% @ 20KHz, 90W, 4 ohms

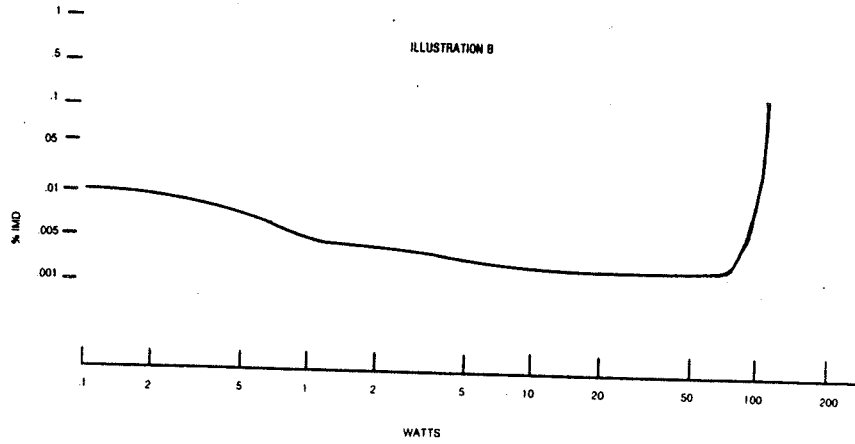
Intermodulation Distortion \*See Illustration B  
(60Hz and 7KHz, 4:1 ratio)  
Less than .03%, 100 mwatt to 60 watts into 8 ohms  
Less than .10%, 100 mwatt to 90 watts into 4 ohms

Frequency Response \*See Illustration C  
(Volume Control Maximum)  
+0, -0.5 dB 15 Hz to 20KHz @ 1 watt  
+0, -3 dB 10Hz to 50 KHz @ 1 watt

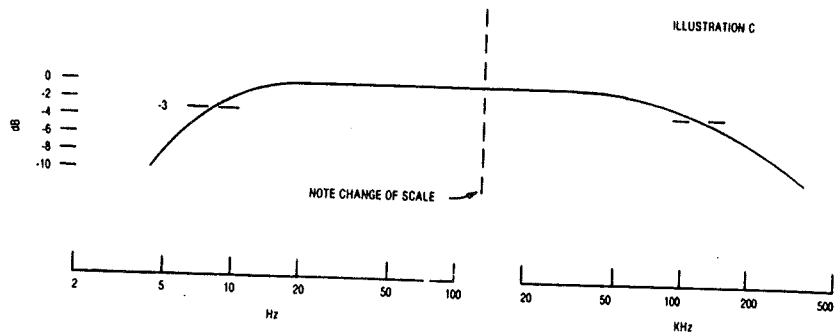
Power Response  
+0, -0.2 dB (20 to 20KHz) 60 watts into 8 ohms  
+0, -0.2 dB (20 to 20KHz) 90 watts into 4 ohms



TOTAL HARMONIC DISTORTION AT 60 WATTS INTO 8



% INTERMODULATION DISTORTION vs. POWER INTO 8Ω (80 Hz & 7 KHz, 4:1 RATIO)



FREQUENCY RESPONSE 1 WATT INTO 8Ω

## OPERATING PRECAUTIONS

- 1) Repeated cycling of the thermal overload protection circuit occurs when the amplifier is overheated. Since the TC/60 is designed to operate continuously under specified conditions, this can be remedied by reducing amplifier operating ambient temperature to below 65°F (19°C).
- 2) Never operate the TC/60 into any device which appears as a low frequency short circuit, such as a transformer, without placing a non-polar (AC) capacitor or 200 volt rating in the head to the red output post. Any impedance lower than 3 ohms is considered a short.
- 3) The ground circuits of the TC/60 are isolated to prevent ground loops. Do not connect the ground lead of an output cable to an input ground; this may cause oscillation.
- 4) Never parallel the output of channel A and channel B by tying them together. Do not parallel the output of the TC/60 with the output of any other power amplifier. Such connections do not result in increased power, and may destroy the output stage power transistors. Damage incurred in paralleling operation is not covered by the warranty.

## MAINTANENCE

The TC/60 professional stereo amplifier has been carefully constructed to provide years of trouble-free professional service. The generously rated components used in the TC/60 have only one real enemy -- heat! To help your TC/60 survive to happy geriatric self sufficiency, keep the heat sink area, the back 3½ inches of the chassis, free from dust and dirt. A soft painters dust brush and a jet of clean, dry, oil-free compressed air at no more than 30 pounds pressure are all that are needed.

Use only a soft cloth dampened with a mixture of 10 parts warm water and 1 part mild hair shampoo on the front panel and painted surfaces. Some ordinary detergents leave a scum.



## BUILDING A SYSTEM

The TC/60 is only one member of the growing family of products from BIAMP Systems designed with the professional user in mind.

BIAMP Stereo Mixing consoles feature low noise, high slewing rate, low distortion, and wide frequency response. Six, eight, twelve and sixteen channel stereo mixing consoles feature 18dB of headroom, pre-fader monitor sends, transformer balanced inputs, built-in reverb and the lowest TIM and SID ratings in the industry.

BIAMP Graphic Equalizers are fully professional in their features and are designed for both portable and fixed sound reinforcement or studio and broadcast application. Single and dual channel octave center equalizers with a +15dB range are available as well as a 27 channel 1/3 octave equalizer with a +12dB range. Both balanced and unbalanced inputs and outputs add to the versatility of these equalizers.

Electronic Crossovers are available from BIAMP in mono 2-way and stereo 2-way/mono 3-way versions. Crossover frequencies are continuously variable as is overall gain. These are all building blocks of a professional sound reinforcement system, and when used with one of the BIAMP professional stereo amplifiers such as the TC/60, TC/120 or TC/225, will provide professional performance.

## LIMITED WARRANTY

BIAMP SYSTEMS, INC. warrants to the original consumer purchaser of each BIAMP product that the unit is free from defects in materials and workmanship. This express warranty commences on the date of purchase from an authorized BIAMP dealer and extends for one year. Completion and return of the warranty registration card enclosed with each unit within ten days of the date of purchase is a condition precedent to coverage and performance under this express warranty.

**EXCLUSIONS AND LIMITATIONS:** This warranty will be VOIDED if the serial number has been removed or defaced, or if the unit has been subjected to abuse, alterations, attempted repair by any person not authorized by warrantor to make repairs, accident, or installation contrary to the warrantor's instructions. Cosmetic blemishes, such as handles, feet, and knobs are not warranted. All implied warranties, including the warranty of MERCHANTABILITY are limited to the duration of this express warranty, and, if the registration card is not promptly returned, the implied warranties are limited to the duration of the express warranty if it had been effective. In no event will BIAMP SYSTEMS, INC. be responsible for incidental or consequential damages, except for injury to the person.

**HOW TO OBTAIN REMEDY:** Carefully pack your BIAMP product and return it to one of the BIAMP Authorized Service Centers or write the BIAMP Customer Service Department at the address below for instructions on how to return your unit to the factory. Pack a letter with the unit explaining the nature of the problem and giving your name and address. You are responsible for freight and insurance charges to the Authorized Service Center or the factory.

**WHAT BIAMP WILL DO:** BIAMP will repair or, at its option, replace each unit covered by this warranty. Units sent to the factory will be returned to the owner freight collect. Units brought to Authorized Service Centers will be held for pickup by the owner for a period of time established by the individual Authorized Service Center, or, at the owner's option, returned to the owner freight collect.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. For instance, some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

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