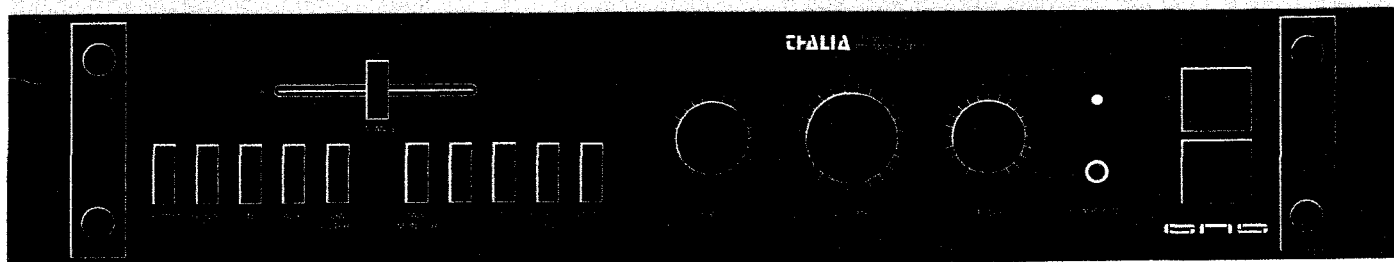


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# SPECIFICATIONS

ALL SPECIFICATIONS ARE DERIVED AT 2 VOLTS OUTPUT INTO A 5K-OHM LOAD (except TAPE which is driven into a 10K-Ohm load).

**PHONO:** \_\_\_\_\_

**GAIN:** 36dB at 1000Hz.

**INPUT IMPEDANCE:** 47K Ohms (100pF shunt).

**INPUT SENSITIVITY:** 3.2 millivolts at 1KHz.

**INPUT OVERLOAD:** Approximately 220 millivolts at 1KHz.

**HARMONIC DISTORTION:** 02% at 2V out into 10K Ohms.

**INTERMODULATION DISTORTION:** 005% at 2V out into 10K Ohms.

**EQUIVALENT INPUT NOISE:** Less than 0.8 microvolt 20-20KHz.  
Less than 0.25 microvolt 400-20KHz.

**OUTPUT IMPEDANCE:** Less than 1K

**HIGH LEVEL INPUTS:** \_\_\_\_\_

**GAIN:** 20dB.

**INPUT IMPEDANCE:** Level control dependant.  
33K Ohms at full C. C. W.  
15K Ohms at full C. W.

**INPUT SENSITIVITY:** 200 millivolts.

**INPUT OVERLOAD:** 1.2 Volts RMS.

**EQUIVALENT INPUT NOISE:** Less than 2.5 microvolts 20-20KHz.

**HARMONIC DISTORTION:** 005% at 2V out into 5K Ohms.  
.015% at 2V out into 1K Ohm.

**INTERMODULATION DISTORTION:** .0015% at 2V out into 5K Ohms.  
.02% at 2V out into 1K Ohm

**RISE TIME:** 2.2  $\mu$ S.

**OUTPUTS:** \_\_\_\_\_

**SOURCE IMPEDANCE:**

Main Output — 120 Ohms.  
Tape Output — Source impedance.

**MINIMUM LOAD IMPEDANCE:**

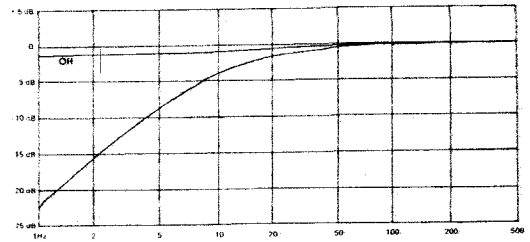
Main Output — 600 Ohms.  
Tape Output — 10K Ohms.

**SIZE:** 19" (W) x 3½" (H) x 10" (D)  
48.3 cm (W) 8.9 cm (H) 25.4 cm (D)

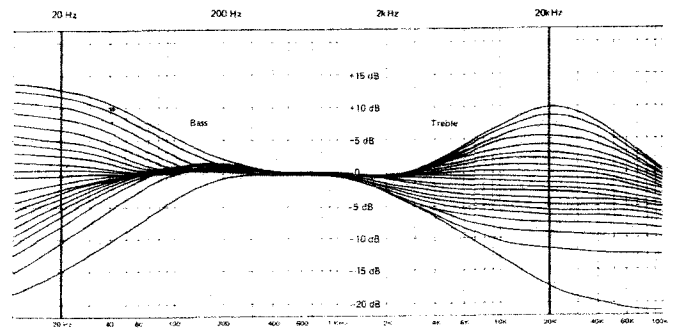
**SHIPPING WEIGHT:** 17 Lbs.  
7.7 Kg.

**WARNING:** To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

### LOW-FILTER CHARACTERISTICS



### SERVO-LOOP TONE CONTROL CHARACTERISTICS



Your THALIA-Servo Loop Preampifier derives its "State of the Art" performance from the technology and experience Great American Sound Co. engineers have gained from the development of THAEDRA and THOEBE. As a result, THALIA delivers a level of performance not found in competitively priced equipment.

Please study the following notes. Observation of these common-sense precautions might save you the embarrassment of some very loud surprises.

1. Always turn the level control to minimum between program or source selections and when turning the power on or off.
2. Do not change any rear-panel connections while THALIA is turned on.

Immediately upon receiving THALIA, carefully unpack and inspect it for any sign of damage. If any damage is evident, please contact your dealer immediately. Please save the shipping carton and all associated packing materials for future use. They have been carefully designed to transport your THALIA with a minimum of disturbance.

Shipment to the factory for any purpose must be made in the original carton and packing. If the original is lost or damaged, contact G.A.S. Company for replacement.

THALIA is designed primarily for mounting on a shelf. Where THALIA is to be inserted into a panel, a 17-6/16 inch by 3-5/16 inch cutout must be provided.

RACK-MOUNTING: THALIA's front panel has been designed to fit any standard 19-inch metal rack. Be certain that 8 insulating plastic bushings (provided) are used under each mounting screw to provide electrical isolation of the unit from the metal rack.

# INTRODUCTION

# PRECAUTIONS

# UNPACKING

# INSTALLATION

# ELECTRICAL CONNECTIONS

With the power switch in the OFF position, plug the line cord into any 105-125V, 50 or 60Hz outlet. Do not turn THALIA on until all other connections have been completed.

## CONVENIENCE OUTLETS

*Refer to pictorial A*

Three convenience outlets have been provided on the rear panel to power associated components in your system. Of these outlets, two are controlled by the front panel on/off switch (750 Watts total) for use with tape recorders, and medium power amplifiers (i.e. SON OF AMPZILLA or GRANDSON). The one remaining outlet is unswitched and may be used for turntables that have built-in power switches mechanically linked to disengage their wheels.

**NOTE:** We do not recommend using these outlets with high power amplifiers. AMPZILLA cannot be plugged into these outlets. A three-to-two prong adapter should never be used to plug AMPZILLA line cord into one of the THALIA convenience outlets! To keep within its warranty provisions, AMPZILLA must be powered directly from a wall outlet where the third wire can be grounded (No ground wire is required or recommended for THALIA).

## SIGNAL CONNECTIONS

### MAIN OUTPUTS

*Refer to pictorial A*

Two stereo pairs of audio-output jacks are provided for connection to power amplifiers or electronic crossovers. Special audio cables with gold-plated contacts have been supplied for this purpose. The gold-plated contacts have the low resistance necessary for reliable interconnection throughout the life of the equipment. In addition, the high-quality coaxial cable with braided shield guarantees highest possible isolation from external electrostatic and electromagnetic radiation. Additional cable sets are available from your dealer.

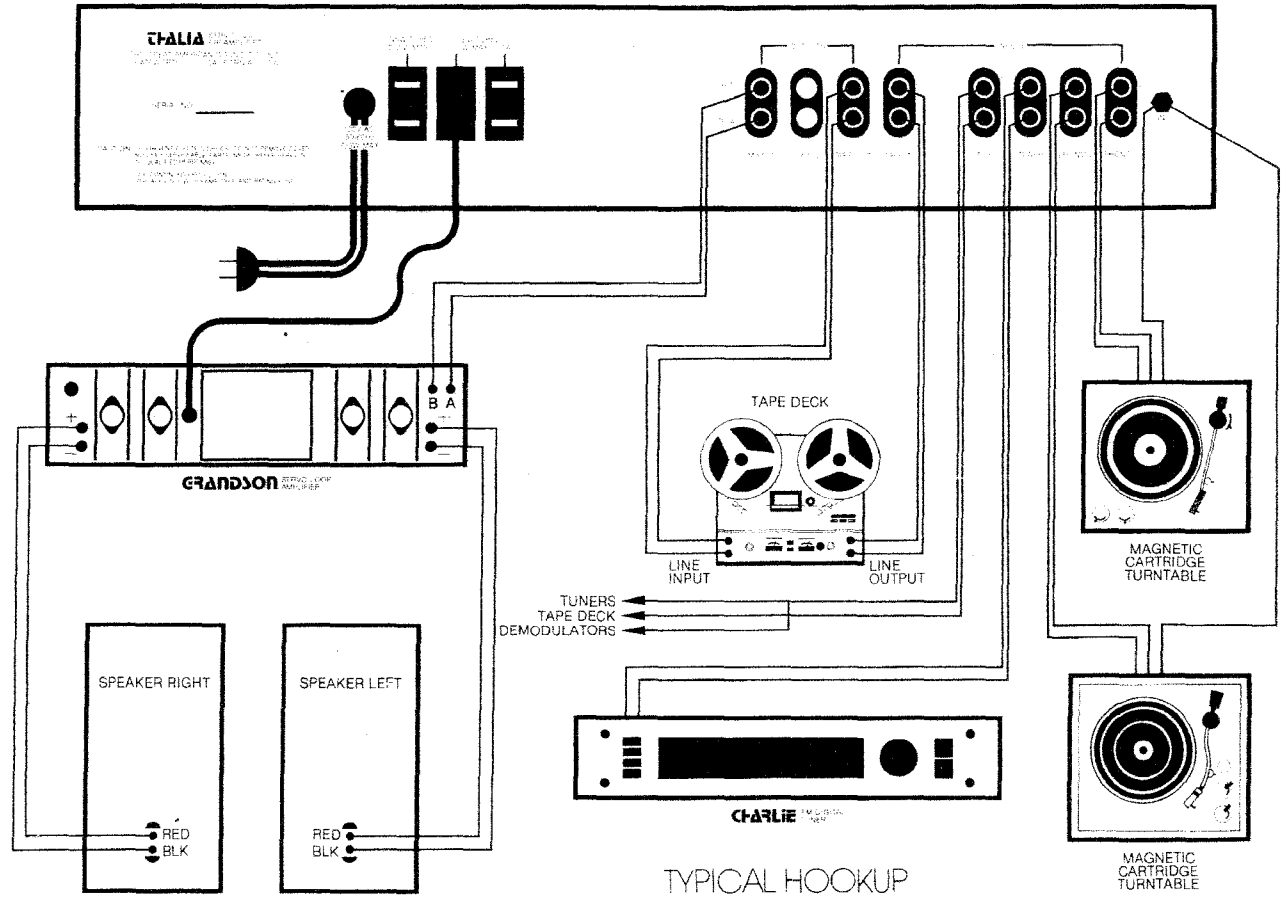
The stereo output jacks are labeled MAIN 1 and 2. They are electrically connected in parallel and can be used for installations requiring multiple amplifiers or crossovers. Make certain that the cable plug contacts are fully engaged so that no loss of circuit ground exists. A very loud hum or buzz will be heard if loss of ground does occur.

The source impedance of the two main outputs are each 60 Ohms, low enough to permit the use of shielded, interconnected cables up to 100 feet in length.

### TAPE OUTPUTS

*Refer to pictorial A*

One pair of stereo output jacks are provided on the rear panel for connection to any tape recorder having a minimum load impedance of 6.5K Ohms or higher. Unlike the main outputs, the tape-output signals are independent of balance, volume, and tone-control settings and are at a level equal to the selected-source input level (Tuner, Aux, etc.).



Pictorial A

## SOURCE CONNECTIONS

### TUNER INPUT

*Refer to pictorial A*

This is a high-level input with a rated sensitivity of 0.2 Volt. Although labeled TUNER (AM or FM), this input may be used with any high level source. The input impedance is 15K Ohms with the volume at maximum and increases to 33K Ohms when the volume control is at minimum. When a source other than TUNER is selected, the input impedance then becomes zero Ohms (shorted).

NOTE: As a result of THALIA's circuit design, the high-level inputs cannot be overloaded by any normal signal source.

### AUXILIARY INPUT

*Refer to pictorial A*

The stereo input labeled AUX is identical in operation and sensitivity to the TUNER input described above. It can be used with any auxiliary equipment having adequate output such as tape recorders, tuner, etc.

### TAPE INPUT

*Refer to pictorial A*

A stereo pair is provided labeled TAPE IN (located on the rear). This input has the same impedance and sensitivity as the TUNER input and is for connection to tape recorder line outputs.

### PHONO INPUTS

*Refer to pictorial A*

Two sets of phono inputs are provided, both are designed for use with conventional magnetic phonograph cartridges, see below.

### MAGNETIC PHONO:

All conventional magnetic cartridges (and other types which require RIAA playback equalization but which do not require input sensitivities below 3.2 mV)

may be used with this input. The input impedance is 47K Ohms (100 pF shunt capacitance) which is standard for magnetic phonograph cartridges. The overload capability is 220 mV at 1kHz which will accommodate cartridges designated "High-output" types.

Well-shielded cable is recommended for connecting to the cartridge and is usually supplied as part of the turntable or changer. It is not recommended that the phono cable length exceeds 5 feet, otherwise audible degradation of high frequencies may occur.

Ordinarily, an additional grounding wire is provided with the turntable which should be connected to the grounding post located between the phono inputs on the rear panel. In some systems, it might be found that this connection actually creates hum. In this case, no ground connection should be made. Be careful to keep all large transformers (such as found in power amplifiers) away from the phono cartridge to prevent magnetically-induced hum.

## SPECIAL NOTES ON HUM REDUCTION

Unfortunately, some components are more prone to hum than others, no cable made is entirely immune to radiated magnetic flux (hum). Therefore, all cables in the systems must be oriented for the lowest level of hum.

The connecting cables from the turntable ordinarily are more susceptible to hum than any other source. These cables must be oriented for maximum hum cancellation. All wires carrying AC power should be located as far away from the turntable and preamp input as is physically possible. Under no circumstances should you ground the turntable or grounding post to a water pipe or other such ground.

Hum can also be introduced by a poor connection from the outer grounding shell of the audio cable plug to the audio input jacks. Be certain that the outer shells of the RCA type phono plugs are squeezed together enough to provide a solid ground connection. Try rotating the plugs 1/2 turn to obtain the best possible ground.

# OPERATION

*Refer to pictorial B*

When first operating THALIA, set the controls as follows:

MODE:	Stereo
TAPE MONITOR:	Out
LOW FILTER:	Out
BASS & TREBLE	Flat (Mid position)
BALANCE:	Mid position
LEVEL:	Minimum (Counter-clockwise)
SELECTOR:	Desired source

Press the AC power switch; the pilot light will then be illuminated. Increase the volume control to the desired loudness. For detailed operation of each control, read the following:

## **POWER SWITCH**

*Refer to pictorial B*

This push-push switch turns on THALIA along with any equipment that has been plugged into the switched convenience outlets. Be certain that the volume control is always set at minimum before turning on THALIA. Power turn-off is instantaneous when the off button is pressed. Prior to turning THALIA off, it is advisable to turn down the level from very loud settings.

## **VOLUME CONTROL**

*Refer to pictorial B*

This controls the output of both channels simultaneously. The stepped, discrete resistor construction maintains inter-channel balance within 0.5 dB at all settings. It has no effect on the signal at the TAPE OUTPUT jacks.

## **BALANCE CONTROL**

*Refer to pictorial B*

This controls the ratio between the left and the right channel. It is useful in achieving a balanced sound level where the speakers are at different distances from the listener or they are of dissimilar efficiencies. The center of the control is detented.

## **BASS CONTROL**

*Refer to pictorial B*

This control alters the low-frequency response of the two channels below 600 Hz. The precise alterations can be seen in Figure 2. The stepped, discrete-resistor construction insures channel-to-channel accuracy within 1 dB throughout its range. When used in conjunction with the low filter, a wide range of corrective alteration is possible, partially negating deficiencies in speakers and source material.

## **TREBLE CONTROL**

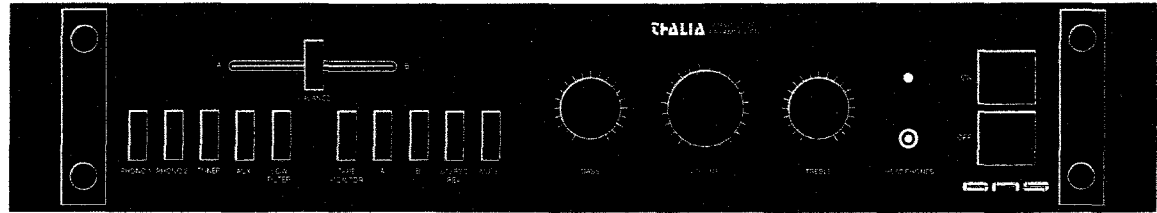
*Refer to pictorial B*

This control alters the high-frequency response of the two channels above 1800 Hz. The precise alterations can be seen in Figure 2. They have the same stepped, discrete-resistor construction as the BASS control. The boost positions incorporate supersonic filtering in a Gaussian frequency distribution. The resultant



BALANCE

PILOT LAMP



FUNCTION  
SELECT

LOW FILTER

TAPE MONITOR

MODE

MUTE

POWER  
SWITCH

HEADPHONES

TREBLE

GAIN

BASS

NOTE: Industry Standard is Ch "A" Left.

curve causes minimum phase distortion of high frequencies and provides the least objectionable interference from noise.

#### **LOW FILTER**

*Refer to pictorial B*

A subsonic frequency filter has been provided which is useful when low-frequency acoustic feedback or other types of subsonic noise are encountered. This filter will attenuate only frequencies below 10 Hz and will not degrade the low-frequency response of your system.

#### **MODE SELECTION**

*Refer to pictorial B*

These buttons determine how the source inputs are channeled to the output jacks. They function as follows:

- A. DEPRESSED The left channel is connected to both outputs.
- B. DEPRESSED The right channel is connected to both outputs.
- A & B. BOTH BUTTONS DEPRESSED. Both channels are combined and the mixed (Mono) resultant is connected to both outputs.
- STEREO. BOTH BUTTONS OUT. This, the normal position, connects the left input to the left output and the right input to the right output.
- REV. (Reverse) Depressing this button connects the left input to the opposite (right) output and the right input to the opposite (left) output; simply reversing the STEREO mode described above.

#### **TAPE MONITOR**

*Refer to pictorial B*

The normal position for this control is OUT. When OUT, the signals selected by the source buttons will be heard. When you wish to monitor the tape recorder connected to the tape input of THALIA, simply depress the button labeled "Monitor."

While in the TAPE monitor position, the signal selected by the push-button source selector will be disconnected and the signal from the tape recorder's output will be substituted. The originally-selected source signal will, however, continue playing into the TAPE OUT jacks. Thus, by switching between tape by 15 dB. This function is useful when the program must be interrupted for any reason, and you wish to return to the same sound level existing before the interruption.

#### **MUTE**

*Refer to pictorial B*

When the "Mute" button is depressed, THALIA's main output level is reduced monitor and source position the two signals can be compared while recording. Of course, this direct monitoring can only be achieved with recorders having adequate head provisions for this purpose.

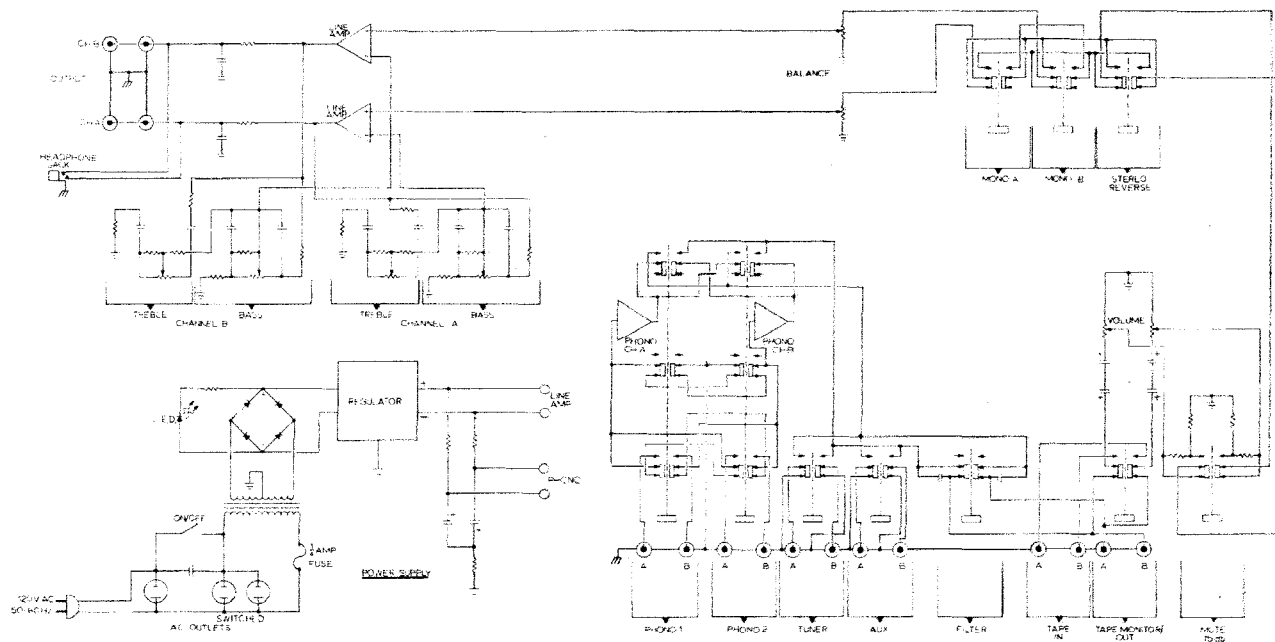
#### **HEAD PHONES**

*Refer to pictorial B*

The HEADPHONE jack accepts phones with impedances of 600 Ohms or more.

# OPERATIONAL THEORY

## THALIA BLOCK DIAGRAM



### PHONO

Refer to pictorial B

THALIA's phono circuit is a Complementary-Symmetry circuit operating in Class "A" mode. RIAA equalization is incorporated in the feedback network. D.C. drift problems normally associated with high-gain complementary circuits are eliminated with the use of D.C. servo control which senses the presence of D.C. drift and generates an amplified correction signal which is fed back to the circuit input.

### LINE AMPLIFIER

Refer to pictorial B

THALIA's line amplifier is also a Complementary-Symmetry Class "A" circuit. Unique to preamps in its class, THALIA's tone control circuits are an integral part of the line amp feedback, thus eliminating the need for an additional tone circuit. The elimination of additional signal processing stages improves overall noise and distortion figures significantly.