

INTRODUCTION

Your Thoebe Servo-Loop Preamplifier derives its "State of the Art" performance from the technology and experience Great American Sound Company engineers have gained from the development of Thaedra. To insure equal performance, Thoebe uses *identical* active circuitry (i.e. phono and line amp cards).

The result is a welcome addition to our growing line of Audiophile equipment.

It must be remembered that Thoebe is a complex, highly sophisticated example of electronic equipment and some common sense must be exercised when operating it.

1. When Thoebe is turned on, there will be a time delay of several seconds before anything will be heard. DO NOT attempt to turn up gain during this period. When the relay closes, you may be delivering in excess of 10V RMS signal to amplifier, your reaction time probably will not save your speakers (or ears) from permanent damage.
2. Turn level down between musical or source selections and when turning the power on or off.
3. Thoebe runs warm! Make sure it has adequate ventilation.

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

PRECAUTIONS

UNPACKING

Immediately upon receiving Thoebe, inspect the carton for evidence of mishandling during shipment. Then, carefully unpack the amplifier and inspect it for any sign of damage. Please save the shipping carton and all the associated packing materials for future use. The shipping materials have been carefully designed to transport your Thoebe with a minimum of disturbance.

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

NOTE: If damage has occurred in shipping, please contact your dealer immediately.

INSTALLATION

THOEBE is designed primarily for mounting on a shelf. An optional wood cabinet is available.

Where THOEBE is to be inserted into a panel, a 17 inch by 5-1/4 inch cutout must be provided.

Allow enough space and/or holes for proper ventilation – Under no circumstances should the ventilation slots on the top and bottom of the chassis be blocked.

RACK-MOUNTING: A rack mount panel version of THOEBE is available from your dealer, for use with the standard, 19 inch metal rack. Be certain that the insulating plastic bushings (provided with the panel) are used under each mounting screw to provide electrical isolation of the unit from the metal rack.

CAUTION: Under no circumstances should you mount the unit in a vertical position. This will cause overheating of the unit.

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

CONVENIENCE OUTLETS:

Refer to pictorial A

Four convenience outlets have been provided on the rear panel to power associated components in your system. Of these outlets, three are controlled by the front panel on/off switch (1000 Watts total) for use with tape recorders, and medium powered amplifiers, (i.e. Son of Ampzilla). The one remaining outlet is unswitched and may be used for turntables that have built-in power switches mechanically linked to disengage their rubber idler wheels.

NOTE: We do not recommend using these outlets with high power amplifiers. AMPZILLA cannot be plugged into these outlets. Under no circumstances should a three-to-two prong adapter be used to plug the AMPZILLA line cord into one of Thoebe's 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 Thoebe).

PRE-PREAMP POWER SUPPLY JACK

Located on the back panel of Thoebe is a power supply output connector. This supplies $\pm 28V$ for using Goliath pre-preamp.

ELECTRICAL CONNECTIONS

SIGNAL CONNECTIONS

MAIN OUTPUTS

Refer to pictorial A

Two stereo sets 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 a reliable interconnection throughout the life of the equipment; additionally, the high quality coaxial cable with braided shield guarantees highest possible isolation from external electrostatic and electromagnetic radiation.

The stereo output jacks are labeled MAIN 1 and 2. They are both identical and turn on is time-delayed by a relay.

Make certain that the cable contacts are fully engaged so that no loss of circuit ground exists when the equipment is turned on. A very loud hum or buzz will be heard if this condition does occur.

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

TAPE OUTPUTS

Refer to pictorial A & B

Two pairs of stereo output jacks are provided on the rear panel for connection to any tape recorder having a minimum load impedance of 5K Ohms or higher. Since the source impedance of each is 500 Ohms, cables up to 100 feet may be used without high-frequency attenuation. 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 source-input level (Tuner, Aux, Etc.)

NOTE: The TAPE OUT stereo phone jack on the front panel has been provided for tape-copying purposes and may always be utilized in the same manner as the rear outputs. (Refer to the paragraph on TAPE COPYING).

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 rated input impedance is 36K Ohms with the volume at maximum and increases to 53K Ohms when the volume control is at minimum. This condition exists only with the push-button source selector in the "TUNER" position, otherwise it is zero Ohms (Shorted).

NOTE: By design, THOEBE's high level input cannot be overloaded by any normal source.

AUXILIARY INPUTS:

Refer to pictorial A

The two stereo input pairs provided, labeled AUX 1 and AUX 2, are identical in operation and sensitivity to the TUNER input described above. They can be used with any auxiliary equipment having adequate outputs such as tape recorders, tuners, etc.

TAPE INPUTS:

Refer to pictorial A & B

Two stereo pairs are provided, labeled TAPE 1 (Located on the rear panel), and TAPE IN (Located on the front panel). These inputs, having identical impedances and sensitivities as the TUNER input, are for connection to tape recorder line outputs.

NOTE: TAPE 2 and Front Panel TAPE IN are connected in parallel and are both switched by TAPE 2 switching.

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 1.6mV) may be used with this input. The rated input impedance is 47K Ohms (100 pF shunt capacitance) which is standard for magnetic phonograph cartridges. Overload capability is 110mV at 1kHz which will accommodate cartridges considered to be "High-output" types.

Well-shielded cable is recommended for connecting to the cartridge and is usually supplied as part of the turntable or changer. Where longer distances are desired for this connection, it is not recommended the phono cables exceed 5 feet, otherwise audible degradation of high frequencies might be encountered. Special care must be taken than all connections are tight and secure.

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 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, by the very nature of the component, some components are more prone to hum than others; no cable made is entirely immune to radiated magnetic flux (hum). It follows then, that all cables in the system must be oriented for the lowest level of hum.

The connecting cables from the turntable will pick up far more 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. Only through the power amplifier should your system be grounded to earth.

Hum can also be introduced by a poor cable connector contact with the outer grounding shell of the plug. Make sure that the outer shells on RCA phono plugs are squeezed together enough to provide an absolutely solid ground connection. Try rotating the plugs to obtain the best possible ground.

OPERATION

Refer to pictorial B

When first operating THOEBE, set the controls as follows:

MODE:	Stereo
TAPE MONITOR:	Out
LOW FILTER:	Off
TAPE COPY:	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 level 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 THOEBE simultaneously with any equipment that has been plugged into the rear panel switched convenience outlets. A time-delay relay will cause a wait of approximately 20 seconds before power is applied to the internal circuits. This feature prevents turn-on voltage pulses from reaching the power amplifier. Power turn-off is instantaneous when the off button is pressed. Prior to turning THOEBE off, it is advisable to turn down the level from very loud settings.

LEVEL 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 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 CONTROLS:

Refer to pictorial B

These controls alter 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 CONTROLS:

Refer to pictorial B

These controls alter 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 controls. The boost positions incorporate supersonic filtering in a Gaussian frequency distribution. The resultant curve causes minimum phase distortion of high frequencies and provides the least objectionable interference from noise.

LOW FILTER:

Refer to pictorial B

Three low frequency attenuation turnover points are selectable with the two push buttons marked "filter" on the front panel. Depressing the top filter button initiates a 20 Hz rolloff. Depressing the lower button initiates a 30 Hz rolloff. Depressing both buttons simultaneously initiates a 10 Hz rolloff. Attenuation slope is 12 dB per octave.

These filters will be useful when low frequency feed back or other source of low frequency noise is encountered.

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 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 push buttons may be heard. When you wish to monitor one of the tape recorders connected to the tape inputs of THOEBE, simply depress the button labeled "Monitor". To select the appropriate recorder, use the push button just below the "monitor" button. OUT will monitor TAPE 1, IN will monitor TAPE 2.

While in the TAPE 1, TAPE 2 position, the signal selected by the push button source selector will be disconnected and the signal from the selected 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 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.

TAPE COPY:

Refer to pictorial B

Two push buttons allow extremely versatile interconnections between either of the two tape recorders connected to THOEBE.

Tape copy function is initiated by depressing "copy" button. "Copy" select button directly below "copy" will function as follows:

1-2 Copy select button out . . . (ie: The signals from tape recorder 1 are fed out to TAPE 2 outputs. (ie: The signals from tape recorder 1 are fed out to tape recorder 2).

2-1 Copy select button in . . . TAPE 2 inputs are connected to TAPE 1 outputs.

NOTE: It is impossible to record the signal from the push button source selection onto the recorder corresponding to the second digit of the COPY select position. For example, if the copy switch is in position 1-2, the tape recorder connected to the TAPE 2 jacks will only receive a signal from tape recorder 1. It will not receive the signal selected by the source selector push buttons (PHONO, TUNER, AUX, ETC.) To record the source selected signals onto recorder 2, the TAPE COPY must be in the off (out) position.

MUTE:

Refer to pictorial B

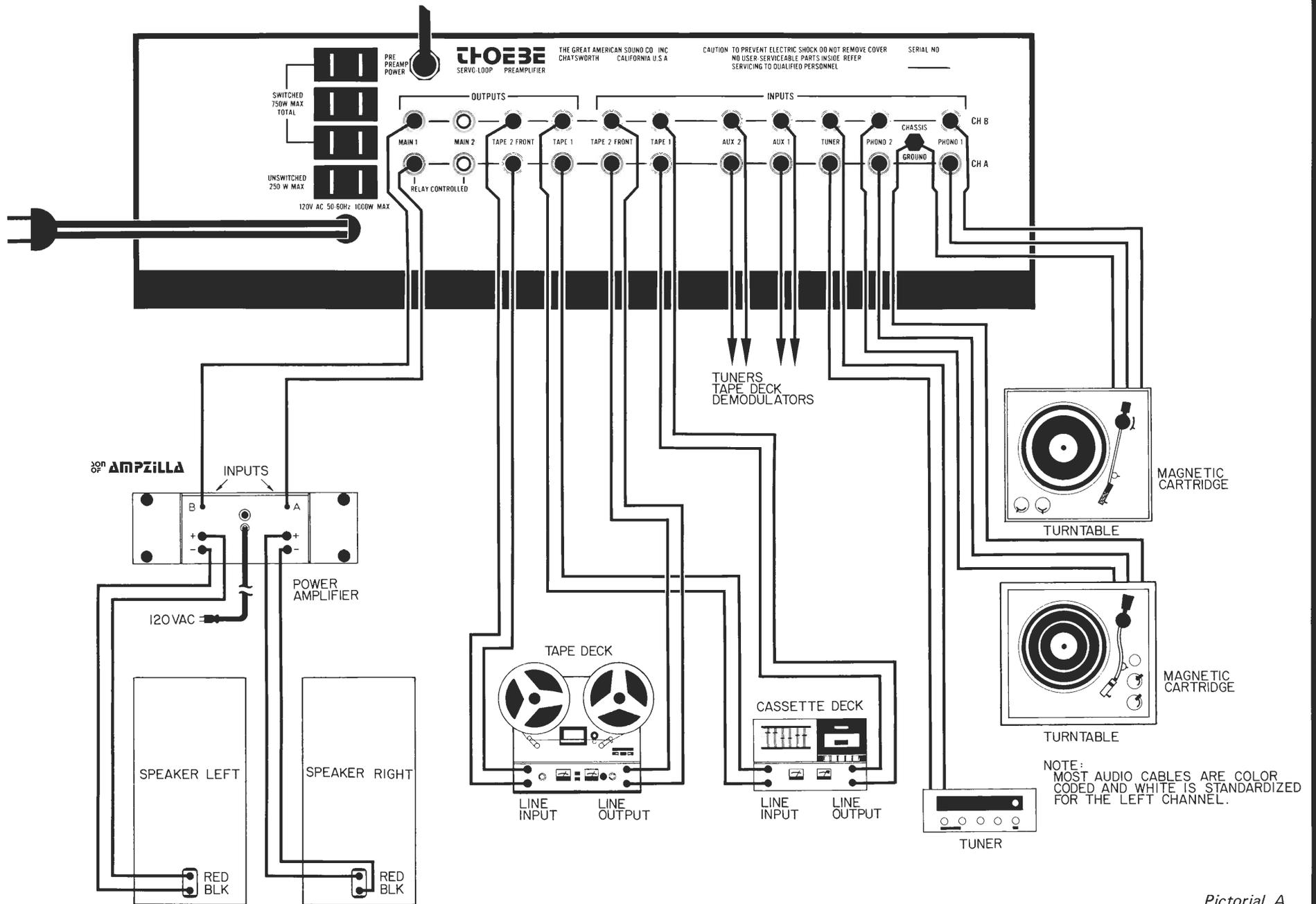
When "Mute" button is depressed, Thoebe's main output level is attenuated 15 dB. This feature is useful when program must be interrupted for any reason, and you wish to return to the exact level before interruption.

HEADPHONES:

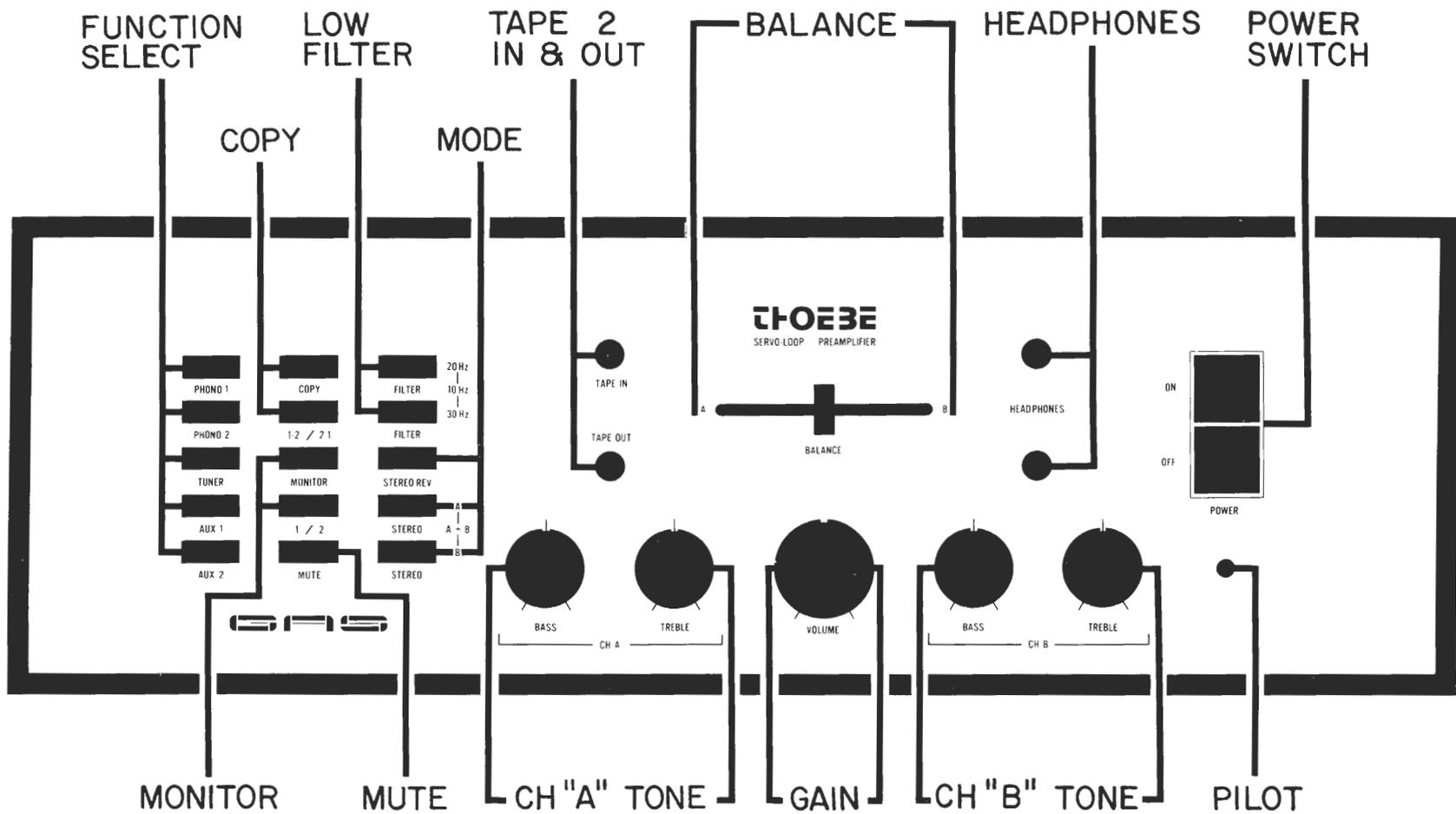
Refer to pictorial B

Either of the two HEADPHONE jacks accepts phones with impedances of 100 Ohms or more. The upper jack leaves the power amplifier connected, while the lower jack automatically disconnects the power amplifier for headphones-only listening.

POWER SUPPLY JACK FOR
GOLIATH MOVING COIL PRE-PREAMP



Pictorial A



NOTE : INDUSTRY STANDARD IS CH "A", LEFT.

Pictorial B

SPECIFICATIONS

PHONO

Gain	42dB @ 1000Hz
Input impedance	47KOhms (100pF shunt)
Input sensitivity	1.6 millivolts @ 1KHz
Input overload	Approximately 110 millivolts @ 1KHz
Equivalent input noise	Less than 0.6 microvolt 20-20KHz
	Less than 0.25 microvolt 400-20KHz
Output impedance	Approximately 500 Ohms

HIGH LEVEL INPUTS:

Gain	20dB @ 1000Hz
Input impedance	Level control dependant
	53K Ohms @ full C.C.W.
	36K Ohms @ full C.W.
Input sensitivity	200 millivolts @ 1 KHz
Input overload	1.2 Volts RMS
Equivalent input noise	Less than 5 microvolts 20-20KHz

OUTPUTS:

MAIN output impedance	60 Ohms Effective
TAPE output impedance	Source impedance
Output load impedance	Not less than 100 Ohms for MAIN
	Not less than 10K Ohms for TAPE

ALL SPECIFICATIONS ARE DERIVED AT 2 VOLTS OUTPUT INTO A 600 OHM LOAD (Except TAPE which is driven into a 10K Ohm load)

Figure 1. LOW-FILTER CHARACTERISTICS

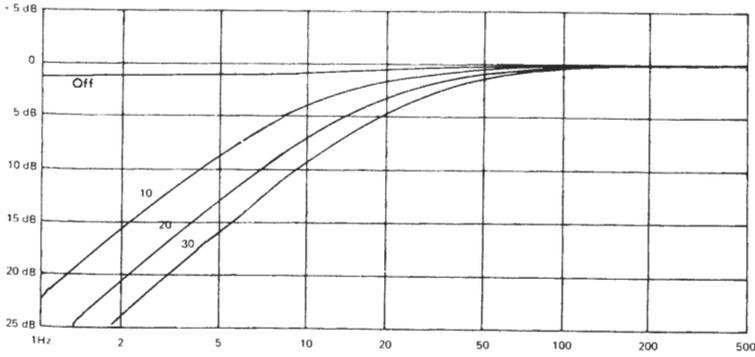
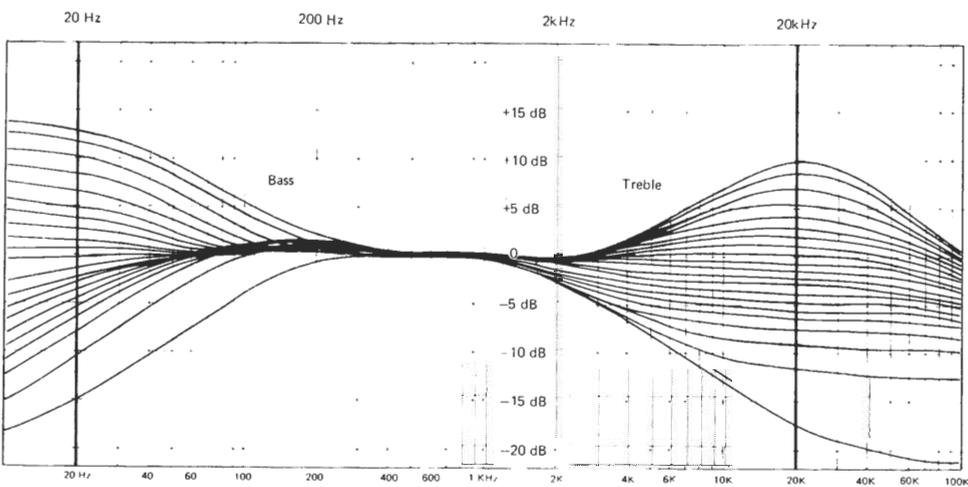
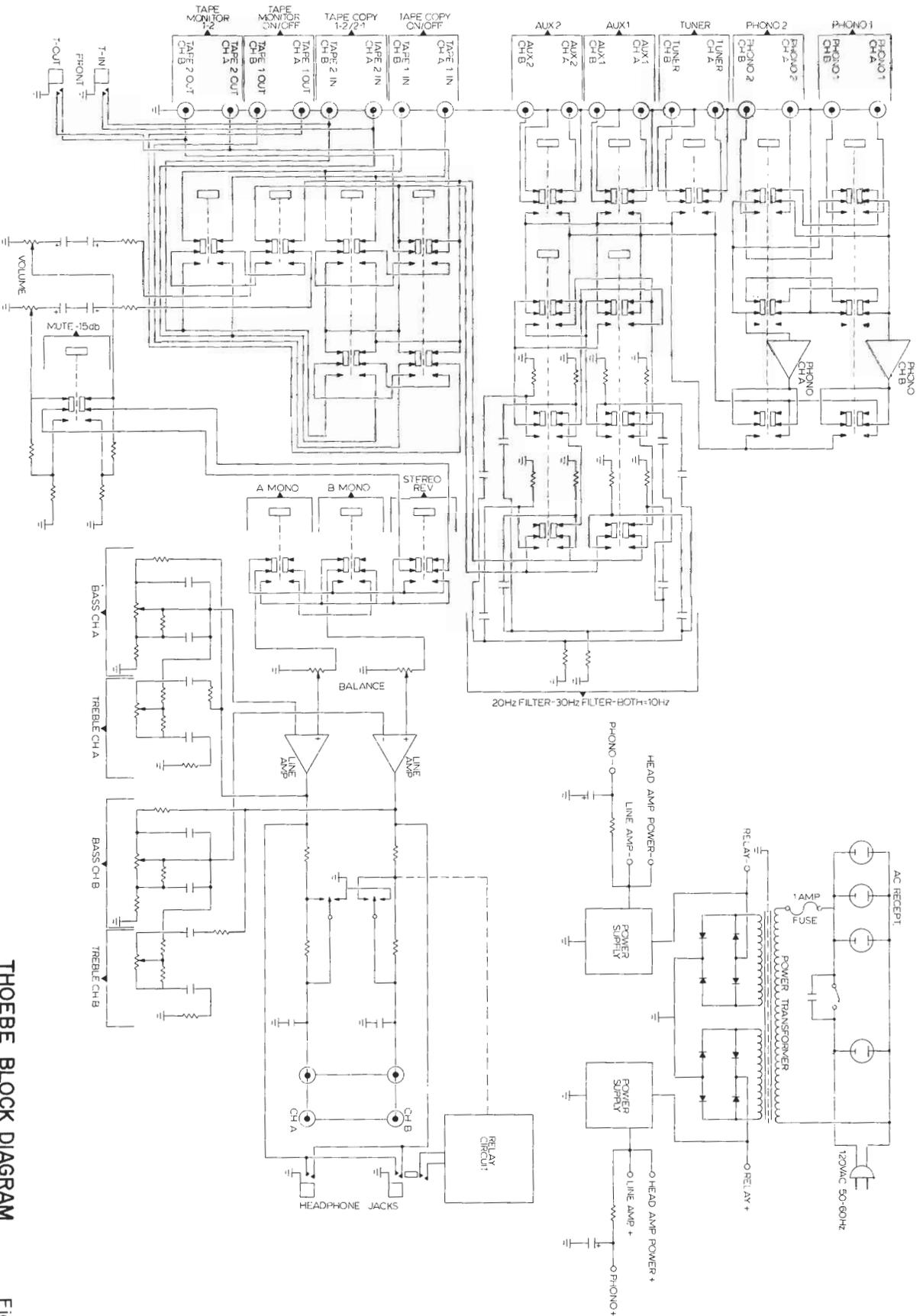


Figure 2. TONE CONTROL CHARACTERISTICS





THOEBE BLOCK DIAGRAM

Figure 3

OPERATIONAL THEORY

From input to output, Thoebe is 100% full complementary, a concept originally conceived by G.A.S. Company engineers. As versatile as the unit is, there are only two stages of amplification. It is this simplicity which allows totally open, unrestricted sound.

All direct (D.C.) coupled amplifiers suffer from a problem known as d.c. drift. The conventional solution has been to use capacitor coupling and/or large amounts of negative feedback, which introduce distortion products of their own.

THE NO COMPROMISE SOLUTION: D.C. Servo Control

The concept of servo control has found many applications but has never appeared in audio electronics. In Thoebe, servo amplifiers (completely outside the audio path) sense and correct all d.c. voltages. Both phono and line amp circuits feature servo d.c. control.

Thoebe's line amp is actually a small *Class A* power amplifier capable of driving headphones directly without the use of amplifier.

FIVE-YEAR WARRANTY

THIS PRODUCT IS WARRANTED UNDER THE FOLLOWING CONDITIONS:

1. PRODUCT IS PURCHASED THROUGH AN AUTHORIZED G.A.S. CO., INC. DEALER.
2. WARRANTY COVERS NORMAL OPERATING CONDITIONS OF HOME USE.
3. WARRANTY PERIOD BEGINS AS OF DATE OF SALE PROVIDED THIS CARD IS FILLED OUT AND REGISTERED BY THE AUTHORIZED G.A.S. DEALER WHERE THE PRODUCT WAS PURCHASED. REGISTRY PERIOD IS 20 DAYS.
4. DELIBERATE MISUSE, MISHANDLING, FAILURE TO REPORT RECEIVING DAMAGED MERCHANDISE, OR UNAUTHORIZED TAMPERING OR MODIFYING TO THIS MERCHANDISE AUTOMATICALLY VOIDS ALL WARRANTIES.
5. WARRANTY PERIOD FOR ALL G.A.S. CO., INC. FACTORY WIRED PRODUCTS IS 5 YEARS COVERING BOTH PARTS AND LABOR. TRANSPORTATION CHARGES TO AND FROM THE DEALER OR FACTORY ARE EXCLUDED.
6. WARRANTY ON ALL G.A.S. CO., INC. PRODUCTS USED IN ANY OTHER FASHION OTHER THAN STATED ABOVE SHALL REDUCE THE WARRANTY TIME PERIOD AND OTHER CONDITIONS TO NEGOTIATIONS BETWEEN G.A.S. CO., INC. AND PROSPECTIVE USER.
7. THIS WARRANTY SHALL EXTEND TO EACH SUCCESSIVE OWNER PROVIDED G.A.S. CO., INC. IS NOTIFIED BY REGISTERED MAIL WITHIN 20 DAYS OF RESALE BY INITIAL OR PRESENT OWNER. THIS NOTIFICATION SHALL CONSIST OF DATE OF SALE, AMOUNT, NAME AND ADDRESS OF NEW OWNER.
8. G.A.S. CO., INC. GUARANTEES THAT ALL G.A.S. CO., INC. PRODUCTS ARE FREE FROM DEFECTS IN MATERIALS AND/OR WORKMANSHIP FOR THE REQUIRED WARRANTY PERIOD. OWNERS OF G.A.S. CO., INC. PRODUCTS ARE ENTITLED TO FREE PERIODIC CHECKS, AT EITHER DEALER OR FACTORY LOCATIONS, TO INSURE PRODUCT PERFORMANCE TO ORIGINAL SPECIFICATIONS.

G.A.S. CO., INC. WILL REPAIR OR REPLACE ANY AND ALL DEFECTIVE PARTS AT NO CHARGE, PROVIDED ALL OTHER CONDITIONS OF THE WARRANTY ARE IN ORDER. THIS FREE CHECKOUT SERVICE IS LIMITED TO A MAXIMUM OF ONCE A YEAR, PER UNIT, PER CUSTOMER.
9. THIS WARRANTY IS NOT VALID UNLESS ACCOMPANIED BY SALES SLIP VALIDATION OR PROPERLY STATED INVOICE (COPY).

880005-876
Printed in U.S.A.



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