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Our Mailing and Shipping Address:

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Austin, TX 78721 U.S.A.
Phone: 512-389-5358
Fax: 512-301-3932
Main Email Address: cvanr@whiteinstruments.com
World Wide Web Site: http://www.whiteinstruments.com/

Note: Repairs and packages should be shipped to Suite 202

EQUALIZER USERS MANUAL

MODELS 4200A, 4240A, 4400, 4500

INTRODUCTION:

CONGRATULATIONS! You have purchased one of the finest One-Third Octave or One Sixth Octave Graphic Equalizer that money can buy!

This ***USER'S MANUAL*** is intended to help you get your new equalizer installed and working. Please fill out and return the User's Service Card packed with your equalizer. Your comments are always appreciated. Recording your ownership of this product with us could help you recover it in the event it is lost or stolen.

WHAT YOU PAID FOR:

By choosing our product you have made a direct contribution to the livelihood of everyone at White Instruments. In all likelihood your new equalizer will be installed in a system upon which you or others depend for a living. We believe we must continue to earn your trust.

White Instruments has manufactured your new equalizer to the highest possible quality standards. We want you to be happy with your purchase over the long term and want you to continue to purchase and recommend our products. We believe we have built our reputation and business on customer satisfaction by offering quality products, personalized service, instant response to field problems and no hype. You, our customer, are the most important person in the world to us as a company. If you have any problems with this product, or if you have any questions please remember that we are as near as your telephone.

White instruments
Division of C VAN R Inc.

Address: 1514 Ed Bluestein Blvd.
Austin, Texas 78721

Phone: (512) 389-3800

FAX: (512) 389-1515

CONTENTS

WARRANTY POLICY

Your White Instruments Equalizer is warranted against defects in manufacturing, workmanship and original components for a period of **ONE YEAR** from the date of purchase. During this period White Instruments will repair or replace the equalizer, at our option, so long as it has **not been subjected to abuse.** Abuse may be physical and/or electrical in nature. White Instruments will be the sole judge of this criteria. White Instruments is the only warranty repair facility in the United States. Outside of the United States, White Instruments Distributors are authorized to make warranty repairs.

HOW TO OBTAIN WARRANTY REPAIRS

The equalizer should be **securely packed** and shipped, **prepaid,** to White Instruments or one of its Authorized Offshore Distributors. A return authorization is preferable but not required.

Our U.S.A. shipping address may be found in the COMMUNICATIONS section of this manual.

Contact the factory for the name and address of the Offshore Distributor nearest you.

A copy of your **sales receipt** should be included to establish the **warranty date.** Without it we will have to rely on the serial number, which indicates when we originally shipped the equalizer to a dealer.

A completed **trouble report** or letter detailing the equalizer's malfunction must be included. See page 16 for an example you may copy.

Your **name, shipping address,** and **telephone number** must be included.

Every effort will be made to complete warranty repairs within five working days of receipt of the unit. Your equalizer will be returned to you via best surface freight, prepaid. **If you instruct us to return your equalizer via air freight, it will be shipped with freight charges collect.**

HOW TO OBTAIN OUT-OF WARRANTY REPAIRS

Should the required repairs not be covered by our warranty you will be charged for parts and the labor required to repair the unit. Should you require an estimate of charges prior to repairing the unit you should notify White Instruments of this **when returning the unit.** Every effort will be made to complete the repair within five working days. The unit will be returned C.O.D. unless other arrangements have been made.

As a service to our customers we **do not** consider our Repair Department to be a profit center.

COMMUNICATIONS

TELEPHONE: (512) 389-3800

FAX: (512) 389-1515

MAILING ADDRESS:

P.O. BOX 698
AUSTIN, TX 78767
USA

SHIPPING ADDRESS:

1514 ED BLUESTEIN BLVD.
AUSTIN, TX 78721
USA

UNPACKING:

Carefully unpack and inspect your equalizer for damage. Save the packing materials to assure safe transit to us in the event your equalizer should ever need factory service. Immediately report any damage to the carrier. Your equalizer was shipped with full insurance unless we were instructed otherwise (domestic orders only). Although White Instruments is not responsible for damage in shipping we will assist you in quickly obtaining parts and/or repairs.

PLEASE FIND THE FOLLOWING ITEMS PACKED WITH YOUR NEW EQUALIZER:

1. Equalizer
2. 4 Rack Mounting Screws
3. 1 User's Manual
4. 1 User's Service Card
5. 1 Security Cover
6. Model 4509 Power Supply (Model 4500 Equalizer only)
7. Note: Plug-in Accessories Ordered are normally installed.

WARNING

To Prevent Fire Or Shock Hazard

Do Not Expose This Appliance To

Moisture Or Rain.

AVAILABLE ACCESSORIES

CROSSOVER NETWORKS (Optional):

4015-f 12dB/Octave, Bi-Amp Plug-In.

4016-f 18dB/Octave, Bi-Amp Plug-In.

4115-f 12dB/Octave, Bi-Amp Plug-In. Optimized For CD Horns.

4116-f 18dB/Octave, Bi-Amp Plug In. Optimized For CD Horns.

4315-fl-f2 12dB/Octave, Tri-Amp Plug-In.

4316-fl-f2 18dB/Octave, Tri-Amp Plug-In.

Specify Frequency(ies).

Inquiries for special plug-in crossover networks and filters are invited. See Filters For Audio Applications Bulletin.

TRANSFORMERS (Optional):
4390 Input Transformer, Plug-In.
4391 Single Channel Output Transformer, Plug-In.
4392 Dual Channel Output Transformer, Plug-In.
4393 Triple Channel Output Transformer, Plug-In.

JUMPER PLUGS (Standard):
4438 Input Jumper Plug, Included.
4439 Output Jumper Plug, Included.
4440 Crossover Jumper Plug, Included.

NOISE GENERATORS (optional):
4262A Pink noise generator with adjustable low-pass filter, plug-in.
4464A Pink noise generator, plug-in.
4533A Pink/white noise generator, plug-in.

SECURITY COVERS (included):
MS4500 Solid Metal, Included Standard.
ST4500 See-Thru, Included Optional.

Specify One When Ordering.

INSTALLATION OF ACCESSORIES

1. Low-Level, Passive Bi-Amp and Tri-Amp Crossover Networks
2. Input and Output Transformers
3. Pink Noise Generators
4. Other Special Filters and Accessories

If your application does not call for the installation of plug-in accessories, make certain that the THREE jumper plugs (4438, 4439 and 4440) are installed in their APPROPRIATE sockets. Please proceed to the next section: Connections To The Sound System.

CAUTION

The Plug-In Accessories must be anchored by inserting two "speed" type nuts, provided with the accessory, into the equalizer's chassis. Once anchored in this manner the accessory may be somewhat difficult (though not impossible) to remove. TWO of the THREE accessory sockets are IDENTICAL. Make certain you anchor the accessory into the CORRECT socket the FIRST TIME.

Support the front panel of the equalizer with one hand while gently and evenly applying pressure with the other hand to push the accessory into its socket. Make certain the accessory is inserted ALL THE WAY into its socket.

CONNECTIONS TO THE SOUND SYSTEM:

The equalizer is connected to the sound system via two barrier terminal strips. Interfa wiring to the equalizer should be high quality, two conductor, shielded cable terminated with insulated, #6 Spade Lugs.

The equalizer is constructed so that the audio circuitry is isolated from the chassis. The chassis is connected to EARTH through the power supply wiring.

It is not the purpose of this manual to provide a dissertation on sound system shielding, grounding and safety techniques. However, a few tips are in order.

1. NEVER remove the grounding lug from the AC power supply. To do so is dangerous (and unlawful in most jurisdictions)! Further it is unnecessary since the audio processed by this unit is already isolated from AC ground.

2. A good technical ground can be achieved through the proper design and installation of the AC system.

3. It is a generally accepted practice to connect the shield to AC ground at only ONE end of the cable. The other end of the cable should be left open or connected through a .01 uF capacitor. For this reason the illustrations in this manual show the shield conductor as a dashed line (meaning optional).

INSTALLATION

All audio input and output connections should be made BEFORE power is applied to the equalizer.

The Model 4500 power supply to equalizer connection should be made BEFORE AC is applied to the 4509 power supply.

INPUT CONNECTIONS

The inputs of the Models 4400, 4240A and 4200A are electronically balanced. The input to the Model 4500 is unbalanced and buffered. An accessory input transformer is available Model (4390). This transformer will provide an isolated input to each Model and present several opportunities to reduce or eliminate hum and/or RFI caused by ground loops and EMI.

The terminals on the Input Barrier Strip are labeled as follows:

1. "+" = Audio + or High Leg. With or without accessory input transformer.

2. "-" = Audio - or Low Leg of accessory input transformer primary. When input jumper plug (4438) is installed, this terminal and the COM terminal are connected internally.

3. "COM" =Audio Common, - or Low Leg. With or without accessory input transformer. One side of the accessory input transfromer's (4390) secondary is connected to this terminal internally.

4. "///" = Chassis, AC ground.

Figures 1 and 2 illustrate the input connections with and without the accessory input transformer. Note the use of the "-" and "COM" terminals.

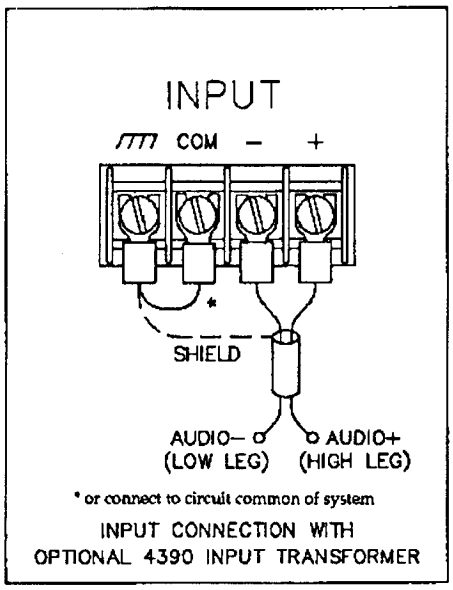


Figure 1

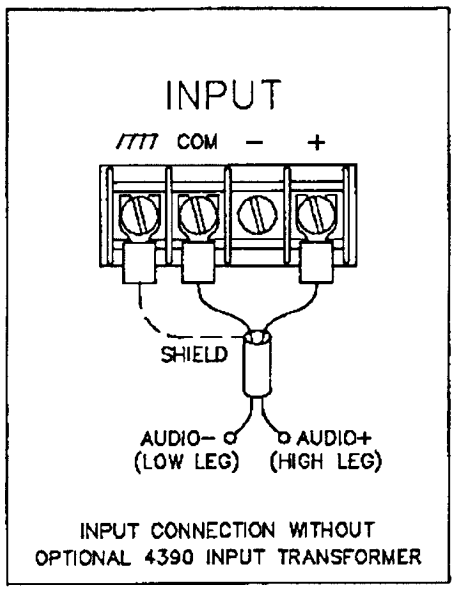


Figure 2

OUTPUT CONNECTIONS

All Models feature three identical single-ended individually buffered outputs. Each output will drive a 600 Ohm load to +18dBu and presents a source impedance of less than 50 Ohms.

Transformer isolated outputs present a source impedance of about 300 Ohms and will drive a 600 Ohm load to + 15dBm.

The Output terminal strip has three sets of labels to accommodate the installation of plug-in accessories.

1. **NORMAL** No accessory Output Transformer or Crossover is installed.

See Figure 3

Output Jumper Plug (4439) and Crossover Jumper Plug (4440) are installed.

Terminal marked COM is audio common.

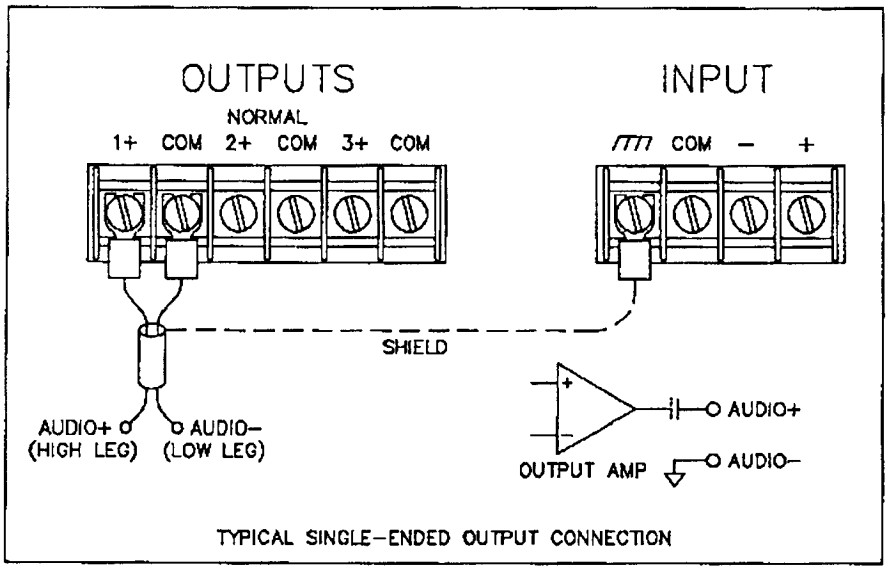


Figure 3

2. **TRANSFORMER OPTION** Models 4391, 4392 or 4393 is installed. Crossover option may or may not be installed.

See Figure 4

Terminal marked "-" is low leg of transformer's secondary.

4391 Isolates output 1 (LF) only. Outputs 2 (MR) and 3 (HF) are not isolated.

4392 Isolates outputs 1 (LF) and 3 (HF) only. Output 2 (MR) is not isolated.

4393 Isolates all three outputs.

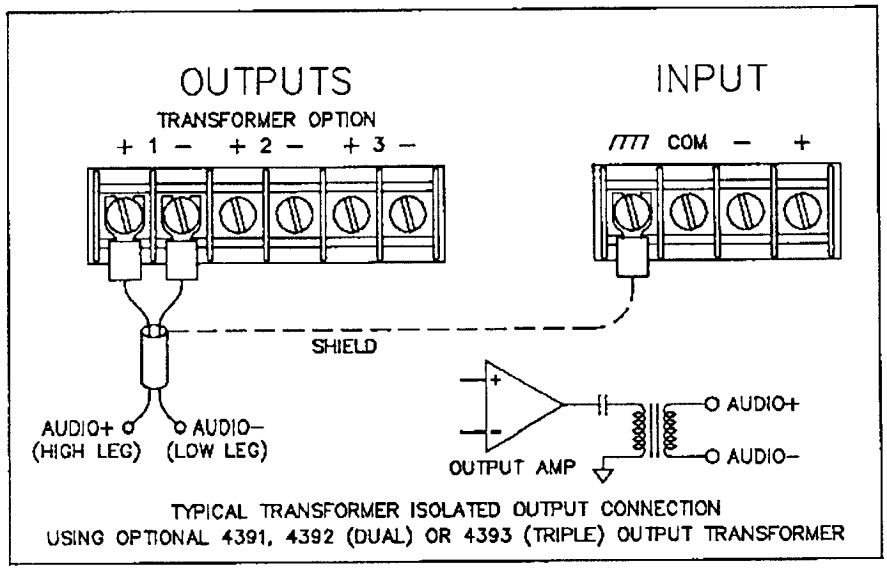


Figure 4

3. **CROSSOVER OPTION** installed. Output Transformer option may or may not be installed.

Bi-Amp See Figure 5

Output 1 (LF) Low Frequency or Low-Pass.

Output 2 (MR) CAUTION! Full Range Output.

Output 3 (HF) High Frequency or High-Pass.

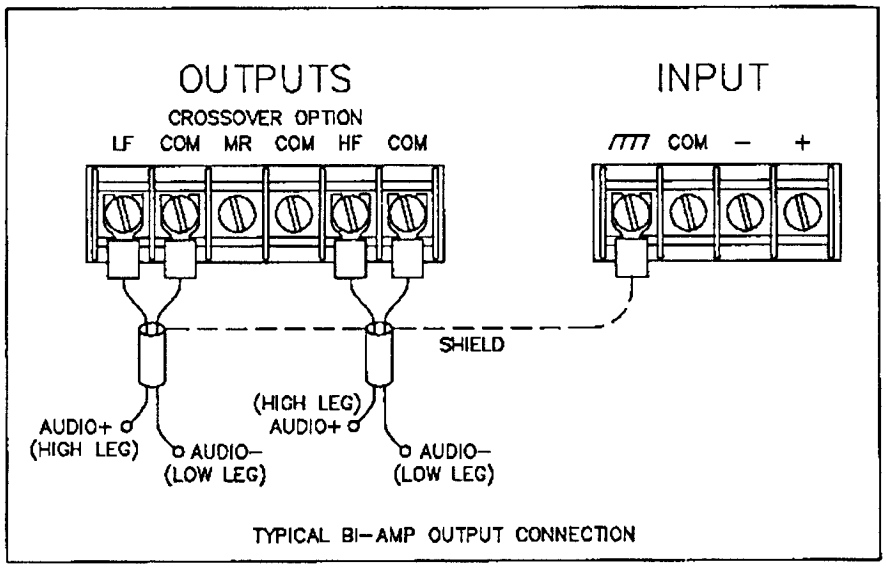


Figure 5

Tri-Amp See Figure 6

Output 1 (LF) Low Frequency or Low-Pass.

Output 2 (MR) Mid Frequency or Band-Pass.

Output 3 (HF) High Frequency or High-Pass.

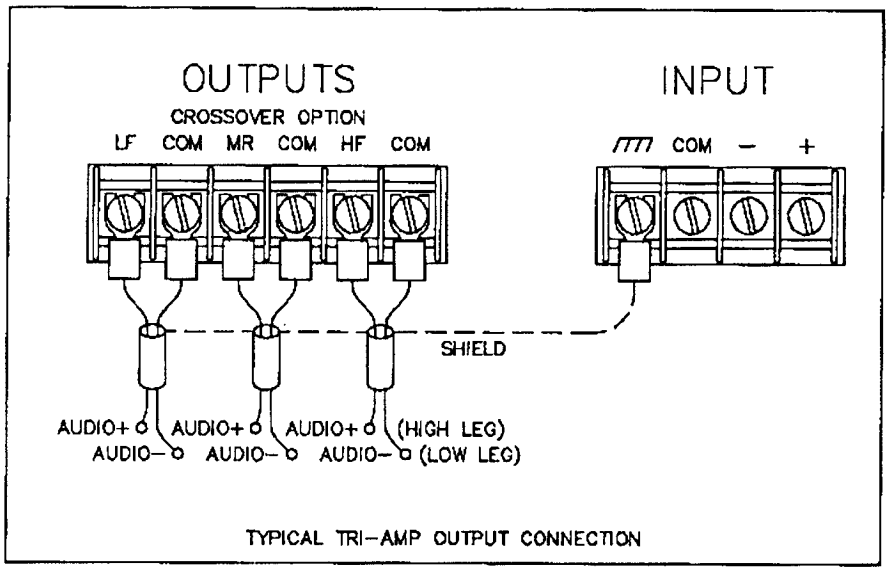


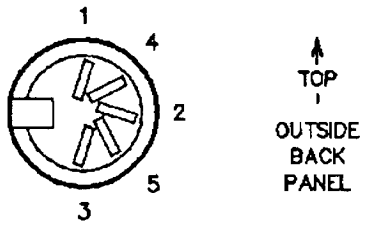
Figure 6

AC POWER CONNECTIONS

MODELS 4200A, 4240A AND 4400 utilize 115/230 Vac at 50/60 hZ with a 0.25amp. slow blow fuse. There is no on/off switch on these units.

The Model 4500 is shipped with a Model 4509 external power supply for 115 Vac, 50/60 Hz operation. The 4509 power supply is equipped with internal, thermally activated circuit breakers which reset automatically. In addition the Model 4500 equalizer is protected with two internal, fail-safe fuses.

REMOTE POWER SUPPLY CONNECTOR
PIN ASSIGNMENTS



1	+18 Vdc
2	AC GROUND, (CHASSIS)
3	−18 Vdc
4	COMMON
5	COMMON

CAUTION

The Model 4500 is not equipped with an AC on/off switch. The unit is turned on when AC is applied to its power supply. The front panel LED will light green.

When powering up ANY PART of the sound system always turn the power amplifiers on LAST.

When powering down ANY PART of the sound system always turn the power amplifiers off FIRST.

Figure 7

COLOR TRANSITION THRESHOLD LEVEL CONTROL (4500 Only)

In its full CW rotation the control causes the power/clip LED to change from green to red at approximately 3dB before clip. As the control is rotated CCW the level at which the green to red transition takes place is lowered. No calibration is given for the control. Note that this control only effects the LED's color transition and not the level at which the equalizer will clip.

FRONT PANEL CONTROLS AND FEATURES: MODEL 4500

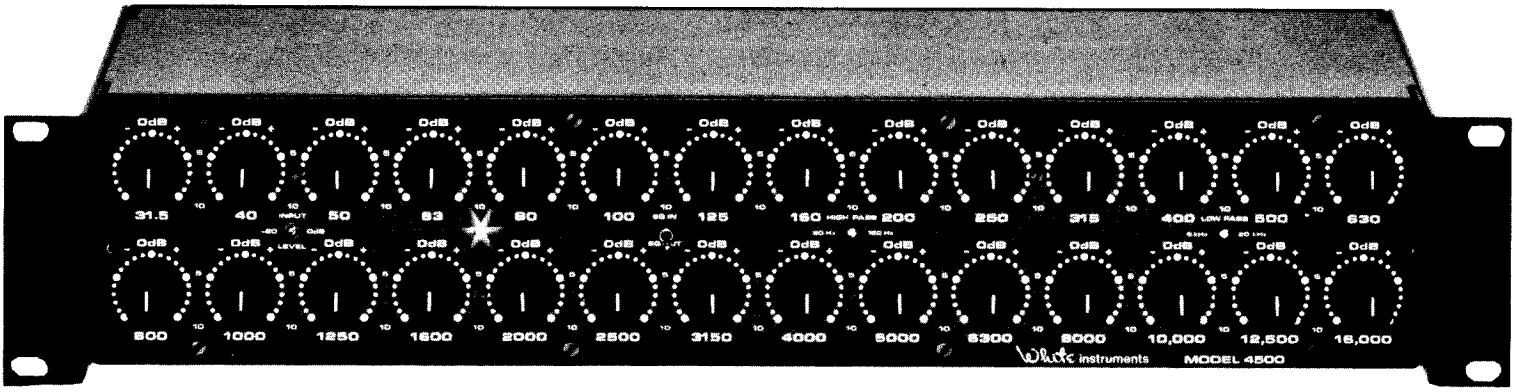


Figure 8

1. 28 One-Third Octave Filter Controls. +/- 10dB Range.
2. Input Attenuator. Unity to -20dB Attenuation.
3. Power/Clip LED.
4. Equalization In/Out Switch.
5. High-Pass Filter. Continuously Variable From 20 Hz To 160 Hz.
6. Low-Pass Filter. Continuously Variable From 20 kHz to 5 kHz.
7. Security Cover Mounting Standoffs.

REAR PANEL CONTROLS AND FEATURES: MODEL 4500

Figure 9

1. Power Socket.
2. Crossover Jumper Installed In Crossover Accessory Socket.
3. Output Transformer Jumper Installed In Output Transformer Accessory Socket.
4. Output Terminal Strip.
5. Attenuator, Output 3 (HF). Unity To 20dB Attenuation.
6. Attenuator, Output 2 (MR). Unity To 20dB Attenuation.
7. Input Terminal Strip.
8. Input Jumper Installed In Input Transformer Accessory Socket.
9. Color Transition Threshold Level Control For Front Panel (4500 Only), Power/Clip LED.

FRONT PANEL CONTROLS AND FEATURES: MODELS 4200A, 4240A & 4400

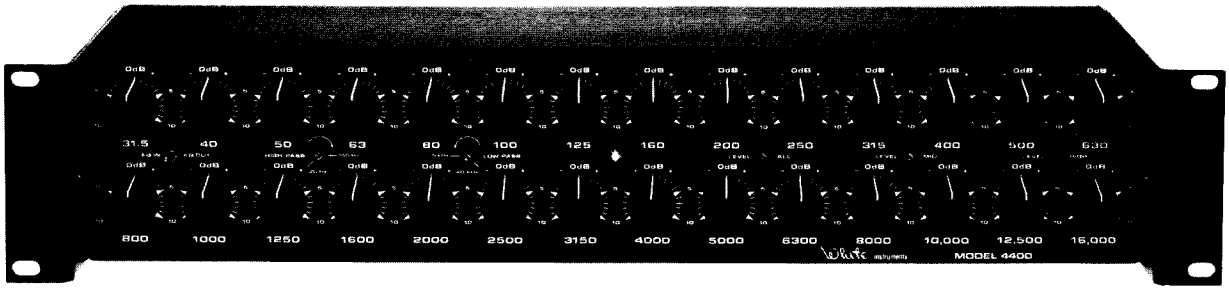


Figure 10

1. Filter Control (1 of 28)
2. EQ In/Out Switch
3. High Pass Filter (Low Cut)
4. Low Pass Filter (High Cut)
5. Power Indicator
6. Output Level Attenuator - All
7. Output Level Attenuator - MID
8. Output Level Attenuator - HIGH
9. Fuse
10. Power Cord
11. 115/230 Vac Selector Switch
12. Power Transformer
13. Serial Number
14. Accessory Socket - Crossover
15. Accessory Socket - Output Xformers
16. Accessory Socket - Input Xformer
17. Output Connectors
18. Input Connectors

REAR PANEL CONNECTIONS AND FEATURES: MODELS 4200A, 4240A & 4400

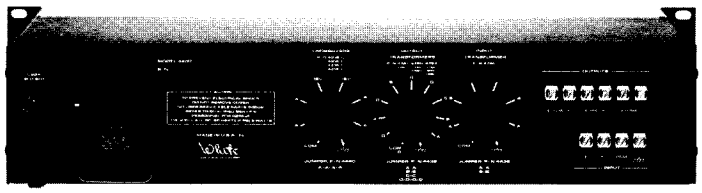


Figure 11

SPECIFICATIONS

FREQUENCY RANGE..... 20 Hz (-3dB) through 20 kHz (-3dB), typical.
FILTER TYPE.....4500 active, tuned resistor-capacitor (R-C), single-pole pair. 4200A, 4240A & 4400 are L-C tuned resonators.
CONTROL CENTERS.... 28 one-third octave filters on standard I.S.O. frequency centers from 31.5 Hz through 16 kHz. 4240A 1/6 octave (250 to 2 kHz I.S.O. centers) plus 8 bands 1, 2/3 & 1/3 on the ends.
FREQUENCY CENTER TOLERANCE .. +/-3% of center frequency.
CONTROL RANGE.... Front panel. -lOdB +lOdB. center detent at OdB (+/-O.5dB). 4200A is cut only -15 dB.
HIGH PASS FILTER..... Front panel. 20 Hz-160 Hz, 12dB/Octave, continuously variable.
LOW PASS FILTER..... Front panel. 20 kHz-5 kHz, 12dB/octave, continuously variable.
RECOMMENDED OPERATING LEVEL. OdBu
INPUT CIRCUIT..... Single-ended buffer amplifier. Optional isolation transformer.
INPUT IMPEDANCE..... Loads at 20 kilohms, nominal.
GAIN..... Unity
INPUT ATTENUATOR..... Front panel. Up to 20dB, continuously variable.
NUMBER OF OUTPUTS..... Three: Low, Mid, High.
OUTPUT CIRCUIT..... Single-ended buffer amplifier. Optional isolation transformers.
OUTPUT IMPEDANCE..... Presents source of less than 50 Ohms. Approximately 300 Ohms with optional output transformers.
OUTPUT ATTENUATORS..... Two: Mid, High. Model 4500 rear panel. Others front panel.
MAXIMUM OUTPUT LEVELS..... +18dBu into 600 Ohms. +15dBu Into 600 Ohms with optional isolation transformers.
CLIP/POWER INDICATOR..... Front panel. Two color LED. Lights green for power and normal operating level. Lights red at +15dBu (3dB from clipping). Peak reading. 4500 only continuously variable r panel control allows the color transition to be set between + 4 and + 15dBu.
NOISE.....4500 80dB, Others 90 dB below 0dBu referenced to the input regardless of the equalization settings. 20 kHz bandwidth.
DISTORTION..... Less than 0.2% THD at +18dBu. Less than 0.02% THD at 0dBu.
POWER REQUIREMENT.....4500 regulated +/-18 Vdc, 150 mA. 115 Vac, 60 Hz remote power supply included. Others 115/230 Vac, 50/60 Hz.
CONTROLS..... Conductive plastic rotary potentiometers with center detent.
EQ IN/OUT SWITCH..... Front panel. Miniature toggle switch. By-Passes filters but not crossover networks or high and low-pass filters.
CONNECTORS..... Barrier Strip.
DIMENSIONS AND WEIGHT..... 3.5" By 19" (Rack Mount) By 5". 7 Lbs.
FINISH..... Black painted, brushed aluminum. White nomenclature security cover furnished.

TROUBLE REPORT

Should your equalizer require either warranty or out-of-warranty factory service, please pack a copy of this Trouble Report with it. Your cooperation will save a great deal of time (and money) processing the repair.

CALL US FIRST: 512 389-3800

Your White Instruments equalizer was designed to be easily serviced in the field (by a competent technician). A telephone call to us might result in a solution to your problem, save you the down time and the expense of re-equalizing your system.

SERVICE INFORMATION

Model Number:_____ Serial Number:_____ Approximate Date of Purchase:_____

Do you consider this service to be performed as...

Warranty Service(Please include a copy of your sales receipt.) Out of Warranty Service.

If Out-of-Warranty service would you like an estimate? Yes No

Your unit will be returned UPS Surface unless otherwise specified.

Have you included any easily detached accessories or other components? Please list.

Your Company Name:_____ Phone Number:_____ Your Name:_____

Street Address:_____ City:_____ State:___ Zip:_____

Please describe the application in which this unit is used.

Brand and Model Number of the component DRIVING this unit:

Brand and Model Number of the component LOADING this unit:

Has anyone other than White Instruments serviced this unit?

DESCRIBE THE NATURE OF THE PROBLEM EXPERIENCED AND WHY THE UNIT IS SUSPECTED TO HAVE FAILED.