Manuals+ — User Manuals Simplified.

api 5500 Dual Equalizer

api 5500 Dual Equalizer Instruction Manual

Contents

api 5500 Dual Equalizer

Product Information

Specifications:

- Product Name: API 5500 Dual Equalizer
- Manufacturer: Automated Processes, Inc.
- Model: 5500
- Address: 8301 Patuxent Range Road, Jessup, MD 20794 USA
- Contact: **301-776-7879**
- Website: **http://www.apiaudio.com**

Product Usage Instructions

- **About the API 5500 Dual Equalizer**
  The API 5500 Dual Equalizer provides superior analog sound and continues the tradition of API excellence. It is hand-assembled with care by professionals at API.
- **Reading the Manual**
  It is recommended to thoroughly read the manual before using the API 5500 Dual Equalizer. Even experienced engineers should familiarize themselves with the manual to maximize the usage of the equalizer during recording, editing, and mixing.

Important Safety Instructions
For your safety and to prevent damage to the device, please adhere to the following safety instructions:

1. Read all instructions carefully.
2. Keep the manual in a safe place for future reference.
3. Avoid using the device near water.
4. Clean the device with a dry cloth only.
5. Ensure ventilation openings are not blocked.
6. Avoid placing the device near heat sources.
7. Do not tamper with the AC plug's safety features.
8. Protect the power cord from damage.
9. Use only manufacturer-specified attachments/accessories.
10. Unplug the device during lightning storms or extended periods of non-use.

11. Seek qualified personnel for servicing needs.

12. Be cautious of exposure to high noise levels to prevent hearing damage.

FAQ

- **Q: How do I connect the API 5500 Dual Equalizer?**

  A: The rear panel of the equalizer features balanced INPUT and OUTPUT connections. Ensure proper connection according to your setup.

- **Q: What is the recommended way to clean the API 5500 Dual Equalizer?**

  A: Clean the device using a dry cloth. Avoid using any liquids or cleaning agents that may damage the equipment.

- **Q: How can I ensure optimal performance from the API 5500 Dual Equalizer?**

  A: Follow the user manual instructions carefully, maintain proper ventilation around the device, and avoid exposing it to extreme conditions such as excessive heat or moisture.

5500 Dual Equalizer

- **OPERATOR'S MANUAL**
- Revised 2024-01-17
- Written for Automated Processes, Incorporated by Daniel Pfeifer
- Automated Processes, Inc. 8301 Patuxent Range Road! Jessup, MD 20794 USA **301-776-7879**
- **http://www.apiaudio.com**
- ©2024 Automated Processes, Inc.
- All rights reserved under International and Pan-American Copyright Conventions.
- API® and the double-spear logo are registered trademarks of Automated Processes, Inc.
- No part of this publication may be reproduced in any form or by any means, whether mechanical or electronic, without the written permission of Automated Processes, Inc.
- As research and development is a continual process, API reserves the right to change the features and specifications described herein without notice or obligation. API cannot be held responsible for any loss or damage arising directly or indirectly from any error or omission in this manual.

PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.

Thank You for purchasing API's 5500 Dual Equalizer!

- Whether you're seeking a truly superior analog sound, or simply want to be part of the more than 55-year tradition of API excellence, we appreciate your purchase.
- API takes great pride – and great care – in the hand assembly of all our professional audio products. Above all, we appreciate our loyal users, who have made the Company what it is today.

Larry Droppa
President

About this Manual

- This manual covers the user operation of the API 5500 Dual Equalizer.
  Most sections are useful to all users and it's recommended that the manual be read thoroughly before purchase and delivery. Experienced engineers may get up and running quickly, but if you are new to API equalizers, it's recommended that you read the entire manual at least once and keep it handy while recording, editing, and mixing.
- Manual Revision History: YYYY-MM-DD format
- Original: 2009-06-29
- Previous: 2017-03-01
- Revised: 2024-01-17

Dan Pfeifer is Professor Emeritus of Recording Industry at Middle Tennessee State University

Important Safety Instructions

1. Please read these instructions
2. Keep this information in a safe place
3. Do not use this device near water
4. Clean only with a dry cloth
5. Do not block any ventilation openings
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other devices that produce heat
7. Do not defeat the safety purpose of the polarized or grounding type AC plug
8. Protect the AC power cord from being walked on or pinched
9. Use only attachments/accessories specified by the manufacturer
10. Unplug this device during lightning storms or when unused for long periods of time
11. Refer all service to qualified personnel

ATTENTION: Exposure to extremely high noise levels may cause permanent hearing loss or damage. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise (this may include music) for a period of time. Be safe.
WARNING – To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture

Overview

1. **History of the API Equalizer**
   - The lineage of the 5500 circuit can be traced back to the original 550 equalizer designed by
   - Saul Walker, the founder of Automated Processes, Inc. That three band EQ was originally used in the earliest API consoles built in the 1960s. Engineers were immediately captivated by its fully reciprocal boost/cut characteristic and its proportional Q design, one of API's many industry firsts.
   - The sound of the 550, 550A, and 550B console equalizers was so highly prized by engineers that many purchased API equalizers separately or took apart old consoles in order to install the equalizers into a hand-made chassis. This allowed them to have that same API console sound available no matter where they were working. Today, API manufactures the six and eight-space Lunchbox and the 10-space VPR rack, making it easier for engineers to bring the API sound to all of their recordings.
   - The 550 was designed as a console equalizer which, due to the architecture of the recording console, uses an unbalanced input. Also, the ergonomics of a console dictates that controls take up little space, sometimes limiting the number of functions that can be included in a design. The 5500 is specifically designed to continue the tradition of API's precision equalization. It features a balanced input, a true straight-wire bypass, an integrated power supply with noiseless muting, and a range control that expands its versatility to mastering applications.

2. **All-Discreet Design**
   - Like all API products, the 5500 contains no integrated circuits in its signal path. The gain comes from two hand-built 2520 operational amplifiers in each channel and the balanced input is handled by a 2510 discrete operational amplifier. Besides being a key component of the API sound, the 2520 coupled with the API 2503 output transformer is capable of delivering +32dBu before clipping. With this much headroom, it is unlikely that the 5500 can be driven to distortion.

3. **Proportional Q Circuitry**

   The Twin "T" topology is found in many equalizer circuits, but the legendary Saul Walker included a novel Proportional Q section that makes it truly musical. Proportional Q works by spreading the equalizer's action over a broad bandwidth at low degrees of boost or cut. This provides delicate shading and subtle coloring of the signal's tone, without leaving the impression that signal processing was applied. As the amplitude is advanced to more extreme settings, the equalizer's bandwidth narrows to provide the user with surgical precision. This allows the equalizer to be useful in removing undesirable noises or radically emphasizing an aspect of an instrument's character, such as its attack. The additional circuitry necessary to provide proportional Q is not included in most other equalizers because it adds nothing to the spec sheet. Listening to musicality in the signal is the only way to appreciate the benefits of the added cost and complexity required for Proportional Q design.

4. **Fully Reciprocal Operation**

   Before the 1960s, few equalizers had the same characteristics in boost mode as in cut mode. (In fact, many earlier designs did not have both boost and cut to begin with.) Today, it is common for equalizers to be reciprocal, but again, Saul Walkers design is special. When switching an API EQ from boost to cut, the exact same components are used, reorganized around the amplifier for the appropriate function. This guarantees 100% reciprocity. The benefit becomes apparent when a track is re-equalized to remove the previously applied equalization. The engineer can be confident that, because of the 5500's fully reciprocal design, a truly flat frequency response will be restored.

5. **Range Control**

   Each channel of the 5500s four-band EQs features a separate Range Control, which allows the users to choose

from several API module boost and cut specifications, detailed below

| Boost / Cut	Application	API Module Reference
+/- 2dB	Standard Equalization	550B
+/- 1dB	Higher Resolution Equalization	550D
+/- ½ dB	Mastering Equalization	550M

The range of the amplitude controls can be reduced to .5 or .25 of their stated scale, with the Q altered identically as before. Range Control provides a means of adjusting the tonal balance with finer resolution in an even gentler manner. This should be especially useful for complex program as contained in stems or submixes, and is ideally suited for mastering purposes. The combination of reduced range equalization coupled with APIs characteristic "warmth" can be useful in helping breathing life to the sterile sound often found in digital recordings.

Power Mute and Bypass
The 5500 features a true hard-wire bypass. In this mode, the output connector is wired directly to the input. Shortly after power is first applied, or immediately after it is lost, a special circuit forces this mode, so signal is never lost and power thumps are never heard. The BYPASS button illuminates in red when the 5500 is in bypass mode, whenever either the special circuit or the operator put it into bypass.

Front Panel Controls

1. **Bypass**
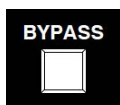
   - BYPASS: When BYPASS is engaged, the unit enters a true hard-wire bypass, the output is connected directly to the input.
   - There are no electronics in the signal path when BYPASS is engaged
   - Illuminates in red when engaged

2. Channel Controls

   The 5500 is a two-channel unit that can be used as two separate mono EQs or in stereo.

   Each channel has an identical set of controls, all of which will be outlined in the following sections.

3. **IN**

   IN: When IN is engaged, the equalizer is fully operational.
   - When it is "out" (not engaged) there is no equalization applied
   - IN differs from BYPASS in that the electronics and output transformer are still in the signal path
   - Illuminates in blue when engaged 2.2.2 Four-Band Equalization The 5500 Dual Equalizer offers four overlapping bands of equalization that enables exception control over tonal shaping: LO, LO-MID, HI-MID, and HI.
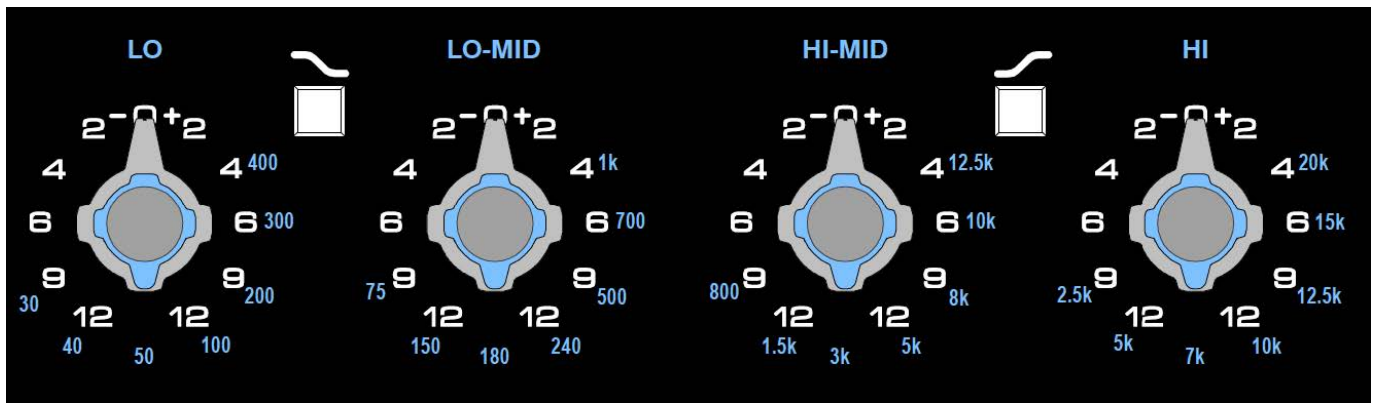
Frequency Selection

- Each band equipped with seven (7) fixed frequency selections:
- LO: 30Hz, 40Hz, 50Hz, 100Hz, 200Hz, 300Hz, 400Hz
- LO-MID: 75Hz, 150Hz, 180Hz, 240Hz, 500Hz, 700Hz, 1kHz
- HI-MID: 800Hz, 1.5kHz, 3kHz, 5kHz, 8kHz, 10kHz, 12.5kHz
- HI: 2.5kHz, 5kHz, 7kHz, 10kHz, 12.5kHz, 15kHz, 20kHz

Peaking and Shelving

- All equalizer sections have peaking (also called "bell" in the UK) response characteristics.
- While the central frequency of that boost (or cut) is the one engraved on the panel, there is of course amplitude variation that occurs to a lesser extent on nearby frequencies. This is termed the Q where higher Q's have less effect on adjacent frequencies. As mentioned before, the API equalizers have a Proportional Q that gets larger as more amplitude change is selected.
- On the LO and HI bands there is an option to select shelving response. When in shelving mode, the equalizer reaches the indicated amplitude at the indicated frequency and remains with that amplitude change for all frequencies to the edge of the audio spectrum.
- LO SHELF: When LO SHELF is engaged, the low-frequency band changes from a peaking to a shelving EQ Peaking is the default mode Illuminates in blue when engaged
- HI SHELF: When HI SHELF is engaged, the high-frequency band changes from a peaking to a shelving EQ Peaking is the default mode Illuminates in blue when engaged

For frequencies towards the center of the spectrum the change is gradual, but the slope differs slightly from the peaking mode. This can have important effects on the midrange character of the sound, but that is not the typical reason to select shelving. The two principal reasons for using a shelving response is either to eliminate noises like rumble that are outside the frequency range of the desired sound, or to give a general "tilt" to the tonal balance towards treble or bass. The API 5500 accomplishes both of these tasks without sounding resonant.

Boost and Cut

Each band equipped with eleven (11) fixed boost and cut selections:

- -12dB

- -9dB

- -6dB

- -4dB

- -2dB

- 0dB

- +2dB

- +4dB

- +6dB+9dB

- +12dB

Range

The RANGE control is a unique and powerful addition to the traditional 550 circuit. It is a formal implementation of a popular factory modification of the 550 EQ. The RANGE of each channel can be set independently.


- In x1 mode, the equalizer behaves identically to the classic 550A and B.

- In x.5 and x.25 modes, the amplitude scale as shown on the front panel is reduced proportionally

- True to the design of the 550, the Q is reduced in an equivalent fashion, meaning that if 6dB of boost is selected in the x1 RANGE, you will get the same amount of boost and an identical shape of the EQ curve by selecting 12dB in the .5 RANGE. The classic subtlety of the 550 when used at low amplitude settings is enhanced by the ability to perform micro-adjustments of tonal color.

- Mastering engineers also prefer an equalizer that has exactly repeatable switch settings and the capability of truly reciprocal operation, features that are common to all API equalizers

Rear Panel Connections

Balanced INPUT and OUTPUT Connections
Each channel is equipped with a set of balanced, line level audio input and output connectors

-
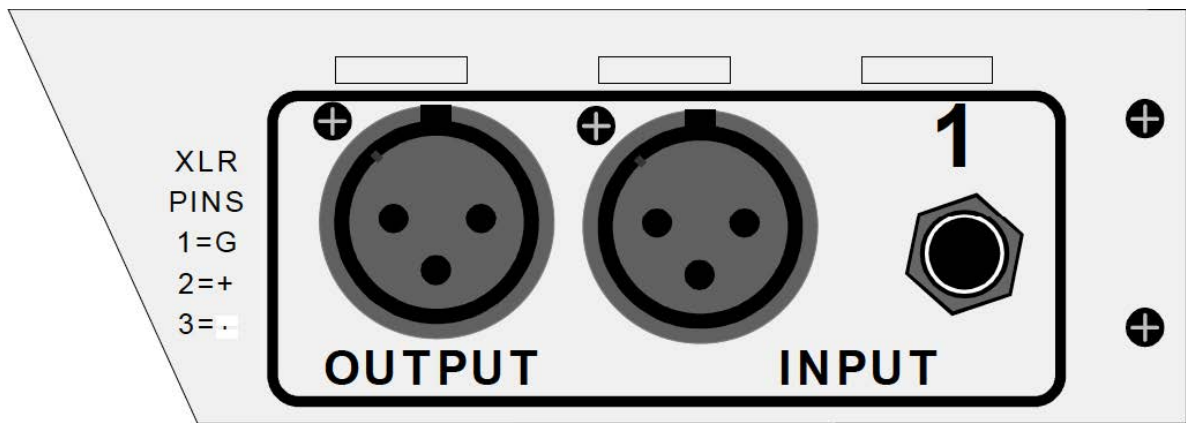
The audio INPUT is a female, 3-pin, XLR connector that feeds an active balanced circuit.

- There is a switching 1/4" TRS (tip, ring, sleeve) connector that interrupts any signal that is present on the input XLR. It is balanced and can be driven from either balanced or unbalanced sources. A positive signal on the tip will deliver a positive signal on pin 2 of the output XLR. Using the 1/4" input does not bypass any internal circuitry and does not change gain or operating level.
- The audio OUTPUT is a male, 3-pin, XLR connector and is driven from a transformer coupled output. The OUTPUT can drive any load from 600 ohms or greater to full output capability.
- The polarity is such that there is no change from input to output, so it is suitable in studios using either pin 2 or pin 3 as the "hot" connection.

AC Power, Voltage Selection, and Grounding

- For line voltages from 100v to 120v, set the switch to 115v. When set to the 115v position use a 500mA GMA fuse with Slo-Blo characteristics.
- The 230v position is good for all line voltages from 200-240 volts. At the 230v setting use a 250mA Slo-Blo fuse.
- IMPORTANT NOTE: It is necessary to change the fuse when changing the supply voltage.
- A chasis ground connection is provided for technical grounding purposes.
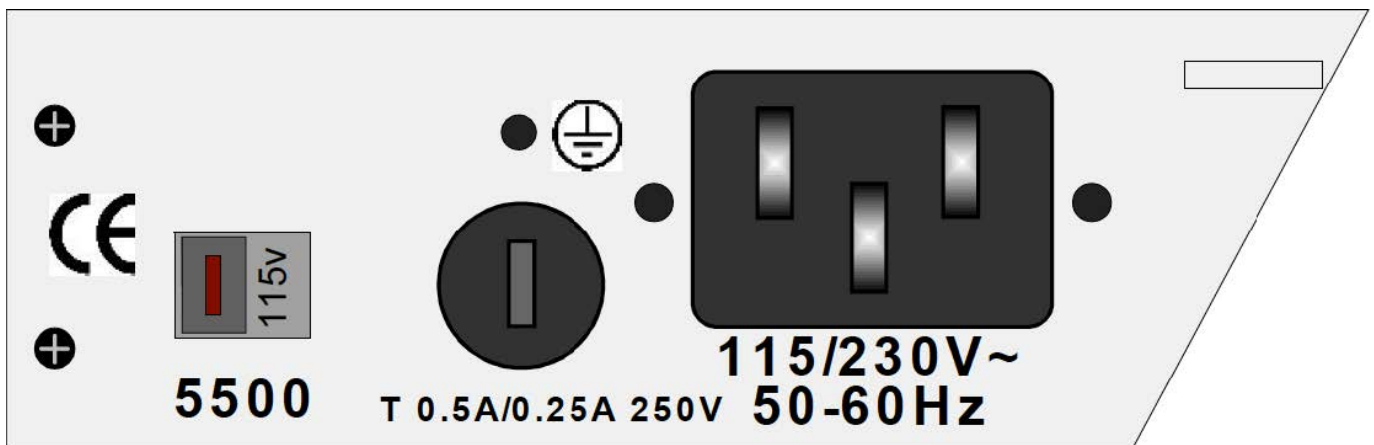
Appendix

A1 5500 Technical Specifications

- Rear Connectors: XLR & ¼" TRS Input, XLR Output
- Input Impedance: 20K Ohms
- Balanced Output Impedance: 75 Ohms, Transformer Coupled, Balanced

- Maximum Input Level: +32dBu
- Maximum output Level: +32dBu
- Frequency Response: +/- 1dB from 20Hz to 30kHz
- Signal to Noise Ratio: -105dB
- Power Requirement: 18 Watts
- Size: 19" x 1.75" (1U) x 11.25" deep
- Size (boxed for shipping): 23.25" x 6.5" x 16"
- Actual Weight: 10 lbs.
- Shipping Weight: 14 lbs.
- Filter Frequency Centers: LO: 30, 40, 50, 100, 200, 300, 400Hz
- LO-MID: 75, 150, 180, 240, 500, 700, 1kHz
- HI-MID: 800, 1.5k, 3k, 5k, 8k, 10k, 12.5kHz
- HI: 2.5k, 5k, 7k, 10k, 12.5k, 15k, 20kHz
- Filter Boost/Cut Steps: +/- 2, 4, 6, 9, 12dB
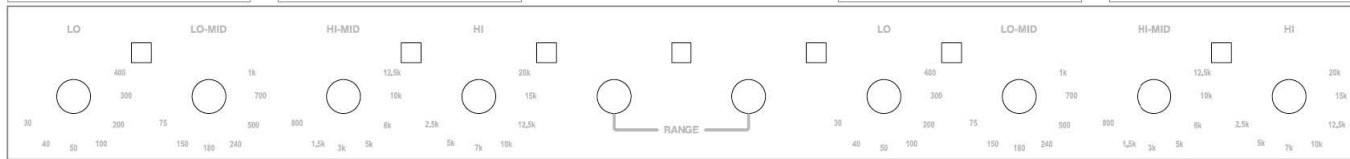- Range Multiplier: x1, x0.5, x0.25
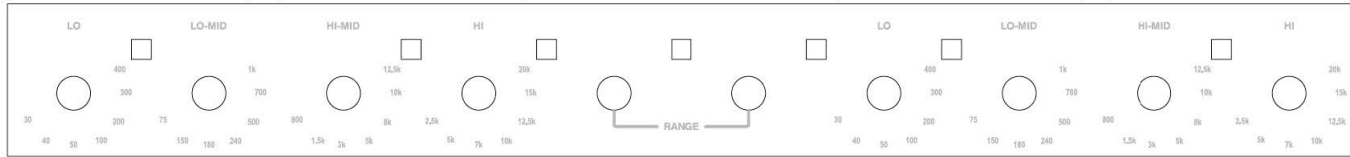
A2 5500 Transformer Option

- There is a field upgradable option for a transformer-coupled input. The discrete balanced input circuitry is bypassed using this transformer. It uses the highest quality line input transformer, which can provide low distortion and wide bandwidth when fed from conventional professional gear. Other brands of audio equipment will encounter clipping at around +24dBu, but another API device could distort any input transformer since it is capable of an undistorted +30dBu output.
- Since API equipment is capable of signal voltages that are typically twice as large as most professional equipment, it is possible that the input transformer will experience some distortion in the low frequencies when fed signals beyond +24dBu.

A3 5500 Recall Sheet

CHAN #	TITLE		CHAN #	TITLE

NOTES	NOTES

CHAN #	TITLE		CHAN #	TITLE

NOTES	NOTES

A4 5500 Housekeeping

Here is a great place to write down the serial number of your 5500 and your purchase date, just in case you need that information someday in the future

- API 5500 serial number _____
- Purchase date: ____/_____/_____

A5 API Limited Warranty and Service Information

- Warranty Information: API products carry a one year factory service and five year parts warranty from date of purchase. API (Automated Processes, Incorporated) does not cover claims for damage due to alteration and/or abuse. This warranty is limited to failures during normal use, which are due to defects in material or workmanship. If any defects are found in the materials or workmanship, or if the product fails to function properly during the applicable warranty period, API, at its option, will repair or replace the product.

- PLEASE NOTE: The design or quality of any non-authorized third party service or vendor is beyond the control of API. Therefore, service or modification of any API unit except by an authorized API representative may VOID this warranty.

- API reserves the right to inspect any products that may be the subject of any warranty claims before repair or replacement is carried out. Final determination of warranty coverage lies solely with API.

- This warranty is extended to the original purchaser and to anyone who may subsequently purchase this product within the applicable warranty period. Proof of purchase may be required.

- For questions regarding operation, interfacing or service of your API product, please contact your API dealer from whom you purchased the unit. Many times, your authorized API dealer is the fastest and most costeffective way to maintain and service your product.

- The below steps are the best way to initiate the repair process or to submit a parts order request:

Repair procedure:

1. Fill out a Return Authorization (RA) form at **service.apiaudio.com**.
2. Wait to receive an e-mail from API Audio with an RA#.
3. Use the API original box to package the unit. Write the RA# large and legibly on the box (if the RA# is not clearly visible on the box, the unit may be rejected by our receiving department)
4. Include copy of the RA form with the unit.
5. Ship the product freight prepaid to: API SERVICE DEPARTMENT 8301 Patuxent Range Road – Ste A1 Jessup, MD 20794

Parts Order procedure:

1. Fill out online PO form (for parts and parts numbers not listed online please fill out PO form with your name, e-mail, contact phone and shipping address and describe the part you need).
2. Submit online PO form.
3. API will e-mail you back with part numbers and procedure how to order/pay.
   - This is your sole warranty. API does not authorize any third party, including any dealer or sales representative, to assume liability on behalf of API or to make any warranty for API.
   - THE WARRANTY GIVEN ON THIS PAGE IS THE SOLE WARRANTY GIVEN BY API AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
   - THE WARRANTY GIVEN ON THIS PAGE SHALL BE STRICTLY LIMITED IN DURATION TO FIVE (5) YEARS FROM THE DATE OF THE ORIGINAL PURCHASE FROM API OR AN AUTHORIZED API DEALER. UPON EXPIRATION OF THE APPLICABLE WARRANTY PERIOD API SHALL HAVE NO FURTHER WARRANTY OBLIGATION OF ANY KIND. API SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES THAT MAY RESULT FROM ANY DEFECT IN THE API PRODUCT OR ANY WARRANTY CLAIM.
   - This warranty provides specific legal rights and you may have other rights, which vary from state to stat

8301 Patuxent Range Road!

- Jessup, MD 20794 USA
- **301-776-7879**
- **http://www.apiaudio.com**

Documents / Resources

api 5500 Dual Equalizer [pdf] Instruction Manual
5500 Dual Equalizer, 5500, Dual Equalizer, Equalizer

References

- ⚡ **API Audio Service Center**
- **User Manual**