

Adire Audio® ADA™ Series Subwoofer Amp Manual ADA300 - ADA600 - ADA1200



TABLE OF CONTENTS

1. WELCOME.....	3
2. WARNINGS!.....	4
3. GENERAL FEATURES	5
3.1. CONNECTIONS.....	5
3.1.1. <i>Signal Input</i>	5
3.1.2. <i>Power Input</i>	5
3.1.3. <i>Output</i>	6
3.2. ADJUSTMENTS.....	7
3.2.1. <i>EQ</i>	8
3.2.2. <i>Crossover</i>	9
3.2.3. <i>Phase</i>	9
3.2.4. <i>Gain</i>	9
4. ADVANCED FEATURES	10
4.1. LINKWITZ TRANSFORM	11
4.2. DIPOLE EQUALIZATION	12
4.3. PHASE ENABLE WITH CROSSOVER BYPASSED	12
5. SPECIFICATIONS.....	13
6. WARRANTY.....	14
6.1. LIMITED WARRANTY.....	14
6.2. SATISFACTION GUARANTEE	15
6.3. LIFE SUPPORT/MISSION CRITICAL APPLICATIONS.....	15
6.4. CERTIFICATIONS.....	15

1. Welcome

Thanks for purchasing the Adire Audio ADA™ series subwoofer amp! This amp represents the most advanced subwoofer amplifier on the market today. Based on a fully custom in-house developed switching topology, this class D amp uses high frequency switching FETs to maximize efficiency.

The ADA series amps use an output topology generically classified as class D. Rather than a continuous sine wave like output, a class D amp uses a switched output signal. The output FETS are switched on and off at a very high rate. The average output level of this signal is representative of the typical “sine-wave” like output you get from regular linear amps. The result is extreme efficiency of operation. Note the absence of heatsinking – that plate is all that’s needed for 1200W of operation!

Our power ratings are true power ratings, too! The amps are capable of supplying continuous rated power for 1 hour, non-stop. These aren’t duty-cycle, peak, music power, or other lower-grade ratings; it’s a true continuous power rating. Something you’ll almost never see in real-life, but it’s nice to know it’s there when needed!

The ADA series amps also boast the most complete feature set on the market. It has the following externally adjustable features:

- Two bands of fully parametric EQ (independently adjustable bandwidth, Fc, and gain)
- Two 2nd order low pass crossovers with independently adjustable corner frequencies
- Defeatable EQ and crossover switches
- Continuously adjustable phase alignment
- Fine resolution 30 dB window of gain
- Two internally summed inputs with oversized entries to accommodate large-sized RCA connections
- Detachable IEC power cord
- Externally accessible fuse

Additionally for advanced users there is an on-board Linkwitz transform and dipole equalization circuits.

The ADA series amps are intended for mounting in a cabinet. They are sealed with high-density foam gaskets and will not leak in typical applications. This greatly simplifies cabinetry, and allows the home hobbyist to make a subwoofer with more power and features than just about any commercially available subwoofer system.

All amps have the exact same set of features, dimensions, and save for power output the same ratings. Every ADA amp owner gets the best, from the quality of the PCBs (with 2 ounce copper plating) to properly gauged IEC cables to the oversized toroidal transformers. No compromise throughout.

Before using or operating this amp we recommend you read through this manual. At the very least read the entire WARNINGS! section prior to installation or use.

2. WARNINGS!

READ THIS SECTION PRIOR TO ANY OPERATION OR CONNECTION OF THE AMPLIFIER!

DANGER! WALL VOLTAGE PRESENT ON BACKSIDE OF AMP! This amp runs off the AC power in your house. The power supply has a live feed of AC. Do NOT touch the back of the amp in any way when it is plugged into the wall. Doing so can result in **PERMANENT INJURY OR DEATH**. It MUST be mounted in a way that access to the rear is restricted prior to connection to the AC mains.

Dangerous voltage levels are present on components for at least 20 minutes after the power is turned off. Wait for a minimum of 30 minutes for the capacitors to properly discharge before exposing the backside of the amp.

This is a **SUBWOOFER AMP**. DO NOT CONNECT IT TO A FULL RANGE SPEAKER. The switching frequency of this amp is 60 kHz; it is NOT compatible with wideband or full range drivers. Do not use this amplifier with signals above 300 Hz.

Do NOT replace the fuse with a size greater than that provided. If the fuse consistently pops, check your load on the amp. These amps are designed for a 4 Ohm nominal load for maximum power output. Operation with lower impedance loads can result in fuses blowing. Don't do it.

The amp is NOT waterproof. Do not install it in a location where it can get wet. AC voltages and water do NOT mix! If the amp does get wet, immediately disconnect the AC power plug FROM THE WALL. DO NOT TOUCH THE AMP ITSELF. Wait for the amp to dry off. If you suspect any water has seeped inside the amp, return the amp to Adire Audio.

There are no user serviceable parts within this amp. We will not provide schematics or repair instructions. PERIOD. Any and all service is by Adire Audio or it's designated repair centers. Modifications or self-service will immediately void any and all warranties.

This amp can generate tremendous amounts of output power. It can easily overdrive and destroy nearly any subwoofer on the market. Proper use and matching of this amp to your subwoofer is critical to ensure a long and healthy lifespan for your subwoofer.

Along with high output power, this amp can generate lethal output voltages. Do NOT touch the output connections or any wires/bare connections attached to the amp output at any time the amp is plugged in. Touching the live outputs of the amp can result in **PERMANENT INJURY OR DEATH**.

This amp, when connected to high power subwoofer systems, can generate extreme SPL levels. Long-term listening to such SPL levels can cause temporary or PERMANENT hearing damage! Respect your ears. If they are ringing or things sound dull or muted IMMEDIATELY reduce the volume.

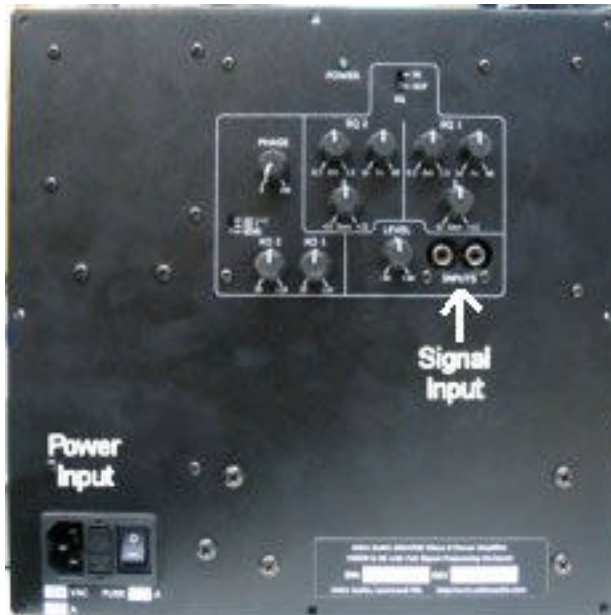
ALWAYS RESPECT ELECTRICITY. IT CAN KILL YOU. WHEN IN DOUBT, TURN EVERYTHING OFF, AND DISCONNECT ALL POWER PLUGS. NEVER WORK ON LIVE AC POWERED EQUIPMENT. IF THERE ARE ANY PROBLEMS CONTACT THE FACTORY IMMEDIATELY.

3. General Features

The ADA series amps have the most complete feature set on the market. There isn't another subwoofer plate amplifier on the market with this set of features and abilities. You have the most advanced amp on the market.

3.1. Connections

There are two external connections of the ADA series amplifiers: the input and power connections.



3.1.1. Signal Input

The inputs are made with industry standard RCA connections. The center-to-center spacing is 0.75", and the cutouts around the connectors are oversized to allow use of heavy jacketed connectors. If you have an RCA that won't fit in these cutouts, let us know, because we weren't able to find one that wouldn't fit.

The inputs are internally summed to create a mono signal. If you have a stereo signal, feed it to the inputs and the amp will generate the mono subwoofer signal on its own.

If you have a single mono bass signal (like the LFE/SUB OUT from a home theater processor or multichannel audio decoder) then you can use either input – you do not need to use both inputs!

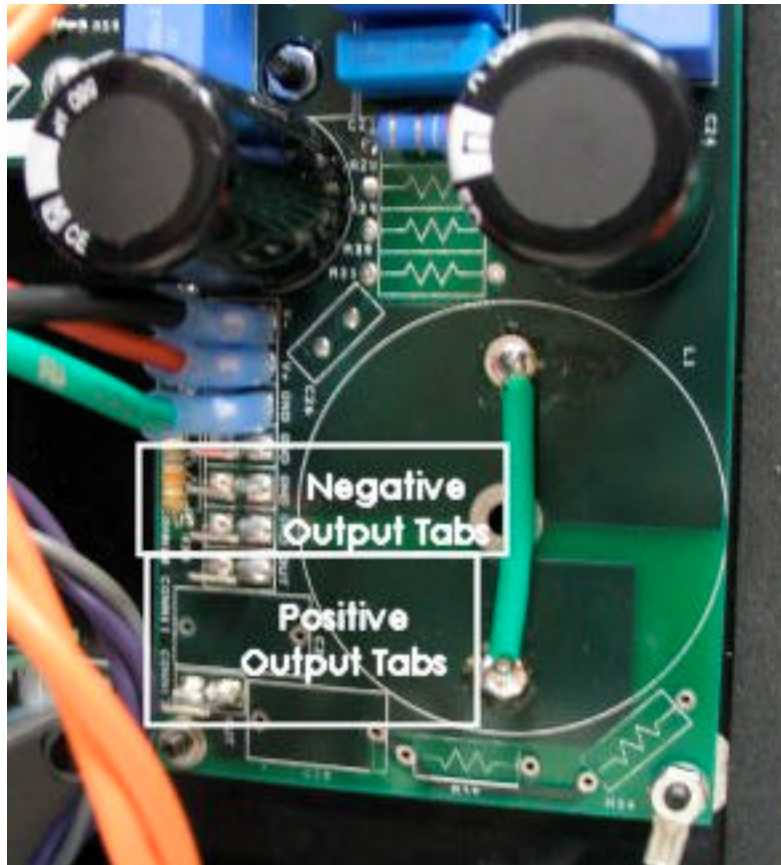
3.1.2. Power Input

Power connection is via the supplied IEC cable. There is an industry standard IEC receptacle on the amp plate. Note that we recommend 16 AWG for the 1200W amp; the lower power amplifiers can be powered with an 18 AWG power cord. Use of larger gauges is fine; just don't use smaller wire than what is listed here.

There is a power switch and fuse holder integrated in the power receptacle. The power switch will turn the amp on or off. The fuse is contained between the switch and the power connector. **DO NOT CHANGE THE FUSE WITH THE POWER CORD CONNECTED!** Only use the original size/value of fuses when replacing blown fuses.

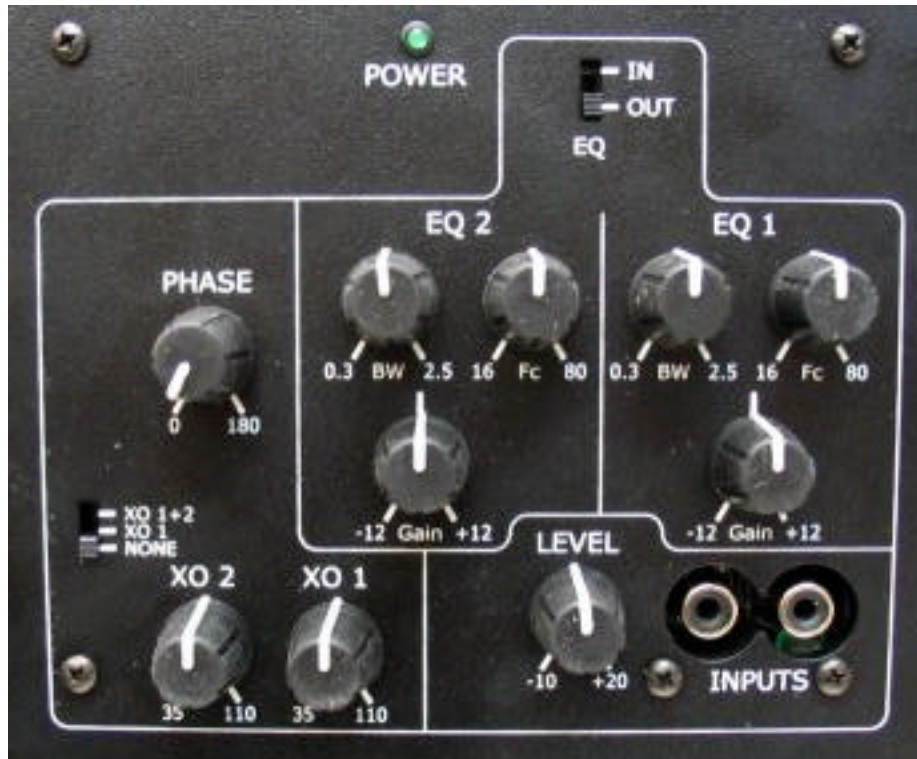
3.1.3. Output

The output is on the backside of the amp. It's made for connection inside the subwoofer cabinet only. Connection is made via the OUT and GND flag connectors on the lower right hand corner of the amp (as viewed from the rear). The OUT is the POSITIVE connection to your driver while the GND is the NEGATIVE connection to your driver. There are two OUT and two GND flags available for you to use; if you wish you can run a pair of voice coils or pair of drivers with direct wiring from the amp. Make sure not to drop below the rated 4 Ohm load impedance, though!



3.2. Adjustments

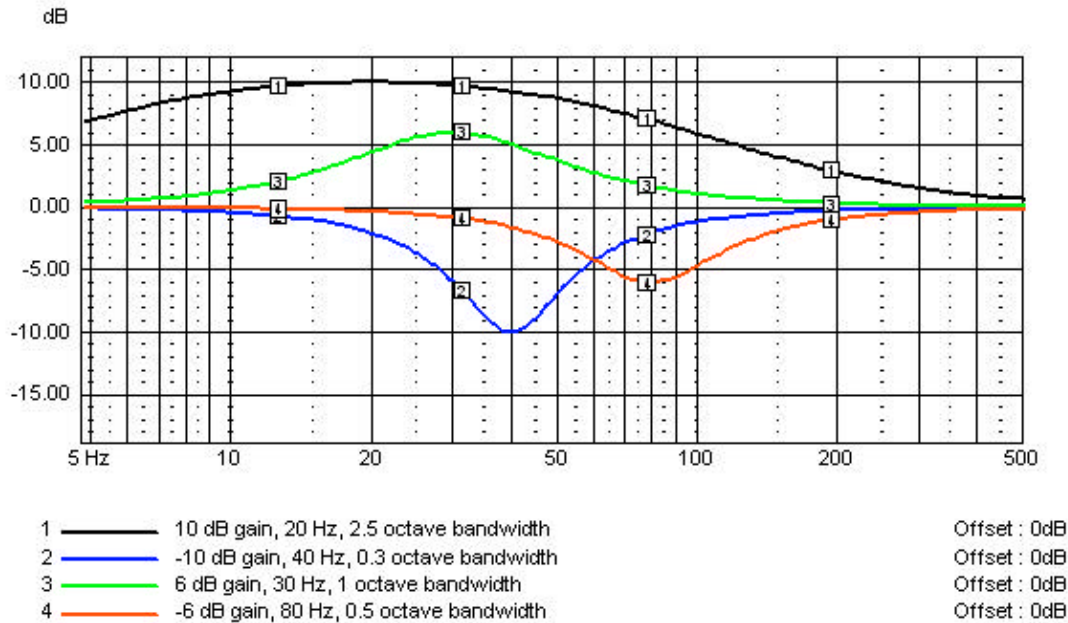
The ADA series amps have a complete set of preamp controls allowing you to tune the sound of your subwoofer system to an amazing degree. Two bands of EQ, adjustable phase, staggered crossovers, and gain are all independently adjustable, and in many cases defeatable.



3.2.1. EQ

The EQ on the ADA series amps is the most advanced EQ available in a plate amp today. It is called parametric, in that you can completely tailor the response of the curve.

- The gain of each EQ is adjustable from -12 to +12 dB.
- The bandwidth of each EQ is adjustable from 0.3 to 2.5 octaves.
- The Fc (center frequency) of each EQ is adjustable from 16 Hz to 80 Hz.



This graph shows just some of the functionality available with this type of EQ. The gain adjusts the peak level of the EQ (either boost or cut). The bandwidth adjusts the frequency range over which the EQ works. The Fc adjusts where the peak of the EQ happens.

There are two bands of this EQ available for the user to use. Typically you'll use one band to reduce the biggest standing mode in your room (resonant mode in your listening space), and use the other to tailor the low end as desired. If your subwoofer system is capable of flat extension below 20 Hz, then you can dedicate both bands of EQ to reducing resonant modes.

Adjustment of these EQ networks can be done via ear, but it's best accomplished with measurement gear. Measure the response of your subwoofer in the room, and use the results to guide where you place the EQ. Remember, it's ALWAYS better to cut peaks than try to boost dips! So use the EQ to cut down your worst offenders of peaks, and you'll have a much better sounding – and measuring – system.

3.2.2. Crossover

The crossover on the ADA series amps is quite unique; it uses two cascaded 2nd order filter networks for additional contouring capability. The crossovers are selectable – either both, just one, or neither.

The corner frequency is the –3 dB point for the crossover. It's adjustable from 35 Hz to 110 Hz. The Q of each crossover is fixed at 0.7 (Butterworth alignment).

If you have sealed main speakers, in a typical stereo application you'll use a single crossover stage set at the lower frequency limit of your main speakers.

If you have ported main speakers, you'll want to use both crossover stages and set them to the lower frequency limit of your main speakers.

For home theater use, or where you have an external bass/crossover network you can disable the on-board crossovers altogether.

Sometimes it's advantageous to set the two crossover points to different frequencies. This should be determined on a case-by-case basis as you are setting up your system.

3.2.3. Phase

The phase of the subwoofer relates to the delay of the subwoofer. Phase is a way of representing the time delay of a given frequency. A delay of 90 degrees means $\frac{1}{4}$ the frequency; a delay of 180 degrees means $\frac{1}{2}$ the frequency.

The reference frequency for our phase network is 60 Hz. You can adjust the phase from 0 to 180 degrees. This allows you to effectively change the position of the subwoofer from 0 to 9 feet. You want to adjust the phase control to best integrate with your main speakers. Set it so that the subwoofer and main speakers provide the smoothest response around the crossover point. Note that the use of EQ or changing your crossover settings (either on the amp itself or in your processor) will affect the needed phase delay.

If you bypass the crossovers, you also bypass the phase adjustment.

3.2.4. Gain

The ADA series amps have a smart range of gain. Most amps have 60, 80 or 100 dB or more of gain range. They allow for extremely high levels of boost (some as high as 40 dB!) and high levels of attenuation (40 dB or more). With such wide ranges, fine-tune adjustments are difficult to make with a typical single-turn potentiometer.

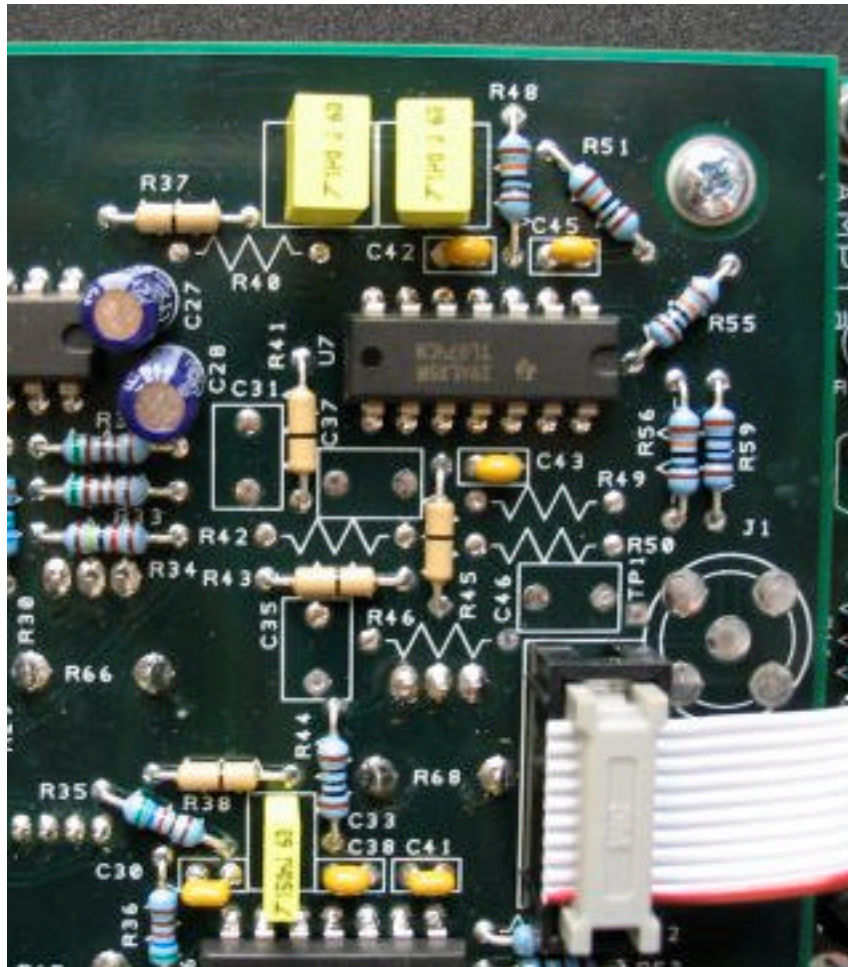
The ADA series amps take a different approach. For nearly all setups, you need a much smaller window of adjustment; we limit the adjustment range to a much smaller 30 dB range, from –10 dB to +20 dB. This means you get 2, 3, or more times the resolution when setting the gain. Most pro-sound amplifiers have 26-40 dB ranges of adjustments for just this reason – better control and accuracy in level setting.

The best way to set the gain is to set any other gains in the subwoofer channel (such as an LFE/SUB OUT level) to zero, then adjust the gain knob for best blend with the main speakers. This will allow you to use just your LFE/SUB OUT adjustment to fine-tune your system.

For stereo applications, it's best to adjust the subwoofer level with music you are familiar with. Start with the gain all the way down, and slowly increase it until it's a bit bottom heavy. Back off a slight amount and you should be set!

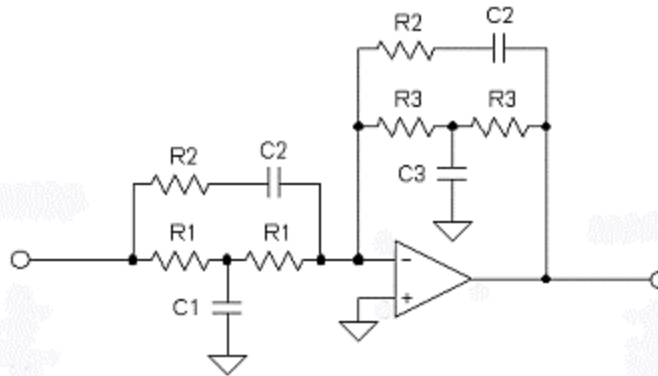
4. Advanced Features

For the more advanced DIYer/OEM, the ADA series amps allow you to utilize additional features for more technically difficult systems. A common circuit block is provided for implementing a Linkwitz transform or Dipole equalization network. If you are unfamiliar with these networks, then you probably don't need to use them. The network is located on the upper right hand corner of the signal processing board, and all components are unstuffed.

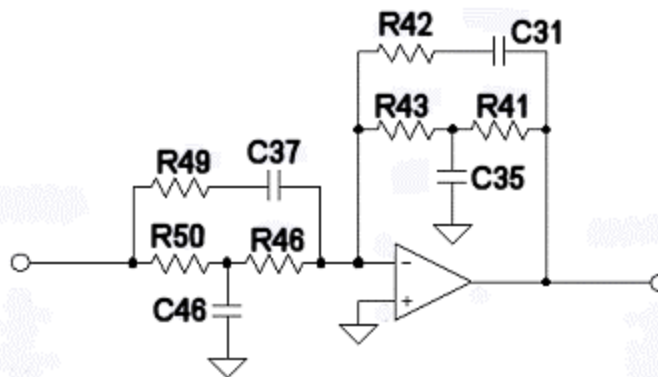


4.1. Linkwitz Transform

Calculate your Linkwitz transform components. We use the standard Linkwitz transform layout for the circuit:



Calculate the standard R1/R2/R3/C1/C2/C3 values. The layout on the PCB uses the following schematic:

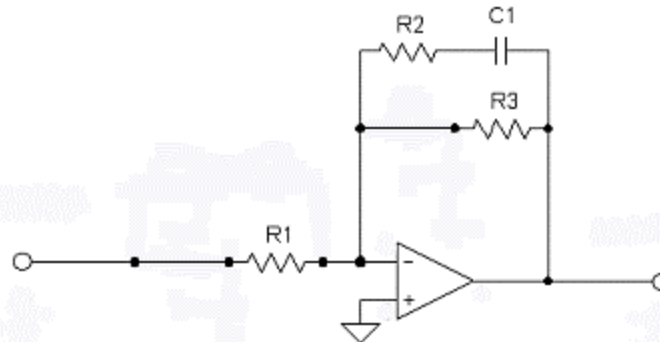


Thus you would stuff calculated values R1 into R50 and R46, calculated R2 values into R49 and R42, and so on.

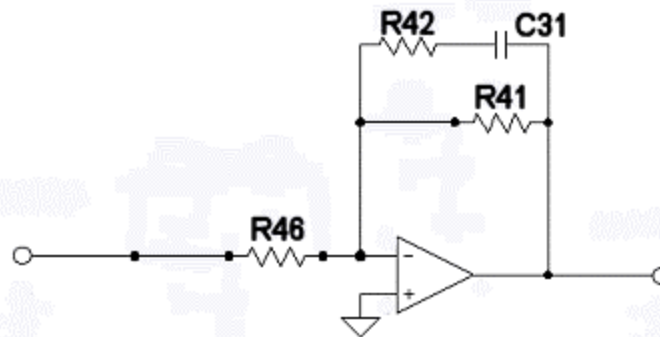
Once the Linkwitz transform is loaded, you need to remove the jumper on R37, and place a jumper on R40. This will put the Linkwitz transform into the circuit.

4.2. Dipole Equalization

You can use the same Linkwitz transform circuit for dipole EQ. The standard dipole equalization circuit is:



In this case you would implement the following network on the LT/DE circuit:



Thus you would place value R1 where R46 is located, R2 where R42 is located, and so on. You load jumpers across R50 and R43, and do not stuff R49, C37, C46, or C35.

Once the dipole equalization circuit is loaded, you need to remove the jumper on R37, and place a jumper on R40. This will put the Linkwitz transform into the circuit.

4.3. Phase Enable with Crossover Bypassed

To keep the phase enabled when the crossovers are bypassed, you must cut jumper R58, and install a jumper on R57. This will keep the phase adjustment active even if the crossover stages are bypassed.

5. Specifications

Power Rating	ADA300: 300W into 4 Ohms (150W/8 Ohm) ADA600: 600W INTO 4 OHMS (300W/8 OHM) ADA1200: 1200W INTO 4 OHMS (600W/8 OHM)
S/N Ratio	Greater than 98 dB
THD	Less than 0.05% (10 kHz measurement bandwidth)
Bandwidth	2 Hz to 500 Hz, +0/-3 dB
Damping Factor	400 AT 4 OHMS (800 AT 8 OHMS)
Input Impedance	10 kOhm resistive
Rumble Filter	2 nd order network 2 Hz corner frequency Q=0.5
Gain	-10 to +20 dB relative to input signal
Phase	0° to 180°
Crossover	Twin cascaded second order Q=0.707 adjustable from 35 to 110 Hz
Crossover Defeat?	YES (SELECT NONE, 2ND ORDER, 4TH ORDER)
EQ	Dual parametric EQs (bandwidth 0.3 to 2.5 octaves, Fc 16 to 80 Hz, gain ±12 dB)
EQ Defeat	YES
Linkwitz transform?	YES (user supplied components)
Dipole EQ?	YES (user supplied components)
Balanced Inputs?	OPTIONAL
Overall Size	10.5" x 10.5" (custom sizes available - contact Adire)
Cutout Size	9.5" x 9.5" (custom sizes available - contact Adire)
Mounting Depth	ADA300: 4.5" ADA600: 5.75" ADA1200: 6.5" Remote mount power supply: 2"
Weight	ADA300: 15 pounds ADA600: 18 pounds ADA1200: 22 pounds

NOTE: Specifications subject to change without notice!

6. Warranty

6.1. Limited Warranty

Adire Audio warrants its products to be free from defects in material and workmanship for a period of 3 years from the date of purchase. Adire Audio and/or its designated representatives shall have all final determination about the validity of a warranty claim.

This warranty shall not apply to any product that has been subject to misuse, neglect, accident, or abnormal conditions of operation, including but not limited to use in professional sound/PA systems and car stereo SPL competitions.

This warranty is limited to Adire Audio equipment only. It does not extend to any other equipment or product connected to or operated in conjunction with this product. We are not responsible from any damage to other equipment or product arising from use of this Adire product.

Adire Audio's obligation under this warranty is limited to repairing, replacing or refunding the original purchase price (exclusive of shipping charges), at Adire Audio's option, any product returned to the factory within 3 years of the date of purchase, provided that Adire Audio determines that the unit is defective and has been used in compliance with the terms of this warranty.

For products that failed due to manufacturing defects Adire Audio will reimburse shipping costs. Shipping costs will be limited to delivery by UPS Ground or US Parcel Post surface, whichever is lower. Costs incurred above and beyond these levels will not be reimbursed.

If misuse, neglect, accident, or abnormal conditions of operation have caused the failure, repair or replacement will be billed at a nominal cost, pursuant to customer agreement to such repair or replacement. No shipping costs will be reimbursed.

The foregoing warranty is exclusive and in lieu of all other warranties, expressed or implied, including, but not limited to, any warranty of merchantability or fitness for any particular purpose. Adire Audio shall not be liable for any special, incidental or consequential damages, whether in contract, tort, or otherwise.

When returning a product you must include a completed Return Authorization Form Products returned to Adire Audio without a completed Return Authorization Form shall not have any action taken until the customer supplies such a form. Products held for 90 days without submission of a completed Return Authorization Form will be considered abandoned and scrapped.

All returns **MUST** be returned in the original factory packaging. If original packaging is not available, Adire Audio can supply packaging materials for a \$25 fee plus all shipping charges related to delivery of packaging materials to customer.

All returns must be sent to:

Adire Audio
2006 196th Street SW
Suite 102
Lynnwood, WA 98036

Product **MUST** be sent pre-paid, and insured for full retail price. Product sent uninsured/underinsured and damaged in shipping will **NOT** be reimbursed/covered by Adire Audio. Turnaround of received warranty products takes a minimum of 2-4 weeks.

6.2. Satisfaction Guarantee

Adire Audio guarantees your satisfaction with its products. If for any reason you are dissatisfied with the performance of an Adire Audio product, you may return the product within 30 days for a partial to full refund depending upon the product purchased. Refunds on raw parts, drivers, kits, and components will amount to the original purchase price plus any applicable sales taxes, minus a 25% restocking fee and any additional charges related to damage and/or wear. Refunds on all other products will amount to the original purchase price plus any applicable sales taxes, minus any additional charges related to damage and/or wear.

NOTE: Refunds may take up to 6 weeks to process.

All refunds are subject to an inspection of returned products. Product damage will result in reduced or eliminated refund. All returned items must include ALL original packaging and accessories. Failure to include any packaging or accessory (including but not limited to power cables, signal cables, grilles, spikes, manuals, and CDs) will result in a reduced or eliminated refund.

NOTE: Under no cases are shipping costs reimbursed for returns covered by the satisfaction guarantee.

Custom/nonstandard products are exempt from the satisfaction guarantee.

6.3. Life Support/Mission Critical Applications

IMPORTANT NOTICE

Adire Audio products are not fault-tolerant and are not designed, manufactured, or intended for use or resale in hazardous environments requiring fail-safe performance, such as in the normal operation of nuclear facilities, aircraft navigation, communication systems, direct life support machines, heart defibrillators, or weapon systems, in which the failure of our product could lead directly to death, personal injury, or severe physical or environmental damage.

6.4. Certifications

This product is designed to the highest standards and in accordance with all Adire Audio internal processes. However this product does not carry any certification relating to safety, standards compliance, or applicability for use in given situations. No certification is expressed or implied. Use of this product is entirely at the user's risk.