



China Patent : ZL2015 1 0464611.6 USA Patent : US9733890 B2

# www.RecoilAudio.com

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# Introduction

Congratulations and thank you for purchasing the SECOL MA800.4i Audio Amplifier, the logical choice in mobile audio amplification. Your SECOL amplifiers have been designed and engineered with the highest quality components and top of the line workmanship to help you reach the superior sound you are after. To achieve optimal performance of your system, please take a few moments to read over this Owner's manual or visit an authorized SECOL dealer.

# EZDSP PROCESSOR/AMPLIFIER SPECIFICATIONS

Class -D High Efficiency Amplifier + DSP Digital Signal Processor 4 X 110 Watts RMS@ 4 Ohm built-in Bluetooth AND PC capable setup capability Hi/Lo Level input

Low Level Input Sensitivity: 0.2V - 5.0V High Level Input Sensitivity: 0.5V - 12.1V 4V output on Pre-Out channels DSP controlled Crossover 6/12/24/48dB Selectable crossover Filter types of Bessel, ButterWorth/ Linkwitz-Riley 6 Channels - 31 Band EQ Selectable Frequency and Q adjustment on ALL channels Digital Time Alignment - in MS/CM/IN Ability to group 1 to 6 channels for EQ and gain and time adjustments

6 Preset Effect/EQ settings

\*\* DSP Dongle INCLUDED for BlueTooth streaming/DSP programming

# LIMITED WARRANTY STATEMENT

One Year Limited Warranty

Recoil Audio warrants the original owner that this product will be free of defects in material and workmanship for the period of one year from the date of the original purchase or installation, if:

(i) The allegedly defective product has not been abused, misused or improperly maintained and/or repaired during the warranty period,

(ii) The defect is not caused by flooding, fire, explosion, earthquakes or similar phenomenon, and

(iii) The defect is not caused by improper use

In order to obtain warranty service, contact your selling dealer or distributor in the country that your product was purchased. Recoil Audio will, at its option, repair or replace the product free of charge.

To the full extent allowed by law, Recoil Audio excludes and disclaims liability, whether based in contract or tort including negligence for any consequential, indirect incidental or special damages of any nature arising out of the sale, maintenance, use or failure of this product, even if Recoil Audio has been advised of the possibility of such damages in advance, and Recoil Audio limits its liability to replacement, repair or refund of the purchase price paid, at Recoil Audio's option.

Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation on implied warranty can incidental or consequential damages may not apply to you. This warranty gives you specific legal rights you may have other rights, which vary from state to state.

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# **PRE INSTALLATION PRECAUTIONS**

- · Please don't operate on products when you are driving.
- To drive safely and protect your hearing, please set the audio volume until you can hear the outside car horns clearly.
- Please don't repair and change products by yourself.
- Please use professional car power supply (@12V) to connect products.
- Must use professional cables and fuses (maximum of 40A).
- Do not mount the products to any area that may have excessive damp.
- Products was designed to heat dissipation by heat sink, Position the amplifier in an area that receives sufficient airflow for proper heat dissipation.
- Make sure cables without any problem then install and connect to the Positive and Negative of products.
- If there are any questions, please stop using products and disconnecting to the car power supply.
- Please ask professionals for installing.
- Please use certified tools to install.
- The products is high power appliance, please start the vehicle when using, Avoid the difficulty of causing the vehicle to start by using too much electricity.
- When car disused for long time, please take off the fuse which is in amplifier connection wire.

# SPECIFICATIONS

#### **POWER CONNECTION**



#### BATT (12V POWER)

Before mounting amplifiers, disconnect the negative cable from the battery to protect any accidential damage to your amplifiers and audio system. Connect the power cables to power terminal 12V.

MA800.4i amplifier is not equipped with fuses so that external fuses should be used. Connect one end of fuse holder to the power cable going into the amplifiers and the other end of fuse holder to positive battery. This fuse location will protect the system and the vehicle against the possibility of a short circuit in the power cable. Be sure to use fuses and fuse holder adequate for the application.

#### GND (GROUND)

Locate a secure grounding connection as close to amplifier as possible. Make sure the location is clean and provides a direct electrical connection to the frame of the vehicle. The ground needs to have as low of a resistance as possible. Connect one end of a short piece of the same size cable as the power cable to the grounding point or to one of your batteries or battery bank. Run the other end of 4 ga cable to the mounting location of the amplifiers for connection to the amplifiers ground terminals and connect the ground cable to the GND (ground terminal).

#### **REM(REMOTE)**

Run a remote turn on cable from the switched 12V source . This may be a toggle switch, a relay, your source unit's remote trigger cables, or power antenna trigger cable. Connect the remote turn on cable to the REM ( remote ) terminal.



#### SPECIFICATIONS

Model	MA800.4i	MA1600.1i
RMS power @ 4 ohm	4x110W	1 X 600W Mono
RMS power @ 2 ohm	4x160W	1 X1100W Mono
RMS power @ 4 ohm mono	2x350W	N/A
Working impedance	11ΚΩ	11ΚΩ
Input Sensitivity	LOW 0.2V-5V/HIGH 0.5V -12V	LOW 0.2V-5V/HIGH 0.5V -12V
Frequency Response	20Hz-20KHz	20Hz-20KHz
Signal to Noise Ratio	≥95dB	≥90dB
Working voltage	9V-16V	9V-16V
Dimensions (inches)	7.09×5.71×1.97	8.58 x 5.71 x 1.97
( mm )	180 x 145 x 51	218 x 145 x 51

# SPECIFICATIONS

#### POWER/SPEAKER END PLATE - MA800.4i



#### SIGNAL END PLATE - MA800.4i



#### SIGNAL END PLATE - MA1600.1i



#### POWER/SPEAKER END PLATE - MA1600.1i



# SPECIFICATIONS

- A. Power input terminal .(Up to 4 Gauge)
- B. Power/Protect LED (Blue color means working status;
  - RED color means Protect Status)
- C. Speaker output terminal (up to 12 Guage)
- D. Low Level Signal Input (RCA)
- E. Line output (Used for connecting to secondary amplifier
- or Active subwoofer
- F. Channels 1/2 Input Gain Adjustment
- G. Channels 3/4 Input Gain Adjustment
- H. High Level Signal Input (Speaker Input)
- I. USB Interface (Used to Connect for Computer tuning)
- J. Bluetooth (Included USB Dongle Model # DO1)
- K. 2/4 CH Input Configuration Switch(parallels Input)
- L. Turn-On select switch(REM/DC/VOX) (Select VOX, Means signal is On; Select REM, This means switched 12V is being used.)
- M. Low/High Pass Crossover Selection
- N. Software Update Port (MA1600.1i ONLY)
- O. 2.4G Wireless Bass Remote (MA1600.1i ONLY)



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# **PHYSICAL DIMENSIONS**

#### MA800.4i

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# **PHYSICAL DIMENSIONS**

#### MA1600.1i







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# MOUNTING AMPLIFIER AND INPUT WIRING HARNESS

Mounting the amplifers - Easiest method is to use the ampilfier as a template. Using a Sharpe Pen mark the 4 corner locations as shown below. Remove the ampilifer and drill 1/8"/2mm holes to make it easier to mount the ampilfiers with the supplied hardware.





# **RECOIL HARNESS WIRING CODE**



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# **INPUT SIGNAL WIRING**



#### **BEFORE YOU START**

You've got your system design ready to go and the wiring part is pretty simple. Use high quality OFC(Oxygen Free Copper) power/ground wire and GOOD signal cables and it will reward you with high quality sound WITH no NOISE and NO overheating issues. The DSP setup. That is a different issue as you have so many ways to make it sound good...as well as to make it sound bad. Take you time and read this manual through mulitple times as it will help make this "dialing in process" go simple. clean and striaght forward as process.

Your Bluetooth device (Phone, Tablet, etc.) must support the A2DP Bluetooth profile (commonly known as stereo audio profile) to work with the MA800.4i. The MA1600.1 does NOT have any DSP processing built into it. Many of the latest mobile Phones and Tablets with built-in Bluetooth functionality will support this A2DP Bluetooth profile. For accurate information about your product, please refer to your Bluetooth device's user manual for details on the Bluetooth profiles it supports and on how to set the device's Bluetooth pairing/searching/setup mode

#### **ABOUT PAIRING**

Pairing is the term used when wirelessly connecting two Bluetooth devices for the first time. This allows the devices to "see" each other and creates a unique lasting connection between the specific devices.



# **BT PAIRING AND SYSTEM SUGGESTIONS**

#### PAIRING & LINKING YOUR BLUETOOTH DEVICE WITH THE EZAMP APP

1) Make sure your Bluetooth device (Phone or Tablet) is fully charged. Turn it on.

2) Enable Bluetooth functionality on your Bluetooth device. Typically, Bluetooth controls are found on the device's tools or settings menu (see your user manual). Make your device "discoverable".

3) Power up the EZDAMP application, make sure that the outputs to the amplifers are disconnected. At least for the intial setup.

4) Choose "add a new Bluetooth device" or "setup Bluetooth device" on your Phone or Tablet. It will start to search. If the pairing attempt fails or times out (after 3 minutes), Power off the MA800.4i, wait 30 seconds and then power it on again and start pairing procedure (see steps 2 - 4).

6) After your device and the MA800.4i have discovered each other, a "Pairing Successful" or similar message should appear on your device and the blue light on the MA800.4i will stop blinking and turn solid blue.

#### SYSTEM SUGGESTIONS

On the next few pages are suggestions for your Car, UTV, Marine and Motorcycle. These are SUGGESTIONS and there are many MANY more possibilities. You MUST design how you want your system to be set up BEFORE doing anything else. Before settings gains, crossovers points, time delay, etc. The following system designs are VERY typcial and repeatable designs that you can follow and should be simple and clear forward

BASIC CONCEPTS TO LIVE BY DURING SETUP:

1. Make sure all speakers are in Phase (use a Phase meter!! available for your smart phone).

 Set Crossover and gain settings FIRST.(See page 9) otherwise you can blow up your tweeters.
Don't spend more than 45 minutes "EQing your system". Make sure to use an RTA and Pink Noise (readily available for your smartphone)

4. Remember that OVER tuning is as BAD, if NOT worse than undertuning.

Go to the RECOIL Website: www.recoilaudio.com and go to the support pages. As we are updating tech tips and adding great information almost on a daily basis to help you get the best sound possible. We are here to help!

#### REMEMBER !

Any decisions you make in your setup can be adjust/modified/changed. It is NOT set in STONE! That is ONE of the beautiful things about DSP. YOU are in control of pretty much EVERYTHING!!

#### **OUTPUT SPEAKER WIRING**

**TYPICAL 4 CHANNEL WIRING** 



**TYPICAL 3 CHANNEL WIRING** 



# TRI-AMPED CAR AUDIO SYSTEM WITH SUBWOOFER

MA800.4i 4-CHANNEL AMPLIFIER/MA1600.1i MONO BLOCK

# TOWER/BOAT MARINE SYSTEM WITH SUBWOOFER

#### MA800.4i 4-CHANNEL AMPLIFIER/MA1600.1i MONO BLOCK TRANSOM SPEAKERS/TOWER SPEAKERS/SUBWOOFER







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# **MOTORCYCLE 4 CHANNEL SYSTEM**



**UTV 6 CHANNEL SYSTEM** 

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# **BASIC DSP SETTINGS**



#### **START SCREEN:**

This is where you decide what you need to control. Just EZ BASS or EZ AMP.4 or EZ ANP.6 This manual is for the EZ AMP.4 Software. Once you've selected EZ AMP.4 it will take you to the EQ page below,

NOTE: in the initial setup (EQ/Crossover) the amplifers should be DISCONNECTED so you do not blow up tweeters, midranges or woofers

#### - NOTE:Software Version!

# EQ SCREEN:

ECOIL

This is the frst screen you come to after TAPPING the EZAMP.4 on the start upscreen.



From this page you can get to all settings. We recommend that you look at all the pages and get familar with all the possible settings. EQ should NOT be your first settings!! We recommend going to ADVANCED page and presetting gains for all channels used. Then go to the CROSSOVER page and preset all your crossovers. BEFORE turning the system "FULLY" on. Ampilifiers should be powered off now.

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**BASIC DSP SETTINGS** 



#### ALL CHANNELS AT -6dB



# **ADVANCED SCREEN: GAIN SETTINGS**

This is SUPER important page as this will greatly simplify the DSP set up procedure IF you do this correctly. Make sure that the amplifiers are powered off, and you have all crossovers turned off (FLAT) and that gain(sensitivity) of the HI-PASS or BAND-PASS channels (the ones driving the tweeters and the midbass)are turned up to about the 10 O'Clock postion (as shown)

Subwoofer amplifer gain should be "Preset to approximently the 12 O'clock position.

At least for now.

# INDIVIDUAL GAIN SETTING:

This the important. MAKE SURE that ALL your amplifers are NOT connected (They are powered off). Now PRE SET the individual gain controls channel by channel. Setup ALL channels - tweeters, midrange/ midbass, woofers to -6dB. Set MASTER level to - 6dB also. With the EZAMP DSP GAINS set up this way...plus your presetting the amplifiers input gain controls . You'll still have over 12dB of gain still to work with BEFORE increasing GAIN on each of the amplifiers. Once this is done save that setting. THIS IS just for intial setup. When you get near the end of setup you can readjust the gain settings here, on the DSP AND on the amplifers.



# BASIC SETUP - CROSSOVEER SETTINGS

# FULLY ACTIVE SYSTEM:

Knowing the basic starting xover frequencies for each speaker as descibed on the previous page. Start setting the xover's up. For this example we will assume a FULLY active system with a 2 way front system NO rear fill speakers and subwoofers. 5/6 Channel.

With this 6 channel "ACTIVE" system start with the tweeters crossover at 3,500Hz. Choose a crossover slope. 6dB , 12dB or 24dB. For this example we'll use 12dB. Touch the WHITE dot on the slider.

Slide the dot to the left or right to change xover frequency.

To get to a more specific crossover frequency, you can tap the center rectangle with the frequency shown and type in the exact frequency.

Since this is an example we will use typical STARTING frequencies which may NOT be the final settings.

TWEETERS - HIGH PASS - 3,500Hz MIDRANGE - BANDPASS - 350Hz - 3,500Hz SUBWOOFER - LOWPASS - 60Hz

Use the same method as above, To create a bandpass use BOTH the High Pass filter AND the Low Pass filter to CREATE a BandPass In reality that is how ALL Band Pass filters are created. A combination of High and Low Pass





# BASIC SETUP - BASIC GAIN SETTINGS AND POLARITY CHECK

# ADVANCED SCREEN: - POLARITY SETTING

This is also the best time to make sure ALL speakers are in phase. There are FREE Polarity apps on-line that can help you do this. AGAIN super important that all speakers are ACOUS-TICALLY in phase. You can easily adjust phase from this screen, just tap the bottom BLUE

rectangle with the 0 inside -This will switch the speaker 180 "Out of Phase" which may put it back INTO phase. You should hear The difference, use a phase meter to make sure.

Using a Phase Meter makes it much easier to get the set-up correctly - FIRST TIME. Having Gain and Phase set-up proberly makes the TOTAL DSP setup experience much easier. We recommend using a



Phase Meter, or Phase Meter "App" off your smartphone to help you with this part of the set-up.

# ADVANCED SCREEN: - GAIN SETTING / PINK NOISE

Now that we know that the speakers are in phase, lets run Pink Noise thru the system and set gains a little closer. This speeds up the setup as using Pink Noise is a more constant sound. Make sure you have set up ALL crossovers and SAVED everything. And "Burned" it to the DSP. IF so....then play pink noise (Thumbdrive, CD, BT) while in the drivers seat. Play at a MODERATE to LOW level. It should sound like a BIG ball of noise. With NO speakers being more prominent or distinct than any other. An easy way to make sure is to MUTE everything but the tweeters in this 5 channel all active system With ONLY the tweeters playing they should sound like they are equal in output. Neither one is louder than the other. If NOT, go into the GAIN settings and turn the bighter (or louder) tweeters DOWN in level, say 1- 3dB. Do this untill they are equal in level to you. Shut off the tweeters and now turn on the midbass drivers. Same "drill", match level to YOUR ears.

SAVE/SYNC/SAVE/SYNC!!!!!

# SETTINGS PAGE - OFF ANY SCREEN

On the Settings page you can see what source(s) you are using and pick between them. You can also see all the Bluetooth devices that you may have paired up to EZAMP. And choose between those also.

Down at the bottom are 2 settings

- *Refresh Device list* This will be useful when you set up this up with your installer/tuner and you. You can choose yourself or your installer can pick himself.
- Reset DSP Tuning This is usefull if you dont like your DSP Settings and want to do a clean setup all over again



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# **BASIC/ADVANCED SETTINGS**





SPECIAL NOTE: If you dislike a memory and want it removed simply Select the memory and swipe to the LEFT and it is now deleted.

#### SAVE SETTINGS/NAME:

This is SUPER important. ALWAYS save settings!! Once you select SAVE on ANY page it will bring you to the "New Settings" text box as shown to the left. You have a choice of Basic Tuning Presets And Advanced Tuning Presets. The difference is that the BASIC setting ...ANYONE can access. ADVANCED ONLY you (or whom ever you give your password to) can access. It is best to first save in BASIC and then once refined in your tuning SAVE in ADVANCED.

Once you've entered YOUR settings name, for example BOB6 it will save it to the APP. As shown to the left. You can save 10 settings. You may want one setting to show that it is ALL 6dB per octave crossovers..so BOB6 is easy to remember and then do the same setting but use 12dB per octave crossover slopes. Call that one BOB12, That way you can hear the difference in slopes, Or different EQ settings.

To sync to MA800.4i, go back to the SAVE button on the top of each pages blue bar. Click on SAVE and look at your saved settings Pick the one you want to be THE setting THE EQ/GAIN/PHASE/DELAY setting. Lets say it is the 66666 saved file that is shown highlighted to the left. Since it is highlighted it is THE selection.

To sync data from MA800.4i to EZAMP APP, click on the top bar with the white outlined box and arrow pointing down. It takes one minute to sync data from MA800.4i.



With this many settings you can now pick and choose what your vehicle sounds like. Be it a car, truck, UTV, motorcycle or boat.

With 6 channels of input and output (the MA800.4 and MA1000.1 amplifiers) there are 1,000's of possibilities.

# EQUALIZER SETTINGS

#### **EQUALIZER SCREEN:**

This is where ALL the "magic" happens. There are 31 bands of Parametric Equalizer adjustments. Which means that YOU can select whatever frequency you need to fix, or bands of frequencies and easily solve the peaks or dips in your system setup. QUICKLY! You can LOCK the EQ on this page also. This makes it so you dont accidently change

an EQ setting while adjusting something else.

#### FREQUENCY:

Each of the 31 Bands can be changed to ANY frequency you need it to be. Click inside the BLUE boxes at the bottom of each frequency and type the frequency, Q or Boost desired.Since there are 31 bands of adjustment = SCROLL Left to Right

#### Q ADJUST:

Q (or width) of the frequency being adjusted. Q's of 1 are very wide, Q of 18 is very narrow As shown below on the APP itself. To change Q simply slide the light blue "Q" bar. Or TAP + /-SPECIAL NOTE: An RTA is an ABSOLUTE necessity to adjust ANY audio system that has an equalizer, especially 1/3 octave



# AN EXAMPLE OF FREQUENCY AND Q

The example to the left shows you what happens at a frequency when Q is adjusted differently at different frequencies. Look at the 1000Hz EQ setting which has a Q of 20 at the same time 6000Hz has a Q of 1. You can use fewer EQ adjustments to effect far greater frequencies making EQ adjustment much quicker. (You MUST have an RTA to properly adjust ANY Equalizer!!)



# TIME ALIGNMENT

Once we have levels, phase and gains pretty much set. Its time to do Time Alignment. Think of all this pre set up as prepping a car to be painted. If youve ever painted a car, it s ALL about the prep work. Paint (in our case Time Alignment) is the finishing touches. and up till now it was ALL just getting ready for this part!

It is important that we do this methodically. Some experts say to Time Align BEFORE EQing the system. Some say do it after. It is up to YOU. Both ways work. And we have found that as much EQing you do in this process BEFORE and AFTER it really doesn't matter.

Lets asssume that you've done some EQ, GAIN and checked to make sure all speakers are "In Phase" ...PLUS ... you've got the system sounding good. Clean, smooth, tight with really good midbass punch. Then it is the PERFECT time to do time alignment.

Below is a conceptual picture of what we (you?) are trying to do. Get speakers that are at different physical dimensions away from your ears to be time coherent. Meaning move them electronically so they SEEM to be in the same time /distance dimension.

Thereby creating the illusion of stereo imaging and soundstage Where the sound does not appear to be coming for the left or right, but in front of you. And out on the hood of the vehicle Plus the woofer sounding like it is under the dash on front of you..even though the woofer is actualy in the trunk of the vehicile



# **FINAL SETTINGS**

At this point you are pretty much done, Our recommendation is that you live with the intial setup (EQ/Time Delay/Gains) for a week and THEN make adjustments.

Also do not spend to much time "tweaking" the system. Once you have gains set CORRECTLY and have Checked "Phase" acoustically (with a Phase Meter - which is built into the AudioTools APP) Spend LESS than 45 minutes EQing your system. Then take a break as your ears and brain will be charcoal!! Rest your ears over night and listen again in the morning. 45 minutes is plenty of time to get a system initially "dialed in". You need to "live" with it for a bit BEFORE randomly changing settings.

#### ONCE MORE TIME! SAVE/SYNC

Now click on the top bar with the white outlined box and arrow pointing down Lets make sure that this LAST "tune" is SAVED and SYNCED to the MA800.4i DSP/AMPILFIER. Double check that ALLthe EQ settings/Time Alignment/Gains, etc. are as you set them and nothing has changed.



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When you tap it, it uploads the DSP data setting from amplifier back to APP. It takes around one minute to upload data to prevent data package dropout.

This is used for data from amplifier to APP. When you select saved file, the data is from APP to amplifier. They are reversed data sync direction.

For example, your DSP tuning is done for a while, but you want another installer to re-tune it, he might need to know what is the current DSP data setup. So that he can start from there.

Or, if you like some other vehicles DSP tuning (using EZAMP) and you want to get their data, you can connect to his vehicle with the EZAMP APP with its amplifier, and upload it into your EZAMP APP, and then load it into one of your 5 memories.

# SAVE/SYNC

#### NEXT SECTION OF THE MANUAL IS HOW TO SETUP THE SAME AMPLIFER(S) ...AND SYSTEM...BUT THIS TIME WITH A WINDOWS PC INSTEAD OF BLUETOOTH OFF YOUR PHONE

#### THE PROCESS IS BASIALLY THE SAME ONLY DIFFERENT EQ/TIME DELAY/GAIN/PHASE ARE STILL"AT PLAY"



# PC INTERFACE - START SCREEN

#### SIGNAL INPUT SETUP



The image ABOVE is the PC software (.exe) that you've installed on your desktop. You'll notice that all functionality is on this one screen. Equalizer, frequency adjustment, Q adjustment, EQ level, crossover filters (HPF and LPF) and output levels. Everything you need to do to adjust your EZ DSP amplifer is here. Make sure you understand what it is you are REALLY trying to do here and as there is a LOT of "stuff" that you can do. GOOD and BAD! You have 186 possibly EQ settings! Good news is you can FIX anything you do here. Pretty much. **WHAT ARE YOU TRYING TO GET HERE? GREAT SOUND QUALITY? IMAGING? WHAT?** All of the above,we hope. This manual will guide you thru all of that. Follow its guidelines and you can have your vehicle sounding great in less than 45 minutes. EQing a system for longer than 45 minutes is NOT recommended. listening fatique kicks in and you'll start fixing issues that actually dont exist.

# SOURCE SELECTION/BLUETOOTH/GRAPHIC EQ/RESET EQ/RESTORE EQ

It is important what source you pick. We HIGHLY recommend that you choose the format AND device youuse the MOST. If it is a OEM headunit then pick that.





#### **FIRST THINGS**

This is SUPER important page as this will greatly simplify the DSP set up procedure IF you do this correctly. Since the DSP is built in to the amplifier the ONLY external adjustment is GAIN. At this point you should have decided what the system will be. Meaning is it a Front/Rear/Sub system? Or a simple Front/Rear system? Or a High Pass (Tweeter is now Front) and Band Pass (rear is Mid-Bass drivers) and Sub (a mono block MA1600.1i Recoil amplifer needs to be used here) Once that is determined then it is straight forward what to do. Lets assume a Front (Tweeter), Rear (Midbass) and Sub (utilizing a sub amplifier) This means you are using the 5/6 channel Pre-Amp output of the MA800.4i into the MA1600.1i mono block). This is called "Tri-Amping" It is easiest if you do the intial PRE SET gain adjustment the HI-PASS or BAND-PASS channels of the AMPLIFIER (the ones driving the tweeters and the midbass) are turned up to about the 10 O'Clock postion (as shown) NEXT UP....setting up the low pass gains on teh subwoofer amplifier (MA1600.1i in this example).





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# **CROSSOVER PRE-SETTING**

Connect RCA cables from the MA800.4i OUTPUT to the MA1600.1i.input (as shown) Make sure the CROSS OVER on the MA1600.1i is set to FULL as the DSP built into the MA800.4i will now control the mono block MA1600.1i. Preset GAIN on the MA1600.1i to "12 0'clock". From this point on till the last settings the internal EZ AMP DSP will control all gains, levels, EQ and crossovers



Connect RCA cables from the MA800.4i OUTPUT to the MA1600.1i.input (as shown) Make sure the CROSS OVER is set to FULL as the DSP built into the MA800.4i will now control the mono block MA1600.1i. Preset GAIN to "12 0'clock". Move on to Crossover and gain setting.

# SECOND THINGS - PRE SET CROSSOVERS

Since this is going to be a totally active system, High Pass Front (tweeters) ... Bandpass for the Rear (MidBass ) and Low Pass for the subwoofer (outout going from the MA800.4i to the mono block MA1600.1i) then we should PreSet all the crossovers BEFORE powering up speakers. Disconnect the negative of all speaker outputs UNTIL the crossovers and gains are Pre Set in the EZ Amp DSP application.

Knowing the basic starting crossover freqencies for each speaker will make it simplier and faster to set up this FULLY active system with a 2 way front system and subwoofer(s).



TWEETERS - HIGH PASS - 3,500Hz MIDRANGE - BANDPASS - 60Hz - 3,500Hz SUBWOOFER - LOWPASS - 60Hz



# **CROSSOVER / GAINS PRE - SETTING**



With this 5/6 channel "ACTIVE" system start with the tweeters crossover at 3,500Hz. Choose a crossover slope. You can shoose Type of Filter desired Bessel,ButterWorth or Linkwitz-Riley. And slope of eitther 6dB, 12dB or 24dB. For this example we'll use 12dB Butter\_W (ButterWorth). Move your cursor over the selection and it willchange to BLUE and hit ENTER. Selection made. Put your cursor over "Slope" scroll down and choose 12dB.

To get to the specific crossover frequency you desire , move your cursor to the center of the rectangle where it says Frequency. Highlight it and type in the exact frequency.

Use the same method as above, To create a bandpass use BOTH the High Pass filter AND the Low Pass filter to CREATE a BandPass In reality that is how ALL Band Pass filters are created.

# THIRD THING -PRE SET DSP GAINS

You have channel gain AND master gain seeting now. Again we are in Pre Set "MODE". This is just to get us in the "ball park" to be able to easily tune the system

you are building. Pre Set ALL gains to -6dB. Front Left (which is really Front Left Tweeter in our example. Front Right (which is Right Tweeter) rear Left (which

Group From	Group Front Tuning		Group Rear Tuning		Group Front & Rear Tuning			Croup Sub Tuning		Volume	
Front-Left	Front-Rig	ht Rea	r-Left	Rear-	Right	Sub	-Left o-	Sub-	Right	0	Loobodor
~40	-40	-40 -	0.0dB	-40 -1	0.048	~40 -	0.0dB	-40 077 1	0.048	0 <b>FF</b> -	- 0 kdB

is Left Midbass) and Rear Right (which is Right MidBass) and Sub Left and Sub Right

Plus Volume (Master GAIN for the entire system) at the far right. Set ALL f the GAINS at -6dB. With the amplifers gains Pre Set and these set at -6dB you will have +12dB of gain to play with once the speakers are re connected and powered UP.



Master Volume (Master gain for system)

# EZ AMP SETUP - PC

# FOURTH THINGS - PHASE

With the system fired up, play some music you know and start setting up all the channel gains. Front-Left/Front-Right/Rear-Left/Rear -Right/Sub-Left/Sub-Right. Once you get it sounding reasonably "even" from a channel balance standpoint, put on "Pink Noise". This can be easily found on the internet. Find a long "Pink Noise" track. Something over 5 minutes if possible. Now "MUTE" all channels but the 2 Front channels (tweeters in this system setup example). Adjust level of just the front 2 channels so that the noise sounds like it is directly in front of you and center. Now "MUTE" the Front 2 channels and Un- MUTE the Rear channels

	Group Front Tuning		Group Rear Tuning	Group Fro Tur	ont & Rear ing	Croup Sub Tuning	Volume	
	Front-Left	Front-Right	Rear-Left	Rear-Right	Sub-Left	Sub-Right	o - <b></b> - o	
IN/OUT	-20	2 - <b>0</b> -20 - <b>0</b> -40 -	2	-20 -10	-22 -40 -	• I =	-2020 -4040 0FF0FF	
	007F - 0.03B	OFF 2 0.0dB	orr 2 0.0dB	OFF - 0.0dB	0.0dB	0008	0.0dB	

Play the "Pink Noise" track again and balance the Rear Channels (MidBass) so that it sounds like it is a BIG ball of sound on the center of the dash, like you did with the tweeters on the Front Channels.

Once all this gain setting is done, lets test "Phase" and make sure that the speakers are "Acoustically in-Phase". WE know they are electrically in Phase. But....are they acoustically? Download the Phase tester for Android or Audio tools for APPLE and in that software is a Phase meter. Then download the special "Tick tick" sounds needed to test for Phase. Place your phone microphone within 6 inches of each speaker and play the special tones. You may want to mute all the speakers that ARENT being tested **Download URL -https://studiosixdigital.com/support/downloads-2/** 

TIP: Best, cheapest most accurate RTA you can buy ...you already have (if you own an APPLE phone) AUDIO TOOLS in the APPLE store. You can JUST buy the RTA part of it for under \$7.00. A MUST have TOOL for setting up your DSP. MUST HAVE!!1



Play the "Pink Noise" track again and balance the Rear Channels (MidBass) so that it sounds like it is a BIG ball of sound on the center of the dash, like you did with the tweeters on the Front Channels.

# 1/3 OCTAVE OR PEG?

# TIME TO BE PLAYING REAL MUSIC AND PINK NOISE

At this point you should be playing REAL music. Something you feel is a well recorded piece of music that YOU actually listen to. NOT some tweeky high end music (Sheffield Labs for example) Something that you would ACTUALLY listen to on a daily basis. Something with voice, bass and highs. Now listen to BOTH pieces of music as you TUNE your vehicle. Switch back and forth between MUSIC and PINK NOISE and usingyour EARS...AND your RTA.

# TIME TO GET "REAL" - REAL EQ TIME!!

Now is the time to start "Playing with the EQ. We know that gains are pretty well set (not perfect but very close) and ALL speakers are REALLY in phase. This "Phase" issue is very important because you will waste a TON OF TIME tuning your system - if your speakers are NOT "In Phase". So IF you sort of skipped that part, GO BACK and make sure!!

# 1/3 OCTAVE EQ OR PARAMETRIC EQ (PEQ)??

This is a personal preference. Many really like 1/3 octave. It is what EQing has been all about for 60+ yrs (YES!! 60!!) This is NOT new stuff! Good news is you can change

your mind at ANY time! We recommend that you try both types of EQ as they work similarly...BUT different. Notice to the right that the Highlighted Button in orange says "Graphic EQ". This actually means that PEQ is engaged. This is when you need an RTA. Apple phones get to use Audio Tools by Studio Six Digital which is a GREAT RTA program. You can calibrate the microphone if you want to be super accurate. BUT remember that the RTA is there to HELP...it is NOT the "End all Cure all". Your ears are the only thing that really counts. If you dont think it sounds good. Then DONT CARE what RTA says.



1/3 octave is used typically for most audio system setups, be it home or auditorium or car. Hence the reason to use RTA software (with pink noise). Make sure to slow down the software. Which is called time averaging. In Audio Tools set it to -3 or -6. This is important as otherwise the meter is moving to fast and you are NOT seeing what is really going on in your vehicle. SLOW it down!!!



# PRE SET UP

#### GRAPHIC EQ (31 BAND -3RD OCTAVE)

The 1/3 octave set up is to the right. We are at 2000Hz (EQ band 21 of 31) and we can see that the Q is 7.208 (very narrow) and has a boost (gain) of 14.9dB. Notice that the band ((21) has been selected as the gain slider is highlighted in GREEN. This is done by using your cursor to click that band. You can now move the band up and down either by using the UP or DOWN arrow on your computer keyboard or by simply grabing the highlighted GREEN slider with your cursor and moving it up and down. Either way works. You can also grab the RED EQ line and move the actual EQ curve with your mouse/ cursor. Just click and hold and slide your mouse UP or DOWN. Now to speed things up you can also use your keyboard Left/Right keys to move to different frequencies. And when using the RTA with software in you vehicle you can EQ very quickly. We recommend that you do this while playing Pink Noise AND music alterna tley.



GAIN: 14.9dB - FREQ: 2,000 - Q: 7.208



# PARAMETRIC EQ (PEQ)

We have switched to Parametric EQ. We are still at 2000Hz. It is best to RESET EQ now so there is NO confusion We changed Q to 1.0 (very WIDE) This was done by highlighting the Q box below Band 21 /2000.and has a boost (gain) of 16dB. Notice that the band (21) has been selected as the gain slider is highlighted in GREEN. This is done by using your cursor to click that band. You can now move the band up and down either by using the UP or DOWN arrow on your computer keyboard. You can also simply grab the RED frquency curve line at the peak of the boost with your cursor and move it left or right changing

SAVE OR DELETE FILE SETTINGS

frequency as you move it. Since it is such a broad band of adjustment (Q of 1.0) it will GREATLY change the audio system sound immediately. At this time you CAN'T change Q while moving it with your cursor, BUT you can change GAIN (Boost or Cut) AND Frequency. By simply sliding left and right, up and down. With your MOUSE. Notice below that the Boost is now at 100Hz, BUT it still shows it at Band 21



# SAVING SETTING:

Now that you've done some EQing, level (GAIN) setting adjustments, it is time

to SAVE settings. This is SUPER IMPORTANT as you will spend way to much time adjusting, and then possibly losing it ALL.

It is IMPORTANT that you save frequently as you can ALWAYS overwrite ANY memory. REMEMBER that. The SAVE setting FUNCTION is over at the TOP RIGHT of the PC software GUI, The setting entry looks like this clicking this and you get into Firmware Update, Call, Save, About. Right (as shown to the right) At this point we are now SAVING your CURRENT setting into one of the memories. Pick the first memory M1.



# LIVE SETUP

# **TIME DELAY - PART 1**

Once you have EQ crossover and basic gain settings to where your vehicle sounds pretty good...AND you have saved those settings It is time to use MUSIC and set TIME DELAY. First thing is to set up your measurements. Do you want it in MS or CM or INCHES?? All are good choices. We perfer dimenisonal measurements. It is easier and more straight forward to deal with this in CM or INCHES. As you want to use a tape measure and measure each of the speakers that are ACTIVE to you forehead. In this example it is a 2 channel amplifer system with 6 channels (actually 5 as we are using the monoblock as a subwoofer amplifier)



# TIME DELAY - PART 2

Volume

0.0dB

Since we have picked Inches as the measurement. Have a note pad ready to take notes of measurements to your forehead/nose of ALL active speakers. With the sample system we will be measuring our tweeters (FRONT Channels 1/2) MidBass drivers (in doors, but we are using the REAR Channels 3/4) and SUB channel (Channels 5/6) on the EZ Amp PC software. 5/6 channels are being "feed" out of the MA800.4 OUTPUTS to the MA1000.1 INPUTS. As the MA1000.1 will drive the subwoofers. Put those measurements into the software. Listen to where the vocal moves. Is it in the center of the dash and forweard?

MS? CM? Or INCHES?

7.208 7.208

Time Delay

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# PLAYING WITH THE ADVANCED SETTINGS

# SETTING BENCHMARKS - OPTIONAL

Sometimes, while you are EQing you may want to copy the EQ of the left tweeter (or midbass) to the Right. At least as a starting point. We dont think it is a good idea as the acoustics, positioning of drivers, reflections, etc .are different from left to right. BUT sometimes it makes it quicker and easier to set BENCHMARKS. This gives you that option.



# FINAL LISTENING AND SAVING / SYNCING TO THE DSP - OR COMPUTER



Typically you'll want to save whatever EQ/Time settings to your computer FIRST. Then Save to DEVICE. You have 5 memories to play with. Remember that you can overwrite ANY memory as many times as you want. Once it is "Saved to Device" it is "Synced" to that device (MA800.4i for example) Until the next time you connect the computer and change it. We recommend that you set your system up,BUT spend no more than 45 minutes on the first "tune". Live with it for a week and then go back and "Play" some more.

YOUR DONE!!!!!!



# EZBASS - MA1600.1

# EZBASS - ONLY FOR THE RECOIL MA-1600.1i

This is a unique feature that the EZ apps family has. EZBASS. Basically this is a SUPER Bass Boost EQ application. But MUCH more!

IMPORTANT NOTE: This app ONLY works with the Recoil MA-1600.1i amplifier! You can do a SUPER high power 1100watt 2 ohm PER CHANNEL STEREO system (using 2- MA1600.1i 's) with 1/3 octave EQ , Time Alignment and SUPER BASS EQ all in one app!.

Click here to get to the app



# EZ BASS EZ AMP.4 EZ AMP.6



EZBASS - MA1600.1i

# EZBASS - ONCE YOU'RE IN!!!

NOTE: for subtle small changes in adjustments (or your fingers are just TOO fat!) use the - and + icons at each end of the sliders to do this in small increments.

Subsonic: You can adjust the subsonic Frequency from 20Hz to 400Hz. Typical subwoofer subsonic filters are at or below the subwoofer enclosure tuning frequency.

ESPECIALLY usefull when tuning BELOW Fs of the subwoofer!!! SUPER useful to PROTECT your subwoofer. With EZBASS Subsonic you can adjust the Frequency AND the filter SLOPE. Slope adjustment is from 6dB - 48dB per octave.

LPF: You can adjust the Low Pass Filter(LPF) FROM from 20Hz to 400Hz. Again this can be done simply by sliding the slider left to right. Or by tapping the - or + box at each end of the sliders for more accurate adjustment. Watch the top screen as the graph will guide you to what is happening

Phase: This is adjustable from 0 to 180 Degrees. Listen to this while sitting in the drivers seat as vou will hear the bass move forward. There is NO right or wrong here.. What sounds best is BEST!

Time Delay: This will increase how far the bass moves forward in your vehicle. There is NO right or wrong here.. What sounds best is BEST!





# EZBASS - ONCE YOU'RE IN!!!

Lots to touch and adjust here. Level, Freq, Q, Subsonic, LPF, Phase AND Time Delay. You can adjust this by EAR or with an RTA, In our opinion.....BOTH.

Level: You have -20/+20 dB of boost here. BE CAREFUL. Boosting ever +3dB means your asking the amplifer to double its power outout. At low listeinig levels that isn't a problem

Freq: You can adjust EQ from 20hz -400Hz

Q: This is adjustable from 0.05 to 20. Watch the screen at the top and you'll see the Q effect. 0.05 is EXTREMELY wide (broad?) and 20is EXTREMELY narrow.



# TIME DELAY - MORE DETAILED

#### **EZBASS - TIME DELAY - BASS**

**Time Delay:** You need to select what measurement you want to use for your delay setting. We favor dimensional type (Inches/CM) as these are more straight forward a measurement. Simply use a tape measure to measure from your listening possition to the the





NOTE: For subtle small changes in adjustments (or your fingers are just TOO fat!) use the - and + icons at end of each slider to do this in small increments.

**Time Delay:** This will increase how far the bass moves forward in your vehicle. Keep increasing (or decreasing) dimension until the subwoofer "sounds like" it moves up to the dash. You WILL hear this! This is the time when you EAR tells what sounds BEST! There is NO right or wrong here..

# BLC-1 WIRELESS BASS REMOTE (MA1600.1i ONLY)



# **BLC-1 - FEATURES AND FUNCTIONS**

Easily pair this wireless remote with our DSP integrated mono amplifier or active subwoofer for convenient bass level control, up to 40 feet away.

- This IPX7 waterproof wireless bass level controller can be used for car, power sports, jet ski or any tough environment.
- The built-in lithium battery has an amazingly long battery life of up to 6 months.
- · Use the included mount to easily attach to your steering wheel. Comes with steering wheel strap.
- It can be mounted on the dash or flat surface with the included Velcro



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RECOI