

# MAGICO SUBWOOFER SETUP AND DSP CONTROL MANUAL



**DSP Password: Fact\_ory**

THANK YOU FOR THE PURCHASE OF YOUR NEW MAGICO S-SUB OR Q-SUB. THE GOAL OF THIS SETUP MANUAL IS TO FIRST INTEGRATE THE SUBWOOFER INTO YOUR STEREO SYSTEM AND ALSO TO DESCRIBE THE VARIOUS ASPECTS OF CROSSOVER AND EQUALIZATION OPTIMIZATION USING OUR HIGHLY ADJUSTABLE DIGITAL SIGNAL PROCESSING SOFTWARE. (FOR THOSE WITH HOME THEATER APPLICATIONS PLEASE CONSULT THE SETUP LITERATURE FOR YOUR HOME THEATER PROCESSOR TO SETUP THE SUBWOOFER USING THE AVAILABLE FUNCTIONS OF THE PROCESSOR: AUTO CALIBRATION, ROOM CORRECTION ETC.)

TO OPTIMIZE THE SUBWOOFER'S PERFORMANCE YOU WILL NEED SOME BASIC MEASUREMENT EQUIPMENT AND SOFTWARE. LISTED BELOW ARE RELATIVELY EASY AND INEXPENSIVE OPTIONS:

**SOFTWARE:**

REW - [HTTP://WWW.ROOMEQWIZARD.COM/](http://www.roomeqwizard.com/) - FREE

OR

OMNI MIC - [HTTP://WWW.DAYTONAUDIO.COM/INDEX.PHP/OMNIMIC-V2-PRECISION-MEASUREMENT-SYSTEM.HTML](http://www.daytonaudio.com/index.php/omnimic-v2-precision-measurement-system.html)

INCLUDES MICROPHONE AND USES CD AS SIGNAL SOURCE, MINIMAL PHYSICAL CONNECTION REQUIRED.

**MEASUREMENT MICROPHONE:**

UMIK-1 - [HTTP://WWW.MINIDSP.COM/PRODUCTS/ACOUSTIC-MEASUREMENT/UMIK-1](http://www.minidsp.com/products/acoustic-measurement/umik-1)

OR

UMM-6 - [HTTP://WWW.DAYTONAUDIO.COM/INDEX.PHP/TEST-MEASUREMENT/UMM-6-USB-MEASUREMENT-MICROPHONE.HTML](http://www.daytonaudio.com/index.php/test-measurement/umm-6-usb-measurement-microphone.html)

FOR THIS GUIDE WE WILL USE REW MEASUREMENT SOFTWARE, BUT ANY MODERN SOFTWARE SHOULD WORK FINE. SINCE WE ARE MEASURING BASS FREQUENCIES THERE IS NO NEED FOR HIGH END MICROPHONES OR HARDWARE TO ENABLE THE MEASUREMENT OF HIGH FREQUENCIES OR DISTORTION.

**GENERAL INFORMATION**

THE MAGICO QSUB IS DESIGNED TO ADD ULTRA LOW FREQUENCIES AND IMPROVE OVERALL BASS BEHAVIOR IN A HIGH END STEREO SYSTEM. THE COMMON CUTOFF FREQUENCY WILL BE 50 HZ AND OPTIMAL INTEGRATION WILL BE ACHIEVED WHEN USED WITH MAGICO S OR Q SERIES LOUDSPEAKERS, WHICH EMPLOY A SEALED BOX DESIGN.

WE WILL RELY SOLELY ON MEASUREMENTS OF THE BASS FREQUENCY RESPONSE. (OUR EARS ARE NOT SENSITIVE ENOUGH TO DETERMINE THE SOURCE OR THE MAGNITUDE OF PROBLEMS IN THE BASS REGION, YET THEY EASILY NOTICE IF THERE ARE PROBLEMS IN THAT REGION). PLACE THE MEASUREMENT MICROPHONE IN THE LISTENING POSITION. (FOR A WIDER LISTENING AREA ONE MUST TAKE MULTIPLE MEASUREMENTS FROM A VARIETY OF LOCATIONS AND AVERAGE THE RESPONSE, THIS IS BEYOND THE SCOPE OF THIS GUIDE)

## SAFETY

BEFORE PLUGGING THE PROCESSOR IN, ALWAYS MAKE SURE THAT THE POWER SUPPLY MATCHES THE PRODUCT SPECIFICATION VOLTAGE (110-220V). DO NOT SUPPLY POWER BEFORE ALL COMPONENTS OF THE SYSTEM ARE SET UP AND CONNECTED PROPERLY. AFTER CONNECTING ALL CABLES, YOU SHOULD MUTE ALL OUTPUTS FIRST OR TURN THE GAIN/LEVEL SETTINGS TO MINIMUM.

## 8 STEPS

1. POSITION YOUR MAIN SPEAKERS
2. UNPACK YOUR QSUB
3. INSTALL THE MAGICO DSP CONTROL SOFTWARE FROM THE CD ACCOMPANYING YOUR QSUB
4. HOOK UP YOUR QSUB
5. POSITION YOUR QSUB
6. REMOVE THE CASTERS AND APPLY FEET TO THE QSUB
7. DETERMINE LEVEL OF THE QSUB
8. DETERMINE CROSSOVER OF THE QSUB
9. DETERMINE EQ IN THE QSUB

1. POSITION YOUR MAIN SPEAKERS TO ACHIEVE THE FLATTEST FREQUENCY RESPONSE POSSIBLE. ADJUST DISTANCE FROM THE REAR AND SIDE WALLS BY INCREMENTS OF 6" AT A TIME TO REMOVE AS MANY FREQUENCY RESPONSE DIPS AS POSSIBLE. ONCE YOU ARE SATISFIED WITH THE POSITION OF THE MAIN SPEAKERS YOU ARE READY TO BRING THE QSUB INTO THE ROOM AND POSITION IT.

### 2. UNPACKING YOUR QSUB

USING A FLAT-HEAD SCREWDRIVER REMOVE THE FOUR CLAMPS FROM THE DOOR. WITH A 9/16" SOCKET BIT ATTACHED TO A CORDLESS DRILL REMOVE THE BOLTS FROM AROUND THE BOTTOM OF THE CRATE. REMOVE THE DOOR. WITH ONE PERSON ON EACH SIDE, LIFT UP THE WALLS OF THE CRATE AND WALK IT BACK WAY FROM THE SPEAKER. ON THE TOP OF THE CRATE DOOR ARE TWO SMALL HOLES, LIE THE DOOR DOWN SO THAT THE TWO DOWELS ON THE OPEN END OF THE CRATE BASE FIT INTO THE HOLES AND THE HINGED SUPPORT ON THE BOTTOM OF THE DOOR IS FOLDED DOWN TO SUPPORT THE DOOR/RAMP. LOOSEN THE STRAPS HOLDING THE SPEAKER IN PLACE AND CAREFULLY LIFT

THEM OVER THE ENDS OF THE SPEAKER AND REMOVE THE TWO WOODEN  
CONSTANTS FROM THE TOP OF THE SUBWOOFER. DISENGAGE THE CASTER  
BRAKES. WITH ONE PERSON ON EITHER SIDE CAREFULLY AND SLOWLY ROLL THE  
SUBWOOFER OFF OF THE CRATES BASED, DOWN THE RAMP AND ONTO THE  
FLOOR.

### 3. INSTALL THE MAGICO DSP CONTROL SOFTWARE FROM THE SUPPLIED CD TO YOUR PC OR APPLE COMPUTER

### 4. HOOK UP YOUR QSUB

YOU WILL NEED A 20AMP C19 IEC POWER CONNECTOR. CONNECT THE  
OUTPUT(S) FROM THE PREAMP TO THE CH. 1 XLR INPUT CONNECTOR (MONO)  
OR BOTH, CH.1 AND CH. 2 XLR INPUT CONNECTORS (STEREO). CONNECT A  
USB CABLE FROM YOUR COMPUTER TO THE SUBWOOFER. MAKE SURE THAT THE  
SUBWOOFER'S POWER SWITCH IS IN THE DOWN (OFF) POSITION. PLUS IN THE  
POWER CORD, MAKE SURE THAT YOUR SOURCE IS ON WITH A MINIMAL VOLUME  
SETTING AND YOUR CAN SWITCH YOUR QSUB ON. (YOU CAN A FIND A MORE IN  
DEPTH DESCRIPTION OF ALL OF THE CONNECTIONS ON THE REAR PANEL AS  
WELL AS THE CAPABILITIES WHEN CONFIGURED VIA ETHERNET CONNECTION TO A  
NETWORK LATER ON IN THIS MANUAL)

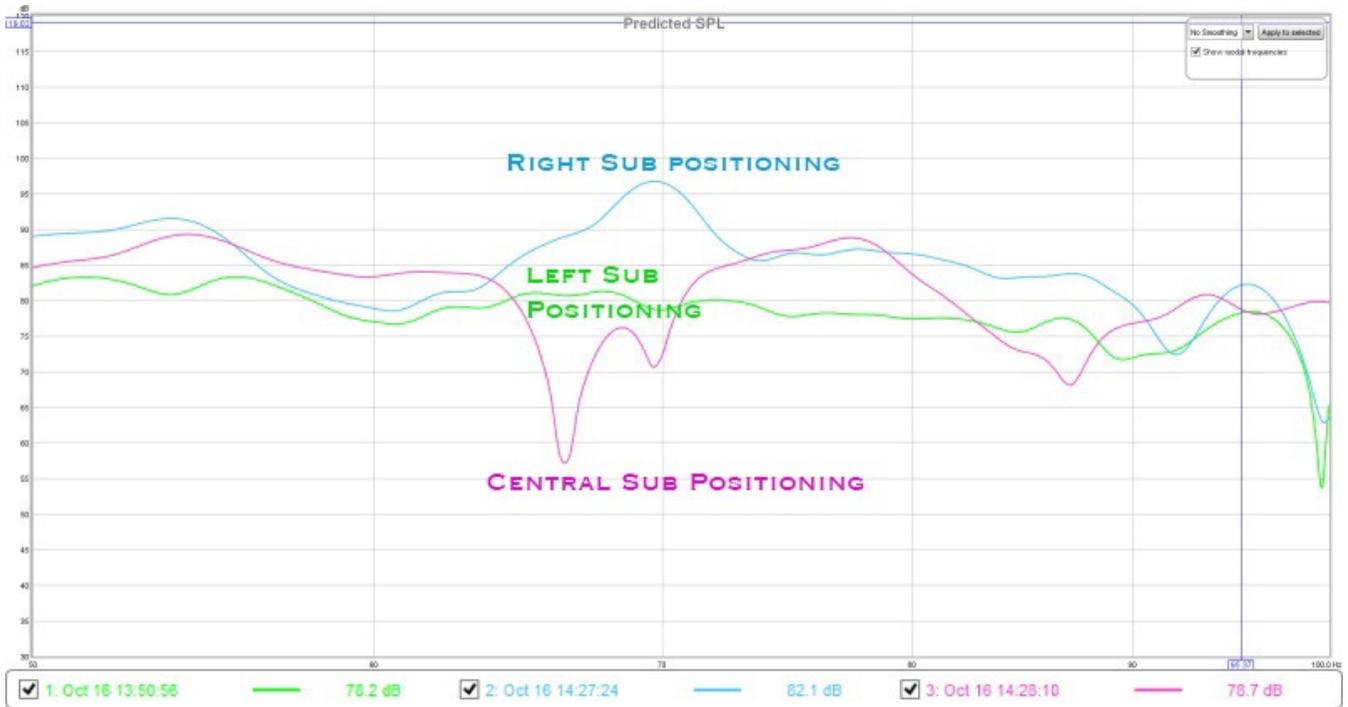
### 5. POSITION YOUR QSUB(S)

WE WILL START BY MEASURING THE QSUB BASS FREQUENCY RESPONSE.  
WE WILL TRY TO OPTIMIZE THE QSUB LOCATION SO WE WILL HAVE SMOOTH  
FREQUENCY RESPONSE UP TO 100HZ WHILE TRYING TO MINIMIZE THE DIPS IN  
THE FREQUENCY RESPONSE. FOLLOW THE INSTRUCTIONS OF YOUR  
MEASUREMENT SOFTWARE TO TAKE SPL MEASUREMENTS OF THE SUBWOOFER  
ALONE FROM A MICROPHONE PLACED AT EAR HEIGHT IN THE LISTENING  
POSITION.

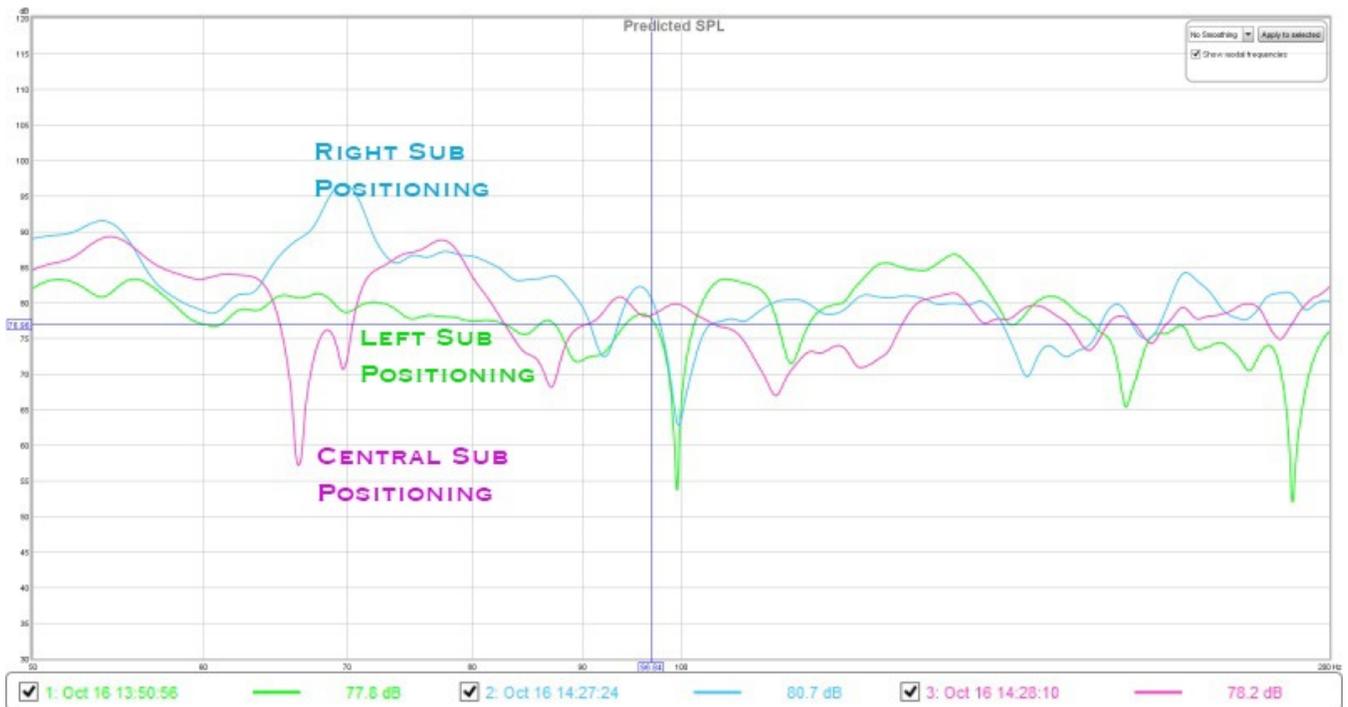
START BY PLACING YOUR QSUB BETWEEN YOUR MAIN SPEAKERS. IF THIS IS NOT  
POSSIBLE, TRY TO PLACE IT NEAR ONE OF THE CORNERS BEHIND YOUR MAIN  
SPEAKERS. MEASURE IT AT THE FIRST LOCATION. BEGIN BY MAKING  
INCREMENTAL MOVEMENTS (6 INCHES AT THE TIME) BOTH IN RELATION TO THE  
SIDE AND BACK WALL UNTIL YOU GET THE SMOOTHEST RESPONSE FROM THE  
SUBWOOFER IN A REASONABLE POSITION IN THE LISTENING ENVIRONMENT.

TRY TO COMPARE YOUR MEASUREMENTS USING OVERLAYS:

YOU CAN OVERLAY THEM ALL UNDER THE "ALL SPL" TAB. NOW DESELECT  
THEM ALL. YOU CAN DO THIS BY RIGHT CLICKING OVER THE LEGEND AREA. YOU  
CAN CHOOSE WHICH TO OVERLAY, MAKING IT EASIER TO ANALYZE THE RESULTS.

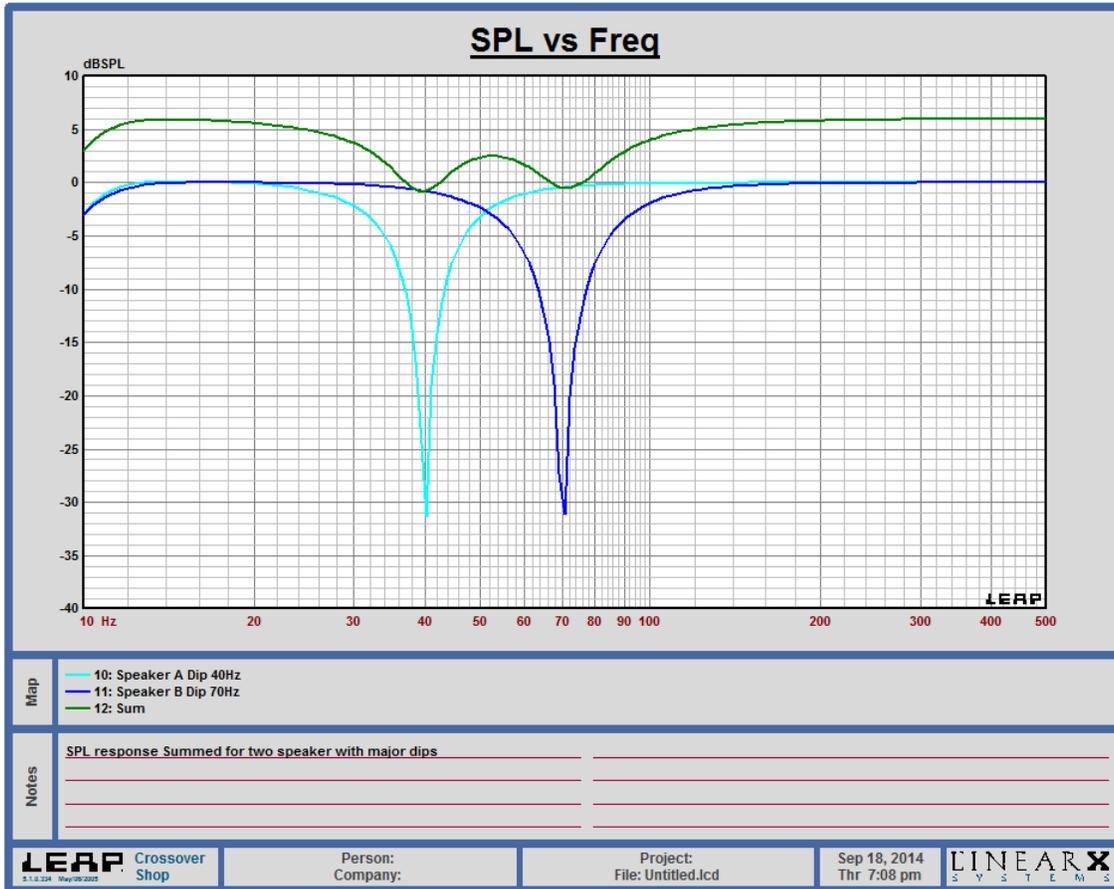


HERE YOU CAN SEE FOR A SINGLE SUBWOOFER THE LEFT POSITION REAR CORNER POSITIONING IS THE BEST. IT IS MUCH SMOOTHER FROM 50 – 100 HZ.



HERE IS THE SAME MEASUREMENT WITH THE WINDOW EXPANDED TO 50-200HZ.

THE ASPECT THAT MANY FIND DIFFICULT IS KNOWING WHAT TO DO WITH THE RESULTS. ONE OF THE MAIN THINGS WE ARE LOOKING FOR HERE IS TO COMBINE ACOUSTIC SOURCES IN DIFFERENT LOCATIONS THAT, WHEN SUMMED, REMOVE FREQUENCY RESPONSE DIPS. COMBINE TWO SPEAKERS WITH THE SAME DIP AND YOU ARE STUCK WITH IT. COMBINE TWO SPEAKERS EACH WITH A DIP IN A DIFFERENT PLACE AND THE OTHER COUNTERACTS IT. WHERE ALL SOURCES ARE IN-PHASE, THEY WILL SUM AS SHOWN.



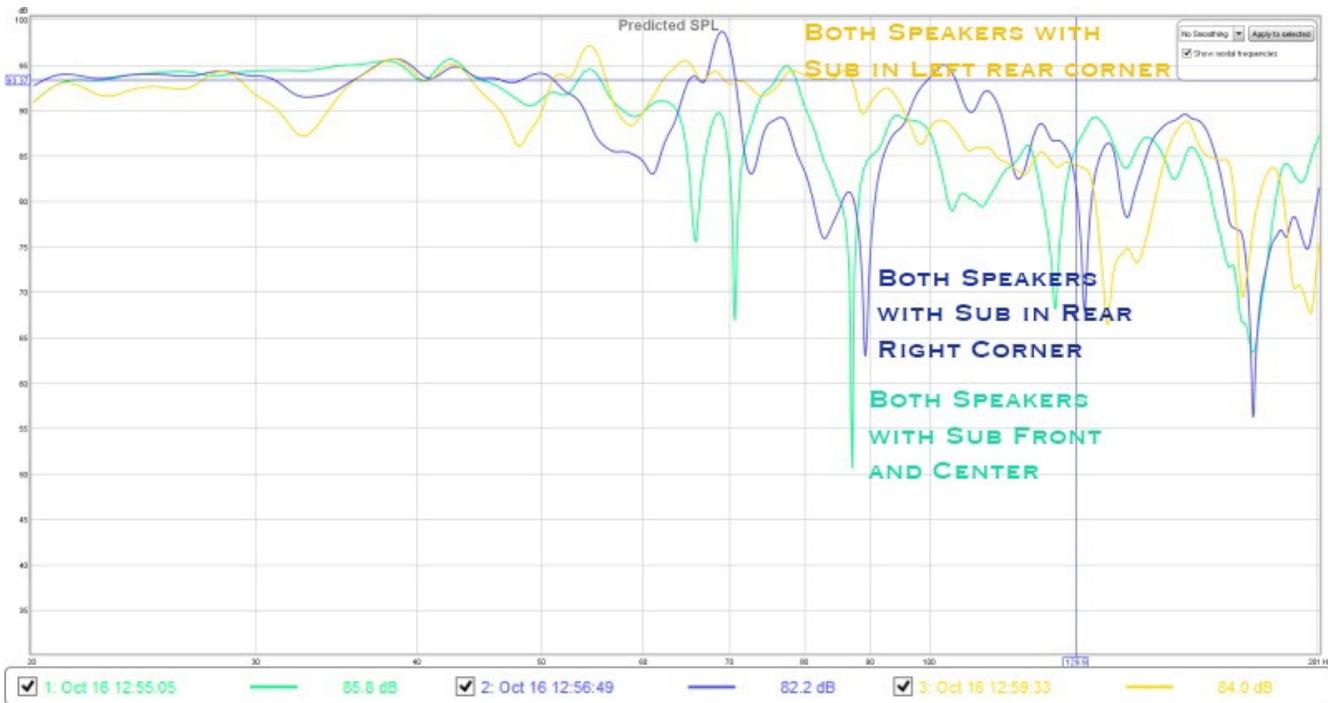
### SPL RESPONSE SUMMED FOR TWO SPEAKER WITH MAJOR DIPS

YOU CAN SEE THAT WHERE BOTH SPEAKERS HAVE THE SAME LEVEL AND ARE BOTH FLAT, THEY GAIN A 6 DB INCREASE IN LEVEL COMBINED. WHEN ONE OF THEM HAS A DIP, THE SPEAKER WITH THE DIP SIMPLY FAILS TO CONTRIBUTE AS MUCH, AND THE RESULT IS THAT THE DIP TENDS TO BE SMOOTHED. IN SOME CASES THE DIP HAS VERY LITTLE EFFECT. YOU CAN USE THIS TO YOUR ADVANTAGE BY SELECTING POSITIONS THAT CANCEL OUT THE DIPS. THE MEASURED RESPONSE OF SPEAKERS IN A ROOM IS QUITE COMPLEX, SO PREDICTING THE COMBINED RESPONSE IS NOT QUITE AS SIMPLE AS ONE MIGHT EXPECT.

THE MAIN PRIORITY IS TO AVOID DIPS. THE PEAKS AT THIS STAGE ARE LESS OF A CONCERN AS THEY CAN OFTEN BE TAMED WITH EQ LATER IN THE PROCESS. IF

DIPS REMAIN AFTER TREATMENT AND THE PLACEMENT OF MULTIPLE BASS SOURCES, THEN THEY WILL MOST LIKELY REMAIN UNFIXABLE.

HERE WE SHOW THE RESULTS (20-201HZ) WHEN THE MAIN SPEAKERS ARE ADDED AND FREQUENCY RESPONSE IS FURTHER SMOOTHED FROM OVERLAPPING OF THE MAIN SPEAKERS AND THE SUB. THE LEFT RED CORNER POSITIONING (YELLOW) IS STILL THE BEST. THIS POSITION IS BOTH SMOOTHER OVERALL AND THE DIP THE ONCE EXISTED AT 100 HZ FOR THE SUBWOOFER ALONE HAS BEEN ELIMINATED BY THE MAIN SPEAKERS.



YOU ARE FINISHED POSITIONING YOUR SUBWOOFER.

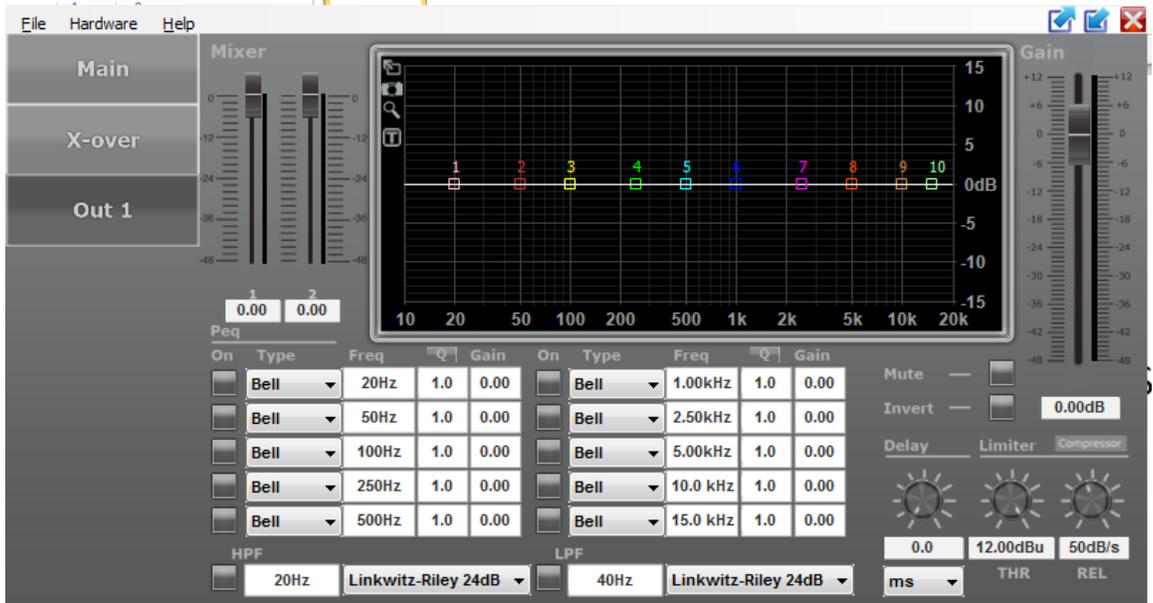
6. REMOVE THE CASTERS AND APPLY THE FEET.

APPLY THE BRAKES ON BOTH CASTERS WHICH HAVE THEM. WHILE TWO PEOPLE LIFT UP THE SIDE OF THE SPEAKER WITHOUT THE BRAKES, A THIRD PERSON UNSCREW THE CASTERS AND REPLACE THEM ONE AT TIME WITH THE FEET. CAREFULLY LOWER THE SUBWOOFER TO THE GROUND AND REPEAT THE PROCESS BY TILTING THE SUBWOOFER IN THE OPPOSITE DIRECTION AND SCREWING IN THE REMAINING TWO FEET. BE VERY CAREFUL TO HAVE AMPLE HELP TO HOLD THE SPEAKER SAFELY WHILE THIS PROCESS IS PERFORMED.

7. DETERMINE THE LEVEL OF THE QSUB

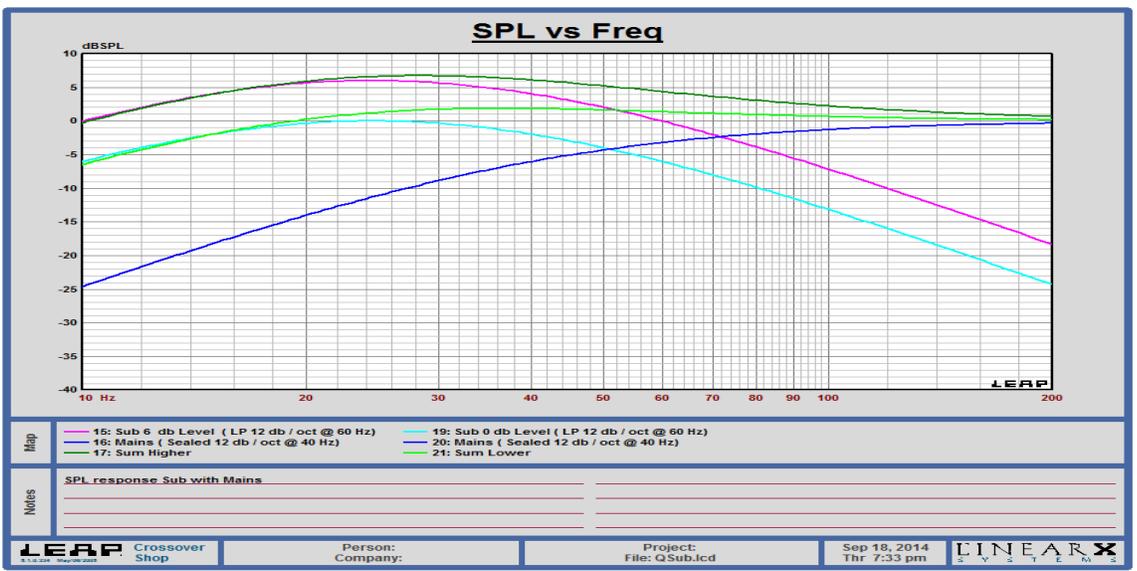
BEFORE APPLYING ANY EQ OR CROSSOVER, MAKE A FINAL MEASUREMENT OF THE QSUB AND BOTH MAIN SPEAKERS. MAKE SURE THE MEASUREMENT IS DONE IN MINIMUM 85 DB LEVEL SO IT WILL REPRESENT NORMAL LISTENING LEVEL.

COMPARE THE TWO (USING OVERLAY IF USING REW); ADJUST THE LEVEL OF THE QSUB WITH THE QSUB GAIN CONTROL (THE RIGHT LEVEL CONTROL ON THE SCREEN SHOT BELOW)

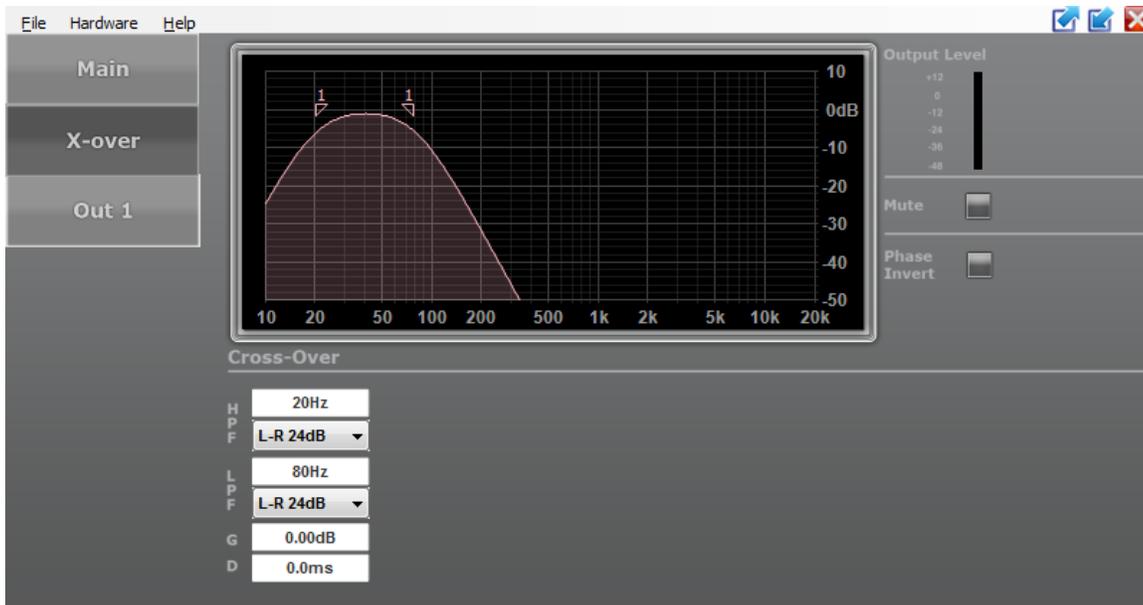


THE LEVEL OF THE SUB SHOULD BE BETWEEN THE MAINS LEVELS UP TO 6 DB MORE. SEE THE GRAPH BELOW.

THIS IS SUBJECT TO THE ROOM STRUCTURE AND LOW FREQUENCIES BEHAVIOR, GENERALLY SPEAKING, WOOD HOUSES IN NORTH AMERICA WILL WORK BETTER WITH THE HIGHER LEVEL AND STONE HOUSES IN EUROPEAN STYLE WILL WORK BETTER WITH THE LOWER LEVEL.



## 8. DETERMINE CROSSOVER OF THE Q SUB



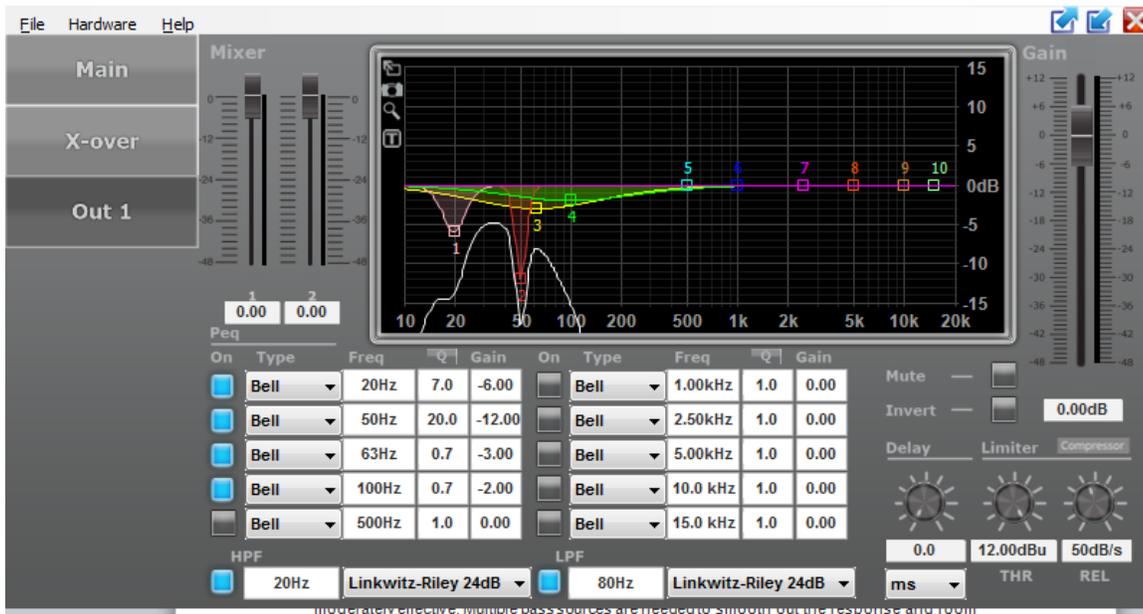
IN THIS SECTION WE WILL DETERMINE THE LOW PASS FREQUENCY AND SLOPE AND THE PHASE OF THE SUBWOOFER. OUR APPROACH IS TO USE THE Q SUB TO HELP SMOOTH THE OVERALL IN ROOM BASS RESPONSE AND EXTEND THE LOW FREQUENCIES. IN ORDER TO ACHIEVE THIS GOAL IT IS RECOMMENDED TO ALLOW OVERLAPPING. YOU SHOULD USE THE FREQUENCY, PHASE AND SLOPE SETTING OF THE SUB TO ACHIEVE THE SMOOTHEST OVERALL BASS RESPONSE. THIS WAY THE MAINS AND A SINGLE Q SUB LOAD THE ROOM FROM THREE POSITIONS. IN THE EXAMPLE IN FIGURE 6 BELOW, THE BEST LOCATION FOR THE SUB (RED LINE) HAS A DIP AT 70 HZ. THE MAINS (BLACK LINE) DON'T HAVE THE SAME DIP SO THEY ARE ALLOWED TO RUN DOWN TO ABOUT 60 HZ TO ELIMINATE THE DIP. WITH THIS ARRANGEMENT ALL DIPS BELOW 100 HZ ARE ELIMINATED. BELOW 100 HZ, EQ IS REQUIRED ONLY TO SHAPE THE RESPONSE TO MATCH THE TARGET CURVE. A CONVENTIONAL CROSSOVER WOULD FAIL TO ELIMINATE THE DIPS REGARDLESS OF THE NUMBER OF SUBWOOFERS. NO POSSIBLE SUBWOOFER LOCATIONS WERE ABLE TO REMOVE THE DIP.



## 9. DETERMINE EQ FOR THE QSUB

THIS IS THE FINAL STEP IN WHICH WE WILL TRY TO ACHIEVE TWO TARGETS:

1. USING EQ FILTERS TO REMOVE AS MUCH AS POSSIBLE PERSIST PEAKS THAT COMES FROM ROOM MODES.
2. USE EQ FILTERS TO SHAPE THE RESPONSE INTO A DESIRABLE IN ROOM RESPONSE.



### STEP 1

SINCE REW HAS A VERY USEFUL EQ TOOL TO CALCULATE FILTER SETTINGS WE WILL USE IT TO DEMO HOW TO ACHIEVE OUR TARGET.

1. CLICK ON THE OVERLAYS ICON IN REW:



2. SET GRAPH LIMITS WITH SENSIBLE SETTINGS, LIMITING THE X RANGE TO 10 - 100 HZ AND EXCLUDING EMPTY DATA.

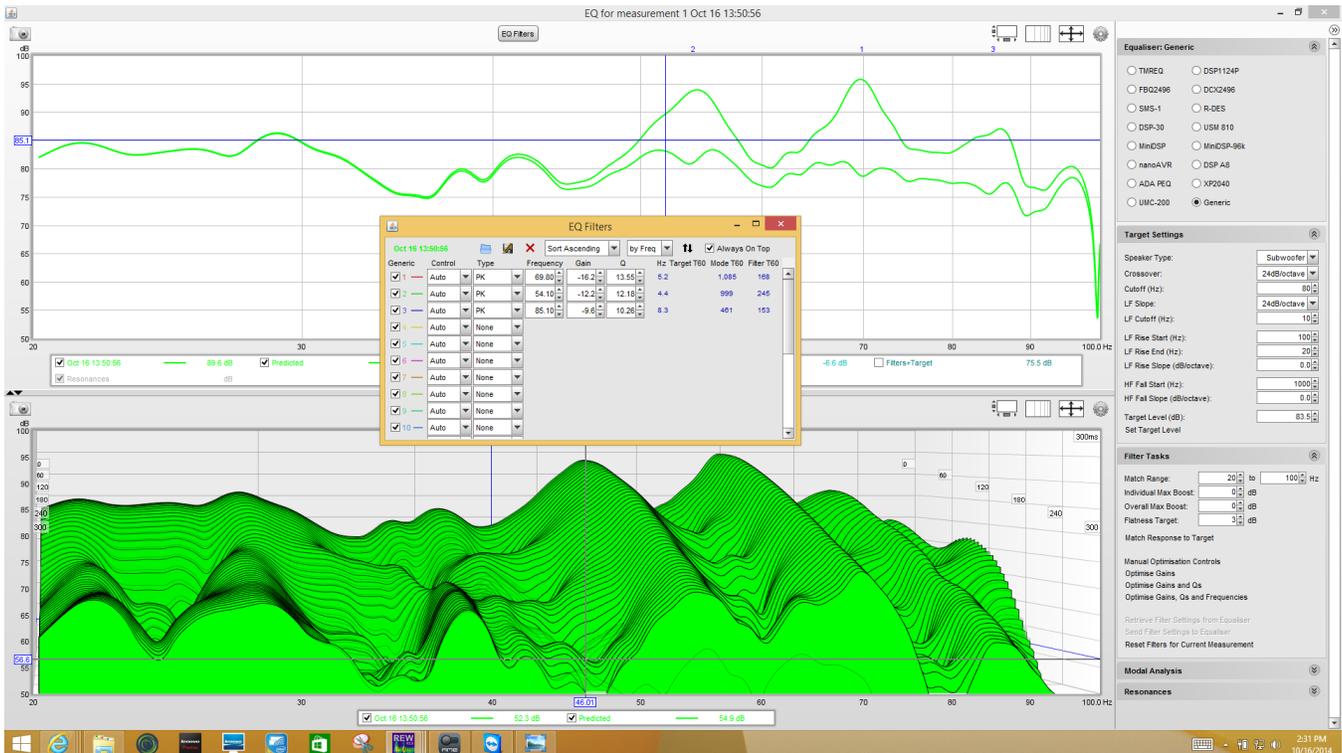
3. CLICK ON THE EQ ICON IN REW:



4. IN THE RIGHT MENU, SELECT THE GENERIC EQ DEVICE.



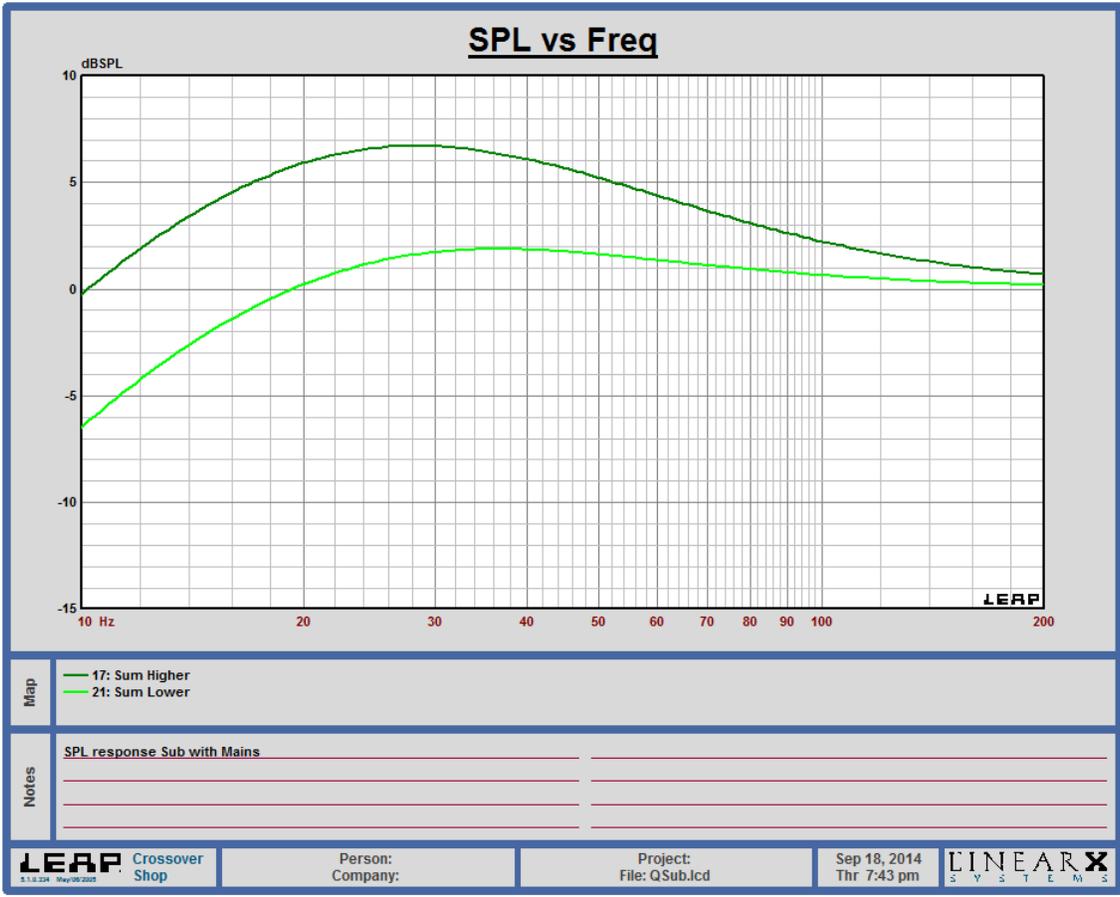
5. RETURN TO THE OVERLAYS WINDOW, AND THEN SELECT THE “PREDICTED SPL” TAB.
6. IN THE LEGEND AREA SHOWING ALL THE PLOTS, RIGHT-CLICK AND SELECT “CLEAR SELECTIONS.”
7. NOW SELECT THE PLOT THAT YOU WANT TO EQ. WITH THIS IN THE BACKGROUND RETURN TO THE EQ WINDOW AND SELECT EQ FILTERS.
8. CHOOSE A PEAK TO TARGET, AND THEN SET THE FREQUENCY, ATTENUATION AND FILTER WIDTH (Q) UNTIL IT IS REMOVED.



## STEP 2:

TARGETS IN THE BASS REGION HAVE A WIDE AREA OF FLAVORS. APPLYING A TARGET CURVE. ONCE YOU HAVE A SMOOTH RESPONSE YOU CAN THEN APPLY A ROOM TARGET CURVE TO YOUR TASTE AND SOURCE MATERIAL.

IN THE GRAPH BELOW WE SHOW A START POINT OF THE COMMONLY USED TARGET RANGE BETWEEN THE TWO GRAPHS WHICH SHOWS THE SUM OF THE SYSTEM IN ROOM.



IN ROOM COMMON TARGET LIMITS



## MAGICO DSP CONTROL INSTRUCTION

### INTRODUCTION

THIS USER MANUAL DESCRIBES HOW TO OPERATE THE MAGICO'S DSP SETTINGS VIA THE USB COMPUTER INTERFACE. ALTERNATIVELY, THE DSP CAN BE CONFIGURED COMPLETELY VIA A REMOTE CONNECTION TO A PC OR MAC USING THE LAN OPTIONS (ETHERNET). AFTER YOU HAVE BECOME TO FAMILIARIZE YOURSELF WITH THE PROCESSOR, WE ENCOURAGE YOU TO EXPERIMENT AND FIND THE MOST EFFECTIVE AND EFFICIENT WAY TO RUN YOUR SYSTEM BY UTILIZING THE POWERFUL PROCESSING OF THE MAGICO CONTROL DSP. THIS POWERFUL PROCESSOR WITH TWO ANALOG INPUTS, FOUR OUTPUTS AND TEN PEQ BANDS PER INPUT AND OUTPUT AND A FREQUENCY RANGE UP TO 26 KHZ. THE RUGGED ANALOG INPUT STAGE ACCEPTS INPUT VOLTAGES OF UP TO +23DBU THUS MATCHING ANY SOURCE ON THE MARKET TODAY, WITH AN EXCELLENT DYNAMIC RANGE OF 110DB.

#### FEATURES:

- 110DB DYNAMIC RANGE (INPUTS)
- ELECTRONICALLY BALANCED INPUTS
- MATCHED-IMPEDANCE OUTPUTS
- TEN PARAMETRIC FILTERS PER INPUT AND OUTPUT
- EQS ARE BELL, HIGH SHELF, LOW SHELF, NOTCH, ALL PASS, BAND PASS, HIGH PASS, AND LOW PASS
- 1000MS DELAY PER INPUT, 5MS DELAY PER OUTPUT
- BUTTERWORTH, BESSEL, LINKWITZ-RILEY FILTERS UP TO 24DB / OCT.
- TRUE RMS COMPRESSOR
- ZERO ATTACK PEAK LIMITER
- LATENCY 990 MICROSECONDS
- FULL CONFIGURATION AND REAL-TIME MONITORING VIA PC OR MAC (USB AND ETHERNET INTERFACE)
- 50 PRESETS
- 64 BITS MULTI-MODE DIGITAL PROCESSING

### 1. OVERVIEW OF CONNECTORS AND CONTROLS

#### REAR PANEL

##### USB CONNECTOR

THE USB CONNECTOR IS USED TO CONNECT THE DSP TO A PC OR MAC. IT CAN THEN BE CONFIGURED AND CONTROLLED IN REAL TIME WITH THE FREELY

AVAILABLE PC AND MAC CONFIGURATION PROGRAM. WITH THIS PROGRAM YOU CAN ALSO UPDATE YOUR DSP TO THE LATEST FIRMWARE.

#### POWER CONNECTOR

THE MAGICO DSP HAS AN INTERNAL AMPLIFIER THAT UTILIZES STANDARD 20A 250VAC IEC CABLE. (C19 PIN CONNECTION)

#### POWER SWITCH

THE POWER SWITCH TURNS THE Q-SUB15 (18) ON AND OFF.

#### ETHERNET CONNECTOR

THIS RJ-45 CONNECTOR IS USED TO CONNECT YOUR PRODUCT TO A NETWORK. IT CAN THEN BE CONFIGURED AND CONTROLLED IN REAL TIME WITH THE FREELY AVAILABLE PC AND MAC CONFIGURATION PROGRAM. WITH THIS PROGRAM YOU CAN ALSO UPDATE YOUR DSP TO THE LATEST FIRMWARE.

#### ANALOG INPUTS

THE ANALOG INPUT SECTION OF THE DSP OFFERS TWO ELECTRONICALLY BALANCED XLR CONNECTORS. THE INPUT LEVEL IS +23DBU MAX, ELECTRONICALLY BALANCED.

## II. GETTING STARTED

### QUICK START

FOR THOSE OF YOU THAT WISH TO JUMP RIGHT IN, THE FOLLOWING INFORMATION HAS BEEN PROVIDED TO ACT AS A QUICK START GUIDE FOR OPTIMIZING PERFORMANCE OF YOUR QSUB.

### CONNECTIONS

WHEN SETTING UP YOUR SUBWOOFER, MAKE CONNECTIONS AS FOLLOWS:

- ALWAYS MAKE CONNECTIONS PRIOR TO APPLYING POWER TO THE SUBWOOFER.
- CONNECT THE OUTPUT(S) FROM THE PREAMP TO THE CH. 1 XLR INPUT CONNECTOR (MONO) OR BOTH, CH. 1 AND CH. 2 XLR INPUT CONNECTORS (STEREO).

### REMOTE MONITORING AND CONTROL

WHEN CONNECTING THE UNIT VIA USB, MAKE SURE TO CONNECT IT DIRECTLY TO YOUR COMPUTER OR TO USE A USB HUB THAT SUPPORTS USB1.0. IF YOU

HAVE PROBLEMS WITH THE USB CONNECTION, PLEASE REFER TO THE INSTALLATION GUIDE FOR DETAILS ON HOW TO INSTALL THE PROPER DRIVER.

WHEN CONNECTING THE UNIT VIA AN ETHERNET NETWORK, YOU HAVE SEVERAL OPTIONS. THE PC/MAC APPLICATION HAS AN AUTO-DISCOVERY TOOL THAT WILL AUTOMATICALLY CONNECT TO ANY UNIT FOUND ON THE NETWORK.

#### STANDARD DHCP NETWORK

FOR THE EASIEST CONNECTION, USE A STANDARD ETHERNET ROUTER, PLUG IN THE UNIT AND YOUR COMPUTER, AND THE CONNECTION SHOULD BE MADE AUTOMATICALLY. STANDARD ROUTERS HAVE A DHCP SERVER BUILT IN AND ENABLED. A DHCP SERVER ASSIGNS A NETWORK ADDRESS TO YOUR COMPUTER AND TO THE DSP, ALLOWING THEM TO CONNECT AUTOMATICALLY.

#### CONNECTION WITHOUT DHCP SERVER

ALTERNATIVELY, YOU CAN USE A DIRECT (CROSS) CABLE OR A SIMPLE ETHERNET SWITCH TO CONNECT THE UNIT TO YOUR PC OR MAC. PLEASE NOTE THAT IN THIS CASE, ESPECIALLY WINDOWS COMPUTERS MAY TAKE UP TO SEVERAL MINUTES TO ASSIGN THEMSELVES A NETWORK ADDRESS (INDICATED BY THE TEXT: "THIS CONNECTION HAS LIMITED OR NO CONNECTIVITY"). THE COMPUTER AND THE DSP BOTH WILL ASSIGN THEMSELVES A NETWORK ADDRESS IN THE ZEROCONFIG RANGE (169.254.0.0 - 169.254.255.255), AND THE DSP WILL BE DISCOVERED AUTOMATICALLY BY THE PC/MAC APPLICATION.

TO FACILITATE CONNECTIONS WITHOUT DHCP ROUTER, IT MAY BE CONVENIENT TO SET YOUR COMPUTER TO A FIXED IP ADDRESS. IF YOU DO THIS, PLEASE CHOOSE ANY ADDRESS IN THE ZEROCONFIG RANGE, AND SET THE SUBNET MASK TO 255.255.0.0.

#### FIXED IP ADDRESS

IT IS ALSO POSSIBLE TO SET A FIXED IP ADDRESS AND SUBNET MASK FOR THE 1800B. WARNING: IF YOU SET A WRONG ADDRESS (IN A DIFFERENT RANGE THAN YOUR COMPUTER), YOU MAY NOT BE ABLE TO CONNECT ANYMORE. IT IS STRONGLY RECOMMENDED TO CONSULT A SYSTEM ADMINISTRATOR BEFORE MAKING SUCH SETTINGS.

#### FIREWALL

AFTER STARTING THE SOFTWARE APPLICATION FOR THE FIRST TIME, YOUR COMPUTER MAY ASK YOU TO ALLOW OR BLOCK THE APPLICATION ACCESS TO THE NETWORK. PLEASE MAKE SURE TO ALLOW THIS; IF THERE IS A FIREWALL BETWEEN THE APPLICATION AND THE DSP THE APPLICATION WILL NOT FIND THE DSP.

#### SYSTEM SETUP AND GAIN STRUCTURE

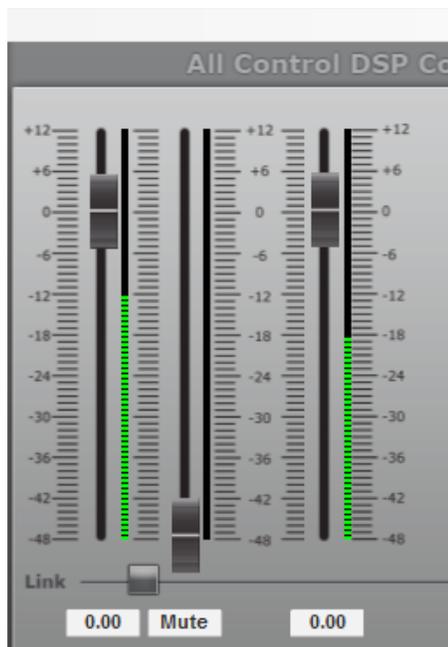
THIS PRODUCT OFFERS A WIDE RANGE OF TOOLS FOR SOUND SYSTEM DESIGN AND SETUP. THESE TOOLS CAN MAKE YOUR SYSTEM MORE EFFICIENT AND BETTER SOUNDING, BUT TO GET THE BEST POSSIBLE SOUND IT IS IMPORTANT TO USE THESE TOOLS PROPERLY. THE FOLLOWING SECTION EXPLAINS HOW TO MAXIMIZE SYSTEM GAIN AND HOW TO USE THE LIMITERS TO PROTECT YOUR AMPLIFIERS FROM CLIPPING. IN TRADITIONAL SYSTEM DESIGN, THE OUTPUT OF YOUR CONSOLE WOULD BE ROUTED TO A SYSTEM EQ, A COMPRESSOR, AND A CROSSOVER WITH OUTPUT LEVEL CONTROL. FROM THE CROSSOVER, THERE MAY BE ADDITIONAL FILTERS THAT ARE EMPLOYED TO IMPROVE THE RESPONSE OF YOUR SPEAKERS. THERE MAY ALSO BE LIMITERS SET UP TO KEEP YOUR AMPLIFIERS FROM GOING INTO CLIPPING AND PROTECT YOUR SPEAKERS FROM THE HAZARDS OF A CLIPPED SIGNAL. YOUR AMPLIFIERS PLAY A VITAL ROLE IN SYSTEM SETUP, BECAUSE THEY ARE LAST ITEM IN THE CHAIN BEFORE YOUR SPEAKERS AND OFFER THE GREATEST AMOUNT OF GAIN (THAT IS THEIR JOB AFTER ALL). IF YOUR LIMITERS AND AMPLIFIERS ARE INCORRECTLY SETUP YOU WILL NOT BE USING YOUR SYSTEM TO ITS FULLEST POTENTIAL AND COULD BE HARMING YOUR SPEAKERS.

## OPERATING PAGES

### INPUT/MAIN MENU SCREEN

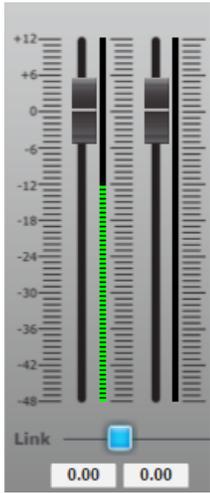
#### GAIN

THE GAIN IS ADJUSTED IN STEPS (0.01dB) AND CAN BE SET VIA THE LEFT (CHANNEL ONE INPUT) AND RIGHT (CHANNEL TWO INPUT) CHANNEL INPUT VIRTUAL FADERS ON THE PC OR MAC INTERFACE. THE OUTPUT LEVEL CAN ALSO BE ADJUSTED FROM THE MAIN MENU PAGE BY USING THE FAR RIGHT SINGLE VIRTUAL FADER.



## CHANNEL LINK

BY LINKING 2 CHANNELS, THE SETTINGS ARE GUARANTEED TO BE IDENTICAL FOR BOTH CHANNELS, EXCEPT FOR MIXER AND MUTE.



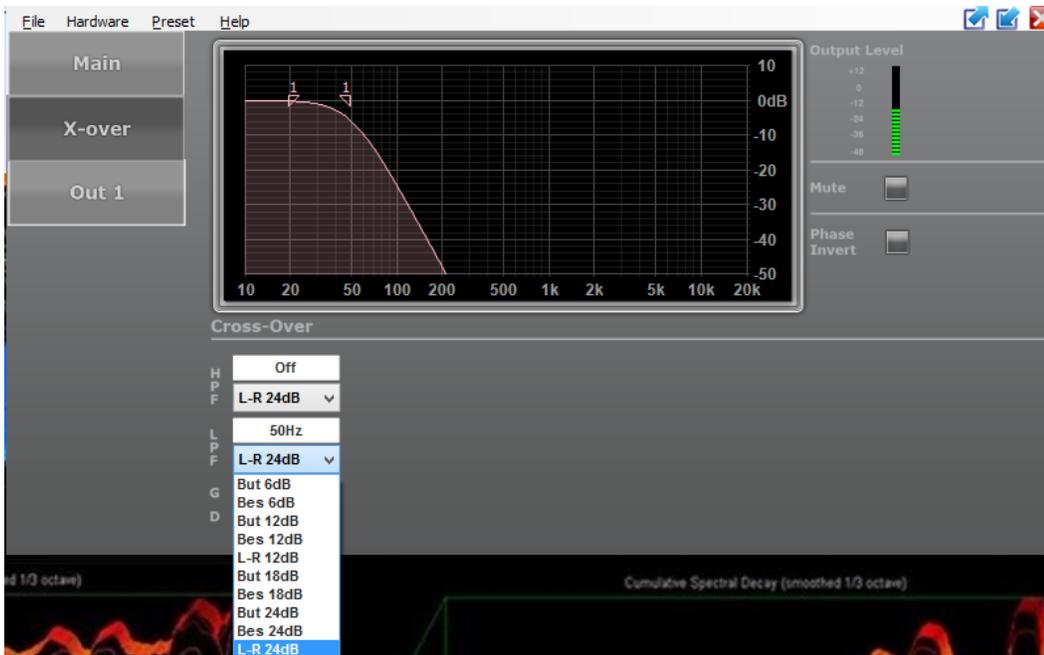
## X-OVER SCREEN

LOW PASS FILTER/ HIGH PASS FILTER

YOU CAN CHOOSE FROM: BUTTERWORTH 6DB, BESSEL 6DB, BUTTERWORTH 12DB, BESSEL 12DB, LINKWITZ RILEY 12DB, BUTTERWORTH 18DB, BESSEL 18DB, BUTTERWORTH 24DB AND BESSEL 24DB.

YOU ALSO HAVE OPTIONS FOR GAIN, DELAY, MUTE AND PHASE INVERSION.

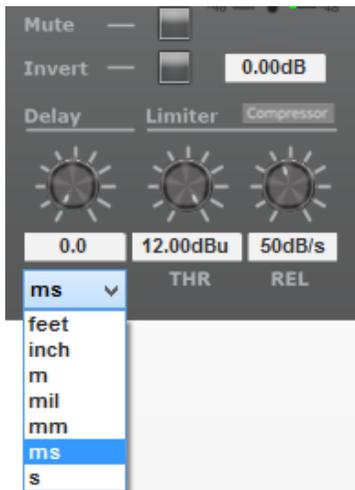
THIS CAN ALSO BE CHANGED FROM THE BOTTOM OF THE OUTPUT SCREEN (SEE OUTPUT DISPLAY SCREEN).



## OUTPUT DISPLAY SCREEN

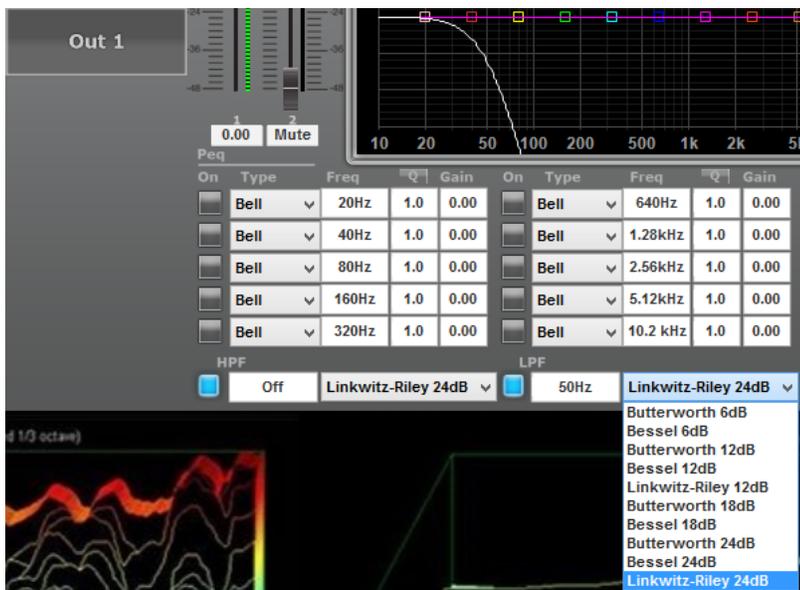
### DELAY

DISPLAYED IN UNIT OF MS OR S, MM OR M, FEET, INCHES, OR MILS:



### LOW PASS FILTER/HIGH PASS FILTER

YOU CAN CHOOSE FROM: BUTTERWORTH 6DB, BESSEL 6DB, BUTTERWORTH 12DB, BESSEL 12DB, LINKWITZ RILEY 12DB, BUTTERWORTH 18DB, BESSEL 18DB, BUTTERWORTH 24DB AND BESSEL 24DB.



### PARAMETRIC EQUALIZER (PEQ)

THERE ARE TEN BANDS OF PARAMETRIC EQUALIZATION. EACH BAND CAN BE ADJUSTED FREELY OVER THE COMPLETE FREQUENCY RANGE OF 20 HZ TO 20 KHZ. THE AVAILABLE PARAMETERS ARE: FREQUENCY (20 HZ TO 20 KHZ), GAIN (-12DB TO +12DB), Q (0.2 TO 25), ENABLED (ON OR OFF), TYPE (BELL, HIGH SHELF, LOW SHELF, NOTCH, ALL PASS, BAND PASS, HIGH PASS, LOW

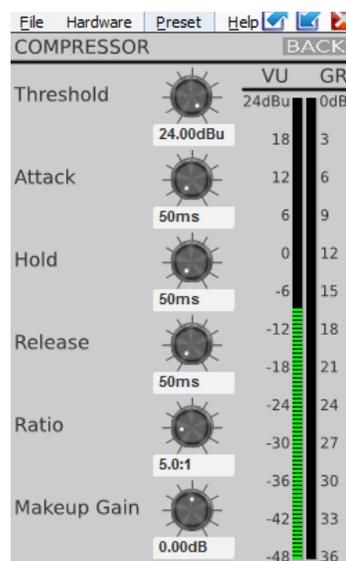
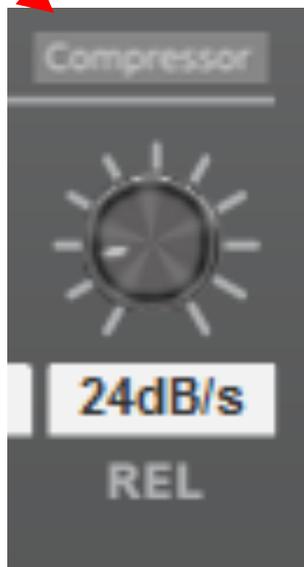
PASS). FOR THE SHELving FILTERS, THE Q VALUE SETS THE STEEPNESS OF THE FILTER IN DB/OCT.

On	Type	Freq	Q	Gain	On	Type	Freq	Q	Gain
<input type="checkbox"/>	Bell	20Hz	1.0	0.00	<input type="checkbox"/>	Bell	640Hz	1.0	0.00
<input type="checkbox"/>	Bell	40Hz	1.0	0.00	<input type="checkbox"/>	Bell	1.28kHz	1.0	0.00
<input type="checkbox"/>	Bell	80Hz	1.0	0.00	<input type="checkbox"/>	Bell	2.56kHz	1.0	0.00
<input type="checkbox"/>	Bell	160Hz	1.0	0.00	<input type="checkbox"/>	Bell	5.12kHz	1.0	0.00
<input type="checkbox"/>	Bell	320Hz	1.0	0.00	<input type="checkbox"/>	Bell	10.2 kHz	1.0	0.00

### COMPRESSOR

THE COMPRESSOR IS A TRUE RMS COMPRESSOR. THE AVAILABLE PARAMETERS ARE: THRESHOLD, ATTACK, HOLD, RELEASE, RATIO, AND MAKEUP GAIN.

TO ACCESS CLICK ON THE GREY COLORED VIRTUAL BUTTON LABELED "COMPRESSOR"



### LIMITER

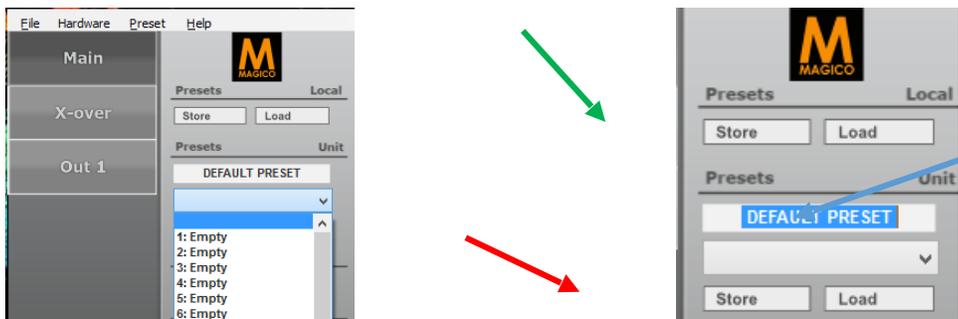
THE LIMITER IS A ZERO-ATTACK PEAK LIMITER. ONLY THE THRESHOLD AND RELEASE CAN BE SET. THE RELEASE VALUE IS DISPLAYED IN DB PER SECOND.



## SAVE PRESET

TO SAVE A SINGLE PRESET- SELECT AN EMPTY PRESET SLOT FROM THE DROP DOWN MENU; AND ENTER THE NAME YOU WISH TO CALL YOUR PRESET IN THE NAME LOCATION (WHERE IT SAYS "DEFAULT PRESET"). THEN PRESS THE "STORE" BUTTON THAT IS UNDERNEATH THE PRESET DROP DOWN. NOT THE STORE BUTTON ABOVE THE DROP DOWN MENU- THIS "STORE" BUTTON WILL STORE ALL OF YOUR PRESETS YOU MADE. YOU SHOULD USE THIS BACK UP "STORE" BUTTON AFTER YOU HAVE MADE ALL THE PRESETS YOU WOULD LIKE DURING YOUR Q-SUB SETUP SESSION OR ANY FUTURE SESSION. THIS WILL ALLOW YOU TO CREATE A BACK-UP FILE TO RECOVER YOUR PRESETS FROM.

WHEN SETTING A PRESET IN AN EMPTY SLOT IT IS GOOD TO KNOW THAT, THE PRESET IN THAT LOCATION WILL BE OVERWRITTEN. THIS ACTION CANNOT BE UNDONE BUT YOU CAN EDIT AND STORE OVER YOUR PRESET IF YOU NEED TO MAKE CHANGES. NOW YOUR PRESET IS SAVED IN THE SELECTED LOCATION. THE PRESETS CONTAIN ALL FILTER, DYNAMICS, GAIN SETTINGS ETC; IN OTHER WORDS EVERYTHING THAT MAKES OUT A LOUDSPEAKER CONFIGURATION. PRESETS DO NOT CONTAIN THE NAME OF THE UNIT, NETWORK CONFIGURATION, AUTOMATIC STANDBY DELAY, USER ACCESS RIGHTS AND PASSWORDS.



## LOAD PRESET

THE PRESET IS LOADED AND ALL SETTINGS ARE APPLIED IMMEDIATELY. ALL SETTINGS THAT WERE IN THE UNIT PRIOR TO LOADING THE PRESET WILL BE ERASED. THIS ACTION CANNOT BE UNDONE. SO MAKE SURE TO SAVE YOUR SETUPS IN PRESET SINGLES OR LARGE PRESET BACK-UPS.

## ACCESS LEVEL

THE DSP HAS THE OPTION OF LOCKING AWAY THE FRONT PANEL CONTROLS TO AVOID TAMPERING OF SETTINGS BY UNAUTHORIZED PERSONS. TO LOCK THE UNIT, SELECT "LOCK UNIT" FROM THE "HARDWARE" DROP DOWN MENU AT THE TOP OF THE SCREEN.

THE SYSTEM WILL ASK YOU TO ENTER A PASSWORD.

ATTENTION: MAKE SURE TO REMEMBER THE PASSWORD! WHEN THE UNIT IS LOCKED AND YOU FORGOT THE PASSWORD, IT IS NOT POSSIBLE TO UNLOCK IT WITHOUT CONTACTING YOUR LOCAL SERVICE REPRESENTATIVE.

THE DEFAULT FACTORY PASSWORD IS "FACT\_DRY"