

Owner's Manual

RCS 2.2X



Preamplifier / Room Correction System



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WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.		



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.




The lightning with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of "Dangerous Voltage" within the product's enclosure that maybe of sufficient magnitude to constitute a risk of electrical shock to a person.

Important Safety Instructions

1. Read these instructions entirely before installing or operating this equipment.
2. Keep these instructions.
3. Heed all warnings.
4. Do not use this equipment near water or allow it to become wet.
5. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat,; doing so may damage the unit and present a fire hazard.
7. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. If the provided plug does not fit into your outlet, consult an electrician for replacement of the outlet to one that is polarized. To protect against electrical shock, match the wide blade of the polarized plug to the wide slot in the outlet and fully insert the plug.
8. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit the equipment. Do not use this unit with a damaged cord or plug.
9. Only use attachments/accessories specified by the manufacturer.
10. Unplug this equipment during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel.

1. Always unplug the unit from the electrical outlet before cleaning.
2. Do not use abrasive cleaners. Simply wipe the exterior with a clean soft cloth. A small amount of nonabrasive cleaner may be used on the cloth to remove excessive dirt or fingerprints.

Cleaning and Maintenance

The >note<  symbol indicates information very useful or essential to daily operation.

“Note” symbol



Acknowledgments

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The information contained in this document is subject to change without notice.

Registration

IMPORTANT!

Please record your serial number here for future reference. You will need this for future upgrades or should you ever require service on your RCS 2.2X Preamplifier.



RCS 2.2X serial number: _____

Optional modules installed:

DAC-1 analog output / main-channels	:__
DAC-2 analog output / subwoofers	:__
ADC analog input	:__

Table of contents

Safety instructions	4
Acknowledgments/Registration	5
Unpacking the RCS 2.2X	7
Introduction	8
Connecting the RCS 2.2X	10
Front Panel Controls	15
Remote Control	16
Front Panel Display	18
Main screen	18
Saving Menu Settings	19
MAIN menu	20
MODE menu	20
ADC menu	21
DOUT FS menu	21
POL menu	22
TEST menu	22
DISPLAY menu	23
COMM menu	24
CRO menu	24
OPTIONS menu	25
DOUT menu	26
AMP menu	26
CORR menu	27
LEVELS menu	28
DELAYS	28
NAME menu	29
PAREQ menu	30
TONE menu	32
TacT 2.2X Room Correction Software	33
System Requirements	33
Software Installation	33
Microphone Installation	33
Connect your RCS 2.2X to your Computer	34
Quick Setup	35
Update the RCS 2.2X Firmware	40

Unpacking the RCS 2.2X

Carefully remove the RCS 2.2X and accessory kit from the carton and visually check for shipping damage. Contact both the shipper and TacT Audio immediately if the unit shows any sign of damage from rough handling. All TacT Audio equipment is carefully inspected before leaving our factory.

KEEP SHIPPING CARTON AND PACKING MATERIALS for future use or in the unlikely event that the unit needs servicing. If this unit is shipped without the original packing, damage could occur and void the warranty.

Accessories

You should find the following items in the accessory kit:

- one AC mains cord
- RJ11 data cable
- RJ11-to-RS232 adapter
- 15' RS232 cable
- CD-ROM with RCS software
- Measurement microphone
- remote control
- 2 AAA batteries
- this manual

Operating voltage

The RCS 2.2X is designed with an automatic switching power supply. It will operate on **65-265 volts at 50-60hz**. No external settings are required.

The RCS 2.2X has three operating modes:

- **OFF** AC mains power is cut off, either via the rear panel mains switch, or by unplugging it from the wall outlet.
- **STANDBY** The unit is powered but all outputs are muted and the display is off. The unit uses very little current and is "idling" or "sleeping". Use the remote or front panel "STANDBY" button to toggle between ON and STANDBY.
- **ON** Everything is powered and ready to go.

Introduction

Congratulations on your purchase of your RCS 2.2X. You have now acquired the most advanced stereo Preamplifier / Room Correction System ever developed!

The RCS 2.2X has four times the processing power of the famous TacT RCS 2.0 and even better AD and DA conversion. This now combined with new features and a more user-friendly interface takes TacT Audio's room correction to new heights. The RCS 2.2X has no noise and extremely low distortion, yielding amazingly transparent accurate sound. Every effort has been made to make this preamplifier the best that money can buy. Add to this the latest evolution of TacT Audio's room correction technology and the result is absolutely staggering.

Room Correction System

TacT room correction technology has been praised by the press all around the world. Comments like "Wholesale improvement in sound quality" have become a standard phrase for reviewers describing the results that can be achieved with TacT's room correction. Now we have taken room correction technology even further, not only in terms of processing power, but also in terms of the measurement and correction systems. The measurement is now done with a triple pulse for each acquisition. This increases the measurement resolution in both the time and frequency domains. Correction resolution is now four times higher than found in the original RCS 2.0.

Separate Subwoofer Control

One of the most exciting features of the RCS 2.2X is its separate subwoofer output. The RCS 2.2X can be used with one or (preferably) two subwoofers. An electronic crossover can be set with a frequency between 60 and 400 Hz and a slope between 12 dB/octave and 60 dB/octave to split the audio signal between the main and subwoofer outputs. The correction software aligns the sub-woofer(s) with the main speakers in the time domain and in the frequency domain, for completely seamless integration surpassing even the best single-box systems.

With the RCS 2.2X, you can add subwoofers to an existing High End speaker system for substantial sonic improvements. Preferably, the subwoofers should be placed in the corners behind the main speakers. Corner placement of the subwoofers will yield much higher efficiency with significantly reduced low-frequency distortion. But more importantly, the transfer of energy from the sub to the listening position will be much more direct, resulting in vastly improved impulse response. The room correction system will easily compensate for the frequency response variations of the subs introduced by corner placement. It will delay the main speakers for perfect time alignment to within 1/8 of an inch.

Flexible DSP's

The RCS 2.2X offers you the opportunity to add subwoofers to a system and improve the transient response tremendously at the same. This contrasts sharply with the normal result of adding subwoofers to a system: slow – undefined bass with lots of frequency and time behavior problems. If the separate subwoofer outputs are not used, then the RCS 2.2X will use all the processing power on the main speakers.

Modular design

The internal layout of the RCS 2.2X is completely modular. All of the expensive components such as DSP's, D/A and A/D converters are a plug-in type and are placed on a motherboard. This allows for easy and inexpensive future upgrades. Even the rear-panel, including the sockets, can be exchanged to accommodate future interfaces.

True Upgradeability

The front-panel and DSP's are 100% software driven, and improvements or new features can be loaded through the RS232 port with firmware upgrades. *It is our policy to offer software upgrades at no cost, and we therefore encourage you to fill out and submit the enclosed registration card by fax or email (info@tactaudio.com).*

RCS 2.2X Connections

Digital input

The RCS 2.2X has 5 digital inputs:

- Three RCA (S/PDIF)
- One AES/EBU (XLR)
- One TosLink (S/PDIF)

All of the digital inputs supports PCM audio data with sampling rates from 32kHz to 96kHz /16-24 bits however, the **AES/EBU and RCA/coaxial input also supports 192kHz.**



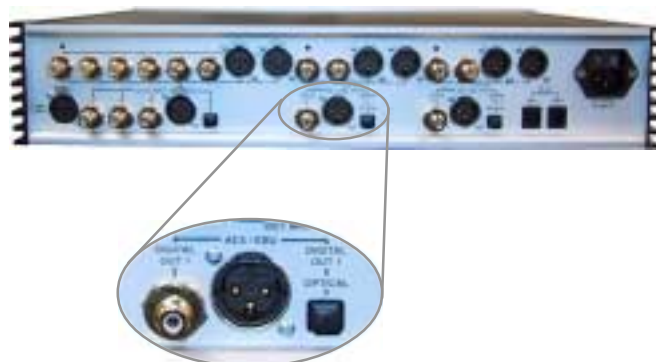
Digital output 1 main channels

The RCS 2.2X has three digital outputs for the main channels :

- One RCA (S/PDIF)
- One AES/EBU (XLR)
- One TosLink

All outputs are 24-bits at 44.1, 48, 88, 96 or 192 kHz sampling rates (TosLink does not support 192kHz). The output sampling rate is set in the “**DOUT**” menu.

The main channel output is used for your main speakers or for Mid/High frequencies when used with subwoofers. Connect one of these outputs to a TacT digital amplifier or external DA converter.



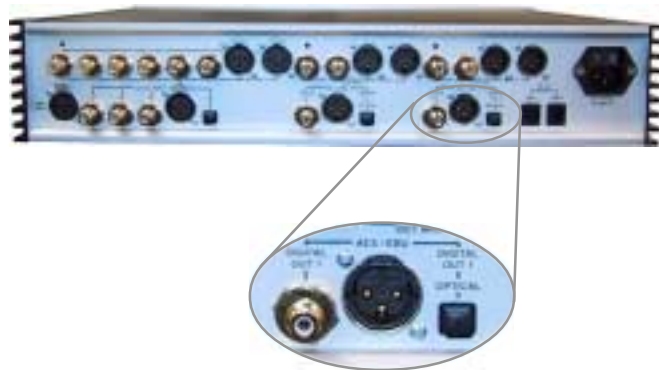
Digital output 2 subwoofers

The RCS 2.2X has three digital outputs for subwoofer(s) :

- one RCA (S/PDIF)
- one AES/EBU (XLR)
- one TosLink

All outputs are 24-bits at 44.1, 48, 88, 96 or 192 kHz sampling rates. The output sampling rate is set in the “**DOUT**” menu. (TosLink does not support 192kHz)

The sub output is for your subwoofer(s) and can be configured for either mono or stereo. Use the “**MODE**” menu to set the appropriate output mode 2.0, 2.1, or 2.2. Connect one of these outputs to a TacT digital amplifier or external DA converter.



Optional modules

The RCS 2.2X is designed to accommodate virtually any input and output needed without adding extra cost for features certain users might not use. There are therefore 3 optional modules that can be installed:

- ADC-converter module for analog inputs such as a Tuner, Cassette deck, VCR etc.
- DAC-converter module for main channels, for example when the RCS 2.2X is used with traditional analog amplifiers
- DAC-converter module for subwoofer(s), for example when the RCS 2.2X is used with analog self-powered subwoofer(s)

These modules are based on the latest 24-bits/192kHz state-of-the-art technology and offer performance far beyond that of most stand-alone converters. Due to the modular design of the RCS 2.2X, these modules can be added any time or exchanged if upgrades should become available.

RCS 2.2X Connections

Analog input (optional ADC module)



The RCS 2.2X has 4 stereo analog inputs when the optional ADC module is installed:

- three analog stereo single ended (RCA)
- one analog stereo balanced (XLR)

NOTE: A/D conversion is always performed at 24-bits/192 kHz.

NOTE: The optional ADC module is required for analog inputs.



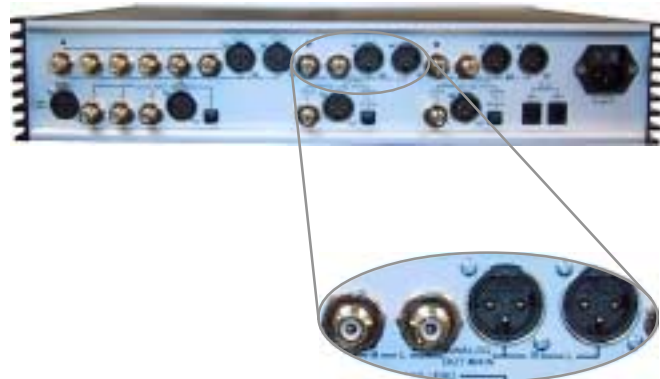
Analog output main channels (optional DAC module)



The RCS 2.2X has 2 stereo analog outputs for main channels when the optional DAC -MAIN module is installed:

- one analog stereo single ended (RCA)
- one analog stereo balanced (XLR)

NOTE: The optional DAC module is required for analog outputs.



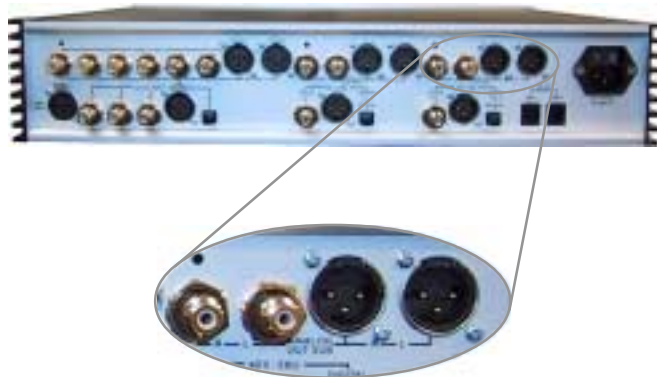
**Analog output
subwoofer(s)
(optional DAC module)**



The RCS 2.2X has 2 analog outputs for subwoofer(s) when the optional DAC-SUB module is installed:

- one analog stereo single ended (RCA)
- one analog stereo balanced (XLR)

NOTE: The optional DAC module is required for analog outputs.



Microphone input



Connect the supplied measurement microphone to the "Mic Input" connector when taking a room measurement for room correction.

CAUTION: To avoid damage through static discharge, we strongly recommend to turn off the RCS 2.2X at the rear panel mains switch before connecting the microphone.



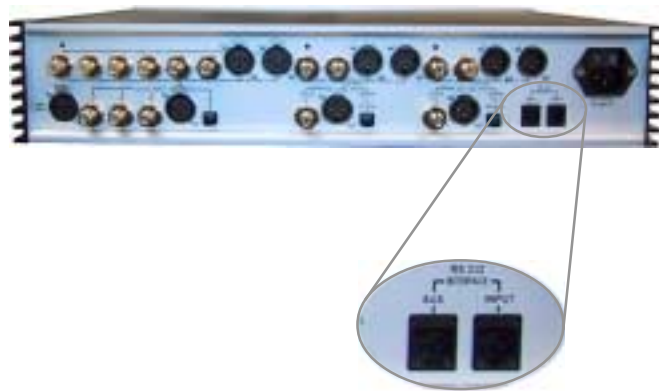
RS-232 interface ports

The RCS 2.2X has two RS232 interface ports:

- INPUT
- AUX

Use the "INPUT" port for communication with your Personal Computer.

Use the "AUX" port to connect to TacT digital amplifiers, or to daisy chain with multiple RS232 components.



AC mains input & mains switch



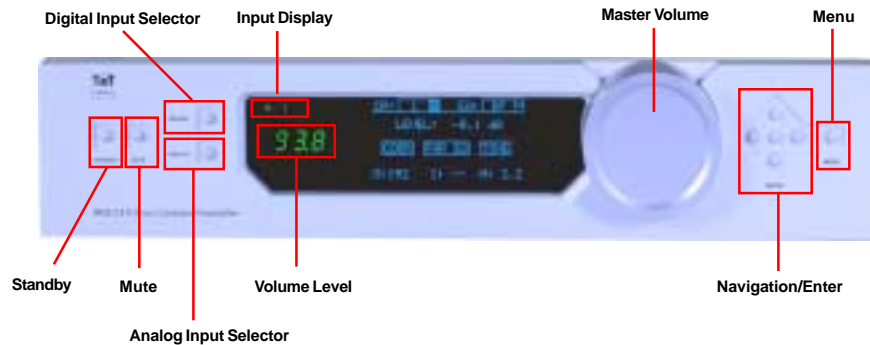
Connect the RCS 2.2X to the AC mains wall socket. Use the mains switch to turn power ON or OFF.

CAUTION: Use the supplied IEC mains cable, or a 3-prong grounded cable only.



Front panel controls

The front panel controls on the RCS 2.2X will allow you to access and control all menu settings.



Standby

Use the “**STANDBY**” button to toggle between Standby mode and ON. The display will indicate Standby mode by displaying a small green light in the left side of the display. When the unit is placed in Standby mode all user settings are saved.

Master volume

The master volume is controlled by turning the “**TacT wheel**”. The green digits on the left side will change as you turn the wheel - this is your master volume level indicator. (The wheel sensitivity, max. volume etc. can be set in the “**OPTIONS**” menu.)

Mute

Use the “**MUTE**” button to mute or un-mute during playback. The volume level indicator will switch to “--” in Mute mode. You can still adjust the master volume while the unit is in Mute mode - the volume level indicator will briefly indicate the level, then switch back to the “--” mute indicator

Digital input selector

Press the “**DIGITAL**” button to select the digital input. This is a toggle switch, and by pressing it multiple times it will toggle through all of the five digital inputs. The selected input will be displayed in the input display portion of the display.

Analog input selector

Press the “**ANALOG**” button to select the analog input. This is a toggle switch, and by pressing it multiple times it will toggle through all of the four analog inputs. The selected input will be displayed in the input display portion of the display.



NOTE: Please note that the optional ADC module is required for analog inputs.

Menu

Press the “**MENU**” button to access the front panel menu system.

Navigation/Enter

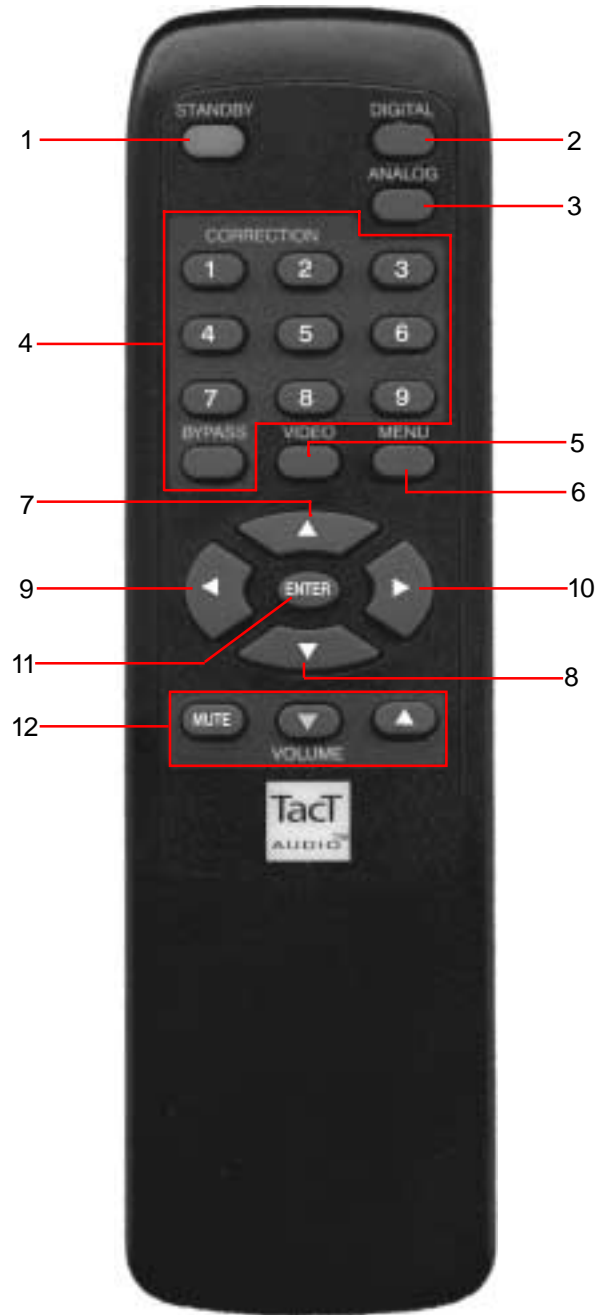
Use the navigational buttons to navigate the options and select with the middle “**Enter**” button .



NOTE: The remote and front panel controls are disabled whenever a Personal Computer is connected and the Room Correction or ParEQ software is running. To enable the remote and front panel controls press the “DIGITAL” and “ANALOG” input selector simultaneously.

Remote Control

The remote control is used to access the front panel display controls and menus.



1 - STANDBY

The STANDBY button will turn the RCS 2.2X on or it will place it into standby mode. When in stand by mode, the unit is placed into a low power “idling” state. The standby button is also used to save changes that were made in the menu parameters. By placing the unit into standby mode the current menu settings are saved.

2 - DIGITAL

The DIGITAL button will scroll sequentially, allowing the selection one of the 5 digital inputs.

3 - ANALOG

The ANALOG button will scroll sequentially, allowing the selection one of the 4 analog inputs.

4 - CORRECTION block

The CORRECTION block consists of 10 buttons. The buttons are numbered from 1 to 9 and one BYPASS. Pressing the BYPASS button will place room correction into bypass mode – no correction. Pressing any of the remaining nine buttons will engage the corresponding room correction preset.

5 - MENU

The MENU button will switch the front panel display from the status screen to the main menu screen.

6. VIDEO

The VIDEO button is inactive with this unit.

7. UP

The UP navigational button is used to select menu options and/or change their values.

8. DOWN

The DOWN navigational button is used to select menu options and/or change their values.

9. LEFT

The LEFT navigational button is used to select menu options and/or change their values.

10. RIGHT

The RIGHT navigational button is used to select menu options and/or change their values.

11. ENTER

The ENTER button will select the menu option currently marked by the blinking cursor or enter an edited parameter.

12. VOLUME Block

The VOLUME block consists of three buttons.

The “MUTE” button will mute/un-mute all enabled channels.

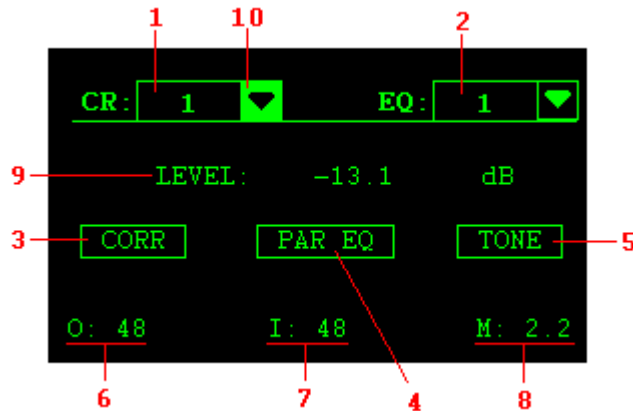
The “UP” button will increase the master volume level

The “DOWN” button will decrease the master volume level.

Front Panel Display

Main screen

When the RCS 2.2X is powered on the main screen will be displayed.



To move the cursor indicator (10) use the front panel or remote control navigation buttons. To select an option press the “ENTER” button.

- 1 - Correction preset selection
- 2 - EQ preset selection
- 3 - Correction menu option
- 4 - Parametric EQ menu option
- 5 - Tone control menu option
- 6 - Output sampling frequency indicator
- 7 - Input sampling frequency indicator
- 8 - RCS 2.2X operating mode
- 9 - Master level in dB
- 10 - Cursor indicator.

Correction preset selection

To select one of the nine correction presets or bypass them use the “LEFT” or “RIGHT” navigation buttons to position the cursor over CR (1). Once the cursor is positioned over CR (1) press the “ENTER” button. The system will then display a pull down list containing all presets. Use the “UP” and “DOWN” navigation buttons to point to the desired correction preset and then press the “ENTER” button. This action will engage the selected preset and display the new selection in the CR box (1). Once the cursor is positioned over CR (1) you can also select a correction preset by pressing one of the ten buttons located in the block labeled “CORRECTION” on the remote control.

EQ preset selection

To select one of sixteen parametric EQ presets or bypass them use the “LEFT” or “RIGHT” navigation buttons to position the cursor over EQ (2). Once the cursor is positioned over EQ (2) press the “ENTER” button. The system will then display a pull down list containing all presets. Use the “UP” and “DOWN” navigation buttons to point to the desired EQ preset and then press the “ENTER” button. This action will engage the selected preset and display the new selection in the EQ box (2). Once the cursor is positioned over EQ (2) you can also select a correction preset by pressing one of the ten buttons located in the block labeled “CORRECTION” on the remote control.

Note: with the remote control you can only select first nine presets. To select the rest you must use front panel controls.



Correction menu option

Move the cursor to the CORR (3) option and press the “ENTER” button to enter the main room correction menu.

Parametric EQ menu option

Move the cursor to the PAR EQ (4) option and press the “ENTER” button to enter the main parametric EQ menu.



Note: An EQ preset must be enabled from the main screen for the PAR EQ and TONE menus to be active. If the EQ preset is set to “BP” the PAR EQ and TONE controls are disabled.

Tone control menu option

Move the cursor to the TONE (5) option and press “ENTER” button to enter the tone control screen.

Output sampling frequency indicator

This displays the currently selected output sampling frequency. The output sampling frequency is can be modified in the “OUT-FS” general menu option.

Input sampling frequency indicator

This displays the sampling frequency of the currently selected digital input. The RCS 2.2X will automatically detect input signal presence and display its sampling frequency.

RCS 2.2X operating mode

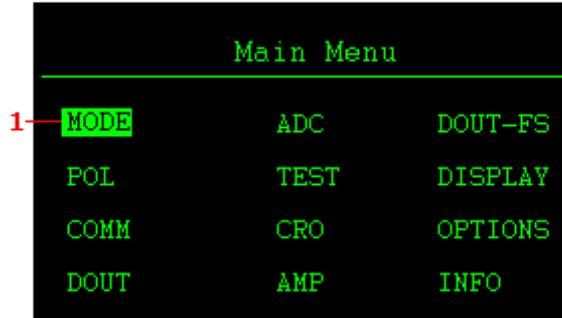
This displays the systems operating mode. The operating mode can be modified from the “MODE” general menu option.

**Saving Menu Settings**

Custom settings that are made to any of the menu selections can be saved by placing the RCS 2.2X into standby mode. If you make changes to any of the menu items and turn the unit off before placing the unit into standby mode all settings will be lost. To place the RCS 2.2X into standby mode press STANDBY button found on the front panel of the unit or the red “STANDBY” button on the remote control.

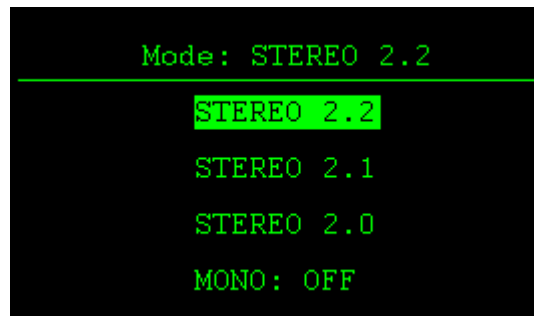
MAIN menu

The main menu screen lists all of the RCS 2.2X general menus. To highlight a menu option(1) use the navigational buttons. To enter a highlighted option press the "ENTER" button.



MODE menu

The RCS 2.2X can be set to one of four operating modes. To highlight an option use the navigational buttons. To enter a highlighted option press the "ENTER" button.



- STEREO 2.2

This mode produces 4 output signals. Left, Right, Left SUB, and Right SUB.

- STEREO 2.1

This mode produces 3 output signals. Left, Right and one SUB signal. In this mode the SUB signal is mono and is output to both the Left SUB and Right SUB outputs.

- STEREO 2.0

This mode produces 2 output signals. This is standard two channel stereo mode. In this mode there is no signal at the subwoofer outputs.

- Mono

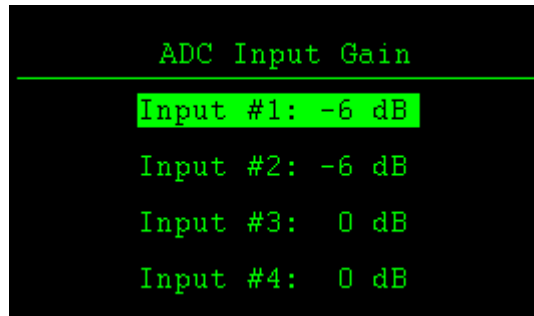
This option can be set to ON or OFF. When set to ON the system will output the same signal for both the Left and Right channels.

**ADC menu
(optional ADC module)**



The RCS 2.2X can be equipped with a state of the art Analog to Digital Converter (ADC module optional) . To further enhance the converters performance, the system offers two selectable gain values for the ADC input stage. These values can be assigned to each input independently.

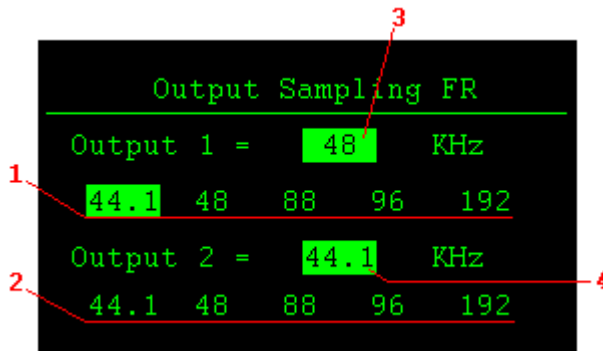
NOTE: The optional ADC module is required for analog inputs.



To select an option use the “UP” and “DOWN” navigation buttons and to change its value press the “ENTER” button to toggle between the -6dB and 0 dB selections.

DOUT-FS menu

The RCS 2.2X is equipped with a sample rate converter on each digital output. Each output can independently be set to 44.1, 48, 88, 96 and 192 KHz sampling frequencies.



To set the sampling frequency for digital output 1, use the “LEFT” or “RIGHT” navigational buttons to highlight the desired option (on line 1) and then press the “ENTER” button to make the selection. The new sampling frequency will be displayed in block (3).

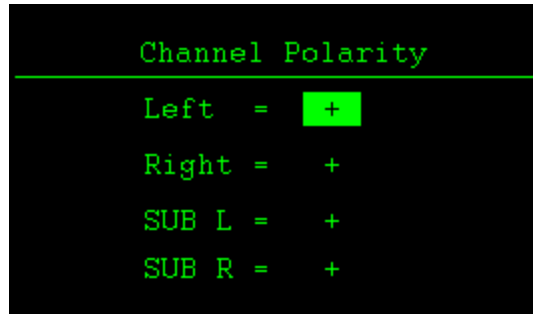
To set the sampling frequency for digital output 2, use the “LEFT” or “RIGHT” navigational buttons to highlight the desired option (on line 2) and then press the “Enter” button to make the selection. The new sampling frequency will be displayed in block (4).



NOTE: This menu does not affect the analog output sampling frequency.

POL menu

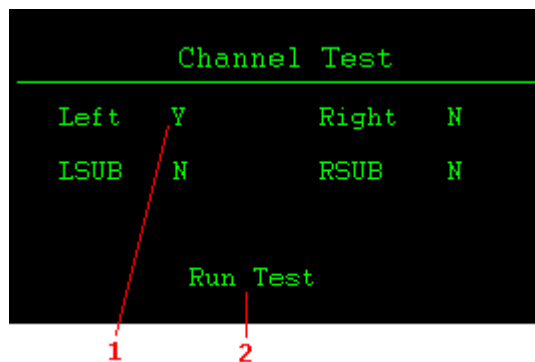
The polarity menu allows for an independent polarity setting for each channel. Each channel can be set to “+” (0) or “-” (inverted).



To select an option use the “UP” and “DOWN” navigational buttons and to change its value press the “ENTER” button to toggle between a “+” or “-” setting.

TEST menu

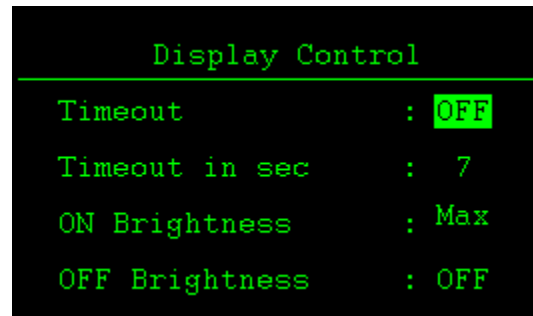
The test menu is designed to allow for a quick system check. When engaged it will produce pink noise on all selected channels (1). When a channel is set to “Y” pink noise will be heard from that channel when “Run Test” is selected.



To highlight an option use the “UP” and “DOWN” navigational buttons and then press “ENTER” button to make your selection. After all selections are made, highlight the “Run Test” option and hold down the “ENTER” button to produce the test signal. The test tone will stop when the “ENTER” button is released. Press the “MENU” button to exit this menu.

DISPLAY menu

The display menu allows for control over the front panel display appearance. To select an option use the "UP" or "DOWN" navigational buttons and then use the "LEFT" and "RIGHT" buttons to change the value.



- **Timeout** - This option is used to turn the front panel timer "ON" or "OFF". When this option is "ON" the front panel timer will count the number of seconds specified by the **Timeout in sec** option, and then turn the display OFF or dim it to a level specified by **OFF Brightness** option.

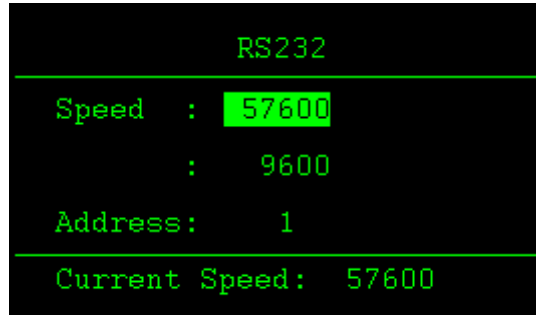
- **Timeout in sec** - This option is used to set the number of seconds that the display will remain on before turning off or dimming after accessing an option on the front panel display. This parameter can be set to a value from 3 to 30 seconds. For example if it is set to 15 seconds the front panel timer will count 15 seconds and then turn the display OFF or dim it to a level specified by **OFF Brightness** option.

- **ON Brightness** - This option determines the front panel brightness after the unit is powered on or an option on the front panel display is accessed. This parameter can be set to any value between 1 and MAX(16).

- **OFF Brightness** - This option determines the front panel brightness after timeout has expired. This parameter can be set to any value between OFF (0) and MAX(16).

COMM menu

The communication menu allows for the RS232 baud rate selection and device address assignment. By default the RCS 2.2X is set to baud rate of 57600.



To change the system baud rate use the “UP” and “DOWN” navigational buttons to highlight the desired baud rate and then press the “ENTER” button to select it. The new baud rate will be displayed on the bottom of the screen.

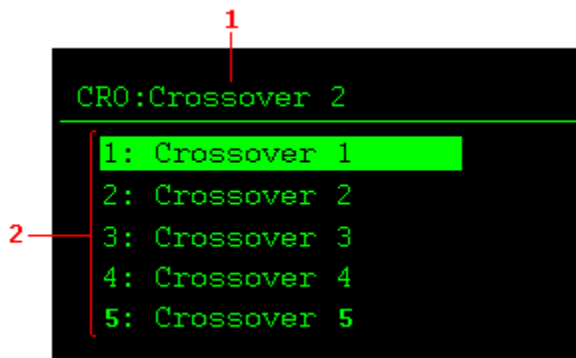
To change the system device address highlight the “Address” option and then using the “LEFT” and “RIGHT” navigational buttons select the desired system address. The RCS 2.2X is shipped with the default address set at 1.



NOTE: If you change the device address make sure that you select the appropriate device address in the RCS 2.2X Room Correction software.

CRO menu

The crossover menu offers five crossover selections options for use in bypass mode only. Crossovers in correction mode are implemented into the correction filter via the RCS software. To highlight an option use the “UP” and “DOWN” navigational buttons. To make a selection press the “ENTER” button. The selected option will be displayed on the top of the screen(1).

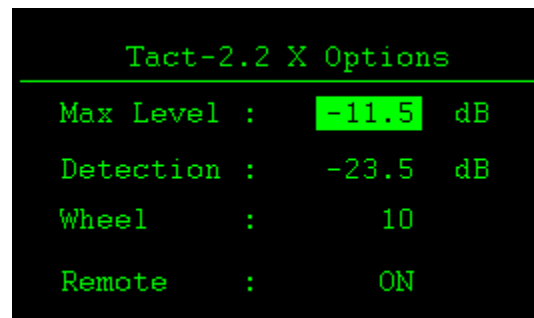


When an option is selected the system will load the crossover filter and resume to normal operation. Crossover filters are user programmable from the Crossover screen in the Room Correction Software.

Crossover names are also user programmable from the Crossover screen in the RCS software. For crossover names you should choose symbolic names that somehow relate to the crossover filter characteristics.

OPTIONS menu

The options menu allows for control of the systems maximum signal level, signal detection threshold (SDTH), wheel speed, and remote control. To select an option highlight it using the “UP” and “DOWN” navigational buttons. To modify a selected option use the “LEFT” and “RIGHT” buttons.



- **Max Level** - This option controls the systems maximum signal level. For example, if this option is set to -3.0 dB, the volume control can not go above -3.0 dB.

- **Detection** - This option sets the signal detection threshold. If the absolute value of the Left or the Right channel signal goes above this threshold the red signaling dot will be displayed on the front panel below the master volume display. This feature can be used to indicate signal presence on either channel or to indicate near clip condition. To use it as a signal presence indicator set the **Detection** to a value close to -90.0 dB. To use it as near clip indicator set the **Detection** to a value close to 0.0 dB.

NOTE: This light does not indicate clip condition.

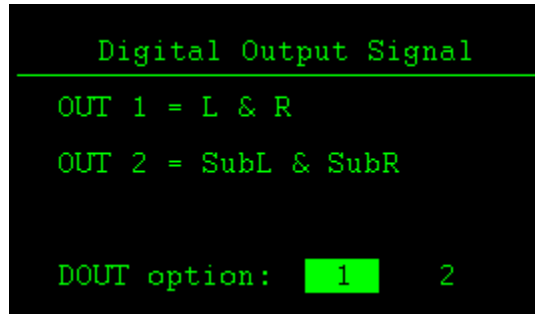
- **Wheel** - This option sets the wheel sensitivity. The wheel sensitivity can be set to between 1 and 10 or to “OFF” to disable the Wheel for volume control. The lower the setting the slower the volume increases and the higher the setting the faster the volume increases with each turn of the Wheel.

- **Remote** - This option enables and disables the remote control. Once the remote control is disabled the unit can only be controlled from the front panel.



DOUT menu

The DOUT menu offers two options. Option "1" will force the system to output Left and Right channel signals at digital output 1, and Left SUB and Right SUB channel signals at digital output 2. Option "2" will output Left main channel and Left subwoofer at digital output 1 and Right main channel and Right subwoofer at digital output 2.

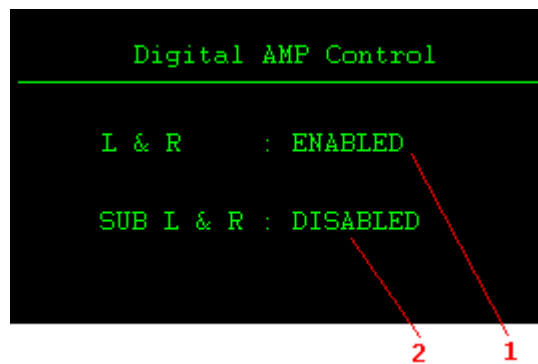


This menu is designed to support TACT digital amplifiers. In many stereo systems digital amplifiers are used to power both main channels and subwoofers. You would use option "1" if both Left and Right channel are connected to the same amplifier, and both Left SUB and Right SUB channel are connected to the same amplifier. In the case where one main channel and one SUB are connected to the same amplifier you need to select option "2". To select one of the options, use the "LEFT" or "RIGHT" navigational buttons to position the cursor over the desired option and press the "ENTER" button to select it.



AMP menu

The AMP menu is designed to allow the RCS 2.2X to interface with the TacT M2150 or S2150 digital amplifiers. The RCS 2.2X can control multiple digital amplifiers. **This setting should be ENABLED only if you have a Tact digital amplifier attached to the RCS 2.2X.**



For example, one amplifier can be used for main left and right channel and second one can be used for the left and right subwoofer channels. If two TacT digital amplifiers are connected, both options (1) and (2) should be set to **ENABLED**. If one Tact digital amplifier is connected only one option should be set to **ENABLED** and the other one should be set to **DISABLED**. Enable should only be set for the output that uses Tact digital amplifiers.

To change the settings use the "UP" and "DOWN" navigational buttons to highlight the option and then press the "ENTER" button to change the setting.

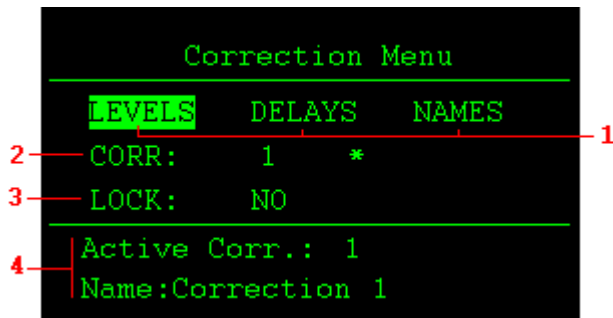


CORR menu

NOTE: When a TacT digital amplifier is controlled by the RCS 2.2X, all of the amplifiers front panel and IR controls are disabled. Use the RS232 port and/or daisy chain to link the components.

CAUTION: The AMP setting should only be set to **ENABLED** if you have TacT amplifiers connected to the RCS 2.2X. When the AMP option set to **ENABLED** both the analog and digital output will output a full level signal regardless of the RCS 2.2X master volume setting. If you do not have TacT amplifiers connected to your system you will not be able to control the output level from the RCS 2.2X volume control. The output is sent at its maximum level and can result in damage to your speakers.

The correction menu allows for control of all the room correction parameters. To highlight an option use the navigation buttons and select it by pressing the “**ENTER**” button.



1 - LEVELS , DELAYS and NAMES are menu options. To enter one of these menu options highlight it using the navigation buttons and then press the “**ENTER**” button to select it.

2 - CORR - This option allows for correction selection. When this option is highlighted use the “**LEFT**” and “**RIGHT**” navigation buttons to scroll through all possible correction presets. To select the displayed preset press the “**ENTER**” button. Note that the “*” character indicates the currently selected correction preset.

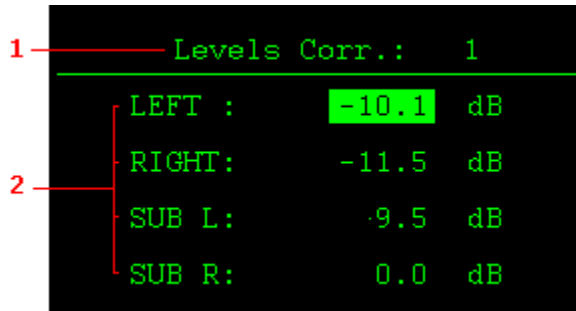
3 - LOCK - This option allows you to lock the correction preset setting. When this option is highlighted use the “**ENTER**” button to toggle between the “**YES**” and “**NO**” options. When “**YES**” is displayed the selected room correction preset is locked and can not be changed by either front panel or remote control.

4 - Active Corr. - This displays the currently selected room correction preset number.

4 - Name - This displays the currently selected room correction symbolic name.

LEVELS menu

The level menu allows for control of the system channel balancing. You can adjust the system balance by changing the attenuation on any of the four output signals. To highlight an option use the “UP” and “DOWN” navigational buttons. To change the current value use the “LEFT” and “RIGHT” buttons.



- 1 - Currently selected correction option.
- 2 - Individual channel level settings.



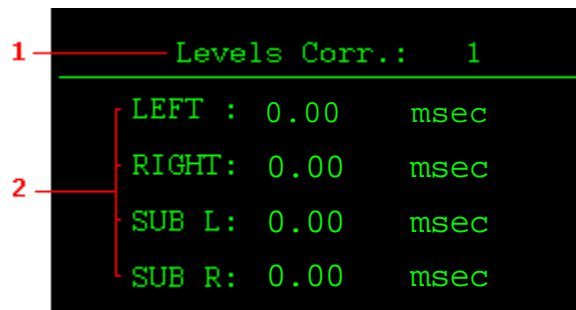
NOTE: The RCS 2.2X provides a unique set of four levels (Left, Right, SUB Left and SUB Right) for each room correction preset including bypass.



NOTE: These levels are automatically adjusted for correction mode. We strongly recommend that you only adjust the levels for Bypass mode - this will allow you to match the level with correction mode.

DELAYS menu

The delay menu allows for control of the systems time alignment. You can adjust the system time alignment by changing the delay time on any of the four outputs. To highlight an option use the “UP” and “DOWN” navigational buttons and to change the current value use the “LEFT” and “RIGHT” buttons.



- 1 - Currently selected correction option.
- 2 - Individual channel delay time settings.



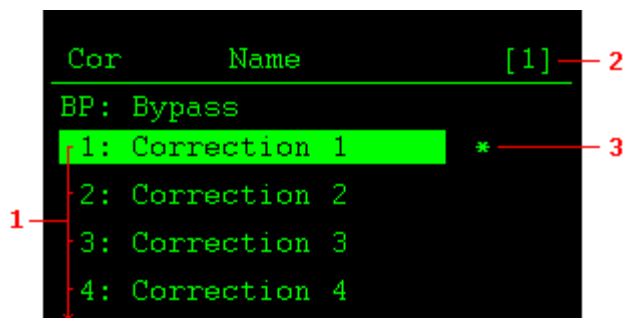
NOTE: The RCS 2.2X provides a unique set of four delay times (Left, Right, SUB Left and SUB Right) for each room correction preset including bypass.



NOTE: System balancing is automatically implemented by the room correction software. You would change these parameters only if you needed additional adjustments.

NAME menu

The name menu allows for selection of Room Correction presets based on their symbolic names rather than based on their numbers. To highlight an option use the “UP” and “DOWN” navigational buttons to select a highlighted option and press the “ENTER” button.



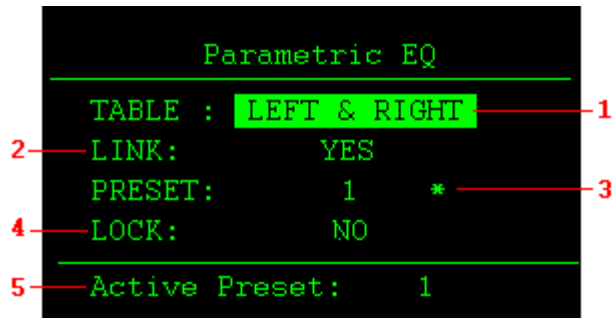
- 1 - Available correction presets and their names. Keep scrolling down for more presets.
- 2 - Currently selected correction preset.
- 3 - "*" - Active correction preset indicator.

Parametric EQ menu



The Parametric EQ menu is used to apply up to twelve bands of parametric equalization for the left and right channels. The EQ processing can be applied in two different ways. Both the left and right channels can be linked together to apply processing globally, or both the left and right channels can be processed independently for unique settings for each channel.

Note: An EQ preset must be enabled from the main screen for the PAR EQ and TONE menus to be active. If the EQ preset is set to “BP” the PAR EQ and TONE controls are disabled.



- 1 - **TABLE** menu option. To enter the TABLE menu screen highlight and select either the “**LEFT & RIGHT**”, “**LEFT**”, or “**RIGHT**” selections and then press the “**ENTER**” button. The available selection will be determined by the setting of the **LINK** option explained below.
- 2 - **LINK** menu option. This option determines if the left and right channels are linked to the same EQ filters. If “**NO**” is selected the channels are not linked and each channel has a separate set of EQ filters. If “**YES**” is selected the channels are linked and there will be only one set of filters used for both the left and right channels. To change the **LINK** setting highlight the current **LINK** selection and press the “**ENTER**” button to toggle between the **YES** and **NO** selections.
- 3 - **PRESET** menu option. This option allows for EQ preset selection. The “*” character indicates the current preset. To select a new preset highlight the **PRESET** option and by use the “**LEFT**” and “**RIGHT**” buttons to scroll through available presets. When the desired preset is displayed press the “**ENTER**” button to select it.
- 4 - **LOCK** menu option. This option is used to lock the current parametric EQ preset. When set to **YES** the parametric EQ preset can not be changed. To change the **LOCK** setting highlight the current **LOCK** selection press the “**ENTER**” button to toggle between the **YES** and **NO** selections.
- 5 - **Active Preset** display. This displays the preset that is currently loaded into the system. This is not a selectable menu option.

Parametric EQ Table - Linked

This is an example of the linked parametric EQ filter table. Its display allows for adjustment of all filter parameters: Level, center frequency and Q factor. The filter parameters will be applied globally to both the left and right channels.

FL	Lev	Fr	Q
1:	0.0	20.0	4.0
2:	-1.1	31.5	4.0
3:	2.3	50.0	4.0
4:	0.0	80.0	4.0

- 1 - Indicates that this table is for linked filters.
- 2 - Current parametric EQ preset.
- 3 - Filter order. For more filters scroll down the list.

To change a parameter first highlight it and press the “**ENTER**” button. Then use the “**LEFT**” and “**RIGHT**” navigational buttons change the parameter value.

Parametric EQ Table - Not Linked

This is an example of the left channel parametric EQ filter table. Its display allows for adjustment of all filter parameters: Level, center frequency and bandwidth and they will be applied independently to the left channel. There is a similar table for the right channel. You can enter the right channel table from the previous menu.

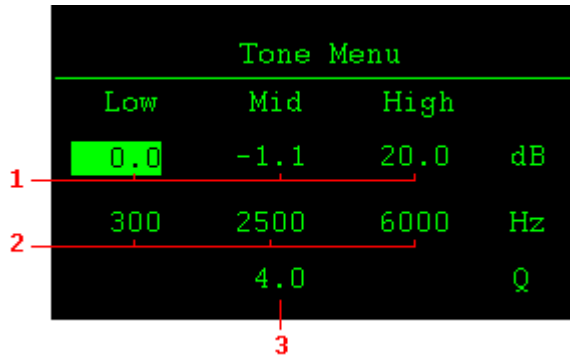
FL	Lev	Fr	Q
1:	0.0	20.0	4.0
2:	-1.1	31.5	4.0
3:	2.3	50.0	4.0
4:	0.0	80.0	4.0

- 1 - Indicates left or right channel filter table.
- 2 - Current parametric EQ preset.
- 3 - Filter order. For more filters scroll down the list.

To change a parameter first highlight it and press the “**ENTER**” button. Then use the “**LEFT**” and “**RIGHT**” navigational buttons change the parameter value.

TONE menu

The tone menu allows for easy and very detailed system tonal control. Use the navigation buttons to highlight an option. To select the highlighted option press the “ENTER” button. To modify the selected option use the “UP” and “DOWN” navigational buttons. To deselect the selected option press the “ENTER” button again.



- 1 - Level control is used to set the low, mid and high frequency filter attenuation. Filter level is given in dB and can be changed in increments of 0.1 dB. Maximum filter level is 12 dB and the minimum filter level is -12.0 dB.
- 2 - Frequency Control is used to set the cutoff frequency for the low and high frequency filters and to set the center frequency for mid (bandpass) filter.
- 3 - Q (Octave) control sets the filter bandwidth for the mid filter.



Note: An EQ preset must be enabled from the main screen for the PAR EQ and TONE menus to be active. If the EQ preset is set to “BP” the PAR EQ and TONE controls are disabled.

TacT 2.2X Room Correction Software

The RCS 2.2X employs some of the most advanced audio-software ever developed. In order to use the proprietary TacT Room Correction System, you will have to install the supplied software on your computer. Complete instructions for using the room correction software can be found in the online help available in the software. To make the room correction process easier for the first time user there is a Quick Setup feature that is described later in this manual.

System requirements

Your computer system must meet the following requirements:

- An IBM compatible PC with Pentium 100 MHz, 64 MB Ram & 100 MB free hard disk space or better
- Microsoft Windows 98, ME, 2000 or XP
- Operating system regional setting must be set to "English(United States)"
- Microsoft Windows-compatible graphics-card and monitor with screen resolution 800x600 or better
- CD-ROM drive
- Microsoft windows compatible 2- or 3- button mouse
- Standard RS-232 serial port with DB-9 connectors

Software Installation

Follow the steps below to install the TACT 2.2X Room Correction Software:

- 1 - Start windows and insert the TacT software CD into your CD-ROM drive.
- 2 - Double-click on the "**My Computer**" icon on the desktop.
- 3 - Double-click on the CD icon to launch the CD browser.
- 4 - Double-click on "**Tact 2.2X vx.x.exe**" and follow the instructions.

After the installation you will have the option to launch the RCS software. If you would like to launch the program at this time when prompted, select "**Launch TacT-RCS2.2X**" and the software will start. You should now see the TacT 2.2X Room Correction System main-screen.

Start The Room Correction software

To start the software go to the Windows "**Start**" menu, select "**Programs**" then "**TacT-2.2 X**" and click on the "**TacT-2.2 X**" icon. You should now see the TacT 2.2X Room Correction System main screen.

Microphone Installation

All TacT measurement microphones are individually calibrated to perform with the highest accuracy and come with a unique calibration file. This file needs to be installed before you perform the correction process. The microphone can be enabled or disabled by clicking on the "mic:" display window found on the main screen with your left mouse button to toggle its setting.

- 1 - Insert the TacT software disc into the computers CD-ROM drive.
- 2 - Start the Tact 2.2X Correction System Software on your computer.
- 3 - Select "**File**" from the menu selection at the top of the main software screen.
- 4 - Select "**Microphone**" and a new window will open.
- 5 - Select your CD-Rom drive in the "**Look-in**" menu you should now see a file in the larger window below.
- 6 - Select the "**Micxxxxx.mic**" file. The number in the file name should match the serial number of the mic that came with your RCS 2.2X.
- 7 - The software installation will confirm with the "**Mic installation complete**" message.
- 8 - After you have installed your mic the mic serial number should be displayed in the "**Microphone**" section at the top of the main page. If it is not please close the software and restart it to register your mic file with the software.

**Connect your
RCS 2.2X to your
Computer**

Your RCS 2.2X must be connected to your computers serial port in order for it to communicate with your computer and to run the Quick Setup and correction process. Please follow the steps below to connect your RCS-2.2 X to your computer.

- 1 - Connect the RS 232 **"Input"** jack on the back of the RCS 2.2X to your computers serial port using the supplied cables and adapters. Your computer must have a standard RS 232 serial port with a DB 9 connector.



NOTE: If you have any Tact digital amplifiers please disconnect their RS232 connection at this time.

- 2 - Turn on your RCS 2.2X.

- 3 - Turn on your computer and start the Tact 2.2X Correction System Software.



NOTE: You may receive a communication error message. Please close the message window and proceed to the next step.

- 4 - Select the **"Communication"** button on the main software screen to open the communication window.

- 5 - Under the Operating Mode select **"Connect"**.

- 6 - Under the COM Port section select **"COM1"**. If you receive an **"invalid port number"** message please try selecting each of the port selections until you do not receive this message. If you receive this message on all COM ports you may not have a COM port installed on your computer. Please refer to your computer manufactures documentation for help to install a COM port.

- 7 - To verify that RCS 2.2X is properly connected to the host computer click on the **"Start"** button to perform the communication test. If everything is functioning properly you should see the results below. Press the **"Stop"** button after about 15 seconds to stop the test.

Rx Buf should display **"0"**.

Count should have counted in increments of 100.

Err Count should be **"0"**.

If the results are as above select the **"Close"** button to close the communication window. Your RCS 2.2X is now connected to your computer.

If the results are not as above please go back to step number **6** and select another COM port. Then repeat step **7**.



NOTE: If you are still are not passing the communication test you may not have a COM port installed on your computer or you may have another device such as a modem or hand held PC that may be sharing the COM port on your computer. If you have a Tact amplifier attached it may be set to the same address. The RCS requires a valid COM port that is not being used by any other devices.



NOTE: You will only have to select the communication port once. The next time you run the Tact 2.2X software it will remember your settings.

Quick Setup

The Tact 2.2X Quick Setup wizard is designed to help both the first time and experienced user perform complete room correction and create nine correction presets quickly and easily. To run the Quick Setup successfully you will need to know your speaker configuration, your loudspeakers lower cut-off frequency, and the type of amplifier(s) that you have connected. This information will allow the Quick Setup to automate the room correction process for you so that you can begin enjoying the benefits of room correction immediately. For a detailed explanation of all of the software features and instruction for performing room correction manually please see the online help available in the software.

Before You Begin



- 1 - Connect the RS 232 **"Input"** jack on the back of the RCS-2.2 X to your computers serial port using the supplied cables and adapters.

NOTE: These instructions assume that you have already established communication between the RCS 2.2X and the Room Correction Software on your computer. See page 32.

- 2 - If you have one or more TacT M2150/S2150 digital amplifiers connect them to the RCS 2.2X. Please make sure that a unique address has been set for each device. For further instructions please refer to your M2150/S2150 owner's manual.
- 3 - Make sure that the **RCS-2.2 X is powered off** from the rear panel mains switch and connect the supplied measurement microphone to the **"Mic Input"** connector on the back of the RCS-2.2 X. Place the mic at the primary listening position at the height of your head. This will require a microphone stand, or something similar.



CAUTION: To avoid damage through static discharge, we strongly recommend to turn off the RCS-2.2 X at the rear panel mains switch before connecting the microphone.

- 4 - Turn your RCS-2.2 X on.
- 5 - Set the **Mode** setting for the RCS-2.2 X from the units front panel. This is the speaker configuration your system will be using. Please refer to page 18 for more information and instructions.
- 6 - Turn on your computer and start the TacT-2.2 X Correction System Software. If you have not installed the software please see page 31 for instructions.
- 7 - Enable your microphone if you are using the Tact microphone that came with your unit. To enable or disable the microphone click on the "mic:" display window found on the main screen with your left mouse button to toggle its setting. When the microphone number is displayed it is enabled. If you have not installed your microphone please see page 31 for instructions.

Getting Started

Start the Quick Setup by selecting the yellow **"Quick Setup"** button located on the Tact-2.2 X Room Correction System main window.

The Tact-2.2 X Quick Setup wizard is broken into three steps. As you complete each step select the **"NEXT"** button move to the next step.

STEP I

Select the speaker configuration setting that you have set for the RCS 2.2x Operating Mode. This setting is found in the "MODE" menu on the front panel of the RCS-2.2 X.



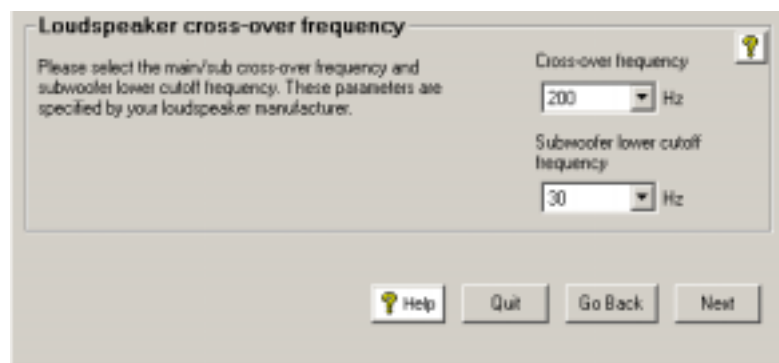
Select:

2.2 operating mode - If your system uses two main loudspeakers and two subwoofers.

2.1 operating mode - If your system uses two main loudspeakers and one subwoofer.

2.0 operating mode - If your system uses only two main loudspeakers.

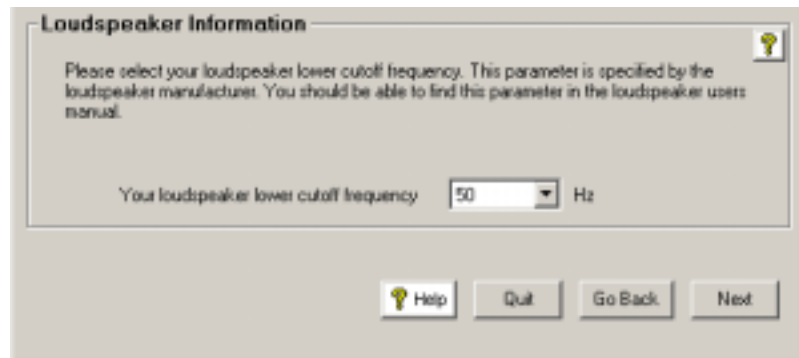
You will then need to set the Loudspeaker Crossover Frequency or Loudspeaker Lower Cutoff frequency. Your Operating Mode selection will determine what parameters will need to be set. Your subwoofer and main loudspeaker frequency response will determine the settings needed for these parameters. Please refer to your main loudspeaker and /or subwoofer manual for this information.



- If you have selected **2.2** or the **2.1 operating mode** you will need to set the:

Loudspeaker crossover frequency (this sets the lowest frequency that will be sent to your loudspeakers.)

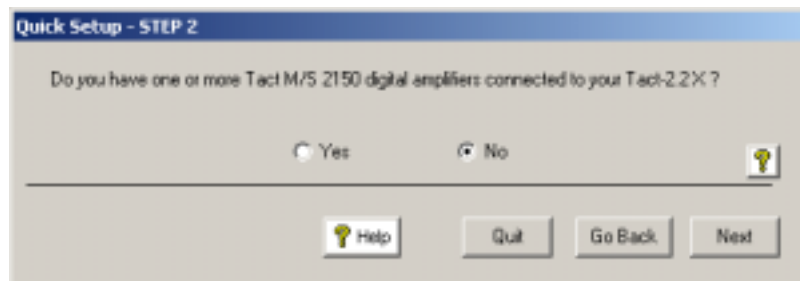
Subwoofer lower cutoff frequency (this is the lowest frequency that your subwoofer can reproduce)



- If you have selected **2.0 operating mode** you will need to set the:
- **Loudspeaker lower cutoff frequency** (this is the lowest frequency that your loudspeakers can reproduce)

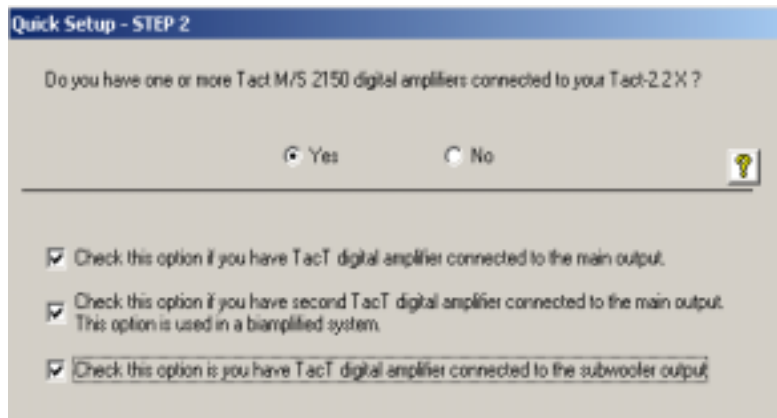
STEP II

Do you have one or more M/S 2150 digital amplifier connected to your TacT-2.2 X?

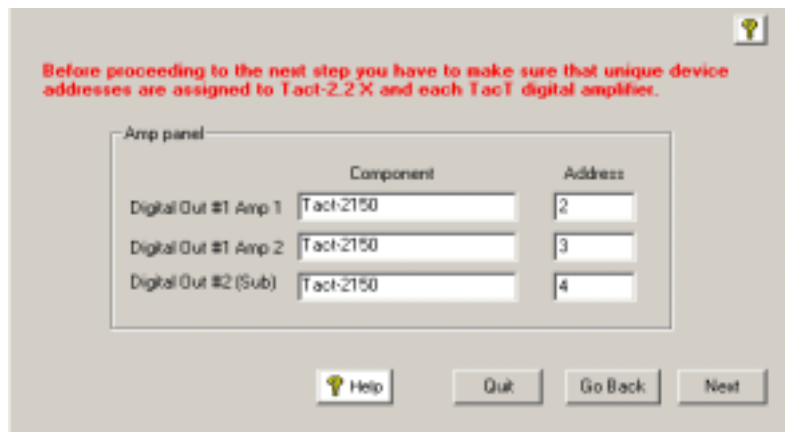


- If you do not use Tact digital amplifiers select **"No"**. Then select the **"Next"** button and go to **Step III**.

STEP II



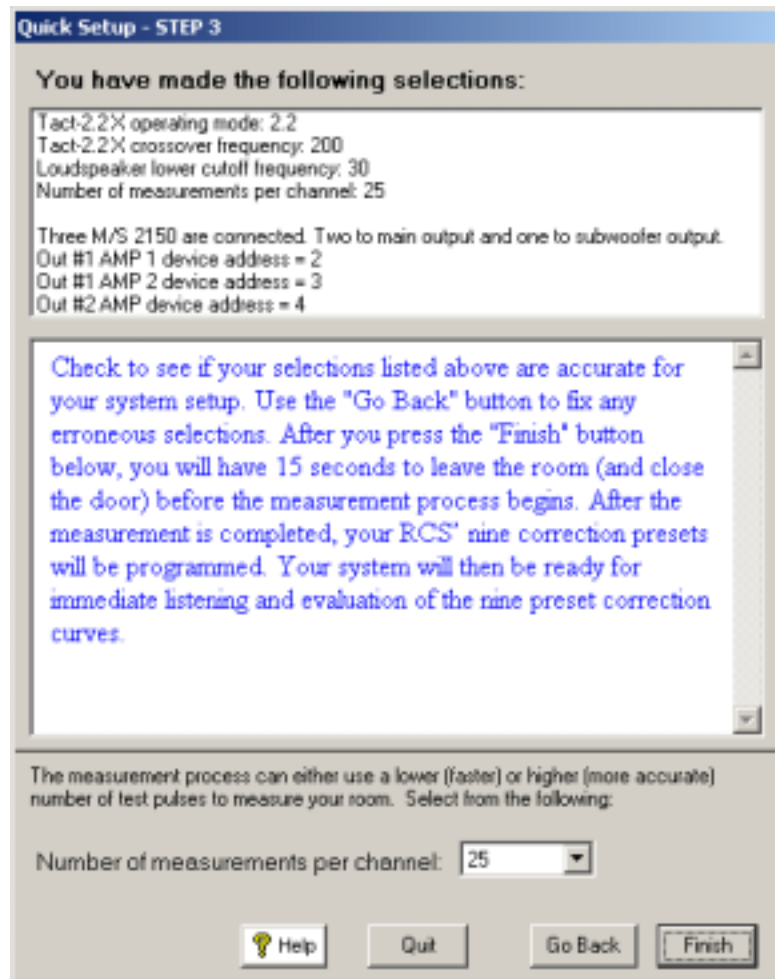
- If one or more M/S 2150 digital amplifiers are connected to your RCS-2.2 X select “**Yes**”. You will now need to select the options that match your RCS-2.2 X connections to your M/S 2150 amplifier(s). If you have more than one digital amplifier you will need to select more than one option.



- Next you will have to enter the unique address number that is assigned to each amplifier in the “**Amp panel**” section. This parameter is automated to enter address numbers 2,3, and 4 consecutively with the selection of your connected amplifiers. The address entered for each amplifier should match the address assigned in the “ADDR” menu of each amplifier. If you need to enter a new address number select the address window that you want to change with your left mouse button and enter the number that you have set for your amplifier.

STEP III

Verify that the selections you made are correct and start the Quick Setup automation.



- If the settings listed are not correct select the “**Back**” button to go back and make the appropriate changes and return to the finish screen when you are ready to start the Quick Setup.
- If the settings listed are correct select the “**Finish**” button. This will start the Quick Setup measurement and programming automation. When the automated process is completed the “**Quick Setup Completed**” message will be displayed. You can now close the RCS 2.2 X software and audition your nine correction presets.



NOTE: The Quick Setup will give you a 15 second delay before the Quick Setup automation starts. This gives you time to leave the listening area before the measurement process begins.

Update the RCS-2.2 X Firmware

Your RCS-2.2 X has been pre-programmed with the latest firmware when shipped from our factory and does not need to be updated with the program CD that came with your unit. TacT Audio may occasionally release updated versions of the RCS software that will be available on our website "www.tactaudio.com". This new software may contain updates or enhancements for your RCS-2.2 X. When instructed by a technician or messaged from our website please follow the instruction below to update your RCS-2.2 X firmware.

Step I: Removing your old RCS2.2X Software



First un-install the current version of the TacT-2.2X RCS software on your computer.

- 1 - Turn on your computer.
- 2 - Open the Windows control panel and select the "Add/Remove Programs" option.
- 3 - Highlight the "TacT-2.2X" option and click on "Change/Remove".
- 4 - Select "Yes" and the old 2.2X software will be removed.

NOTE: Your target curves and measurements stored under unique names will NOT be removed.

Step II: Install your new RCS2.2X Software

You now need to install the new TacT-2.2X RCS software on your computer.

- Double-click on the "Tact 2.2X vx.x.exe" file that you have downloaded or is found on the root of your CD and follow the installation instructions.

Step III: Reprogramming the RCS2.2X Firmware



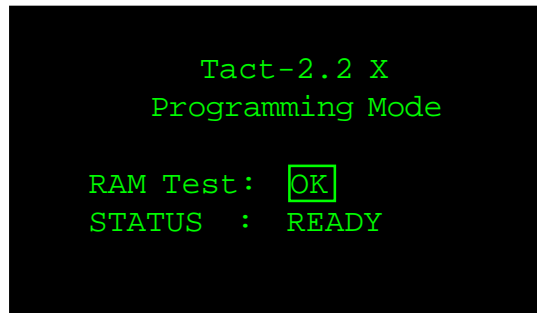
Program the new firmware for the RCS-2.2 X.

- 1 - Connect the PC to the RCS2.2X using the RS232 cable. Please refer to the RCS 2.2X RS232 section of the user's manual or the RS232 Connection document for help.

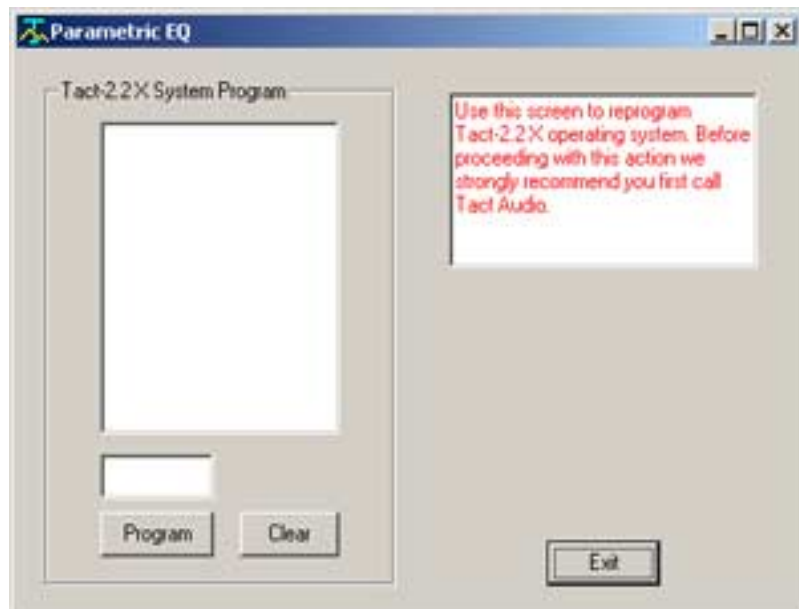
CAUTION: The RCS-2.2 X should be the only device connected to the RS232 cable during system reprogramming. Please disconnect any TacT digital amplifiers that may be daisy chained to the RCS-2.2 X.

- 2 - Start the TacT-2.2X RCS software on your computer
- 3 - Use the "Communication" option in the TacT-2.0 S room correction software to make sure that the RCS-2.2 X and your computer are communicating. Please refer to the RCS 2.2X RS232 section of the user's manual or the RS232 Connection document for help.
- 4 - Turn the RCS-2.2 X OFF from the rear panel mains switch.

5 - Press and hold the “**DIGITAL**” and “**ANALOG**” buttons on the front panel of the RCS-2.2 X simultaneously while you turn the unit back ON from the rear-panel mains switch. Hold the buttons until the display shows the “**PROGRAMMING MODE**” screen.



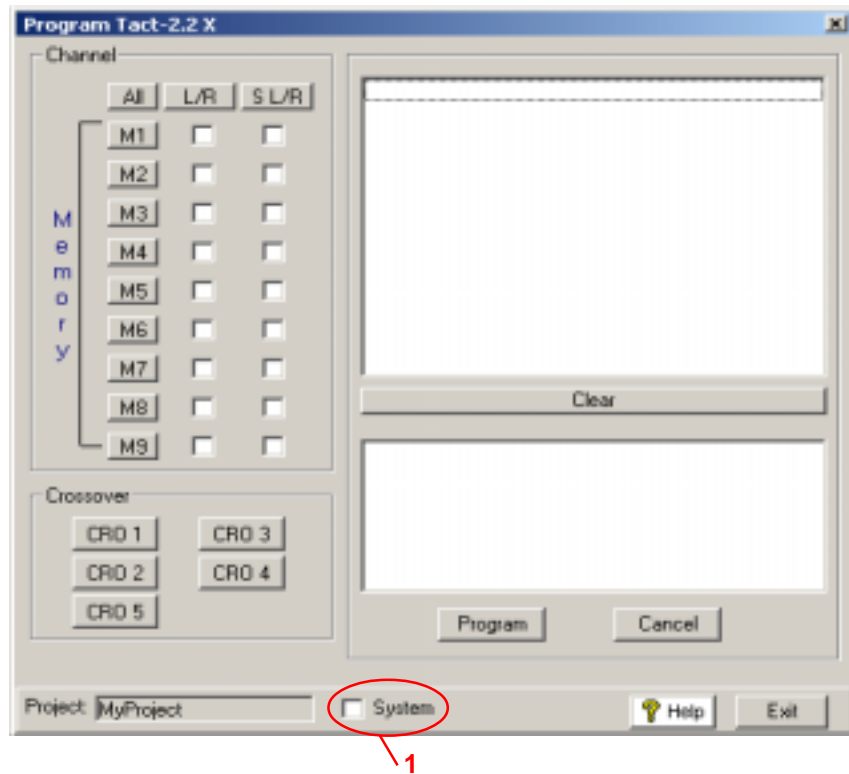
6 - From the Tact-2.2 X RCS software main screen, click on the “**Add-Ins**” and then select the “**Standard**” option. You should now see the Add-Ins window.



7 - Select the “**Program**” button and follow the prompts by answering all questions. You will need to be able to answer “**Yes**” to all questions to start the programming. The RCS-2.2 X will turn OFF and ON and then return to normal operation.

Step IV: Reprogram the System Files

After updating the firmware the System Files now need to be reprogrammed.



1 - From the TacT-2.2 X RCS software main screen, click on the “**Program TacT-2.2 X**” button. You should now see the programming window.

2 - Press and hold the “**Control**” key on your computer keyboard and then press the “**S**” key simultaneously. This should display the **System Option (1)** in the bottom center of the programming window.

3 - Left click your mouse in the square next to System to select it with a check mark.

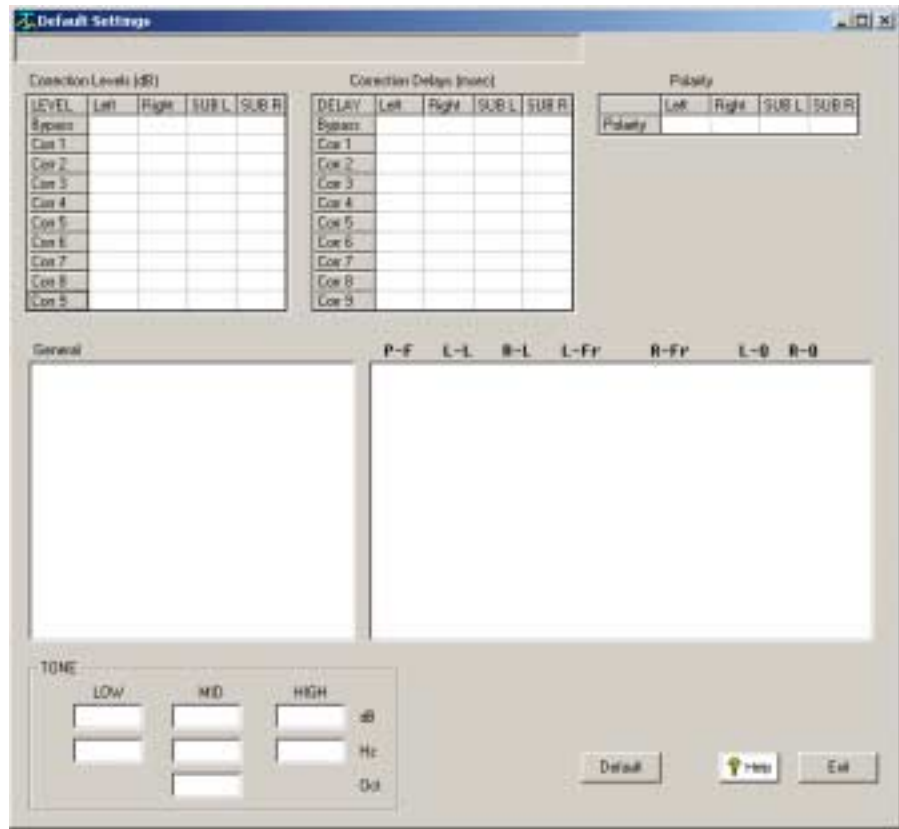
4 - Press the “**Program**” button and follow the prompts by answering all questions. You will need to be able to answer “**Yes**” to all questions to start the system file reprogramming. The RCS-2.2 X will return to normal operation mode when finished.

**Step V:
Restoring the Default
RCS2.2X Settings**

This step is optional and is only required if you would like to reset all internal settings in the unit to their factory defaults. If you proceed you will erase your custom user settings.

Restore the default settings for the new firmware installed on the RCS-2.2 X.

1 - From the TacT-2.2 X RCS software main screen, click on the “**Options**” menu selection at the top of the screen and then select the “**Default Settings**” option. You should now see the Default Settings window.



2 - Select the “**Default**” button and the default parameters for the RCS 2.2 X will be loaded into the RCS 2.2X. The RCS 2.2X will turn OFF and then ON and return to normal operation when finished.



NOTE: If you have TacT digital amplifiers attached to the RCS-2.2 X you must set the “AMP” front panel general menu to “DISABLED”. The default settings will not be programmed if these parameters are set to “ENABLED”.

**RCS 2.2X
update complete**

You have now completed updating your RCS 2.2X and it is ready for normal operation.

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