

THIEL

SmartSub™

SI 1 Integrator

Owner Information



Thank you for purchasing the THIEL SmartSub Integrator. It has been engineered to provide a very high level of performance and incorporates innovative patented concepts in its design to solve the integration and balance problems subwoofer systems usually exhibit.

In addition to the hookup and adjustment instructions contained in this booklet, the Setup and Adjustment Flow Chart on page 8 may (but doesn't have to be) used as a reference for all aspects of SmartSub and Integrator system configuration, hookup and adjustment.

You are welcome to contact our Customer Service department with any questions or for help in setting up this system. Our contact information is:

Tel: 859-254-9427 Fax: 859-254-0075 E-mail: service@thielaudio.com

Contents

Introduction	3
Connecting the Integrator	4
Modes of operation	4
Crossover mode connections	4
Augment mode connections	4
Speaker Polarity	5
Adjusting the Integrator	6
Presets	6
System Parameters	6
Main Speaker Parameters	7
Performance Parameters	7
Setup and Adjustment Flow Chart	8
Integrator Parameters for THIEL Speakers	10
Advanced Adjustment Tips	10
Equipment rack mounting	10
Maintenance	11
Remote Control Battery Replacement	11
Remote Control Interference	11
Specifications	12
Warranty	12
Remote Control Command Codes	13

Introduction

The SI 1 SmartSub Integrator provides unprecedented ability to perfectly match any SmartSub with any main speakers, and provide total system performance that is as well integrated and balanced as a full range speaker. This superior performance is achieved by innovative circuitry (patent 6,687,379, other patents pending) that automatically calculates the ideal subwoofer response to perfectly match the characteristics of the main speakers. Therefore, instead of the usual crossover controls that tell the subwoofer how to perform, the SmartSub Integrator has settings for the characteristics of the main speakers you are matching, the configuration of your system and the performance you desire. This information is then used to automatically calculate and implement the ideal subwoofer response. In addition, the unit enables the total system to operate in either augment or crossover system mode and can control up to 16 subwoofer units in either mono or stereo configuration.

Connecting the Integrator

1 Connect the SmartSub Integrator to the subwoofer with an XLR type balanced interconnect cable from the units' Sub Output to the subwoofer's Normal Input. If stereo subwoofer operation is used, connect one subwoofer from each channel of the Integrator.

For multiple subwoofers, connect one subwoofer from the Integrator and daisy-chain the others, with the second unit connected from the first's Normal Output, etc. Or, if two subwoofers are used in mono operation, they can both be connected to the Integrator using the left and right outputs.

2 If the system has a surround processor then connect its LFE or subwoofer output to the Integrator's LFE input.

3 If you are using a second Integrator or a THIEL passive crossover to derive a subwoofer signal from channels of your system other than the left/right channels, then connect the output(s) of that unit to the "Bridge In" connectors with an XLR type balanced interconnect cable.

Modes of operation

The Integrator has two modes of operation available, Augment or Crossover, which may use different methods of connection.

If you wish to have the ability to switch between these two modes of operation, then crossover mode connections must be used.

Augment mode should be used if you wish to use the main speaker normally, receiving the full-spectrum signal, and are therefore using the subwoofer only to "fill out" and extend the deep bass response of the main speakers. (In addition to reproducing the subwoofer channel.)

Crossover mode should be used if the main speakers are not able to play loudly enough or you wish to restrict the bass energy that the main speakers will reproduce, transferring this energy to the subwoofer.

Crossover mode connections

This connection method can be used for operation in either Crossover and Augment mode.

4 Connect the preamp/processor left/right outputs to the Integrator inputs.

5 Connect the Integrator outputs to the power amplifier inputs.

Either balanced or unbalance connections can be used depending on which type of connections are available from the preamp/processor and to the amplifier.

Augment mode connections

In this case the main speaker system hookup is left as-is, with no changes. The Integrator can receive its input either from the output of the power amplifier (speaker level) or from the output of the preamp/processor (line level).

To implement the speaker level input connection method:

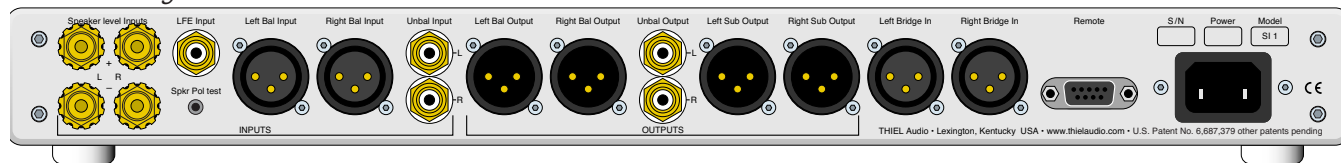
4 Connect cables from the power amplifier output terminals to the respective speaker level input terminals on the Integrator. Connect the positive amplifier outputs to the positive Integrator inputs. The cables used for these connections can be small since no power is being transferred. *Remove the shorting pins when these connectors are used.*

To implement the line level input connection method:

4 Connect the preamp/processor's left and right channel outputs to the respective inputs of the Integrator using either unbalanced (regular) or balanced interconnect cables since the Integrator will accept either.

This input connection method can only be implemented if either the preamp/processor has two sets of such outputs (since one set is already used for connection to the main amplifier inputs), or if a "Y" connector is used to split the output into two cables.

SmartSub Integrator rear connections



These speaker level inputs may be used for operation in Augment mode. Wires to these terminals are connected from the main speaker power amplifier.

This is used to receive the LFE signal from the processor. Pressing this button checks speaker polarity.

For Crossover mode either these or the unbalanced inputs must be used to receive input from the processor or preamp. For Augment mode operation they are an alternative to the speaker level inputs.

These are an unbalanced alternative to the balanced inputs.

For crossover mode these or the unbalanced outputs are used to supply the Integrator's output to the main speaker amplifier's inputs.

These are an unbalanced alternative to the balanced outputs.

These connectors are used to supply signal to the subwoofer unit(s).

These connectors are used to add the output from another Integrator or a passive crossover into the Subwoofer signal.

This connector is used to remotely control the unit as an alternative to a hand-held remote control.

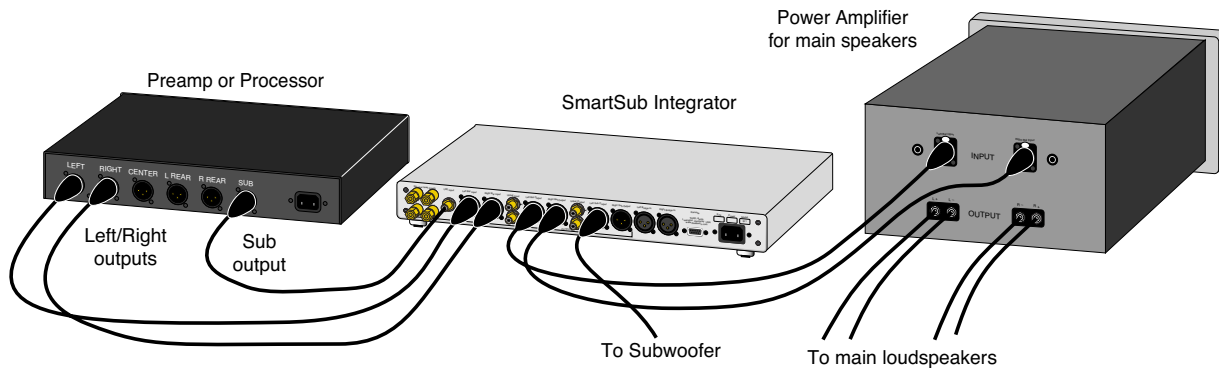
The AC power cord connects here.

Speaker Polarity

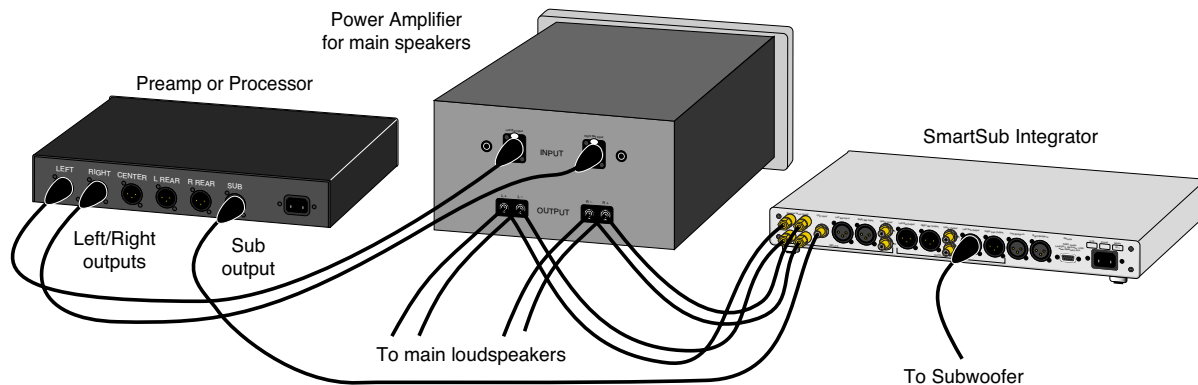
It is necessary that your main speakers be wired in correct polarity. Since some speakers and amplifiers reverse the signal polarity, the Integrator includes a test button to determine if your speakers are connected correctly.

With the Integrator left/right outputs connected to the main speaker power amplifier and the Integrator set to Augment mode, pushing the “Spkr pol test” button on the rear of the Integrator should cause the woofers to move outward. If they move inward, you must reverse the + and – wires connected to each speaker.

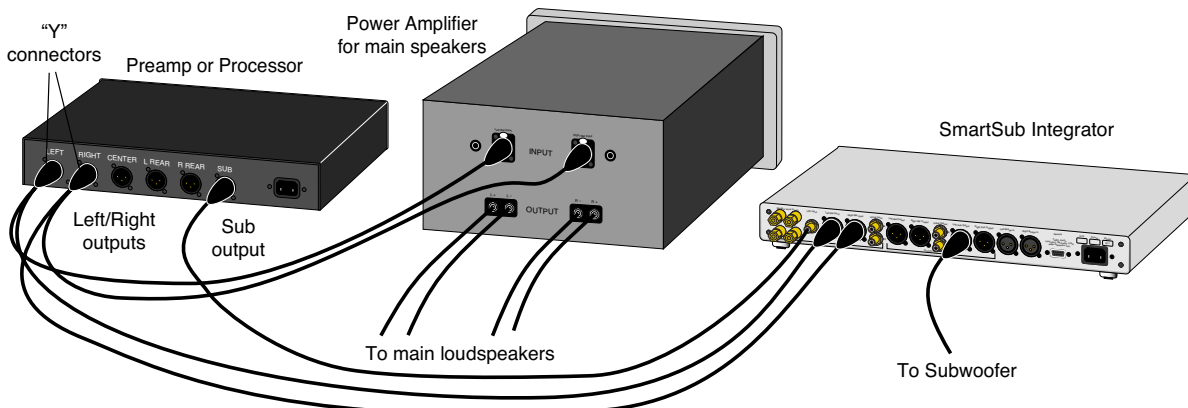
Crossover mode



Augment mode, speaker level input



Augment mode, line level input



Adjusting the Integrator

The SmartSub Integrator is adjusted using the four buttons at the right side of the front panel. All adjustments are made by first selecting which of the 12 parameters is to be adjusted and then by increasing or decreasing the setting of that parameter. A parameter is selected by pressing the *Select Prev* or *Select Next* button until the light for the desired parameter is on. Once the desired parameter is selected, the current setting will be shown in the numerical display and pressing the *Increase* or *Decrease* buttons will change the setting. The parameters Mode, Channels and Type do not have associated numerical settings and therefore when one of these is selected the display will be blank. These parameters instead each have two alternate options that can be selected by the *Increase* or *Decrease* buttons and the current setting is indicated by which option is lighted.

Only the four performance settings (or three if Augment mode is used) should be considered adjustments for taste and requirements. The other parameters should be considered setup adjustments that are not changed unless there are changes to the main speakers or the system configuration.

Presets

There are six presets available, each of which stores the setting of all 12 parameters. The presets can be stored or recalled from the front panel.

To create a preset, first set all 12 parameters to the settings you wish to be saved. Pressing the *Store Preset* button will cause the display to flash "Pr". Use the *Increase* and *Decrease* buttons to select which preset, from P1 to P6, in which you wish to store the current settings and then press the *Store Preset* button again to complete the save. The display will stop flashing.

Pressing the *Recall Preset* button will cause the display to flash "Pr". Use the *Increase* and *Decrease* buttons to select which preset, from P1 to P6, you wish to recall and then press the *Recall Preset* button again to complete the recall. The display will stop flashing.

If you don't press the store or recall button the second time within 10 seconds, the store or recall will be aborted and the display will revert to what it was before the button was pressed.

System Parameters

Mode [Augment or Crossover]

Augment mode should be used if the main speakers are able to play loudly enough and the subwoofer is needed only to extend the bass range. With this mode the signal to the main speakers will not be altered by the Integrator.

Crossover mode should be used if the main speakers are not able to play loudly enough or it is desired to limit their bass extension. In this mode the subwoofer will reproduce the bass that would normally go to the main speakers.

Channels [Mono or Stereo]

If only one subwoofer unit is used then *Mono* must be selected. If more than one subwoofer is used then *Stereo* may be selected (but does not have to be). Stereo allows the bass range of the left and right channels to remain separate and therefore can provide better left/right "imaging".

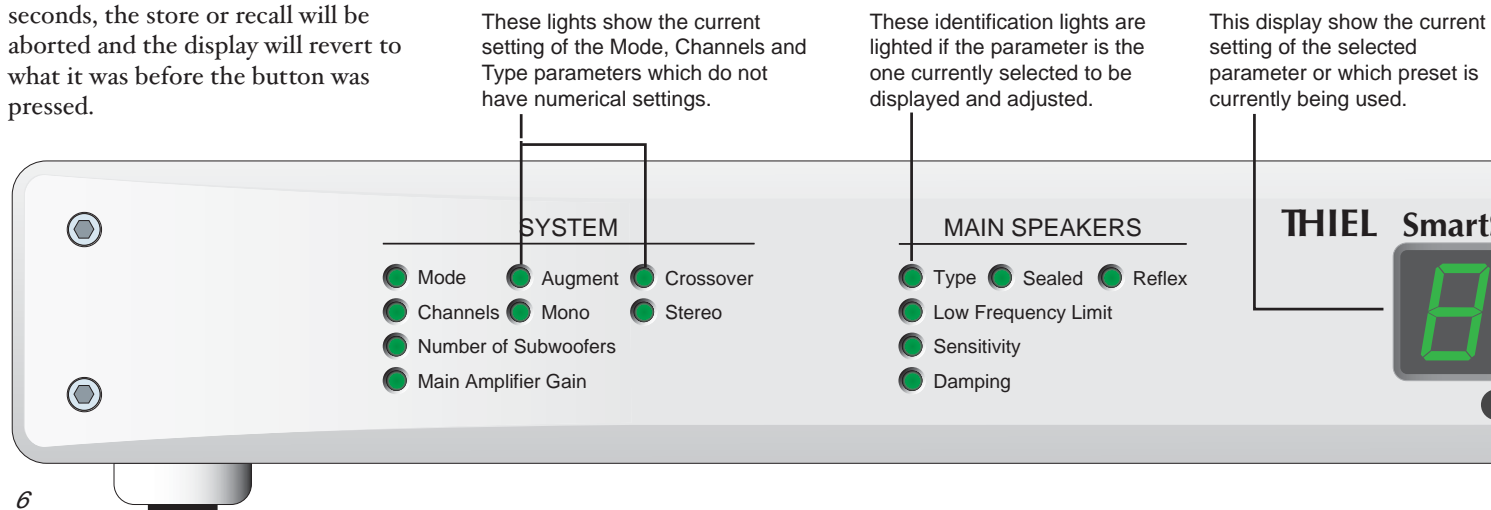
Number of Subwoofers [1 to 16]

This must be set for the total number of subwoofers in the system. If Stereo Channels is selected then only even numbers are available. Stereo configurations must use the same number of subwoofers in each channel.

Main amplifier gain [in dB, 20 to 40]

The setting is the amplification of the main amplifier in dB (decibels). The number can probably be found from the owner information or the manufacturer of the amplifier.

This does not need to be set if the only inputs used are speaker level (when not using the LFE, Bal or Unbal inputs).



Main Speaker Parameters

Type [Sealed or Reflex]

Sealed should be selected if the main speakers are a sealed or “closed” design. *Reflex* should be selected if the main speakers are a ported or passive radiator design.

Low Frequency Limit [in Hz, from 20 to 90]

This parameter should be set to the main speaker’s “minus 3 dB” bass extension specification. This can usually be obtained from the speaker’s owner information or from the manufacturer.

Sensitivity [in dB from 83 to 95]

This parameter should be set to the main speaker’s sensitivity (or “efficiency”) specification (output level in dB with a 2.83 volt or 1 watt input and at a 1 meter distance). This can usually be obtained from the speaker’s owner information or from the manufacturer.

Damping [from .5 to .9]

This parameter should be set to the main speaker’s “Q” specification. It is not a critical setting and excellent results can be obtained by using a setting of .8 for sealed speakers and .7 for reflex speakers.

Visit www.thielaudio.com/subsetup.cfm for information about parameter settings for most speakers, regardless of brand.

Performance Parameters

Low Frequency Extension [-3 dB frequency in Hz, 15 to 40]

In Augment mode only settings at least 5 less than the Low Frequency Limit setting are available.

This setting determines how extended the left and right channel bass reproduction will be. The lower the number the more complete the reproduction will be. However, a very low number will place somewhat more demand on the subwoofer. The louder you play and the larger the room the harder it is for the subwoofer. If the subwoofer cannot play loudly enough you can either increase this number (to 30 or 35) or add more subwoofer units to your system.

Low Frequency Level [boost or cut in dB, -6 to +6]

This setting controls how much extra left and right channel bass will be produced by the main speaker/subwoofer system. Normally it should be set to zero. It provides increased or decreased bass energy, in the range below 80 Hz when in crossover mode, and below the main speaker’s low frequency limit when in augment mode.

Crossover Frequency [in Hz, 40 to 99]

This parameter is only available if Crossover Mode is selected. Only settings above the Low Frequency Limit setting by 10 to 30Hz, depending on speaker type and damping, are available.

This setting determines the frequency below which energy is directed away from the main speakers and to the subwoofer. Unless the main speakers are very small, it is usually preferable that this setting not be higher than 80. Lower settings will usually provide better sonic results but will also place more demands on the main speaker to reproduce bass.

LFE Level [in dB, 0 to 10]

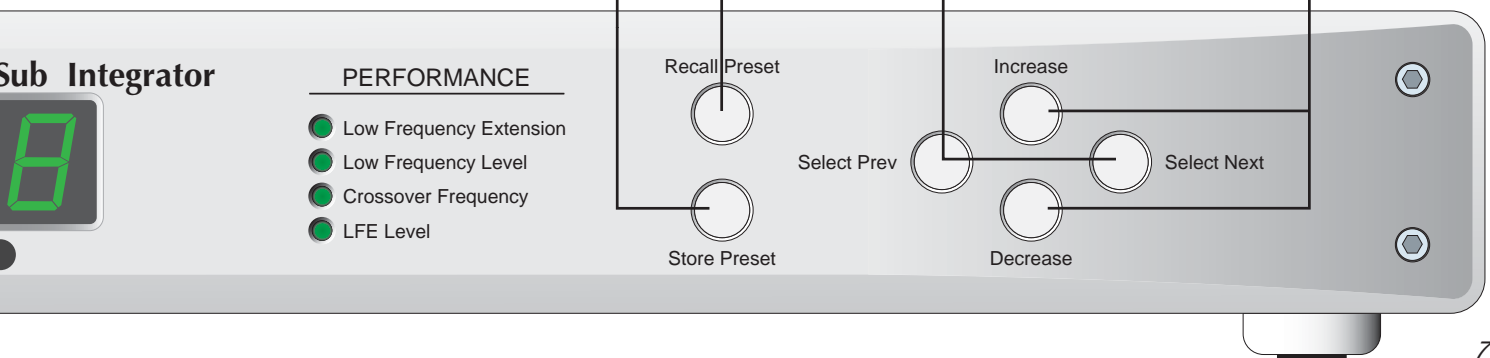
This setting determines the loudness level of the special effects channel information. Zero is normal, higher numbers increase the level.

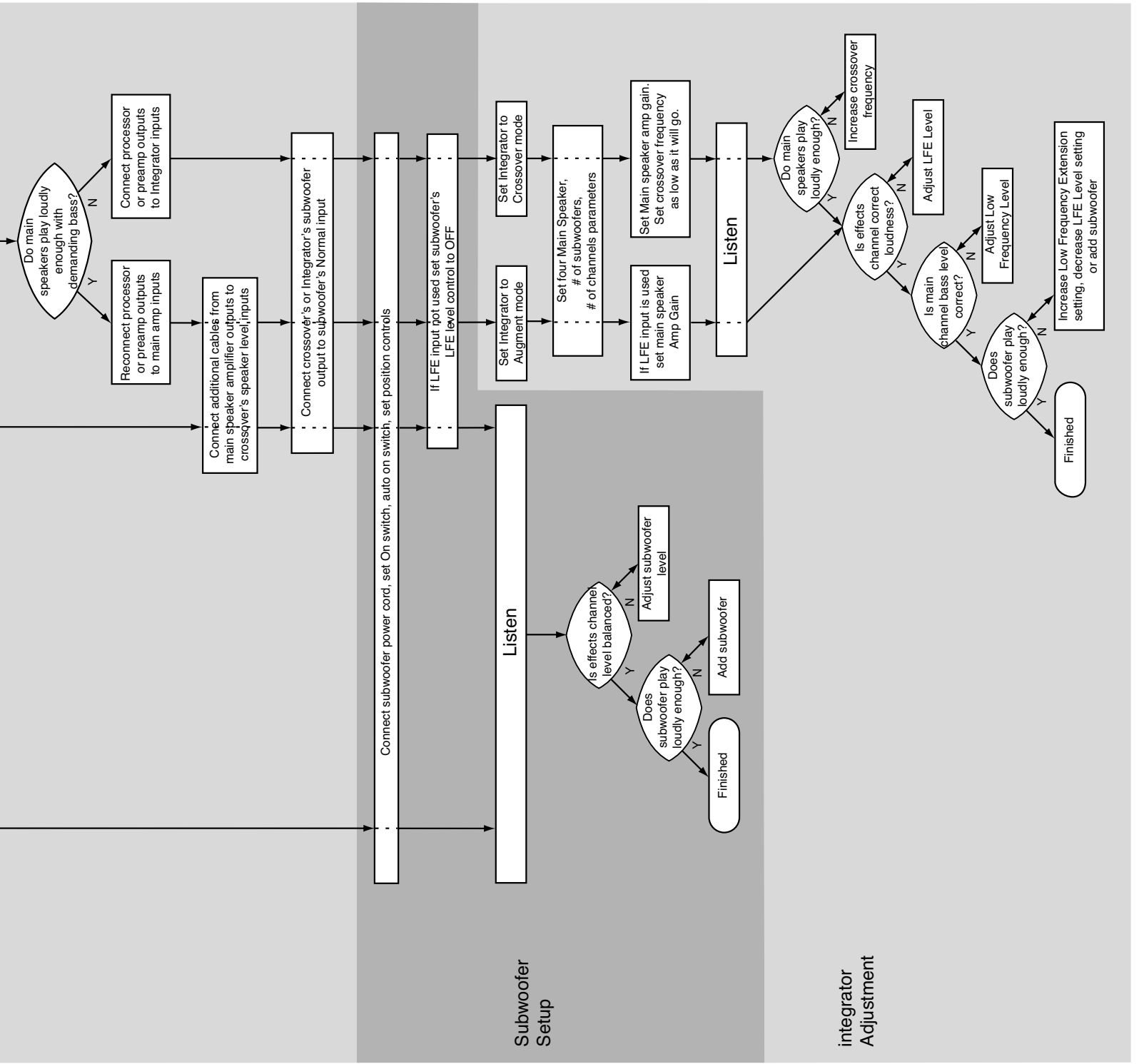
To store a set of parameter settings first press this button, select which number to use with the Increase and Decrease buttons, and then press this button again.

To recall a previously stored set of parameter settings first press this button, select which preset using the Increase and Decrease buttons, and then press again.

Use these two buttons to select which parameter you can adjust.

Use these two buttons to increase or decrease the setting of the selected parameter.





Integrator Parameters for THIEL Speakers

Visit www.thielaudio.com/subsetup.cfm for information about parameter settings for most speakers, regardless of brand.

Model	Type	Low Frequency Limit	Sensitivity	Damping
CS1.6	Reflex	49	90	.7
CS2.4	Reflex	33	87	.7
CS3.6	Reflex	27	86	.7
CS6	Reflex	27	86	.7
CS7.2	Reflex	23	86	.7
MCS1	Reflex	47	90	.7
PCS	Reflex	55	87	.7
SCS3	Reflex	46	87	.7
PowerPoint	Sealed	75	89	.8
PowerPlane	Sealed	75	89	.8

Advanced Adjustment Tips

The accuracy of results achieved in providing a perfect transition between the subwoofer and the main speakers is limited by the accuracy of the main speaker specifications. If these specifications are not accurate, then the results will not be optimum. Even the use of inaccurate specs will almost always achieve fairly good results but if you feel the results are not optimum you may experiment with altering the three main speaker parameter settings other than type. The performance effect of these settings are listed below.

Low Frequency Limit

Increasing this setting will cause more output in the frequency region of the setting and decreasing the setting will cause less output. For example, if the main speaker -3 dB limit is specified as 50 Hz, then increasing the setting to, say, 53 will cause somewhat more output in the 50 Hz region.

Sensitivity

Increasing this setting will cause the subwoofer to play louder by the amount of the setting change and decreasing it causes the subwoofer to play more quietly. For example, increasing the setting one dB will increase the subwoofer's output by 1 dB across its entire bandwidth (which is up to the main speaker's low frequency limit if in augment mode, or up to the crossover frequency if in crossover mode).

Damping

Increasing this setting will cause LESS output in the region above the speaker's -3 dB limit and decreasing the setting will cause more output in the region. For example, if the main speaker has specifications of a low frequency limit of 50 Hz and damping of 0.7, then increasing the damping setting to 0.8 will cause about 1 dB less output in the region from 50 Hz to 100 Hz.

Equipment rack mounting

Included with the Integrator are two Rack Mount "ears" for mounting the unit into a standard 19" equipment rack. To install these "ears":

Remove the 4 screws in the unit's front panel, place the ears so their rear protrusions fit into the front panel's screw recesses, and re-install the panel screws through the ear holes.

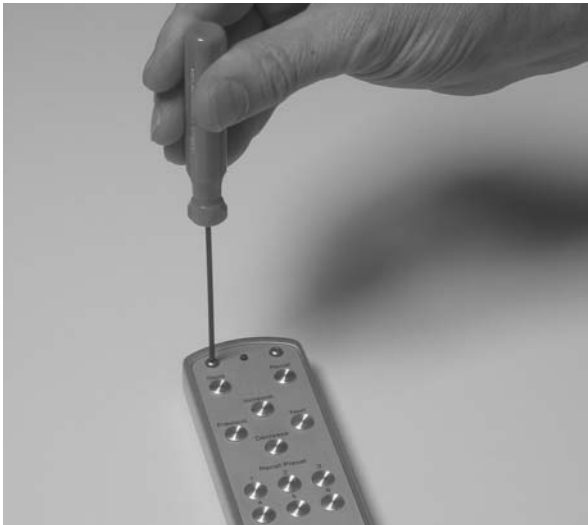
Maintenance

Remote Control Battery Replacement

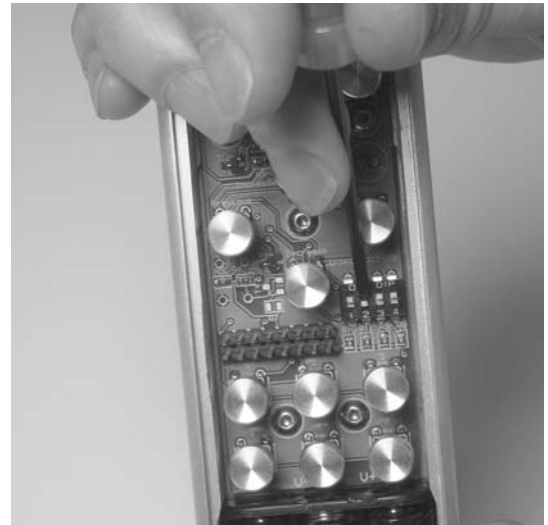
The green light on the front of the Remote Control should light when any of the buttons are pushed. If it does not the batteries need to be replaced. Access the batteries by removing the four screws on the front of the unit using the hex driver provided, and lifting off the front cover (see illustration below). Replace the three AAA size batteries, taking care to insert the new batteries in the proper direction as indicated on the battery holder. The center battery should be positioned with its small, positive terminal toward the bottom end of the unit, and the other two batteries in the opposite direction. When replacing the panel some jiggling of the buttons may be required to align them with the holes in the panel.

Remote Control Interference

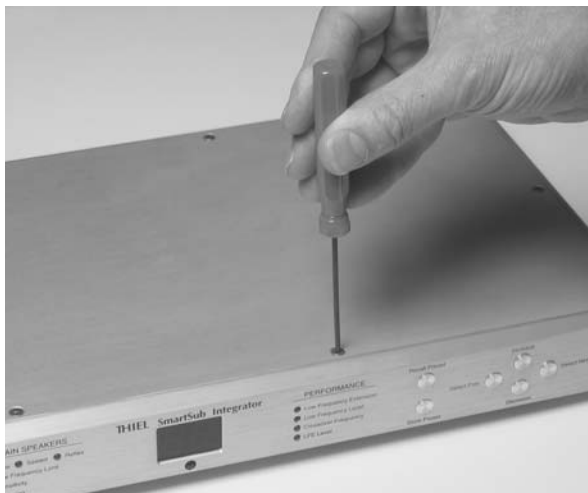
It is possible that the Integrator's remote control will also affect other equipment or that the remote control of other equipment will affect the SmartSub Integrator. In case this happens, the Integrator and its remote are able to operate on any of 16 channels so that a channel can be selected that does not interfere with other equipment. A different channel is selected by changing the settings of 4 miniature switches inside both the Integrator and its remote. Removing the top cover of each piece using the hex driver provided allows access to the switches (see illustrations below). They can be switched to any of the 16 possible combinations but the settings in the remote must be the same as those in the Integrator. Experiment until a channel is found that is free from interference.



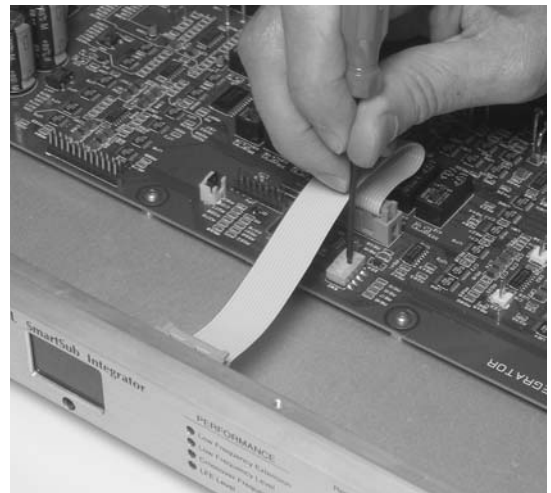
Removing the remote's panel to access its batteries and channel selector switches.



Adjusting the remote's channel selector switches.



Removing the Integrator's top panel to access its channel selector switches.



Adjusting the Integrator's channel selector switches.

Specifications

Size	17" wide, 1.75" high (2" with feet), 9" deep
Inputs	Speaker level, Line level balanced and unbalanced, LFE unbalanced, bridging Sub
Main Speaker Outputs	Balanced and unbalanced
Subwoofer Output	Balanced
Line Voltage	90-130 or 180-260

Warranty

THIEL warrants every THIEL model SI1 system against defects in materials and workmanship to the original owner for a period of ten years from the date of purchase. THIEL will, at no charge, replace any defective part and make any repairs necessary to ensure its proper performance when the defective unit is returned to us postpaid.

This warranty does not cover damage due to accident or abuse and is void if the unit has been tampered with.

Remote Control Command Codes

This information is provided for developers of automated systems. It is not relevant to most users.

Function	Allowed values	RS-232 code * (## = values)	RC5 code (Dec) Command **
Next		SS00NT	10
Previous		SS00PV	11
Increase		SS00IC	12
Decrease		SS00DC	13
Store#	0-6 ‡	SS##SO	14+#
Recall#	0-6 ‡	SS##RL	21+#
Augment		SS00AG	28
Crossover		SS00XO	29
Mono		SS00MN	30
Stereo		SS00SE	31
#subs	1-16	SS##NU	31+#
Amp gain	20-40	SS##AN	48 §
Sealed		SS00SD	49
Reflex		SS00RX	50
LF limit	20-90	SS##LT	51 §
Sens	83-95	SS##SN	52 §
Damping	5-9 †	SS##DM	48+#
LF ext	15-40	SS##ET	58 §
LF level	0-12 ††	SS##LL	59 §
XO Freq	40-99	SS##XF	60 §
LFE level	0-10	SS##LE	61 §
Digit	0-9		0-9

* RS-232 port protocols are: 38,400 Baud, 8 data bits, 1 stop bit, no parity.

‡ Values of 1 to 6 execute a direct store or recall to that memory.

A value of 0 initiates the command. For completion, increase or decrease commands select which memory, and a second store or recall completes the command.

† Multiply desired setting by 10. Example: setting of 0.7 = value of 7.

†† Add 6 to the desired LF setting. Example: setting of zero = value of 6.

§ These commands must be followed by two digit commands or the sequence is aborted.

** RC5 system value depends on DIP switch settings:

Switch settings	System
on-on-on-on	7
on-on-on-off	11
on-on-off-on	14
on-on-off-off	15
on-off-on-on	17
on-off-on-off	18
on-off-off-on	19
on-off-off-off	20
off-on-on-on	21
off-on-on-off	22
off-on-off-on	23
off-on-off-off	24
off-off-on-on	25
off-off-on-off	26
off-off-off-on	27
off-off-off-off	28

DIP switch settings must be the same in the Integrator and the Remote control unit. The DIP switches are accessed by removing the top cover of each unit.

The RC5 code is a 14 bit word that is built with a start bit of "1", a second bit of "0", a toggle bit that changes with each new key press, 5 "system" bits and then 6 "command" bits. In decimal notation, this is 16,384, plus 64 times the system value, plus the command value, with 4096 added to each alternate key press.

Function	RS-232 code	RC5 code (Dec)			RC5 word (hex)**			
		System*	1 st	2 nd	3 rd	1 st	2 nd	3 rd
Recall preset 4	SS04RL	25	25			4659	—	—
Set XO Freq to 65	SS65XF	25	60	6	5	467C	4646	4645
Set LF Level to +3	SS09LL	25	59	0	9	467B	4640	4649

* If DIP switches set to off-off-on-on. ** Assuming toggle bit = 0.

THIEL

1026 Nandino Blvd., Lexington, KY 40511

Tel: 859-254-9427 • Fax: 859-254-0075 • Email: mail@thielaudio.com • www.thielaudio.com