

CIRCLE SURROUND 3X™ FOR HOME CINEMA CS-3X, Jr.



The SMART Center Surround 3X for Home Cinema adds that extra dimension of sound to your Dolby Digital™ or DTS Digital™ soundtracks from LaserDiscs or DVD Discs. Add one or more rear wall speakers and additional amplifiers to get the full enjoyment from the latest film releases encoded with the new Surround EX™ format. In addition, this product even allows you to play your existing digital soundtracks and hear them in a way you have never heard them before. The existing in-phase material present in the Left Surround and Right Surround channels is routed to the rear wall speakers and the directionality is greatly enhanced. A CENTER FILL level control lets you easily balance the rear wall speakers against the Left Surround and Right Surround speakers. You can easily select between the CS-3X mode and the regular LS-RS mode with the push of a button. Built-in pink noise lets you easily set the surround channel levels, and if you have equalizers installed, the pink noise source gives you a signal that a Real Time Analyzer expects. This product even has a built-in subwoofer output signal for adding those usually missing low frequencies to your surround system. By adding a subwoofer system to the surrounds, when a sound pans from the front speakers to the surrounds, the low frequency information can also be heard from the surround system. This can significantly enhance your listening experience if your surround speakers do not handle low frequencies very well.

SMART
Devices, Inc.

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5945 Peachtree Corners East
Norcross, GA 30071-1337

IMPORTANT SAFETY INSTRUCTIONS

CAUTION:

--Read all of these instructions.

--Save these instructions for later use.

--Follow all warnings and instructions in this manual and on the product.

- 1 Read all the safety and operating instructions **before** connecting and operating the product.
- 2 Follow all operating and use instructions.
- 3 Remove power from this product before cleaning.
- 4 Use only a slightly damp cloth for cleaning.
- 5 To avoid potential fire and shock hazards, do not use this product near water or damp places.
- 6 The product should only be operated from a power source of the type indicated on the power pack and on the product. Failure to do so could damage the equipment, void the warranty, and present a potentially dangerous situation.
- 7 Do not attempt to service this product yourself. Opening this product may expose you to dangerous voltage or other hazards.
- 8 If service is required, only authorized service centers should perform the work using only replacement parts specified by the manufacturer. Unauthorized parts substitutions may result in electric shock, fire or other hazards.
- 9 This product should be placed away from heat-producing sources such as radiators, heat registers, or other products (including amplifiers) that produce heat.
- 10 It is normal for this product to be warm to the touch in normal operation. It should not be so warm that you cannot comfortably leave your hand on the product for an indefinite period of time.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVERS. THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Thank you for buying this SMART product.

Please take the time to familiarize yourself with this product by carefully reading this manual. Most questions can be answered by reading and following the instructions contained herein. Because of the multitude of products from other manufacturers, this manual cannot possibly cover all the different configurations and hookups. Please consult with your Home Cinema Dealer for any unusual situations involving the connection and use of this product with equipment from other manufacturers. When properly connected and operated, this product should deliver outstanding results.

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Circle Surround™ is a registered trademark of SRS Labs, Inc.,
Santa Ana, CA, USA

DTS Digital™ is a registered trademark of Digital Theatre Systems,
Agoura Hills, CA, USA

Surround EX™ and Dolby Digital™ are registered trademarks of
Dolby Laboratories, Inc., San Francisco, CA, USA

This product has a serial number located on the bottom.
Please record this serial number for your records.

SERIAL # _____

INSTALLATION PRECAUTIONS

Noise Interference may result if this product is placed too close to an operating television set or a computer, or if it is placed on top of an amplifier or power conditioner product.

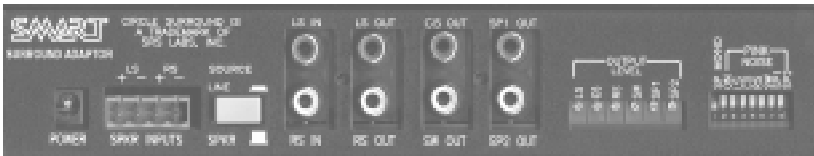
High temperatures are detrimental to the performance and longevity of electronic equipment. Do not place too close to high temperature devices.

CONNECTIONS

The Center Surround 3X connects between the existing processor surround output channels and the power amplifiers and speakers. The Center Surround 3X can accept either standard line level processor outputs from RCA jacks or amplifier outputs which normally connect to the surround speakers. If you have an integrated processor/power amplifier, it may be possible to break the signal between the processor outputs and the amplifier inputs. See your equipment manual for information on whether this is possible. If so, you may be able to use the surround amplifier channels in the integrated unit. If this is not possible, then you will need a separate dual channel power amplifier for the Left Surround and Right Surround speakers.

POWER

Connect the power pack plug into the POWER jack. Make sure it is fully seated. Use **ONLY** the power pack supplied. Do not substitute as damage could occur.



LINE LEVEL SOURCE

If you are using the line level surround outputs from your processor, disconnect them from your existing surround channel amplifiers and connect them to the RCA jacks marked LS IN and RS IN. Push the SOURCE pushbutton to the LINE position.

SPEAKER LEVEL SOURCE (AMPLIFIER OUTPUTS)

If you are using the existing surround amplifier speaker outputs as your source, then connect them using ordinary speaker hookup wire to the 4 terminals marked LS+ and LS- and RS+ and RS-. Connect the + terminals to the hot side of your amplifier outputs and the - terminals to the ground or minus side of your amplifier outputs. Release the SOURCE pushbutton to the SPKR position.

OUTPUTS

Connect a RCA patch cable from the LS OUT and RS OUT jacks to the Left Surround and Right Surround amplifier inputs. Connect a RCA patch cable from the CS OUT jack to the amplifier input for the rear wall surround speakers. If you have a surround subwoofer system, connect a RCA patch cable from the SW OUT jack to the Subwoofer Amplifier input. The SP1 and SP2 outputs are for special future formats such as overhead surround channels and are not used at present.

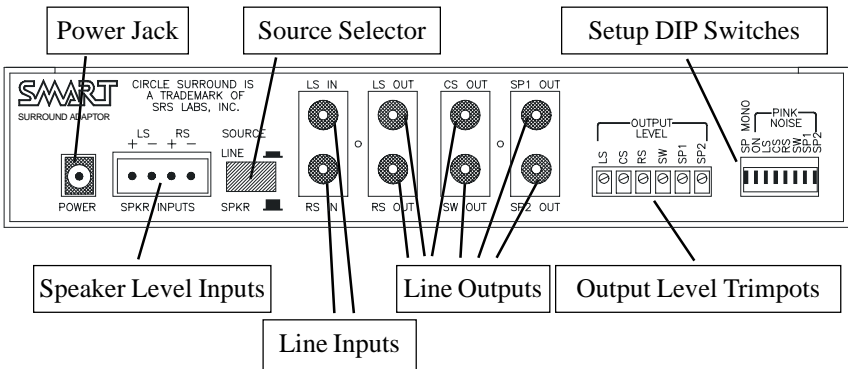
SETTING LEVELS

The CS-3X, Jr. comes from the factory set up for unity gain levels. This means that whatever levels are going in are also the same levels going out. This is probably adequate for most situations. However, there are trimpots provided for adjusting the levels of each individual channel. In addition, there is a volume adjustment knob (marked CENTER FILL) on the front panel for setting the rear wall (CS) speakers' volume relative to the Left and Right Surround volume. Typically, the CS channel volume is set about 3dB higher than the Left and Right Surround channels. You may want to experiment with the CENTER FILL control to get the best effect in your particular listening room.

Also, there is built-in pink noise which can be used to help balance the levels between the surround channels if any adjustment is needed. To activate the pink noise, push down the DIP switch marked ON. Then to send the noise to a particular channel, push down the DIP switch corresponding to the desired channel. **Be sure to push all the Pink Noise DIP switches back up when you are finished with the pink noise.**

There are six OUTPUT LEVEL trimpots which are used to adjust the output levels if needed to balance the levels between the various surround channels. In most cases, these can be left at the factory settings. If you need to adjust these, use the supplied alignment tool or a small jeweler's type screwdriver. These trimpots are multi-turn types. If you turn them all the way to one end, they will click slightly as you continue to turn them. You cannot damage them by turning too far.

This picture of the back of the CS-3X, Jr. shows the connection points, controls and switches which are used in setting up the product for proper operation. The SP MONO DIP switch is for setting the SP1 and SP2 outputs for mono operation. It is used for future formats only.



CAUTIONS

This product requires that the LS and RS inputs have reasonably well-balanced levels and NO equalization or tone control shaping of the signals. If your processor has gain or balance adjustments for the LS and RS channels, make sure that the signal levels are set the same. Likewise, if you have tone or EQ controls for the LS and RS channels, make sure that these are set to the flat positions, i.e., no boost or cut at any frequency. If you want to equalize the surround channels, add equalizers between the CS-3X, Jr. outputs and the amplifier inputs.

OPERATION

The CS-3X, Jr. is very easy to use. There are only three front panel controls and switches. Normally, the only thing to do is to select the proper format depending on whether you are playing a digital soundtrack or a standard stereo soundtrack through a matrix decoder such as Circle Surround™ or Prologic™ .

The pushbutton marked CS-3X and LS-RS is the format pushbutton. In the CS-3X format (pushbutton in), digital soundtracks with separate left and right surround tracks will be played in the Surround EX™ format. This produces three separate surround channels. This is the format you will normally use with digital soundtracks.

The LS-RS format (pushbutton out) is used for playing matrix decoded stereo soundtracks. This format can also be used when playing a digital soundtrack if the resulting sound with the CS (rear wall) speakers playing is not as you desire. In the LS-RS format, only the Left and Right Surround speakers are active.

The ON/OFF pushbutton does not actually turn off power to the unit, but instead bypasses the LS and RS inputs directly to the LS and RS outputs. This pushbutton would only be placed in the OFF position if there was a problem with the CS-3X, Jr. and you wished to take it out of the circuit.

The CENTER FILL control is used to adjust the CS channel output level relative to the Left and Right Surround levels. It can be used to raise or lower the CS volume to suit the particular soundtrack being played. Usually this level is about 3dB higher than the Left and Right Surround channels.

BACKGROUND

Even though the Surround EX™ format was created recently and has only been **specifically** used in a couple of movies, the fact is that ALL digital soundtracks have had in-phase material recorded on the surround channels when the sound mixer wanted the surround sound to appear to come from somewhere between the left and right walls. This in-phase material is decoded by the CS-3X and sent to the rear wall channel speakers and can enhance the directionality and the overall listening experience. If this effect is not desired for a particular movie, simply place the CS-3X in the LS-RS format. Ultimately it is up to you how you prefer to hear your system perform.

MULTI-CHANNEL MATRIX DECODER

This product can also be used as a complete multi-channel matrix decoder for use with a standard 2-channel audio source such as a Hi-Fi Stereo VCR, LaserDisc or DVD player. Using the product in this way requires that you have a processor or control center with multi-channel analog inputs. Of course, it cannot be used in this manner and simultaneously as a surround adaptor for digital soundtracks.

The LS and RS inputs become the Left and Right inputs. These would be connected to the Left and Right outputs of the 2-channel source.

The LS and RS outputs become the Left and Right outputs. The CS output becomes the Center output. The SP1 and SP2 outputs become the Left Surround and Right Surround outputs. The SW output is still the Subwoofer output.

The Circle Surround matrix delivers outstanding results compared to other matrix types used in the home cinema market.

The CS-3X, Jr. does not have a built-in time delay for the surround channels. But in many home environments, there is not always a need for a time delay due to the size of the listening room.

Also, some matrices are better than others at keeping the front channel material out of the surround channels, and the Circle Surround matrix is quite good in this respect. One of the reasons for time delay in the professional cinemas is that dialog sometimes leaks into the surround channels and causes a very annoying echo effect. Time delay is used to mask this problem. If the matrix is good at keeping dialog out of the surround channels, then time delay is not as big an issue for the home environment with the smaller listening space.

SPECIFICATIONS

Device Type	Multi-Channel Surround Decoder
Inputs	2 Line Level - LS IN and RS IN Unbalanced high impedance 2 Speaker Level - LS IN and RS IN Balanced high impedance
Outputs	6 - LS OUT, RS OUT, CS OUT, SW OUT, SP1 OUT and SP2 OUT Unbalanced low impedance Adjustable by trimpots on rear chassis
Signal to Noise Ratio	Better than -70 dB re: -10dBV input
Dynamic Range	85dB at operating input level of -10dBV
Headroom	14 dB above operating input level of -10dBV
Distortion	Typically less than .05% at 1 kHz at -10 dBV input level Typically less than 0.1% at 1kHz at +4dBV input level
Subwoofer Output	-3 dB at 125 Hz, 12dB per octave low pass crossover
Channel Separation	Typically better than 25 dB at 1 kHz
Pink Noise	Built-in pink noise source, switch selectable to each output
Power Supply	UL Approved Wall Plug Power Pack 120 VAC 60 Hz Input - 15 VAC 320 mA Output
Weight and Dimensions	3.5 lbs. 8.6" W x 2.00" H x 6.25" D

LIMITED WARRANTY

SMART products and accessories are warranted against malfunction or failure due to defects in workmanship or materials for a period of one year from the date of shipment. If a problem occurs during the warranty period, the unit will be repaired, without charge for materials or labor. This limited warranty does not cover products that have been abused, altered, modified, or operated in other than specified conditions. Returned equipment or defective parts must be shipped freight prepaid to us by the dealer or customer. Our limited warranty does not cover damages resulting from accident, misuse or abuse, lack of responsible care, or failures not attributable to manufacturing defects, except as provided herein. SMART Devices, Inc. makes no warranties, express or implied, including warranties of merchantability or fitness for a particular purpose.