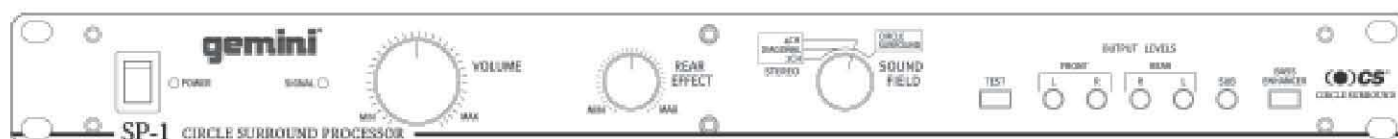




SERVICE manual

SP-1

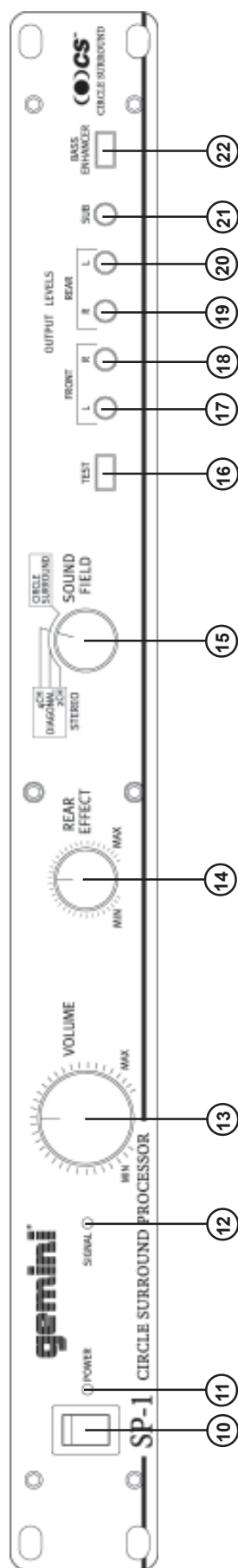
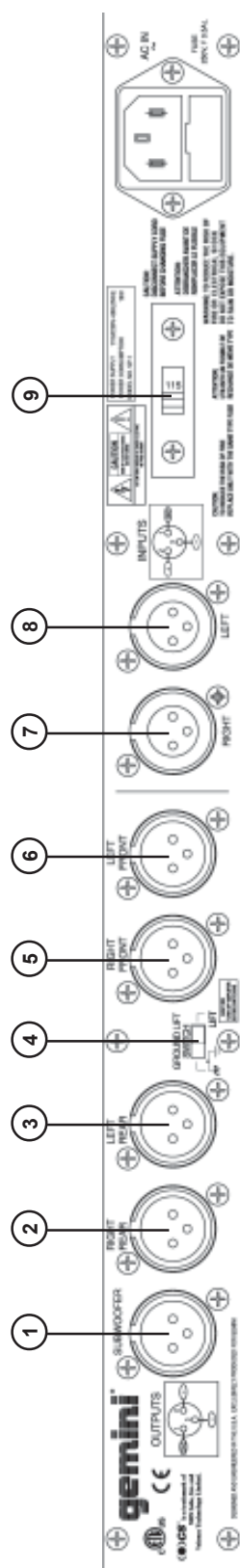


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Specifications:.....	Page 5
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Schematics:.....	Page 10

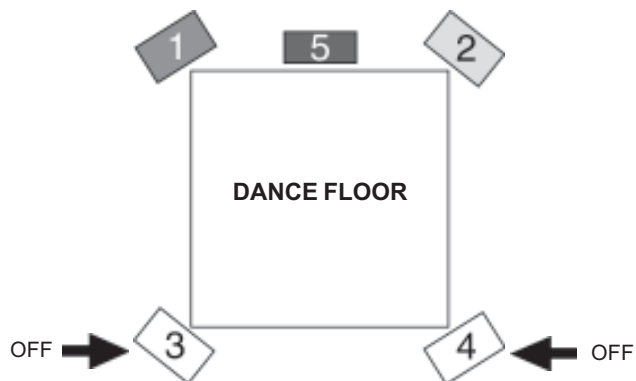


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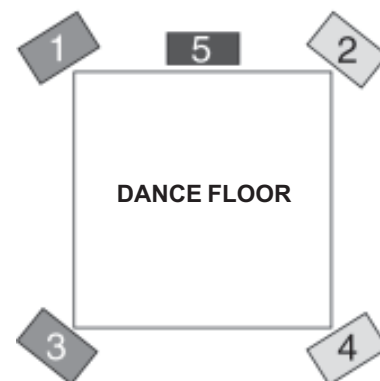


<p>1 Front Left Speaker</p> <p>2 Front Right Speaker</p> <p>3 Rear Left Speaker</p>	<p>4 Rear Right Speaker</p> <p>5 Subwoofer</p>
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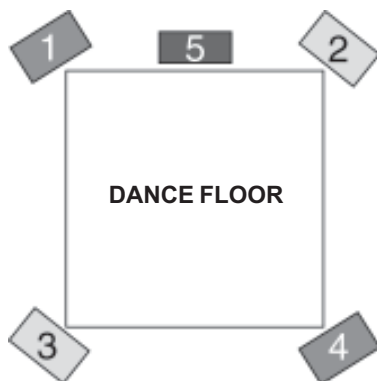
Two Channel Stereo Configuration



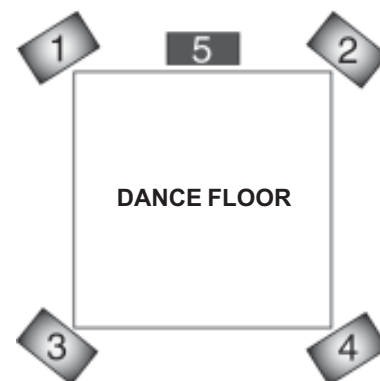
Two Channel Four Speaker Stereo Configuration



Two Channel Four Speaker Stereo Diagonal Configuration



CS[™] Circle Surround Configuration



Connections

1. Before plugging in the power cord, make sure that the **VOLTAGE SELECTOR (9)** switch is set to the correct voltage.
2. Make sure that the **POWER (10)** switch is in the off position. The **POWER LED (11)** will be off. All connections must be made with all equipment OFF.
3. On the rear panel is one set of electronically balanced stereo **INPUTS (7, 8)**. The **INPUTS (7, 8)** are used to connect to the output of your mixer using standard XLR cables. The balanced inputs have three separate conductors, two of which are signal (positive and negative) and one which is a shield (ground). Pin 1 is ground (shield). Pin 2 is signal hot (positive). Pin 3 is signal cold (negative).
4. The SP-1 is supplied with 5 **BALANCED OUTPUTS (1, 2, 3, 5, 6)**. The **BALANCED OUTPUT** connectors are used to connect to your amplifiers using standard XLR cables. Connect the **BALANCED OUTPUT (1)** to the amplifier for the subwoofer. Connect the **BALANCED OUTPUT (2)** to the amplifier for the rear right speaker. Connect the **BALANCED OUTPUT (3)** to the amplifier for the rear left speaker. Connect the **BALANCED OUTPUT (5)** to the amplifier for the front right speaker. Connect the **BALANCED OUTPUT (6)** to the amplifier for the front left speaker. The **BALANCED OUTPUTS** have three separate conductors, two of which are signal (positive and negative) and one which is a shield (ground). Pin 1 is ground (shield). Pin 2 is signal hot (positive). Pin 3 is signal cold (negative).

Speaker Placement

Just like in a theater or a home surround system set up, speaker placement should be arranged to create a box in order to maximize the effect of the SP-1. Refer to Page 2 for greater detail. Position the subwoofer between the front speakers. If you position the subwoofer in front of a wall or facing away from a corner, you will gain subwoofer output.

Using the Ground Lift Switch

Depending on your system configuration, sometimes applying the ground will create a quieter signal path. Sometimes lifting the ground can eliminate ground loops and hum to create a quieter signal path.

1. With the unit on, listen to the system in idle mode (no signal present) with the ground applied (the **GROUND LIFT SWITCH (4)** in the left position).
2. Then turn the power off before moving the **GROUND LIFT SWITCH (4)**. Lift the ground by moving the **GROUND LIFT SWITCH** to the right, turn the power back on and listen to determine which position will provide a signal devoid of background noise and hum. Keep the **GROUND LIFT SWITCH** in the ground position if the noise level remains the same in either position.

CAUTION: Do not terminate the AC ground on the unit in any way. Termination of the AC ground can be hazardous.

Operation

1. After you have finished connection and placing the speakers in their proper position, turn the **POWER (10)** on to the SP-1 (the **POWER LED (11)** will glow) and the rest of your equipment.

Note: Turn on your equipment in the order that the sound travels, beginning with the source and ending with the amps.

2. Move the **SOUND FIELD (15)** control to the Circle Surround position, then press the **TEST (16)** button on the SP-1. White noise will cycle through each speaker (except the subwoofer) so that you may monitor the levels of each speaker individually. While standing in the center of the dance floor, check the noise levels with a sound pressure level (SPL) meter or listen to the noise levels. Use the **OUTPUT LEVEL (17, 18, 19, 20)** controls to adjust the output level of the 4 channels. Note: The **REAR EFFECT LEVEL (14)** is disabled in test mode. When you've finished the test, use the **SUBWOOFER OUTPUT LEVEL (21)** control to adjust the output level of the subwoofer.

Note: The subwoofer will work in all modes of operation and is always on. Disconnect the subwoofer if you don't want to use it. See the Bass Enhancer instructions for more information.

Front Panel Controls

1. **Volume Control:** Use the **VOLUME (13)** control to adjust the overall volume.
2. **Rear Effect Level:** Starting from the center position, use the **REAR EFFECT LEVEL (14)** to adjust the rear speaker levels. You may boost the rear channels if you feel not enough sound is coming from them. You can also readjust the rear levels for music with varying spatial information.
3. **Sound Field:** Use the **SOUND FIELD (15)** control to choose a mode of operation.
4. **Test Button:** In Circle Surround mode, press the **TEST (16)** button on the SP-1, and white noise will cycle through each speaker (except the subwoofer) so that you may monitor the levels of each speaker individually. The test button is recessed so you can not accidentally initiate a test in the middle of your music program.
5. **Output Level Controls:** Use the **OUTPUT LEVEL (17, 18, 19, 20)** controls to preadjust the output levels of the 4 channels to compensate for different amps and speaker sensitivity. Use the **SUBWOOFER OUTPUT LEVEL (21)** control to adjust the output level of the subwoofer.
6. **Bass Enhancer:** Press the **BASS ENHANCER (22)** button to boost the level of the bass of the subwoofer by +6 dB at 40 Hz. The Bass Enhancer works optimally with most vented prosound subwoofers, and when activated, special filters shape the frequency response to optimize bass performance while cutting subsonic frequencies. Note: the Bass Enhancer only boosts the bass from the subwoofer output.
7. **Signal LED:** The multi-color **SIGNAL LED (12)** indicates the level of the signal and changes color incrementally from green to red. When the **SIGNAL LED (12)** glows red, the unit is in overload, and you should lower the **VOLUME (13)**. Sometimes you can also stop an overload by lowering the **REAR EFFECT LEVEL (14)** or the **SUBWOOFER OUTPUT LEVEL (21)**. Ideally, the **SIGNAL LED (12)** should flash between green and orange.

Modes of Operation

Use the **SOUND FIELD (15)** control to choose one of the following modes of operation:

1. **Two Channel Stereo:** In this standard stereo mode, the rear speakers are disengaged and only the front speakers function.
2. **Two Channel Four Speaker Stereo:** In this four speaker stereo mode, the rear speakers mirror the front speakers' program signal.
3. **Two Channel Four Speaker Stereo Diagonal:** With diagonal mode, the rear right and left sides reverse so that the rear right speaker mirrors the front left speaker's program signal and the rear left speaker mirrors the front right speaker's program signal. This mode is useful in large rooms or club environments to avoid people on one side of the room hearing only one channel of a stereo program.
4. **CS™ Circle Surround:** In Circle Surround sound mode, any stereo signal can be used to generate surround play. A frequency and phase dependent amplitude based signal processor uses ambience and directional information already present in the stereo signal to generate 3D surround sound. And unlike other surround formats where the rear output is mono and bandwidth limited, Circle Surround separates the left and right rear channels with full bandwidth. In this mode, the rear speakers will not output the full program (the rear levels will be lower than the front), because the rear speakers are used to create an enhanced spatial perception. Note: The Circle Surround Experience is dependent on the source itself, therefore some tracks of music may sound better in Circle Surround than others. Signals encoded for Circle Surround will give you the best circle surround experience.

Specifications

Balanced Inputs:

Sensitivity.....1 VRMS
Impedance.....20 kOhm

Balanced Outputs:

Level.....2 VRMS
Impedance.....600 Ohm

Frequency Response:

Stereo Mode.....10 Hz - 60 kHz +0, -1 dB
Circle Surround Mode.....10 Hz - 22 kHz +0, -1dB

Distortion:

Stereo Mode.....<0.01%
Circle Surround Mode.....<0.15%

S/N Ratio:

Stereo Mode.....>90 dB
Circle Surround Mode Front Channels.....>80 dB
Circle Surround Mode Rear Channels.....>55 dB

Subwoofer Channel:

Low Pass Filter.....@ 100 Hz, 12 dB/oct
High Pass Filter.....@ 15 Hz, 6 dB/oct
High Pass Filter in Enhanced Mode.....+ 6 dB @ 40 Hz (Q=2),
12 dB/oct


Rear Channel Effect Max./Min. Ratio.....12 dB

Power Source.....115V/230V, 60 Hz/50 Hz

Power Consumption.....10 W

Dimensions.....19" x 1.75" x 10.5" (483 x 44 x 266 mm)

Weight.....10.5 lbs (2.5 kg)

Circle Surround and the  symbol are trademarks of SRS Labs, Inc. in the United States and selected foreign countries. Circle Surround technology is incorporated under license from SRS Labs, Inc.

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Parts Lists

Cabinet Parts and Packing

Item #	Description	Part #
1	PANEL CONTOL	002-292
2	COVER TOP	031-035
3	COVER BOTTOM	032-070
4	PANEL REAR	034-070
5	AC SOURCE FIXER	022-305
6	LED HOLDER 3f (8.5mm)	003-998
7	LED HOUSING	003-733
8	KNOB ROTARY (BIG)	003-139
9	KNOB ROTARY (SMALL)	003-140
10	KNOB PUSH	002-536
11	BUSHING PUSH KNOB	002-537
12	PAD FOOT	049-206
13	GND SCREW	146-710
14	SERIAL NO, LABEL	196-062
15	OWNER'S MANUAL	157-963
16	GIFT BOX	255-132
17	POLYFORM	153-137
18	WARRANTY CARD	156-089
19	PAN-HEAD TAPPING SCREW (TWIN	110-153A
20	TOOTH)PAN-HEAD TAPPING SCREW	110-158
21	FLAT-HEAD TAPPING SCREW (5.1-5.3)	111-043A
22	BAND-HEAD TAPPING SCREW	111-046A
23	BAND-HEAD TAPPING SCREW	111-055
24	BAND-HEAD TAPPING SCREW/TW-E	121-003A

Printed Circuit Boards

Item #	Description	Part #
1	PRINTED CIRCUIT BOARD SP-1-1	262-241
2	PRINTED CIRCUIT BOARD SP-1-2	262-242
3	PRINTED CIRCUIT BOARD SP-1-3	262-243

Parts Lists - Main PCB

ICs

Item #	Designators	Description	Part #
1	IC1	INTEGRATED CIRCUIT LB1403N	074-022
2	IC2-3, IC12-15	INTEGRATED CIRCUIT 4558DD (BA15218, M5218A)	074-163
3	IC6	INTEGRATED CIRCUIT TL072CP	074-168
4	IC7	INTEGRATED CIRCUIT SSM2005RS-REEL	074-172
5	IC9	INTEGRATED CIRCUIT PIC16C505-04/P	074-171
6	IC8	INTEGRATED CIRCUIT NJM78L05A	074-173
7	IC4	INTEGRATED CIRCUIT NJM78L06A	074-174
8	IC5	INTEGRATED CIRCUIT NJM79L06A	074-175
9	IC11	INTEGRATED CIRCUIT NJM7815FA	074-088
10	IC10	INTEGRATED CIRCUIT NJM7915FA	074-089

Electrical Parts

Item #	Designators	Description	Part #
1	LD1	LED (GREEN/RED) 3 mm	080-111
2	Q1, Q2, Q6	TRANSISTOR 2SA1048 (2SA1317)	076-104
3	Q3-5	TRANSISTOR 2SC2878	072-295
4	D1-5, D10-14	SILICON DIODE 1N4148	079-003
5	D6-9	RECTIFIER DIODE 1N4002	079-027
6	ZD1, ZD2	ZENER DIODE 1/2 W 3.3V	079-056
7	SW1	ROTARY SWITCH 1-4-3 L=17mm SOUND FIELD	082-030
8	SW3	PUSH BUTTON SWITCH LOCK; PC1 SW3 BASS ENHANCER	083-114
9	SW2	PUSH BUTTON SWITCH UNLOCK; PC1 SW2 TEST NOISE	083-115
10	VR1	ROTARY VR 16 mm 10KA×2 VOLUME	071-217
11	VR2	ROTARY VR 16 mm 10KB FADER	071-218
12	VR3-7	ROTARY VR 9 mm 10KA	071-219

Parts Lists - Input/Output PCB

ICs

Item #	Designators	Description	Part #
1	IC1-4	INTEGRATED CIRCUIT 4558DD (BA15218, M5218A)	074-163

Electrical Parts

Item #	Designators	Description	Part #
1	Q2-11	TRANSISTOR 2SC2878	076-095
2	Q1	TRANSISTOR 2SA1048 (2SA1317)	076-104
3	D1-2	SILICON DIODE 1N4148	079-003
4	XLR3-7	PHONE JACK XLR	092-113
5	XLR1-2	PHONE JACK XLR	092-069
6	SW1	SLIDE SWITCH PC1 GND LIFT	081-030

Parts Lists - Switch PCB

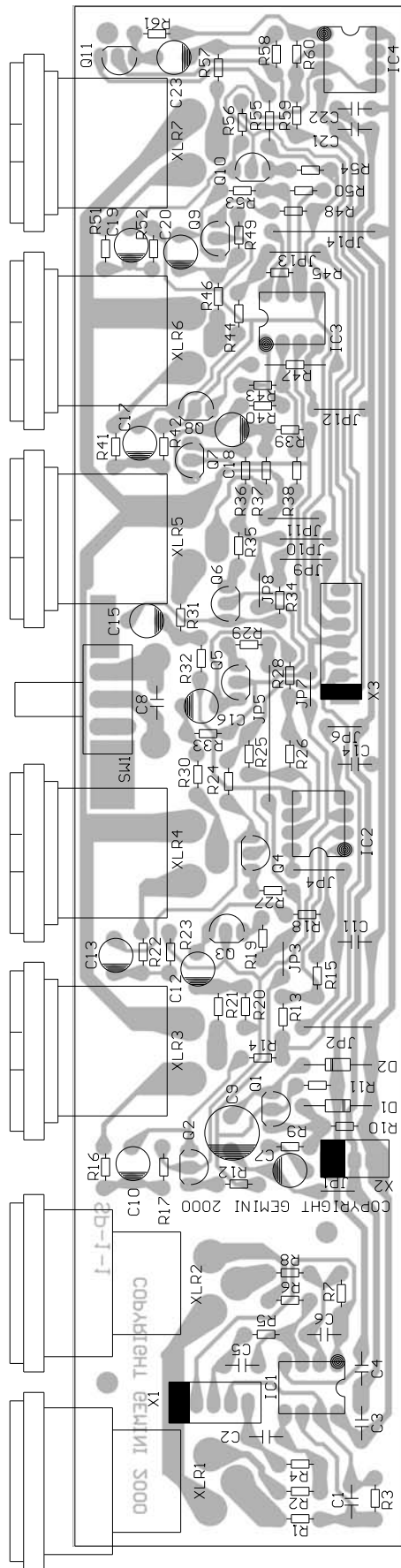
Electrical Parts

Item #	Designators	Description	Part #
1	DO3	LED (RED) 3 mm	080-003
2	SWO1	POWER SWITCH	083-070
3	CO2	CERAMIC CAPACITOR UL 0.0047μ/400V	151-156

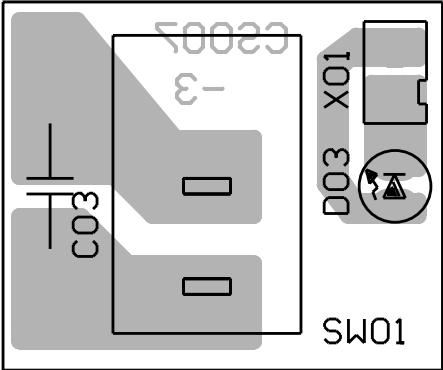
Main PCB



Input/Output PCB



Switch PCB



Schematic

