



INSTALLATION AND OPERATION

MANUAL

for the

Broadcast Tools® SS 3.1

Switcher/Router

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BROADCAST TOOL® SS 3.1
SWITCHER ROUTER


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BROADCAST TOOL® SS 3.1
SWITCHER ROUTER


INTRODUCTION

Thank you for your purchase of a **Broadcast Tools® SS 3.1 Switcher Router** (referred to as the SS 3.1 throughout this manual). We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the Broadcast Tools® SS 3.1 Switcher Router.

 **NOTE:** *This manual should be read thoroughly before installation and operation.*

SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

 **CAUTION!** *Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.*

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

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THANK YOU FOR CHOOSING BROADCAST TOOLS® BRAND PRODUCTS!

Product Description

The SS 3.1 Stereo Audio Switcher/Router passively switches or routes a variety of electrical signals to a single destination or vice-versa. The SS 3.1 Stereo Audio Switcher/Router selects any one of three stereo inputs to a single stereo output. The SS 3.1 Stereo Audio Switcher/Router provides PASSIVE switching through gold contact relays. The passive switching means that the unit can route a signal in both directions (multiple sources to a single destination, or a single source to multiple destinations). Due to the passive nature of the switching, distortion and noise are almost non-existent and in no way change the quality of the signal it is switching. In addition to their normal use with audio signals, the unit may be used to switch AES/EBU digital signals, telephone lines and composite stereo audio.

The SS 3.1 Stereo Audio Switcher/Router is controlled by means of rear panel switches, contact closures with the provided rear panel 9 pin male D-Sub connector and/or the multi-drop RS-232 serial port.

The SS 3.1 Stereo Audio Switcher/Router has features to allow selecting which of any source is active at power-up; the last selected source, audio mute; allowing the user to turn off the audio output when activated; a step input, providing a means of stepping through each source or it may be used to step through each source every 50 seconds. A RS-232 multi-drop serial port is provided; allowing operation of up to eight units from one serial port. Source number one is configured to route audio to the output in the case of loss of power to the unit. The sources, which are not selected, are terminated with a 10K Ω , $\frac{1}{2}$ watt load resistor.

Applications

Digital processing monitor switching, EAS audio switching or any type of stereo, monaural, composite audio, AES/EBU, ISDN, RS-232/422/485 or telephone line switching, multiple station music on-hold and/or PA switching

Rear Panel Description

Source Switches:

Each switch represents an input to be routed to the switcher's output. The switches are highly reliable switches, which will give the user years of dependable service. Each switch has an LED indicator, which will illuminate when that particular source is routed to the output. When a source is selected, the previous source will be deselected, (interlock).

The rear panel contains the inputs, outputs and remote control interfacing connectors. Signal inputs and outputs are routed through removable screw terminals. Remote control is accomplished via a 9 pin "D-Sub" connector and/or a RS-232 multi-drop serial port.

Power:


Connect the 2.1mm barrel type power connector into the unit and the 9vac, 500 ma wall transformer into a 120 Vac 50-60 Hz power source. The rear panel green power LED indicates when power is applied to the unit. (220 Vac 50-60 Hz wall transformer OPTIONAL)

REAR PANEL DESCRIPTION

Audio Signal Connector:

Removable screw terminals.

- **OPTIONS:** Follow the tables below for options.

 **NOTE:** *The < * > denotes factory setting.*

Unit Address (ID):

Serial Address	SW5-1	SW5-2	SW5-3
0 *	OFF	OFF	OFF
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON
6	OFF	ON	ON
7	ON	ON	ON

Baud Rate:

Description	SW5-4
9600 Baud Rate (8,N,1)	OFF *
2400 Baud Rate (8,N,1)	ON

Operation:

Description	SW5-5
Last selected channel	OFF *
User selected channel. Hold down the desired channel switch and wait for the LED(s) to flash.	ON
Description	SW5-6
Normal SS 3.1 operation	OFF *
Unit functions as SS 2.1 (Sustained op)	ON

INSTALLATION GUIDELINES

Remote Connector:

A male 9 pin “D-Sub” connector is provided for connection to equipment, which will remotely control the SS 3.1 Stereo Audio Switcher/Router with TTL/CMOS compatible 5 volt level and contact closures. Pulsing the “MUTE” input to ground (low) would turn off the audio output of the SS 3.1 until a rear panel source switch is pressed, a remote control input is activated or the unit is powered up. Pulsing the “STEP” input to ground will step the unit one source for each low to high transition on this input. Automatic sequencing may be accomplished by holding the step input low. The unit will now step through each source at a fifty-second rate, allowing you to preview each source. The step input is helpful in freeing up valuable remote control channels. This feature may also be used to sequence through multiple station air monitor signals for music on-hold or overhead PA feeds. The SS 3.1 may be configured to act as a SS 2.1 switcher. With SW5-6 turned ON, input one is selected. By pulling pin 2 on J1 low, input two is selected.

Installation of the SS 3.1 in **high RF environments** should be performed with care. Shielded cable is suggested for all control, audio inputs and outputs. All shields should be tied to the EGND terminals. The station ground should be connected to the chassis ground screw located on the far right side of the SS 3.1 as viewed from the rear. It is recommended that all cables connected to the SS 3.1 be looped through ferrite cores to suppress RF. Surge protection with RF filtering is also suggested for the wall transformer. The purchase of an inexpensive UPS will provide back up in case of power outages.

The SS 3.1 Stereo Audio Switcher/Router is very simple to install. The signal inputs, outputs are connected via removable screw terminals. Installation of the SS 3.1 Stereo Audio Switcher/Router consists of six steps:

1. Inspection
2. Removal of the source termination resistors, if applicable
3. Bench test
4. Mount the unit on a rack shelf or rack panel (RM-2,3 or MSO-8) if needed.
5. Connect your equipment to the unit
6. Serial operation, if applicable.

STEP 1: INSPECTION

Please examine your SS 3.1 Stereo Audio Switcher/Router carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package should contain the SS 3.1 Stereo Audio Switcher/Router, 9vac, 500 ma wall power transformer, this manual, modular cable w/S-9 adapter and a 9-pin female D-Sub connector/shell.

INSTALLATION GUIDELINES

STEP 2: SOURCE TERMINATION RESISTOR REMOVAL

Input sources that are not selected are terminated with a 10K Ω load (1/4 watt maximum). If you do not want this load applied across the **deselected sources**, it may be removed from each channel. Each channel has a pair of resistors.

Ⓜ **EXAMPLE:** Channel 1, relays K1 A&B switches the signal; R1 & R2 are the load resistors. As delivered, all channels are configured with these resistors installed. To remove the load resistors from a channel, locate via the schematic the proper resistors for that channel, cut its leads and discard the resistors.

STEP 3: BENCH TEST

Place each unit on a workspace and connect power to the unit. Check to see if the power LED is lit. Connect an audio source to stereo input one and a monitoring device to the output. Select channel one and verify that audio is present. Repeat the process until each channel's operation has been verified. This would also be a good time to set up the desired option switch.

STEP 4: MOUNTING

Mount the unit on a rack shelf, such as the Broadcast Tools RM-2, RM-3 or MSO-8, allowing adequate airflow for cooling. The optional RM-2/3 may be ordered separately for rack mounting. Front panel switches and indicators may be added by purchasing the MSO-8.

STEP 5: CONNECT YOUR EQUIPMENT

The SS 3.1 Stereo Audio Switcher/Router interfaces to your equipment (sources, loads and remote control) through the rear panel connectors. Follow the legends for the desired audio input and output connections. The connectors are removable. Use a small screwdriver to loosen each screw terminal, insert the stripped wire (18 to 26 gauge wire), tighten the screw and reinsert the connector.

STEP 6: SERIAL OPERATION

Connecting the RS-232 serial port of the SS 3.1 may be accomplished by using the supplied modular cable and S-9 adapter. Plug the modular cable into the modular jack J14 and other end of the modular cable into the S-9 adapter. The adapter may now be plugged into a PC's com port. Select the desired address for each unit. Never duplicate address numbers. The protocol is as follows: 9600/2400, N, 8, 1.

To select a channel, send the following string: *tdi

Where the < * > Denotes start of string character

< t > Product type code, in this case 3

< d > ID (address, 0 through 7) number

< i > Input channel (1 through 3 or m, denoting MUTE).

Ⓜ **EXAMPLE:** *303 This string would turn on channel 3 with an address of 0.

*30m This string would MUTE the switcher's output with an address of 0.

INSTALLATION GUIDELINES

 **NOTE:** *No serial status is provided.*

Apply power to the SS 3.1 via the wall transformer. Your SS 3.1 Stereo Audio Switcher/Router is now fully functional.

REMOTE CONTROL CONNECTOR PINOUTS


Control:

The rear panel switches are brought out through the rear panel REMOTE CONTROL connector, providing a means of controlling the SS 3.1 Stereo Audio Switcher/Router from a remote point. These digital inputs require a momentary. The inputs are compatible with 5 volts CMOS/TTL logic, open collectors or contact closures to ground. Inputs are pulled high.

Status:

The status signals from the rear panel indicator LED's are supplied through the remote control connector as individual open collectors. This may provide status to a remote control point to indicate which source is selected. The status output for the selected output will go low, providing a return for an LED indicator or TTL/CMOS logic. External pull-up resistors may be required in some installations.

J1, Remote Control Pin Numbers:		J1, Remote Status Pin Numbers:	
1	Switch number 1	6	Status number 1
2	Switch number 2	7	Status number 2
3	Switch number 3	8	Status number
4	Mute	9	Ground
5	Step		

 **NOTE:** *JP2 is provided to facilitate connecting the front panel switches and LED's of the MSO-8 to the SS 3.1*

Install the 10-position connector supplied with the MSO-8 into JP2. Verify that pin 1 (Black wire) of the MSO-8 connector is matched with pin 1 on JP2 (The pin below the "J" in JP2)

BROADCAST TOOLS® SS 3.1 SWITCHER ROUTER SPECIFICATIONS

Inputs/Outputs:	<i>Any input level and impedance can be used. Inputs may be balanced or unbalanced. Output levels, impedance, distortion, noise and balancing will match that of the selected input.</i>
Switching Method:	<i>Passive. Two sealed relays utilizing 2-form-C Bifurcated-Crossbar silver alloy with gold overlay contacts.</i>
Logic:	<i>Flash microprocessor</i>
Operation Control:	<i>Rear Panel - Momentary switches. Remote - Momentary, compatible with 5 volts CMOS/TTL logic, open collector or contact closures to ground. Serial – Multi-drop RS-232, Receive only, 2400/9600, 8, N, 1</i>
Status:	<i>Rear Panel – Green indicator LED's. Remote - Open collector output, limit current to 100ma @ 24vdc per output. Pull-ups may be required.</i>
Interfacing:	<i>Audio - Rear panel removable screw terminals</i>
Power Requirements:	<i>Audio - Rear panel removable screw terminals Remote Control - Male 9 pin "D" connector. Mate supplied RS-232 – 4C modular cable w/9 pin female D-Sub adapter supplied.</i>
Physical Dimensions:	<i>7.75" x 4" x 1.25" (WDH)</i>
Weight:	<i>2.0 lb.</i>
Shipping Weight:	<i>3.0 lb.</i>
Options:	<i>RM-2 Rack Panel. 3 - RU RM-3 Rack shelf. 1 - RU MSO-8 1 – RU</i>

BROADCAST TOOL® SS 3.1
SWITCHER ROUTER

**BROADCAST TOOLS, INC.
LIMITED WARRANTY AND REMEDIES**

LIMITED WARRANTY

The term “Buyer” as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person’s or entity’s own use.

Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

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If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer’s acquisition of the item, and if the item is returned in to Broadcast Tools in accordance with Broadcast Tools’ instructions for confirmation by inspection of the defect (which at Broadcast Tools’ election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

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