



Installation and Operation Manual

for the

3 x 2, Ver C

Three Input, Dual Output Stereo Audio Switcher

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3 x 2, Version C, Dual Stereo Audio Switcher

INTRODUCTION

Thank you for your purchase of a Broadcast Tools, Inc., 3x2 C Dual Stereo Audio Switcher. 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 unit.

✍ **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.

Broadcast Tools Products, as 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 or contact us directly.

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PRODUCT DESCRIPTION

The **3 x 2 C Dual Stereo audio switcher** is designed to accommodate three stereo inputs and two stereo outputs.

The **3 x 2 C Dual Stereo audio switcher** may be controlled via any momentary and/or sustained switch, contact closure, TTL/CMOS logic, while Status/Tally open collector outputs are provided for remote status. The **3 x 2 C Dual Stereo audio switcher** also has the ability to be controlled by a computer or any serial RS232 device.

The **3 x 2 C Dual Stereo audio switcher** features three (3) operating modes:

1 - Mix mode # 1. Allows control with an alternate action (Toggle) low logic level pulse via the remote control connector. This mode is also available via the serial port. The power-up feature may be used in this mode.

2 Mix mode # 2. Allows control with a sustained low logic level via the remote control connector. This mode may be used to interface with the Scott Studio 8255 I/O card. ***NOTE: Serial control and the power-up feature is disabled in this mode.***

3 Interlock mode. Provides that when a channel is selected, the first audio source will be immediately turned off and the second audio source will be turned on. Serial control and the power-up feature for output # 1 are functional.

Another user selectable feature is the way the **3 x 2 C Dual Stereo audio switcher** will act when power is first applied (or re-applied after a power failure). You have your choice of all channels being OFF on power-up or any one of the three input channels being assigned to either output channel at power-up. Disabled in some modes.

INSTALLATION

Installation of the 3 x 2 C 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 3 x 2 C as viewed from the rear. It is recommended that all cables connected to the 3 x 2 C be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite ISOBAR 4 or 6 is also suggested for the wall transformer. The purchase of an inexpensive UPS will provide back-up in case of power outages.

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INSTALLATION, Continued

The 3 x 2 C Stereo Audio Switcher is simple to install. The input and output signals are connected via pluggable screw terminals. Installation of the 3 x 2 C Stereo Audio Switcher consists of five steps:

1. Inspection
2. Bench test
3. Mount the unit on a rack shelf or a desk top
4. Connect your equipment to the unit
5. Serial operation, if applicable

STEP 1: INSPECTION

Please examine your 3 x 2 C Stereo Audio Switcher 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 3 x 2 C Stereo Audio Switcher, 16 to 18 Vac @ 600 ma wall power transformer, this manual, 15 pin female D-connector/shell, 7 foot modular cable, 9 pin D-Sub adapter.

STEP 2: BENCH TEST

Place each unit on a workspace and connect power to the unit. Check to see if LED #1 (Switch 1) and the power LED are lit (Source one is the power-up factory default). Connect an audio source to stereo input one and a monitoring device to the output. 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 jumper options.

STEP 3: MOUNTING

Mount the unit on a rack shelf, such as the Broadcast Tools RM-1, allowing adequate airflow for cooling. The optional RM-1 may be ordered separately for rack mounting. A filler panel, model number FP-1 may be ordered to fill the gap if only one 3 x 2 C Stereo Audio Switcher is mounted in the RM-1.

STEP 4: CONNECT YOUR EQUIPMENT

The 3 x 2 C Stereo Audio Switcher interfaces to your equipment (sources and loads) through pluggable rear panel screw terminals. Follow the legends for the desired audio input and output connections. Follow the legends for the desired audio input and output connections, which appear on the rear side of the printed circuit board and also on the layout drawing on the last page of this manual. Remove each screw terminal, strip each conductor and insert the conductor into the terminal and screw down the capture screw. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire.

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INSTALLATION Continued

STEP 5: SERIAL OPERATION

The supplied modular cable, 9 pin D-sub adapter may be connected to the 3 x 2 C Stereo Audio Switcher by inserting one end of the modular cable into the provided modular jack located on the rear of the 3 x 2 C. Plug the other end of the modular cable into either the 9 pin D-sub adapter labeled S or S-9 . The adapter may now be plugged into your computers serial port. Only use the modular cord that is supplied with the 3 x 2 C or a replacement that reverses. Plug the supplied wall transformer into a source of 117vac and the cable end of the transformer into the power receptacle on the 3 x 2 C. The 3 x 2 C may operate at 2400 baud. The unit is shipped set for 2400 baud, with 8 data bits, no parity and one stop bit. Load your favorite communication software package (Procomm, Bitcom, Windows 3.1/3.11 Terminal, Windows 95/98/ME/NT/2000/XP Hyper Terminal, etc.) Using the protocol of 2400-N-8-1. Set the mode to: DIRECT, Flow Control to: NONE and emulation to: ANSI. Follow the instructions below. The protocol is as follows: 2400, N, 8, 1.

Burst Mode Command Protocol

A burst mode command must be sent within 5 seconds. It starts with an asterisk (*), then the listed command codes. Syntax of burst mode commands are listed below:

- i - Input channels 1 through 3.
- o - Output channels 1 and 2
- *i1 - Connect input "i" to output 1.
- *i2 - Connect input "i" to output 2.
- *iB - Connect input "i" to both outputs.
- *i0 - Disconnect desired input channel from both output channels
- *i4 - Connect input "i" to output 1.
- *i5 - Connect input "i" to output 2.
- *i6 - Disconnects input "i" from output 1.
- *i7 - Disconnects input "i" from output 2.

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REMOTE CONTROL CONNECTOR PINOUTS

Control of the switcher is available through the rear panel REMOTE CONTROL connector, providing a means of controlling the 3 x 2 C Stereo Audio Switcher/Router from a remote point. These digital inputs may be connected to any remote pair of switch contacts, such as external relays, switches, etc. The digital inputs may also be connected to external open-collector circuits or 5-volt logic signals.

NOTE: MIX modes 1 & 2 only !

<u>J2 Pin #:</u>	<u>CONTROL</u>	<u>J2 Pin #</u>	<u>STATUS</u>
1	- Input 1 to output 1	7	- Input 1 to output 1
3	- Input 2 to output 1	9	- Input 2 to output 1
5	- Input 3 to output 1	11	- Input 3 to output 1
2	- Input 1 to output 2	8	- Input 1 to output 2
4	- Input 2 to output 2	10	- Input 2 to output 2
6	- Input 3 to output 2	12	- Input 3 to output 2
		14-15	- Digital Grounds

NOTE: INTERLOCK Mode only !

<u>J2 Pin #:</u>	<u>CONTROL</u>	<u>J2 Pin #</u>	<u>STATUS</u>
1	- Input 1 to output 1	7	- Input 1 to output 1
2	- Input 2 to output 1	9	- Input 2 to output 1
3	- Input 3 to output 1	11	- Input 3 to output 1
4	- Not used in this mode	8	- Input 1 to output 2
5	- Master mute	10	- Input 2 to output 2
6	- Output 2 select	12	- Input 3 to output 2
		14-15	- Digital Grounds

NOTE: Pin 6, the output 2 select pin must be held low to select and/or mute any input on output 2.

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SETUP

Mode Selection *(Refer to the PCB layout diagram on the last page of this manual).*

- | | |
|--|--------------------------|
| JP-1, Pins 1 & 2 - 3 & 4 open | - Mix Mode # 1 |
| JP-1, Pins 1 & 2 closed 3 & 4 open | - Mix Mode # 2 (Default) |
| JP-1, Pins 1 & 2 open and 3 & 4 closed | - Interlock Mode |

Power-Up selection

To select a channel configuration at power-up, select the proper jumpers on JP-3. To select **NO** channels at power-up, remove the two jumpers on JP-3 (Default).

Input and Output Levels

Once the input and output connections have been made, the input levels can be set. The switcher is factory set for unity gain. Recommended input levels would be in the range of -15 dBu to +27 dBu. The inputs and outputs can both add an additional 15 dB of gain from the factory settings. Should input levels need to be changed, they are accessible from the rear panel. Each stereo input is labeled and has one input adjustment. Similarly, the output channel adjustment may be accessed with the top cover removed.

Input expansion

Input expansion (P1) may be accomplished by connecting a shielded cable between the first units SM1L to the second units output channel. The shield is to be connected to the AGND terminal. Follow the same procedure for the second and right channels. The above example provides 6 inputs, with the first units # 1 output.
NOTE: P1 may be accessed with the top cover removed.

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SPECIFICATIONS

<u>MAX INPUT LEVELS:</u>	+27dbu, Active balanced, 20 k Ω .
<u>OUTPUT LEVELS:</u>	Stereo balanced output 1 & 2, +24 dbu, < 100 Ω .
<u>GAIN:</u>	15db.
<u>FREQ RESPONSE:</u>	20 to 20 kHz; +/- .25 dB.
<u>SIGNAL/NOISE RATIO:</u>	>85 dB nominal, unweighted, below +4dbu.
<u>DISTORTION:</u>	Less than 0.01% THD at +24dbu.
<u>CROSSTALK:</u>	-80 dB @ 1khz / -65 dB @ 10 kHz from adjacent off channel.
<u>EXPANSION INPUT:</u>	Unbalanced summing inputs @ 10k Ω , 0 dbu.
<u>SWITCHING METHOD:</u>	Sealed relays, utilizing 2-form-C Bifurcated-Crossbar silver alloy with gold overlay contacts.
<u>LOGIC:</u>	Microprocessor.
<u>OPERATION CONTROL:</u>	<i>Momentary and/or Sustained</i> - Switches, Contacts, TTL/CMOS. RS-232 - Serial 2400 baud, 8N1.
<u>STATUS:</u>	<i>Remote</i> - Open collector. No serial status.
<u>CONNECTORS:</u>	<i>Audio</i> - Rear panel screw style pluggable connectors. Mating connectors supplied. <i>Remote Control</i> - Male 15 pin D connector, supplied. <i>RS-232 Serial</i> - 6P4C Modular, Adapters & cable supplied.
<u>POWER:</u>	16 to 18 Vac @ 600 ma. 120 Vac 50-60 hz wall transformer. Supplied. (240 Vac 50-60 hz optional)
<u>MECHANICAL:</u>	8.50" X 1.75" X 6.25" (WHD)
<u>WEIGHT:</u>	3.0 lbs.
<u>MOUNTING:</u>	Optional RM-1 rack mount. Optional FP-1 filler panel

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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.

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