BROADCAST tools INC

# Installation and Operation Manual

## SS 4.2

## Four Input, Dual Output Stereo Audio Matrix Switcher

Software Version 1.21

Manual update 8/29/04

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## INTRODUCTION

**Thank you for your purchase of a Broadcast Tools® SS 4.2 Four Input, Dual Output Stereo Audio Matrix Switcher (referred to as the SS 4.2 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 4.2 Four Input, Dual Output Stereo Audio Matrix Switcher.**

## SAFETY INFORMATION

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

## 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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### 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.

### NOTE:

This manual should be read thoroughly before installation and operation.

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## DESCRIPTION

The Broadcast Tools® SS 4.2 provides matrix audio switching of 4 stereo inputs to 2 stereo plus 2 mono outputs. Matrix switching allows any or all inputs to be assigned to any or all outputs. The SS 4.2 may be controlled via front panel switches, contact closures, 5-volt TTL/CMOS logic and/or the multi-drop RS-232 serial port. Installation is simplified with removable screw terminals (Euro).

## FEATURES

- Separate input selection pushbuttons are provided for each output channel.
- Three switching modes. Interlock, overlap and mix.
- Internal audio activity/silence sensors monitor both output channels. Each is equipped with front panel LED indicators; spst alarm relays and adjustable alarm delay and restore duration. Sensitivity is factory set at –36db.
- Power-up selection of inputs to outputs, mute or last source selected.
- Stereo headphone amplifier with front panel output selection switch, headphone jack and level control.
- Most configuration options via rear panel dipswitches.
- 16 input GPI port (RMT or PIP) with LED indicator.
- 4 open collector channel status outputs or programmable via burst commands.
- 4 spst relay outputs with multiplex function on output two. Programmable via burst commands.
- Multi-turn input and output level controls.
- Electronically balanced stereo inputs.
- Electronically balanced stereo and monaural outputs.
- Low noise and distortion circuitry.
- Remote control of front panel functions and status.
- Multi-drop RS-232 serial port with data activity LED.
- Multiple units may be cascaded to expand inputs.
- Depluggable screw (EURO) terminals for ALL I/O connections.



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## FUNCTION DESCRIPTION

### Front Panel:
The SS 4.2 is a 1-rack unit device (19”w x 1.75”h x 4.8”d). The front panel supports ten selection switches, 16 LED indicators, headphone selection switch, _” jack and level control.

### Rear Panel:
Installation is simplified with pluggable screw terminals. The rear panel hosts audio and control pluggable screw terminals, input/output trimmer controls, PGM dipswitch, multi-drop RS-232 modular connector and 16 VAC @ 600 ma power supply connector.

### Switches:
The front panel of the SS 4.2 contains separate input selection pushbuttons are provided for each output channel. A mute switch is provided to turn off each audio channel, while the enable switch may be configured as a safety switch. A push-push switch is furnished for headphone monitoring of the two output channels. The input channels may be programmed for the following operations:

- Overlap - Overlap one audio source with another while the button for the second source is held down. Both channels will be fed to the output until the second button is released, at which time the first audio source will be switched off.

- Mix - May connect more than one input at a time to any given output - Push once to connect input, then hold MUTE and press the selected input again to disconnect.

- Interlock - Connecting one input to any output disconnects all other inputs from that output

### LED Indicators:
The SS 4.2’s front panel LED indicators provide operational display of the following information:

- Led indicators on each input channel switch.
- The mute indicator is lit when all channels are off.
- Two “ACT” led’s indicating audio activity for each output channel. Sensitivity set at
- –36db.
- Two “SS” led’s indicating when an output channel has drop below –36db.
- “PIP” Parallel Input Port (GPI) active, indicating any change with the 16 input GPI “Pulse Stretcher” ports.
- “Pwr/Ser” led which indicates valid power and will flash when the serial RS-232 port is receiving or transmitting data.

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### Controls:

- Headphone monitor switch to select which output channel is monitored.
- Headphone jack
- Headphone level control

### Audio Inputs:

Each of the 4 stereo inputs are balanced bridging (20KW) at a nominal line level of +4dBu. Sufficient gain is provided for unbalanced consumer level products. Multi-turn level controls are provided for each channel.

### Audio Outputs:

The SS 4.2 provides two balanced stereo outputs. Two balanced monaural outputs are also provided which follow their respective stereo outputs. The outputs may be adjusted.

### Silence Sensor:

The SS 4.2 contains individual silence sensors for each of stereo output channels. For each channel, a detector monitors the sum of each stereo channel. The factory default delay is set at 10 seconds, with a threshold of -30 dB, while the restore time is set at 10 seconds. Upon silence delay detection, the "SS-1 or SS-2" spst relay is closed for the duration of the silence and the Corresponding (SS-1 or SS-2) LED is lit for duration of silence. The sensor may be programmed for:

- Number of seconds of silence that must be present before an alarm state is reached or terminated.
- Number of seconds that valid audio must be present before an alarm state is cleared.
- Remote Control (GPI) Inputs:
- Most front panel functions may be controlled with the 5-volt TTL/CMOS logic compatible, contact closure inputs.

### PIP (GPI) Input:

The Parallel Input Port with the Programmable Pulse Stretcher provides 16 pulse-stretched parallel 5-volt TTL/CMOS compatible GPI inputs. The inputs are pulled high to 5 volts through a 20KW resistor and are activated by pulling the input to ground. These inputs supply status to any serial polling device (when the unit ID is set to 0, no polling of inputs is required). For each channel, a pulse of specified minimum input duration (000 to 2.55 Seconds) causes the status to go true or the end of the input pulse.

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### "Open Collector" Status Outputs, 4 Port Output Control

The SS 4.2 provides four open collector status outputs. The status outputs may be configured to operate in one of three modes:

- The status outputs follow the associated channel.
- The status outputs a one-second pulse when the associated channel is selected.
- Software control

### Relay Outputs, 4 Port Output Control:

The SS 4.2 contains 4 spst (normally open) relays. Each relay may be latched on, latched off or momentarily turned on by a non-dedicated computer. The "pulse" time may be set from 100 msec to 9.9 seconds. The default pulse length is one-second. The relays may be set for "MPX" mode. In the multiplex mode, the relay follows the associated channel on output two.

### Serial Communication:

The SS 4.2's serial communication is supplied with a multi-drop RS-232 port, allowing up to 4-SS 4.2's on the same computers serial port. Commands may be entered either via a menu (menu mode) or a short form code (burst mode). All commands and responses use normal ASCII characters, facilitating scripting. A burst mode command starts with an asterisk ("*") followed by the device (ID) address as a single decimal digit. The command to enter menu mode starts with a space (" ") followed by the device (ID) address as a single decimal digit. The menu mode displays certain parameters, and allows the setting of the command serial communications rate ("baud rate"), front panel lockout mode, silence sensor delay/restore times and the selection of audio inputs and outputs.

### User Programming:

The SS 4.2 programming is stored in non-volatile memory. Configurations are set with selection dipswitches and computer commands.

## INSTALLATION GUIDELINES

### Inspection:

Please examine your SS 4.2 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package contains the SS 4.2, 16.5 vac @ 600ma power transformer, Installation manual and a reversed modular serial cable with a (S9) 9 pin D-Sub adapter.

### Setting Operation "DIP" Switches:

The SS 4.2 is equipped with an 8-position "PGM" dipswitch. The dipswitch specifies 2-bit unit ID, baud, audio modes (mix, interlock, overlap), and other features listed below. Access to this switch is on the rear panel. Follow the description below.

**DIP (SW-13) "PGM" Switch Functions**

| Switch Number | Default Setting | Function |
|---|---|---|
| 1 | OFF | Add 1 to Address (Default ID = 0) |
| 2 | OFF | Add 2 to Address |
| 3 | OFF | Baud rate (Default = 9600) |
| 4 | OFF | Baud rate |
| 5 | OFF | Stereo Audio Switching (Default = Overlap) |
| 6 | OFF | Stereo Audio Switching |
| 7 | OFF | Remote Control (Default) / PIP/GPI |
| 8 | OFF | Power up modes (Default = Last Source Selected) |

**Address (ID) DIP Switches**

| *SW13-1* | *SW13-2* | *Mode* |
|---|---|---|
| OFF | OFF | ID = 0 |
| ON | OFF | ID = 1 |
| OFF | ON | ID = 2 |
| ON | ON | ID = 3 |

**Baud Rate DIP Switches**

| *SW13-3* | *SW13-4* | *Mode* |
|---|---|---|
| OFF | OFF | 9600 |
| ON | OFF | 2400 |
| OFF | ON | 19200 |
| ON | ON | 38400 |

**Audio Switch Mode DIP Switches**

| *SW13-5* | *SW13-6* | *Mode* |
|---|---|---|
| OFF | OFF | Overlap |
| ON | OFF | Interlock |
| OFF | ON | Interlock |
| ON | ON | Mix |

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**Remote Mode DIP Switches**

| SW13-7 | Function |
|---|---|
| OFF | Remote Control |
| ON | PIP enabled |

**Power-up Mode DIP Switches**

| SW13-8 | Function |
|---|---|
| ON | Last Source Selected |
| OFF | Program via front panel |

| SS 4.2 Front Panel switch operation | |
|---|---|
| *Action* | *Result* |
| 1. Push Channel Button in the "OP-1" area | Channel is connected to output 1. To mute the active channel, simultaneously hold down the mute switch and the desired input channel. |
| 1. Push Channel Button in the "OP-2" area | Channel is connected to output 2. To mute the active channel, simultaneously hold down the mute switch and the desired input channel. |

## Mounting:

The SS 4.2 is designed to be rack mounted in a standard 19" rack. It should be mounted in an area that is accessible from the rear and preferably away from sources of heat. We recommend before permanently installing the SS 4.2, you bench test and become familiar with the operation of the unit.

## Power Supply Connection:

Install the 16.5 Vac @ 600ma power supply connector into the power receptacle on the SS 4.2. When ready, plug the power supply into the appropriate AC receptacle.

## Connecting The Audio Inputs, Outputs, Status Inputs And OC/Relays:

The input channels are numbered from 1 through 4 on the rear panel from left to right. The SS 4.2 interfaces to your audio equipment through depluggable (Euro) screw terminals. 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, 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. Connections may be made to the + and - inputs for balanced operation, or to the + input and grounding the - side for unbalanced input operation. Connections can be made to the + and - outputs for balanced operation, or to the + output and ground for unbalanced output operation.

**The input impedance is 20KΩ, 600Ω terminations may be installed on the connector.**

**CAUTION!**

*In no case should either the + or - outputs be connected to ground.*

*Installation of the SS 4.2 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" terminal on each channel. The station ground should be connected to the chassis ground screw (CH1) located behind J1 as viewed from the rear. For lightning protection devices, check out www.polyphaser.com and www.itwlinx.com.*

It is recommended that all cables connected to the SS 4.2 be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite "ISOBAR 4" is also suggested for the power transformer. The purchase of an inexpensive uninterruptible power supply (UPS) will provide back up in case of power outages. Check out our web site for lightning protection links.

### Adjusting 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. Recommended input levels would be in the range of -15 dBu to +10 dBu. Should input levels need to be changed, they are accessible from the rear panel. Each stereo input and output is labeled and has one trimmer per channel.

### Input Channel Expansion:

Input expansion may be accomplished by connecting a shielded cable between the first units EXT 1+ input terminal and the second units unbalanced output. The shield should be connected to the ground terminal. Follow the same procedure for the EXT +1 right channel. The above example provides 8 inputs, with the first providing the main output.

### Remote Control:

Most front panel functions of the SS 4.2 may be remote controlled via the pluggable screw connectors located on the rear panel. The SS 4.2 accepts momentary contact closures, open collector or TTL/CMOS logic levels. Open collector status/tally is also provided and follows the action of the front panel LED's.

### Serial Interface:

The multi-drop RS-232 transceiver always switches between transmit and receive mode, unless the unit ID is zero. In that case, the unit will always leave the RS-232 transceiver enabled. This is the correct setting for a single unit controlled via RS-232.

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**Front Panel LED's:**

| Front Panel LED's | Number Of LED's | Activation Event/Mode | Activation Behavior |
|---|---|---|---|
| Input connected to "OP 1" | 4 Green | State of Connection | On if connected |
| Input connected to "OP 2" | 4 Red | State of Connection | On if connected |
| "Mute" | 1 Red | System Mute Status | On |
| "Pgm" | 1 Red | Future applications | Off |
| "ACT-1" Audio activity for output 1 | 1 Green | Valid Audio "OP 1" | On if audio for output 1 is above threshold |
| "ACT-2" Audio activity for output 2 | 1 Green | Valid Audio "OP 2" | On if audio for output 2 is above threshold |
| "SS-1", Silence Alarm for output 1 | 1 Red | Duration of Silence | On if alarmed |
| "SS-1", Silence Alarm for output 2 | 1 Red | Duration of Silence | On is alarmed |
| "PIP" Pulse Active | 1 Yellow | Any valid GPI input, when enabled. | On |
| "Pwr/Ser" Status | 1 Green | Valid Power and/or serial data. | On |

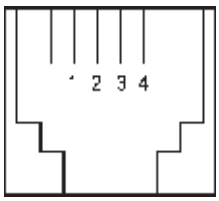
**Front Panel Switches:**

| Switch(es) | Function |
|---|---|
| 1-4 for each output | Input Channel 1-4 |
| MUTE | Mute either or both Outputs |
| ENABLE | Use as a safety switch. May be enabled by removing JP3. |
| Hidden "PGM" switch | Used to program the power up configuration |

## Connecting the RS-232 Serial Port:

Use the provided modular (S9) 9-pin D-sub connector adapter and reversed modular cord to connect the SS 4.2's serial connector to your serial port.

| RJ-11 Adapter Pin | DB-9 D-Sub | SS 8.2 (Point of view) |
|---|---|---|
| 4 | 3 | RS-232 Receive |
| 3 | 2 | RS-232 Transmit |
| 2 | 5 | Ground |




Modular Jack Pin Numbers

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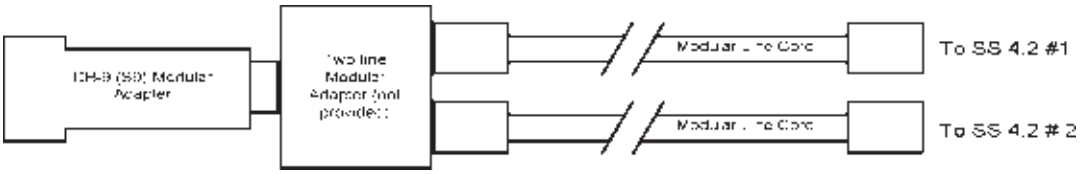
The SS 4.2 is supplied with a X-Over modular cable and a (S9) 9-pin D-connector modular adapter for serial control. Only use the modular cord that is supplied with the SS 4.2 or a replacement that reverses (X-over), such as Radio Shack Cat No. 279-0347. Connect the cable between the SS 4.2 and your computer. The SS 4.2 may operate at baud rates from 2400 to 38400 baud. The unit is shipped set for 9600 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 9600-N-8-1. Set the mode to: DIRECT, Flow Control to: NONE and emulation to: ANSI.

### Connecting Two SS 4.2's To A Single Computers Serial Port:

Multiple SS 4.2's may be cascaded serially to operate from the same serial port. The first step is to assign ID's to each SS 4.2. One suggestion is to assign 1 to the first SS 4.2 and 2 to the second switcher. The second step is to parallel the serial ports of the SS 4.2's. Plug the male end of the duplex modular adapter into the supplied female (S9) DB-9 to RJ-11 adapter, then attach the supplied modular line cords into each of the duplex modular adapter receptacles (Radio Shack Cat No. 279-0357) and the other ends into each SS 4.2 modular receptacles. See the diagram below. NOTE: Three or more SS 4.2's may be daisy chained by using the above description and a Radio Shack Cat No. 279-0410, 5-jack modular adapter.




### Serial Control:

The unit is controlled in either Menu or Burst mode. It can run at the following data rates:

- 2400
- 9600 Default
- 19,200
- 38,400

Serial communications is multi-drop RS-232. Commands may be entered either via a menu (menu mode) or a short form code (burst mode). All commands and responses use normal ASCII characters, facilitating scripting. A burst mode command starts with an asterisk ("*") followed by the device (ID) address as a single decimal digit. A burst mode command must be entered within 5 seconds or it will time out. The command to enter menu mode starts with a space (" ") followed by the device (ID) address as a single decimal digit. The menu mode displays certain parameters, and allows the setting of the command serial communications rate ("baud rate"), front panel lockout mode, silence sensor delay, silence sensor restore and the selection of audio inputs and outputs. In both cases, device (ID) address (0-3) is specified in the on-board dipswitches.



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## Serial Burst Mode Commands:

Burst mode allows a computer or ASCII terminal to control and interrogate the unit. This section defines all burst mode commands. Each burst mode commands starts with an asterisk ("*"). Next is a single decimal digit that corresponds to the unit (ID) address 0-3. Following that are one or more ASCII characters specifying the command. No carriage-return or line-feed is required to terminate the command except for those few commands of variable length, if the maximum length is not sent. If the command requested a response, the response will consist of an upper case "S", followed by the unit address, and then the specific response. If acknowledgements are enabled, successful commands are responded to with "RRR" while errors get an "EEE" response. The syntax of each command is given below. The syntax shows the command exactly as it should be sent, except that lower case characters represent values that should be substituted:

## Glossary Of Command Notation:

| Character String | Meaning | Allowable Values |
|---|---|---|
| u | Unit ID | 0-3 |
| ii | Input Number | 01-04 |
| o | Output Number | 1-2 |
| r | Output Relay | 1-4 |
| o | Open Collector | 1-4 |

## Set-up Commands:

*uMM - Open up Menu

*uC4x - Set RS-232 mode timings: x = 1, Turn ON RS-232 mode NO delays on sending data. x = 0, Turn OFF RS-232 mode (delay for RS-232 charge pump startup before sending response, unless ID = 0).

*uCCx - Set Serial Speed. See dipswitch SW13-3 & 4.

*uCEx - Enable Error and Good Responses - Where x = Y to enable and N = disable. In this mode, when a command is sent that is in error, the unit will reply (possibly before receiving the entire command) with "EEE." If the command is sent correctly, the unit will reply with "RRR."

*uCDEF - Set factory defaults

*uCIIttt - Set "PIP" Programmable Pulse Stretcher Input Duration = ttt: 000 –> 255 hundredths of seconds (255 = 2.55 Seconds)

*uCIOiittt - Ignore, send OK

*uCLx - Lock Front Panel if x is "L". Unlock Front Panel if x is "U"

*uCPR - Power up audio state: Restore audio from power up state

*uCPS - Power up audio state: Save power up state

*uCRtt - Set Relay Momentary Pulse Length – tt: 00-99 for 00 –> 9.9 Seconds

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*uCSAtttt - Set silence sensor time delay to tttt seconds (0002 – 9999), 0000 = OFF
*uCSBtttt - Set silence sensor restore delay to tttt seconds (0002 – 9999), 0000 = OFF
*uCSDttt - Ignore, send OK
*uCST - Ignore, send OK
*uCSVttt - Ignore, send OK

### Relay and Open Collector Commands:

*uORrF - Unlatch output relay "r"
*uORrL - Latch output relay "r"
*uORrP - Pulse output relay "r"
*uOOoF - Unlatch open collector "o" (Only works in NON-Remote mode
*uOOoL - Latch open collector "o" (Only works in NON-Remote mode
*uOOoP - Pulse open collector "o" (Only works in NON-Remote mode

### Audio Switch Control Commands:

*uiio - Apply input "ii" to output "o"
*uiiA - Apply input "ii" to ALL outputs
*uiiEott - Start overlap – Apply input ii to output o. After tt tenths of a second, remove all other inputs from output o.

NOTE: Only one at a time can be pending per output. Max time 9.9 seconds

*uE - End overlap if in overlap mode. This applies to all outputs that have changed since the last "end overlap" command was issued.
*uB,a,a,a,a - Sets inputs, ignoring mode: NOTE: Input commands MUST be in CAPS.

- A = All "OUTPUTS" OFF
- B = Output 1
- C = Output 2
- D = Outputs 1 + 2

Example: *0B,B, C, D, A (Input 1 to output 1, Input 2 to output 2, Input 3 to both outputs, input 4 is OFF.
*uii3 - For input "ii", set output 1 on without affecting any other audio status
*uii4 - For input "ii", set output 2 on without affecting any other audio status
*uii5 - For input "ii", set output 1 off without affecting any other audio status
*uii6 - For input "ii", set output 2 off without affecting any other audio status

*uiiMA - Mute input "ii" for all outputs
*uiiMo - Mute input "ii" for output "o"
*uMo - Mute output "o"
*uMA - Mute all outputs



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### Information Retrieval Commands:

*POLL - Respond with unit (ID) address in appropriate time slot. If there are multiple units on the line, each will respond with a different delay after receipt of this command.

*0SA - Ignore, Send status.

*uSL - Send Audio Status: SuLo,x,x,x,x<CR><LF>. "u" is unit ID, "o" is output, and "x" is "1"for connected; "0" for not connected for each respective input. Example: "S1L2, 1,0,1,0<CR><LF> says that unit 1, output 2 is connected to inputs 1 and 3.

*uSPii - Send single input (GPI) PIP status. Response is "SuP,ii,x" where "x" is 1 if the corresponding input is high, 0 otherwise.

*uSPA - Send ALL input (GPI) PIP status. Response is: "SuP,A,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x<CR><LF > where input 0 is first and input 15 is last. "x" is 1 if the corresponding input is high, 0 otherwise.

*uSO - Send status of all Open Collectors. Response is: SuO,x,x,x,x<CR><LF>

*uSR - Send status of all relays. Response is: SuR,x,x,x,x<CR><LF>

*uSS - Send status of silence sensors. Response is "SuS,a,b<CR><LF>
a = Output 1 / b is Output 2. 1 = Not silent, 0 = Silent.

*uU - Send Unit Information:<name(SS 4.2)><version><cr><lf

*uY - Display configuration

### Real Time Control Commands:

*uDxx - Delay xx seconds before processing next command.

*uDLxxx - Delay xxx seconds before processing next command.

*uZx - Echo character "x" to serial control port. This is useful in debugging command strings.

### Output Port Control:

4 spst relay outputs may be controlled by software. Each relay may be commanded to:

| | |
|---|---|
| Latch On | Turns on and stays on (through power failures) until turned off. |
| Latch Off | Turns off and stays off (through power failures) until turned on. |
| Momentary On | Overrides latch; turns on for (default) second, then latches off. |
| Multiplex | In the ("MPX") multiplex mode, the relay follows the associated input channel on output two. |

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## Audio and remote connections:

TB 9 The bottom connector has two functions, depending on the position of SW13-7

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K 1 Com. | K I N.O. | K 2 Com | K 2 N.O. | K 3 Com | K 3 N.O. | K 4 Com | K 4 N.O. | OC1 | OC2 | OC3 | OC4 | Gnd | SS1 | SS1 | SS2 | SS2 | Gnd | Top Row |
| PIP1 | PIP2 | PIP3 | PIP4 | PIP5 | PIP6 | PIP7 | PIP8 | PIP9 | PIP10 | PIP11 | PIP12 | PIP13 | PIP14 | PIP15 | PIP16 | Gnd | Gnd | SW13-7 ON Bottom Row |
| In 1 to 1 | In2 to 1 | In 3 to 1 | In 4 to 1 | In 1 to 2 | In2 to 2 | In 3 to 2 | In 4 to 2 | Mute | "Pgm" | N/A | N/A | N/A | N/A | N/A | N/A | Gnd | Gnd | SW13-7 OFF Bottom Row |

**NOTE:**

*Non-mechanical latching relays. When power is removed, each relay will open. When power is restored, each relay will return to the pre-power failure state.*

**NOTE:**

*In burst mode, momentary timing on each relay can be set from .1 to 9.9 seconds.*



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## SPECIFICATIONS

| | |
|---|---|
| Input Levels: | Max + 27 dBu, balanced, bridging. > 20k W |
| Output Levels: | Stereo balanced outputs 1 & 2, +24 dBu. @ 600 W. / +27dbu @ 10KW<br>Monaural balanced outputs 1 & 2, +24 dBu. @ 600 W. / +27dbu @ 10KW<br>Headphone output, 4.7 W. |
| Gain: | 6 dB. |
| Frequency Response: * | 20 to 20 kHz; +/- .0.25dB |
| Signal/Noise Ratio: * | >85 dB nominal, weighted 20 to 22Khz, @ +27dBu. |
| Distortion: * | Less than 0.01% THD @ +27dBu. |
| IMD (250/7kHz): * | Less than 0.01% IMD @ +27 dBu. |
| Crosstalk: * | -80 dB @ 1khz / -55 dB @ 10 kHz from adjacent off channel. |
| Mix Input: | Unbalanced summing inputs @ 10k W, 0 dBu. |
| Switching Method: | Digitally controlled professional level analog switch arrays. |
| Logic: | Microprocessor / Non-volatile memory. |
| Operation Control: | Front Panel - Momentary switches.<br>Remote – Momentary (>50ms), compatible with 5 volts CMOS/TTL logic, open collector or contact closures to ground. Serial – Multi-drop RS-232, 2400, 9600, 19200, 38400 8,N, 1. |
| Status/Control: | Front Panel - LED indicators.<br>Control - 4 - SPST Relays / Silence Sensor - 2 - SPST<br>Remote - 4 - Open collector outputs.<br>RS-232 - Multi-drop RS-232, 2400, 9600, 19200, 38400 8,N, 1. |
| Interfacing: | Audio & Remote Control - Depluggable screw terminals. Accommodates 16 – 28 AWG wire. Mating connectors supplied.<br>RS-232 Serial - RJ-11/6P4C Reversed modular cable & S9 D-Sub Adapter, supplied. |
| Power: | 16.5 Vac @ 600 ma, 120 Vac 50-60 Hz power transformer. Supplied. (CE 240 Vac 50-60 Hz optional) |
| Mechanical: | 19” x 1.75” x 4.8” (WHD) |
| Weight: | 5 lbs. |

**WEBSITE:**

*Visit our web site for product updates and additional information*




e-mail: support@broadcasttools.com voice: 360.854.9559 fax: 360.854.9479

## LIMITED WARRANTY

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