

INTERCOM CONSOLE MODULE
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BROADCAST[®]
t o o l s **INC**
PROBLEM SOLVED

Installation and Operation Manual



SS 2.1 MLR/BNC *Switcher/Router with Mechanical Latching Relays*

Manual update: 09/04/2012

If you need a firmware upgrade, contact Broadcast Tools[®]

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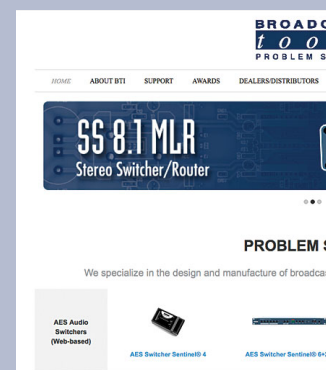
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INTRODUCTION

Thank you for your purchase of a BROADCAST TOOLS® SS 2.1 MLR/BNC transparent two input, dual output switcher/router (referred to as the SS 2.1 MLR/BNC 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®

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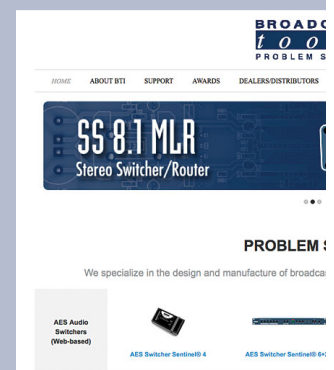


NOTE:

This manual should be read thoroughly before installation and operation.

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INTRODUCTION

Product Overview

The SS 2.1 MLR/BNC is a transparent two input, dual output switcher/router with mechanical latching relays and BNC connectors. The SS 2.1 MLR/BNC is perfect for all types of passive signal switching via front panel switches, contact closures and/or serial RS-232. The switching is accomplished with mechanical latching gold contact relays, which means that the unit can route a signal in either direction. Due to the passive nature of the switching, any input level and impedance can be used. Inputs may be balanced or unbalanced, while output levels, impedance, distortion, noise and balancing will match that of the selected input. The SS 2.1 MLR/BNC can be controlled and monitored locally and/or with simple contact closures to ground, as well with multi-drop RS-232 serial commands.

Features/Benefits

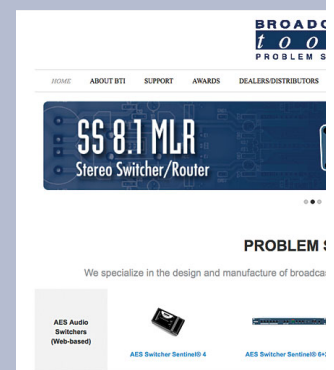
- Front panel channel selection push buttons with active channel LED indicators.
- The audio “MUTE” function allows the user to turn off all audio.
- Front panel Enable switch can be configured to provide a safety lock to the front panel selection push buttons.
- Remote control via contact closures, 5-volt TTL/CMOS logic levels and/or the multi-drop RS-232 serial port. TCP/Telnet control/monitoring with our optional ESS-1, RS-232 to Ethernet adapter.
- Two SPDT relay outputs for remote channel status
- Audio/signal switching via mechanical latching sealed relays utilizing 2-form-C bifurcated - crossbar silver alloy with gold overlay contacts.
- BNC connectors are used for audio or signal I/O connections, and removable euro-block screw terminal connectors are used for remote control and status to simplify wiring and service, euroblock mating plugs are supplied.
- The power-up source selection feature allows the user to select which source is active at power up, including the last source selected.
- If power is lost, the last selected channel is passed to the output.
- Fully RFI proofed.
- Surge protected internal power supply, domestic power supply provided. Optional CE 240 Vac 50-60 Hz power supply available.
- Up to three units may be mounted on the optional RA-1 rack shelf. Desk top and wall mounting is also possible.

Applications

Switching/routing applications include: Composite stereo audio, NTSC video signals, Analog and/or AES audio sources, Studio selection, Audio processing selection, Exciter input selection, STL source selection, EAS audio, RS-232, RS-422 or RS-485 data signals and telephone lines.

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Inspection

Please examine your SS 2.1 MLR/BNC carefully for any damage that may have been sustained during shipping. If any damage is present, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package should contain the SS 2.1 MLR/BNC, a modular cable with 9-pin “S9” female D-sub adapter, a 7.5 to 12 VDC wall transformer and a quick start guide. Manuals may be downloaded from our web site.

Installation

Surge Protection

The SS 2.1 MLR/BNC has built-in resistance to voltage changes; we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and/or other high voltage surges may damage your SS 2.1 MLR/BNC and connected equipment if it is not properly protected. For lightning protection devices, check out www.polyphaser.com and www.itwlinx.com.

UPS Standby Power System

We recommend that you connect your SS 2.1 MLR/BNC to a UPS system. A UPS helps minimize the risk to the SS 2.1 MLR/BNC and provides power during a power outage.

NOTE: If power is lost, the last selected channel is passed to the output.

Installation/Operation

Selection push buttons

Each push button represents an input to be routed to the switcher’s output, along with the mute and enable push button. Each push button has an associated LED indicator, which will illuminate when that particular channel or function is selected. When a channel is selected, the previous channel is deselected (interlock). The enable (safety) push button (the enable LED is illuminated when this function is enabled) requires the user to hold down the enable push button while selecting any of the other front panel push buttons.

LED indicators

- “PWR” LED: Illuminates when power is applied and blinks when serial data is active.
- “Enable” LED: Illuminates when the front panel enable push button is enabled.
- “SS”: (silence sensor) operation and LED isn’t active on the BNC version.
- Channel and Mute LED’s illuminate when the input channel is selected.

Power

Connect the 2.1mm barrel type power connector into the unit and the 7.5 to 12 VDC domestic power transformer into a 120 Vac 50-60 Hz power source. Never use any type of power supply other than the specified/supplied power supply.

I/O and Remote Control Connectors

The rear panel contains BNC connectors for I/O and removable screw terminals for remote control interfacing with mating connectors. The multi-drop serial port is equipped with a modular RJ-11 jack.

Remote Control Wiring

The SS 2.1 MLR/BNC interfaces to external equipment through removable euroblock screw terminals. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire. Before installing a wire, remove the euroblock screw terminal plug and turn each capture screw fully counterclockwise. Strip each conductor to a length of 0.25" and insert the conductor fully into the terminal. Turn the capture screw fully clockwise to secure the conductor.

Remote Control

The remote control connection to the switcher is via the bottom row of the connector TB4. Each channel may be selected by a momentary or sustained (depending on the configuration) contact to ground. Each channel is pulled high (5-volts) through a 22K resistor.

Relays

SPDT relay contacts are available on the top row of the remote control connector TB4. K3 is associated with input channel one, while K4 is associated with input channel two.

Note: K5 is not installed on the BNC version.

Note: For wiring information, refer to the grid below, silk-screen text on the rear panel of the product or the fractional schematic(s) in the appendix.

Relay Outputs (Top Row, TB 4)

K3 N.O.	K3 Common	K3 N.C.	K4 N.O.	K4 Common	K4 N.C.
SW-1	SW-2	SW-3 (Mute)	GND	N/A	N/A

Control Inputs (Bottom Row, TB 4)

Configuration Jumpers

- JP2: Not used on the BNC version
- JP3: Disabled = Front panel enable switch defeated.
 Enabled = Front panel ENABLE push button active.
 The enable LED is illuminated.

NOTE: This push button must be held closed to operate any of the other front panel push buttons and isn't associated with any of the remote control functions.

- JP4: Bypass = Bypasses R14, 75 ohm resistor. BNC output connector J3.
 Enabled = Inserts R14, 75 ohm resistor.
- JP5: Bypass = Bypasses R15, 75 ohm resistor. BNC output connector J4.
 Enabled = Inserts R15, 75 ohm resistor.

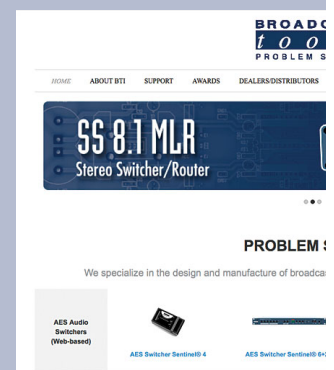


CAUTION!

Installation of the SS 2.1 MLR/BNC in high RF environments should be performed with care. The station ground should be connected to the designated chassis ground terminal using a 20 to 24-gauge wire.

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INSTALLATION

Configuration DIP-switch Setup

Follow the tables below for configuration options.

Unit ID	SW5-1	SW5-2
ID 0 *	OFF	OFF
ID 1	ON	OFF
ID 2	OFF	ON
ID 3	ON	ON

Baud Rate	SW5-3	SW5-4
2400	ON	OFF
9600 *	OFF	OFF
19200	OFF	ON
38400	ON	ON

Power Up	SW5-5
User selected	ON
Last source selected*	OFF

Note: To select an input at power-up with SW5-5 ON, hold down the push-button for the desired input channel or mute until the front panel LED's flash.

Operation	SW5-6	SW5-7
Normal *	OFF	OFF
Sustained	ON	OFF
Not Used	OFF	ON
Toggle	ON	ON

- Normal operation mode: Pulse 1-IN to select channel 1, Pulse IN-2 to select channel 2, or pulse the "M-IN" (mute) pin to turn off both channels.
- Sustained operation mode: Hold IN-2 low to select channel 2.
- Toggle operation mode: Alternately pulse 1-IN to select between the two channels.

Note: After changing any dipswitch, please repower the unit.

Note: * Denotes factory setting.

SERIAL OPERATION

RS-232 Control

Connect one end of the modular cable to the RJ11 jack on the rear panel of the product and the other end to the RJ11 to the jack on the "S9" 9-pin female D-sub adapter. Connect the 9-pin female D-sub "S9" adapter to the COM port of the controlling PC. Note: An optional USB to RS-232 adapter cable may be required if your PC isn't equipped with a RS-232 COM port. Select the desired address for each unit using the configure DIP-switches. Never duplicate addresses. The default protocol is as follows: 9600, N, 8, 1 (other baud rates are user selectable).

Serial Commands

The switcher may be controlled and monitored by burst serial strings or by the embedded menu.

Where the < * > Denotes start of string character
< - > Unit ID (address, 0 through 3)
< i > Input channel (1, 2 or M (MUTE)).

*-i Switch to input i.
*-M Mute audio output (Turn Off Audio)
*-SL Send Audio Status: SuL1,x,x<cr><lf>
 Note: x: 0 = OFF / x: 1 = ON
*POLL Display unit ID in appropriate time slot.
*U Enter menu mode

Examples: *02 This string would turn on channel 2.
 *0M This string would MUTE the switcher's output.
 *0U Accesses the menu. (NOTE: The menu times out
 after 60 seconds of keyboard inactivity).

Menu Operation

Broadcast Tools® SS 2.1MLR BNC, v1.9b - Setup Menu

S - Turn ON audio input

M - Turn OFF audio

V - Save Audio State for Power Up

C - Show Configuration and Status

F - Set Factory Defaults

Audio Status: Chan 1 On

Enter Selection, or Q to quit:

To select a menu function, simply enter the letter on the left side of the menu and wait for the prompt.

Example: Type the letter S

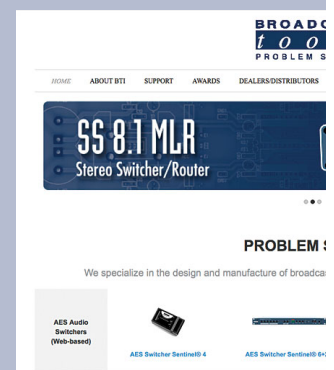
Response: Enter Input Channel: Entering a 1 would select channel 1.

SPECIFICATIONS

Inputs/Outputs:	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.
Switching Method:	Passive. Mechanical latching sealed relays utilizing 2-form-C bifurcated-crossbar silver alloy with gold overlay contacts.
Logic:	Flash microprocessor with non-volatile memory.
Operation Control:	Front Panel - Momentary switches. Remote - Momentary or sustained, 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:	Front Panel - LED Indicators. Remote - Two SPDT relays. 1-amp 30 vdc. Refer to the fractional schematic and/or text on the rear panel for connection details.
Interfacing:	I/O - BNC Remote control - Rear panel pluggable screw terminals. Mating connectors supplied. RS-232 - (RJ-11) Reversed modular cable/female "S9" 9-pin D-Sub adapter supplied.
Power Requirements:	7.5 to 12 VDC @ >500 ma. 120 Vac 50-60 hz transformer supplied.
Physical Dimensions:	5.65" x 7.10" x 1.575" (WDH)
Weight:	2.0 lb.
Shipping Weight:	3.0 lb.
Options:	RA-1 rack shelf, holds three units (1-RU) / Filler panels supplied. (CE 240 Vac 50-60 Hz power supply optional)

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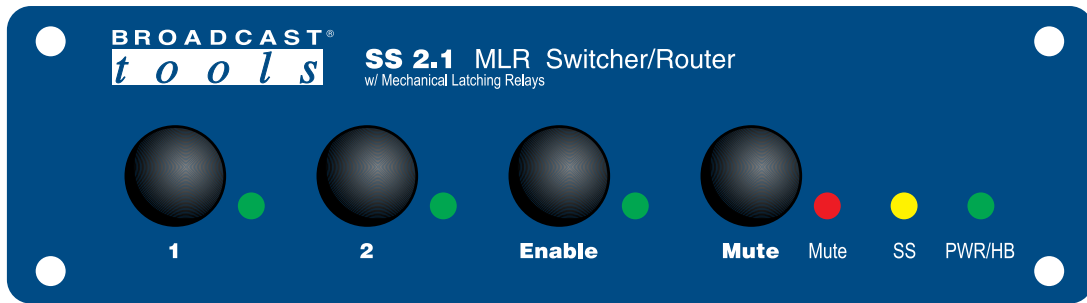
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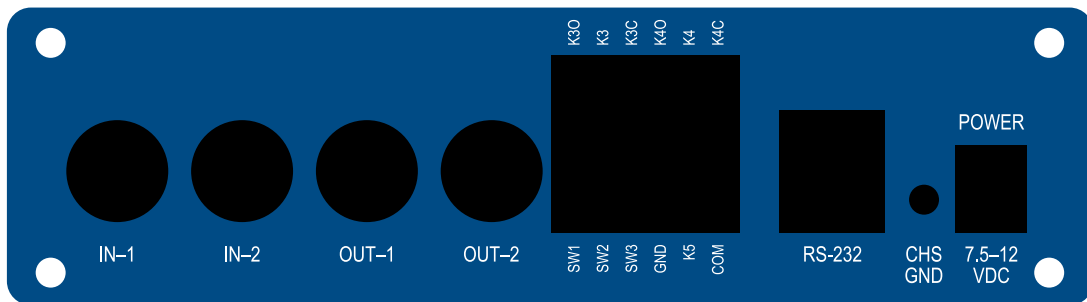
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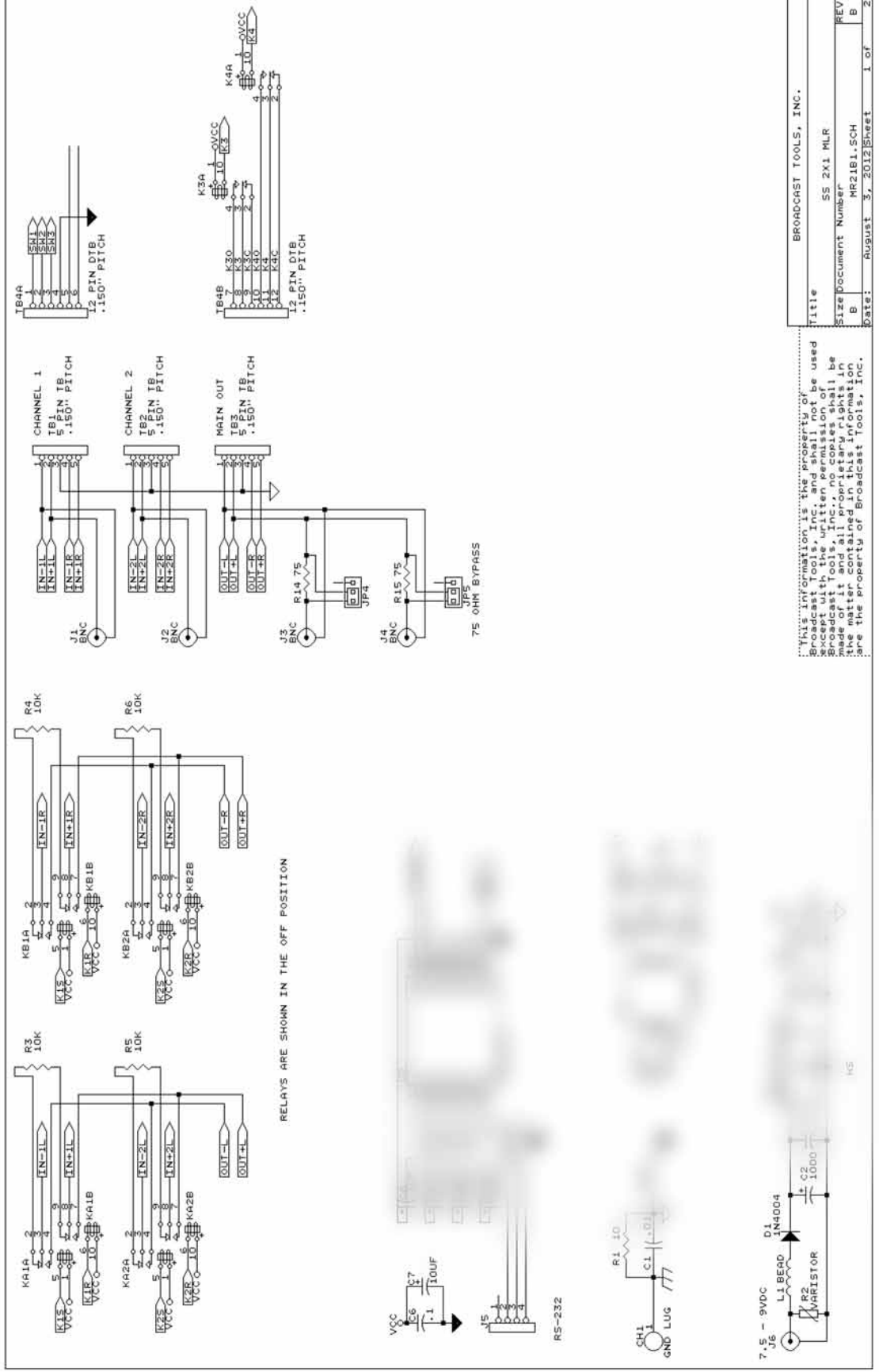


FRONT PANEL



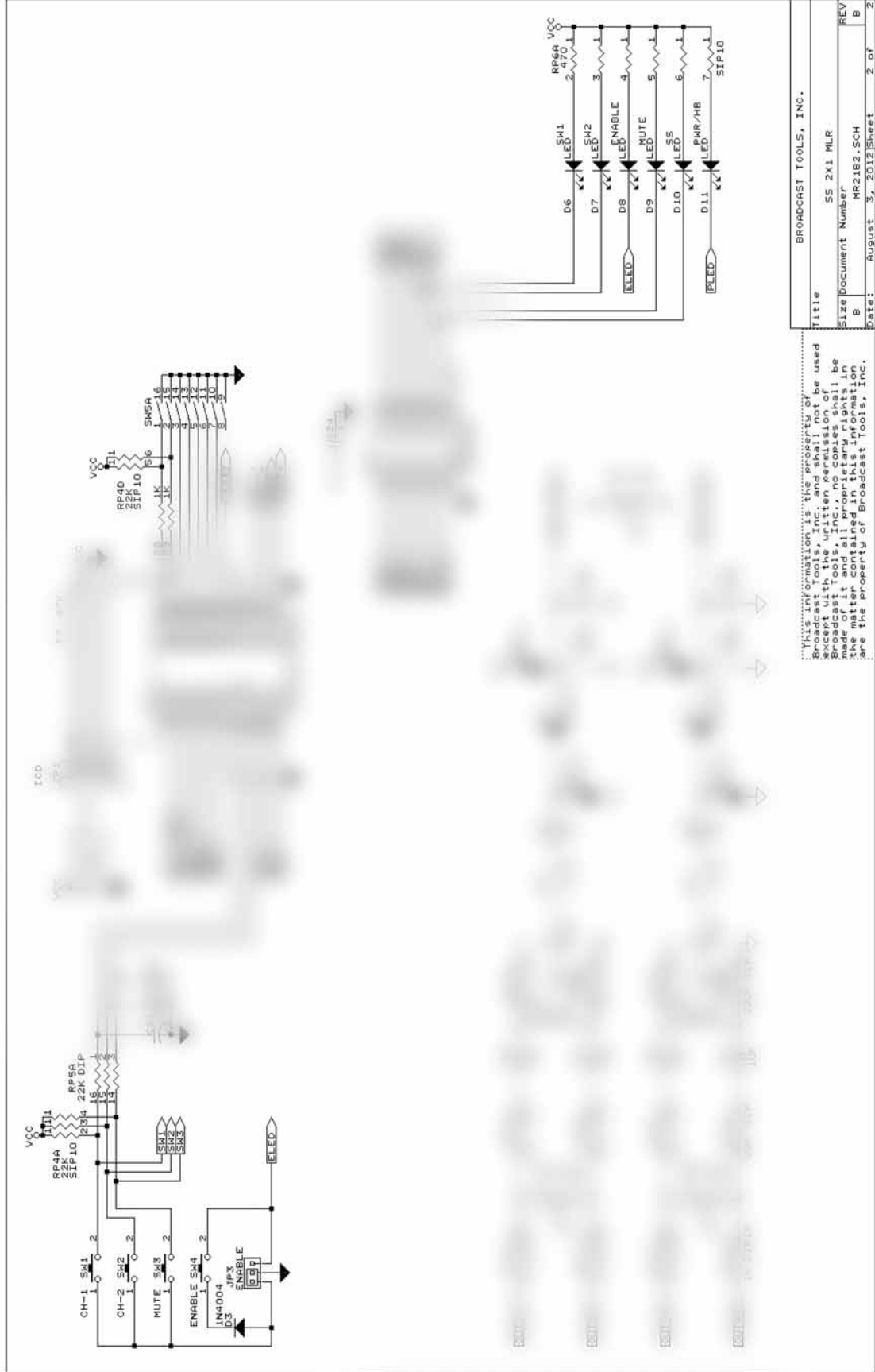
REAR PANEL

Fractional Schematic



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Fractional Schematic



Broadcast Tools® SS 2.1 MLR/BNC

Jumper and Switch Layout

