BROADCAST tools ®

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Installation and Operation Manual

SM-III
Silence Monitor III

Firmware Version 1.6

Manual Revised 02/10/2004

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INTRODUCTION

Thank you for your purchase of a Broadcast Tools® Silence Monitor III (referred to as the SM III 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® SM III.

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.

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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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PRODUCT DESCRIPTION

The Broadcast Tools® Silence Monitor III improves on the features of the original Broadcast Tools® SSM. The Silence Monitor III is designed to monitor any stereo or two independent monaural sources, generate alarms and transparently switch to back-up source equipment when silence is detected. Features include: front panel, remote control and relay monitoring; removable screw terminals; "Plug & Play" (NO POTS) installation; dipswitch selection of silence detection of –23, –25, –35 and –45db; precise time delay from 2 seconds to 85 minutes; precise restore timing delay from off to 42 minutes; defeatable sonalert aural alarm; relays for most remote functions. The SM III may be set on a desktop, mounted on a wall or as part of the new RA-1, "Rack-Able" mounting shelf.

PRODUCT FEATURES

- Active balanced inputs
- Transparent stereo or dual monaural program switcher
- Dipswitch selection of silence detection of –23, –25, –35 and –45db
- Precise time delay from 2 seconds to 85 minutes
- Precise restore timing delay from off to 42 minutes
- May be configured for stereo or dual independent monaural operation
- Hidden front panel "Test" switch
- Front panel "Mute" switch with built-in sonalert and remote defeat input
- Front panel "Arm/Disarm" switch with front panel LED, remote input and SPDT relay
- Front Panel Alarm "Reset" switch, Tripped LED and SPDT relay
- External ("Ext") alarm input with front panel indicator and SPDT relay
- Front Panel Power LED
- Two independent SPST audio alarm relays
- Two pulse open collector alarm outputs
- Removable screw (Euro) terminals
- The SM III may be set on a desktop, mounted on a wall or as part of the new RA-1, "Rack-Able" mounting shelf.
- Optional RA-1 rack shelf for mounting up to three units in 1-RU

INSTALLATION GUIDELINES

Inspection:

Please examine your SM III 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 should contain the SM III, 16 vac@600 ma wall power transformer and this manual.

Mounting:

Mount the SM III where it will be visible and rear panel accessible. Four (4) screw holes are provided for mounting. The SM III may be set on a desktop, mounted on a wall or as part of the new RA-1, "Rack-Able" mounting shelf.

Connecting user equipment:

NOTE: Due to an error with the first production run of the SM III metal work, the connection legend for the program switcher is incorrect. Please follow the label below when wiring up the SM III, unless the correction has been made.

1LT- 1LT+ G 1RT- 1RT+ 2LT- 2LT+ G 2RT- 2RT+ CML- CML+ G CMR- CMR+ G

NOTE: The number in quotes (#), refers to independent channels in dual monaural mode. (1) refers to the left, while (2) refers to the right channel (2).

TB 1, 16-position connector on the rear of the SM III.

1 LT -	1 LT +	Chs Gnd	1 RT -	1 RT +	2 LT -	2 LT +	Chs Gnd	2 RT -	2 RT +	CML -	CML +	Chs Gnd	CMR -	CMR +	Gnd
K3 CM Trpd	K3 NO Trpd	K4 CM Armed	K4 NO Armed	K5 CM EXT	K5 NO EXT	K6 CM LT Alarm	K6 NO LT Alarm	K7 CM RT Alarm	K7 NO RT Alarm	Pulse 1 OC's	Pulse 2 OC's	Mute Input	Arm /Disarm Input	Reset Input	Ext Input

Connect the audio source (air monitor, etc) to the left and right inputs, ground the negative (-) side if the source is unbalanced and observe proper phasing. These are labeled 1LT - and 1LT + for the left channel (1) and 1RT - and 1RT + for the right channel (2).

NOTE: If the audio source is a tuner or receiver, be sure to feed the SM III from the fixed output such as the tape monitor outputs.

SM III Operation Configured for Backup Switching:

- Connect the source (MAIN) equipment (Console, Automation, etc) to 1LT - and 1LT + for the left channel and 1RT - and 1RT + for the right channel.
- Connect the source (BACK UP) equipment (Console, Automation, etc) to 2LT - and 2LT + for the left channel and 2RT - and 2RT + for the right channel.
- Connect the destination equipment (PROCESSING) to CML - and CML + for the left and CMR - and CMR + for the right channel.
- Shields may be connected to the terminal labeled "Chs Gnd"

When the main (Console, Automation, etc) audio is lost, the SM III will sense the loss and start timing. When the time-out is reached, the SM III will switch to the back-up source. When audio returns, the SM III will automatically switch the main source back to the processing.

NOTE: The SM III is designed to route the main audio input to the output in the event of a power or unit failure.

REMOTE CONTROL

• Mute	This input is used to mute the sonalert alarm. The sonalert on the "B" version may be disabled by removing JP4 on the rear panel.
• Reset	This input clears all alarms.
• Ext	This input may be used by external equipment to generate an alarm.
• Arm/Disarm	This input allows the disarming or arming of the system.

NOTE: All of the above inputs are active LOW and 5 volt TTL.CMOS compatible.

• Tripped Relay (K3)	This SPDT (version B) relay will close when any alarm is triggered and stay latched until reset.
• Armed/Disarmed Relay (K4)	This relay closes when the system is armed. The relay may be configured as normally open or closed.
• Ext Relay (K5)	This SPDT relay is activated as long as the EXT input is low.
• Left Audio (1) Alarm Relay (K6)	This SPDT relay is activated after the timed loss of audio and returns when the audio returns (this is determined by the setiing of the RESTORE timing switches).
• Right Audio (2) Alarm Relay (K7)	This SPDT relay is activated after the timed loss of audio and returns when the audio returns (this is determined by the setiing of the RESTORE timing switches).
Pulse 1	Refer to pages 10 & 11for the operation of
Pulse 2	these open collector outputs.

It is recommended that all cables connected to the SM III be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite "ISO-BAR 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.

CAUTION!

Installation of the SM III 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 "CHASSIS GROUND" terminal. 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.

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INSTALLATION

PROGRAMMING GUIDELINES

Mode Setup:

Jp-2 selects the two operating modes: Installed = Stereo   Removed = Dual Monaural

Sensitivity Setup:

A 4-position dipswitch is provided to change the sensitivity of the SM III. Locate SW 7 and follow the grid below.

Sensitivity	SW 7-1 / Left (1)	SW 7-2 / Left (1)	SW 7-3 / Right (2)	SW 7-4 / Right (2)
- 23 db	ON	ON	ON	ON
- 25 db	OFF	ON	OFF	ON
- 35 db	ON	OFF	ON	OFF
- 45 db	OFF	OFF	OFF	OFF

Delay timing setup:

The SM III time delay is set via SW 1, the 8-position dipswitch and Jp-1. The default for this jumper is installed. This provides TWO second resolutions. To provide longer time resolution, remove and stow Jp-1, which will provide 20 second resolution. The switches are set at the factory for a 6 second delay (switches 1 & 2 ON and Jp-1 installed). Each switch has a digit value as shown in the two tables below. For the factory default setting, as shown in the two-second-resolution table below, we have turned ON switches one and two. Switch one represents a one-digit value, while switch two represents a two-digit value. We add these two digit values together to obtain a total digit value of three. Each value is given a time delay of two or twenty seconds, so we therefore multiply the total digit value of three by two (or 20) to obtain six (or 60) seconds. NOTE: The following table refers to the time delay in seconds.

Time Delay   *Two (2) Second Resolution Table*

SW-1 Switch Position and Jp-1 installed.	1	2	3	4	5	6	7	8
Digit Value	1	2	4	8	16	32	64	128
EXAMPLES:								
1 = 2 seconds	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
1 + 2 = 3 x 2 = 6 seconds	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
1 + 2 + 4 = 7 x 2 = 14 seconds	ON ↑	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
32 x 2 = 64 seconds, or 1 minute and 4 seconds	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑	OFF ↓	OFF ↓
255 x 2 = 510 seconds, or 8 minutes and 30 seconds	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑

Time Delay   *Twenty (20) Second Resolution Table*

SW-1 Switch Position and Jp-1 removed.	1	2	3	4	5	6	7	8
Digit Value	1	2	4	8	16	32	64	128
EXAMPLES:								
1 = 20 seconds	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
1 + 2 = 3 x 20 = 60 seconds or 1 minute	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
1 + 2 + 4 = 7 x 20 = 140 seconds or 2 minutes and 20 seconds	ON ↑	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓
32 x 20 = 640 seconds or 10 minutes and 40 seconds.	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑	OFF ↓	OFF ↓
255 x 20 = 5,100 seconds or 85 minutes.	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑	ON ↑

Restore timing setup:

The SM III restore time delay is set via SW 2, the 8-position dipswitch and Jp-1. The default for this jumper is installed. This provides TWO second resolutions. To provide longer time resolution, remove and stow Jp-1, which will provide 20 second resolution. The switches are set at the factory for off. Each switch has a digit value as shown in the two tables below. For the factory default setting. Please note the table below refers to the restore time delay in seconds.

Restore Delay — *Two (2) Second Resolution Table*

SW-2 Switch Position and Jp-1 installed.	1	2	3	4	5	6	7	8
Digit Value	1	2	4	8	16	32	64	Enable
EXAMPLES:								
1 = 2 seconds	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON↑
1 + 2 = 3 x 2 = 6 seconds	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON↑
1 + 2 + 4 = 7 x 2 = 14 seconds	ON ↑	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON↑
32 x 2 = 64 seconds, or 1 minute and 4 seconds	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑	OFF ↓	ON↑
Restore is turned OFF.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	OFF↓

Restore Delay — *Twenty (20) Second Resolution Table*

SW-2 Switch Position and Jp-1 removed.	1	2	3	4	5	6	7	8
Digit Value	1	2	4	8	16	32	64	Enable
EXAMPLES:								
1 = 20 seconds	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑
1 + 2 = 3 x 20 = 60 seconds or 1 minute	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑
1 + 2 + 4 = 7 x 20 = 140 seconds or 2 minutes and 20 seconds	ON ↑	ON ↑	ON ↑	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑
32 x 20 = 640 seconds or 10 minutes and 40 seconds.	OFF ↓	OFF ↓	OFF ↓	OFF ↓	OFF ↓	ON ↑	OFF ↓	ON ↑
Restore is turned OFF.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	OFF ↓

Front panel switches:

Hidden "TEST" switch
This switch forces the SM III into an alarm condition as long as the switch is held closed. Use a non-metallic object to operate the recessed test switch.

Mute switch
Used to silence the sonalert. To permanently disable the sonalert, it must be unsoldered from the PCB.

Arm/Disarm Switch
Arms and disarms the SM III. When armed, the front panel "ARMED" LED will be illuminated and the armed relay will be closed.

Reset switch
This switch clears all alarms, sonalert and resets the program switcher. If the alarm still exists, the SM III will alarm again after the time out delay period. If the SM III has automatically reset, pressing the reset switch will clear the tripped and audio alarm LED(s) and relays.

Stereo Mode operation
When the SM III is armed, it will trigger in the absence of audio (see sensitivity setup) on either or both channels after the delay time has expired (See delay dip-switch SW1) and will cause the following action:
1 - Switch from the main source to the backup source.
2 - Turn on the failed audio alarm LED's (Left and/or Right) and relays.
3 - Turn on the "Tripped" LED and relay.
4 - Pulse the pulse 1 open collector for 1 second.
5 - Sound the sonalert.

NOTE: The sonalert (rear panel jumper) may be defeated by pressing the front panel "mute" switch or remote mute input.

NOTE: The "EXT" (external) input will trigger immediately and switch to the backup source. This may be used to monitor STL or satellite squelch relay, etc.

When **both channels return** and the restore time delay has expired (if enable), the following action occurs:
1 - Switch from the backup source to the main.
2 - Open the left and right audio alarm relays.
3 - The front panel left and right audio LED's will light
4 - Pulse the pulse 2 open collector for 1 second.
5 - The left and/or right audio alarm indicators will stay illuminated to provide history of the alarm.
6 - The "tripped" relay stays energized until the SM III is reset.

OPERATION GUIDELINES

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Dual Monaural Mode Operation :
When the SM III is armed, it will trigger in the absence of audio (see sensitivity setup) on each of the independent channels after the delay time has expired (See delay dipswitch SW1).

The SM III when triggered, will cause the following action:

  1 - Switch from the main source to the backup source of each independent mon aural channel.
  2 - Turn on the failed audio alarm LED (1 or 2) and each relay.
  3 - Turn on the "Tripped" LED and relay.
  4 - Pulse the pulse 1 open collector for 1 second for channel (left) 1.
  5 - Pulse the pulse 2 open collector for 1 second for channel (right) 2.
  6 - Sound the sonalert.

Note: The sonalert (rear panel jumper) may be defeated from either the front panel or remote input.

When either channel returns and the restore time delay has expired, the following action occurs:

  1 - Switch from the back up source to the main source of each independent monaural channel.
  2 - Open the appropriate audio alarm relay(s).

SPECIFICATIONS

Input level:	–20 to +27 dbu, balanced bridging (22 K Ω),
Program switcher: (2 x SPDT Relays)	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.
Sensitivity:	Dipswitch selectable: –23, –25, –35 or –45 db for each channel.
Operation Control:	Front Panel - Momentary switches. Remote inputs - Closure to ground or 5 Volt TTL/CMOS Logic levels. Relays - SPDT sealed relays utilizing bifurcated-crossbar silver alloy with gold overlay contacts, 1 amp @ 30 vdc, (2 x 2PDT for program switcher). ***NOTE: For safety, do NOT connect 120 Vac circuits to these Relays!*** Open collectors - 15 vdc @ 100ma
Time Delay:	2 seconds to 85 minutes, in 2 or 20 second increments, via an 8-position dipswitch and Jp-1.
Restore delay:	Off to 42 minutes in 2 or 20 second increments, via an 8-position dipswitch and Jp-1. This feature may be defeated.
Logic and audio:	Microprocessor, op-amps.
Interfacing:	Audio & Remote Control - Pluggable screw terminals (Euro). dual-row 16 position (Version A). Supplied. 18 position (Version B). Supplied. Power - 2.1 mm barrel.
Power Requirements:	16 Vac, 600 ma. 120 Vac 50-60 hz transformer. Supplied. (CE 240 Vac 50-60 Hz optional)
Physical Dimensions:	5.65” x 6.50” x 1.55” (WDH)
Weight:	2 pounds.
Options:	RA-1 rack shelf, holds three units (1-RU) / Filler panels supplied

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LIMITED WARRANTY

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