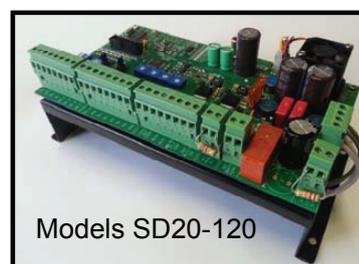


# EVACTION

## SD Series Evacuation Units

Installation Manual *ver3.1*



The EVACTION SD series amplifier units are a new range of Building Occupant Warning System (BOWS) which provide Automatic and Manual control of Alert and Evacuation tones. The SD series units are available in a variety of sizes- 20, 40, 60, 120 and 250 watt.

### NEW KEY FEATURES INCLUDE

- High efficiency, class D amplifiers.
- Removable SD Card with voice-over messages for Alert and Evacuation tones.
- A library of messages and tones easily changed to suit individual customer's requirements.
- 4 x Inputs to play custom tones and messages *e.g. school bell, lock-down, chemical alarm etc*
- Test and False Alarm messages using on-board push buttons.
- 2 wire Monitored Strobe Output, up to **3amps** to directly drive strobe indicators.
- Local microphone connection including socket for plug-in mic using EVACTION **MIC-SD**.
- Local microphone output, for simple looping of microphone, no balancing transformers required.
- Balanced AUX input for paging/music with 3.5mm socket for speaker testing with IPOD etc.
- T.G. 1V audio output with RCA connection to drive additional slave amplifiers if required.
- Plug-in terminal connectors for easy upgrades and powering up/down.
- Test Tone for 100V speaker output calibration.

### OTHER FEATURES INCLUDED

- 22-30vdc power input with reverse-polarity protection.
- Onboard LED indication for fault and function status.
- ALERT and EVACUATE tones (Evac ISO T3-default or Evac2220 selectable via DIP switch)
- Alarm input with ALERT to EVAC change-over timer 0-8 minute.
- Chime feature available for both M1 and M2 if required, upon activation.
- Monitored 100v speaker output with open and short protection.
- Fault output contacts selectable N.O. or N.C. with remote common-fault input and output.
- Fault condition after 10 minutes if no action or left in ISOLATE.
- Connections for standard wired in **003 KEY SWITCH** or **SELECTOR SWITCH**.
- IDC socket for connection to EVACTION **KEYPAD**.
- LMU4 compatible. Multiple EVACTION LMU4 cards can be connected.
- Easy access from above for all controls and connections.
- Supplied on powder coated base plate (same footprint mount for model SD20, 40, 60 & 120)

## EVACTRON SD SERIES EVACUATION UNITS

### TERMINAL INPUTS

TB1-1	COM	Common 0v	
TB1-2	AUTO	0v to activate.	
TB1-3	EVAC	0v to activate.	
TB1-4	ALERT	0v to activate.	
TB1-5	SD-C	0v to activate.	SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-6	SD-D	0v to activate.	SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-7	SD-E	0v to activate.	SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB1-8	SD-F	0v to activate.	SD Card input, DSW1-3 ON = latched, OFF = un-latched (default)
TB2-1	M1/1V	Mic1 audio loop out, connect to M1+ in on slave/s (M1 GAIN removed) to loop hand mic	
TB2-2	PA1	0v to activate M1 audio input	
TB2-3	M1+	Mic1+ balanced audio in, 1mV (default) for hand microphone	
TB2-4	M1-	Mic1- balanced audio in, 1mV (default) for hand microphone	
TB2-5	0v	Audio ground, 0V	
TB2-6	M2-	Mic2- balanced audio in, 1v (default) for line level (music etc)	
TB2-7	M2+	Mic2+ balanced audio in, 1v (default) for line level (music etc)	
TB2-8	PA2	0v to activate M2 audio input (must be in AUTO-NON ALARM)	
TB3-1	24VDC OUT	Output fused 1amp max (+24vdc, power for control relays, paging mics pre-amp etc)	
TB3-2	CON OUT	Control output, 0v, 300mA max (0v out for LMU4 all call, speaker relays etc, if required)	
TB3-3	ALM+	24vdc in to activate, reverse polarity protected. <i>See connection diagram for options</i>	
TB3-4	ALM-	0V in to activate, reverse polarity protected. <i>See connection diagram for options</i>	
TB3-5	N.O/N.C.	Selectable common fault relay contacts. N.O. closes in fault, N.C (default) opens in fault.	
TB3-6	COM FAULT	COM contact for common fault relay.	
TB3-7	R.FLT OUT	Remote common fault contact out, 0v output up to 1amp max, in fault condition	
TB3-8	R.FLT IN	Remote common fault in, 0V in to activate, used for fault connection to LMU4/s, SRB1's etc	
TB4-1	STR A+	Monitored strobe output, 4k7 E.O.L.	<b>A+ = +24vdc in ALERT</b> <b>A+ = 0vdc in EVACUATE</b>
TB4-1	STR E+	Monitored strobe output, 3amp max	<b>E+ = 0vdc in ALERT</b> <b>E+ = +24vdc in EVACUATE</b>
TB5-1	+24V BATT	Battery/PSU input +22-30vdc	
TB5-2	0V BATT	Battery/PSU input 0v	
TB6-1	100V SPK	Monitored, 100V speaker output	22k E.O.L supplied on speaker output terminals, relocate to end of speaker circuit to monitor.
TB6-2	100V SPK	Monitored, 100V speaker output.	
TB7-1	4R	Amplifier output 4 ohm to step-up transformer	
TB7-2	C	Amplifier Common to step-up transformer	
TB7-3	A1 100V IN	100v from step-up transformer, <i>Loop to A1 input on LMU4 if installed.</i>	
TB7-4	A2 100V IN	100v from step-up transformer, <i>Loop to A2 input on LMU4 if installed.</i>	

### CONNECTORS

<b>3.5mm M2 SOCKET</b>	A 3.5mm socket has been provided for connection to an IPOD etc for speaker testing. This input is looped from M2 in so only one source can be used at once. Use a male 3.5mm to 3.5mm phono lead to connect between IPOD and SD1. M2 GAIN jumper <b>must</b> be in the 1V position (default) To activate input, place M2 jumper from CTRL to LOCK and select AUTO.
<b>4 PIN MIC1 SOCKET</b>	4 Pin socket for connection to plug-in hand microphone EVACTRON model <b>MIC-SD1</b>
<b>AUD-OUT</b>	RCA 1v common audio out to drive slave amplifier/s.
<b>IDC CONNECTOR</b>	16 way - connection for keypad control, EVACTRON model <b>KEYPAD-SD1</b> .

## EVACTRON SD SERIES EVACUATION UNITS

### FUNCTION SETTINGS

#### DIP SWITCH

- |  |   |  |
|--|---|--|
| <p><b>1-Evacuate T3/2220</b></p> <p><b>2-Messages in manual</b></p> <p><b>3-SD-Latching</b></p> <p><b>4-100V Test Tone</b></p> | <p><b>OFF</b> (default) = T3 temporal EVAC tone.<br/><b>ON</b> = old 2220 EVAC tone</p> <p><b>OFF</b> (default) = ALERT and EVACUATE messages in AUTO only<br/><b>ON</b> = ALERT and EVACUATE messages in MANUAL and AUTO.</p> <p><b>OFF</b> (default) = Non-latching- SD Card inputs C, D, E &amp; F only play whilst input is low.<br/><b>ON</b> = Latched - 0v momentary to trigger, will play full file whilst in AUTO.</p> <p><b>OFF</b> = Test tone off (default)<br/><b>ON</b> = 100v test tone active. Adjust <b>TONE VOL</b> to <b>100vac MAX</b> on SPK output.</p> |  |
|--|---|--|

#### TIMER ALERT to EVACUATE change-over time in AUTO-ALARM mode.

Check on-board TIMER switch, BLUE type with clear power relay have a different timer setting (due to pin out configuration)

<p><b>BLACK</b> (Vertical)</p>	<p>0=min straight to EVAC 1=1min ALERT then EVAC 2=2min ALERT then EVAC 3=3min ALERT then EVAC 4=4min ALERT then EVAC 5=5min ALERT then EVAC 6=6min ALERT then EVAC 7=7min ALERT then EVAC 8=8min ALERT then EVAC 9= stay in ALERT</p>	<p><b>BLUE</b> (horizontal)</p>	<p>0=min straight to EVAC 1=2min ALERT then EVAC 2=1min ALERT then EVAC 3=3min ALERT then EVAC 4=8min ALERT then EVAC 5=10min ALERT then EVAC 6= stay in ALERT 7=11min ALERT then EVAC 8=4min ALERT then EVAC 9=6min ALERT then EVAC</p>
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**WITH CLEAR POWER RELAY**  
(Located beside BATT in)

#### VOLUME CONTROLS

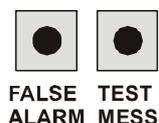
- |   |  |
|---|--|
| <p><b>MIC1 VOL</b></p> <p><b>MIC2 VOL</b></p> <p><b>TONE VOL</b></p> <p><b>MESS VOL</b></p> | <p>Adjusts level of MIC1 input, <i>see M1 GAIN jumper links below</i></p> <p>Adjusts level of MIC2 input, <i>see M2 GAIN jumper links below</i></p> <p>Adjusts ALERT, EVACUATE &amp; TEST TONE level</p> <p>Adjusts TONE and MESSAGE files (loaded on SD Card)</p> |
|---|--|

#### JUMPER LINKS

- |   |   |
|---|---|
| <p><b>M1 GAIN</b></p> <p><b>M2 GAIN</b></p>   | <p><b>1mV</b> (default) microphone level, <b>1V</b> line level (music/PABX) &amp; <b>3V</b> if removed.</p> <p><b>1mV</b> microphone level, <b>1V</b> (default) line level (music/PABX) &amp; <b>3V</b> if removed.</p>           |
| <p><b>FUNC1</b> SPK Monitoring Disable</p>    | <p><b>ON</b> speaker monitoring is disabled (used when no speaker caps fitted)<br/><b>OFF</b> (default) speaker monitoring is enabled (22k E.O.L required)</p>  |
| <p><b>FUNC2</b> Strobe Monitoring Disable</p> | <p><b>ON</b> strobe monitoring is disabled (used when connecting multiple SRB1's)<br/><b>OFF</b> (default) strobe monitoring is enabled (4k7 E.O.L. required)</p>   |
| <p><b>PA1</b> STD/SEL</p>                     | <p><b>STD</b> (default) for all connections other than selector switch.<br/><b>SEL</b> link when connecting selector switch.</p>  |
| <p><b>PA2</b> CTRL/LOCK</p>                   | <p><b>CTRL</b> (default) control output 0v is active with any function other than PA2.<br/><b>LOCK</b> PA2 locked on (0V) and Control output active.<br/><b>REMOVED</b> all functions activate control output, including PA2.</p> |
| <p><b>COM-FLT</b> Common Fault Contacts</p>   | <p><b>N.C.</b> (default) Closed under normal conditions, opens on com fault or loss of power.<br/><b>N.O.</b> Remains open under normal conditions, closes on com fault or loss of power.</p>                                     |

#### PUSH BUTTONS

- |  |  |
|--|--|
| <p><b>F</b> FALSE ALARM MESSAGE</p> <p><b>T</b> TEST MESSAGE</p> | <p>Press button "F" to play False <b>Alarm message</b>.</p> <p>Press button "T" to play <b>Test Message</b>.</p> |
|--|--|



## EVACTRON SD SERIES EVACUATION UNITS

### SD CARD

The SD1 units have been supplied with a removable SD card, this stores a library of messages and tones for you to choose from if required. Also loaded onto the card are various data sheets and installation notes.

To view files simply remove the SD Card, located under the left hand corner of the PCB (next to IDC) then insert into a SD slot on your computer. Copy files from the library into the required trigger folder, replacing existing ones.

**NOTE removing SD Card will not stop ALERT and EVAC tone from functioning.**

Multiple files can be loaded into trigger folders. These will play in alphabetical or numerical order, re-name if required.

e.g. 1bell.wav 2bellmessage.wav 3bellmessage.wav (bell tone will play once followed by bell message twice)

Note a file with the same name can not be loaded into a trigger folder as it will try to over-write the file.

**1 Tone Library** contains various tones files to choose from.

**2 Message Library** contains various messages to choose from.

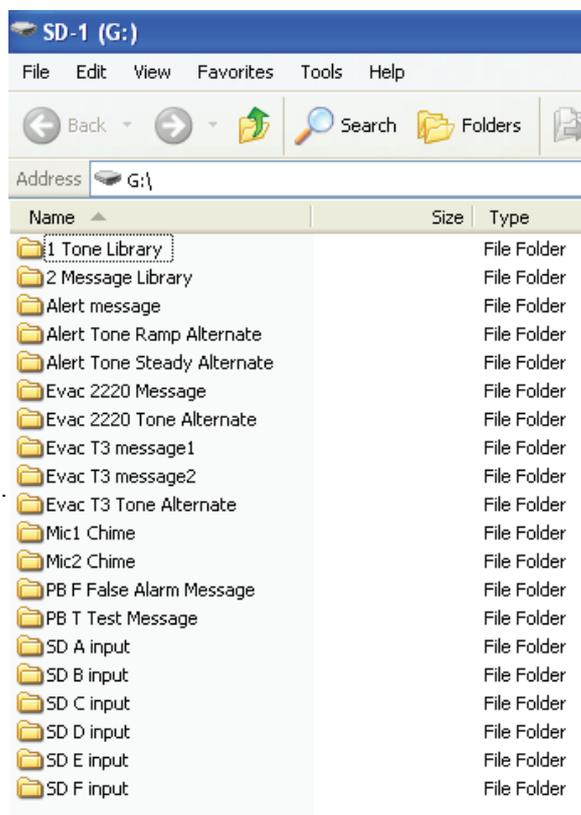
### TRIGGER FOLDERS

ALERT and EVAC default tones are loaded on to the EEPROM.

If different tones are required, load the new files into the "Alternate" folders and they will override the default tones, once the SD Card is re-inserted.

Note if the old 2220 Evac tone is required, select DSW1-1 to ON.

- **Alert Message** -plays after every 5 tone pulses.
- **Alert Tone Ramp Alternative** -insert a different file if required.
- **Alert Tone Steady Alternative** -insert a different file if required.
- **Evac 2220 Message** -plays after every 4 tone pulses.
- **Evac 2220 Tone Alternative** -insert a different file if required.
- **Evac T3 Message1** -plays after every 3 tone pulses.
- **Evac T3 Message2** -insert for alternating messages in EVAC If loaded, message 1 & 2 will alternate after each 3 tone pulses.
- **Evac T3 Tone Alternative** -insert different file if required.
- **Mic1 Chime** -insert chime file, will play when mic1 is activated.
- **Mic2 Chime** -insert chime file if required, when mic2 is activated.
- **PB F False Alarm Message**-default message loaded.  
Press push button 1 "F" to activate.
- **PB T Test Message**-default message loaded.  
Press push button 2 "T" to activate.
- **SD A Input**- activated via SD-KEYPAD.  
Test message (default) insert different file if required.
- **SD B Input**- activated via SD-KEYPAD.  
False Alarm message (default) insert a different file if required.
- **SD C Input**- default file loaded, change if required.
- **SD D Input**- default file loaded, change if required.
- **SD E Input**- default file loaded, change if required.
- **SD F Input**- default file loaded, change if required.



### LOADING YOUR OWN FILES

You may choose to record or supply your own CUSTOM files to load onto SD Card, they must be in the following format.

#### FILE TYPES SUPPORTED

Uncompressed PCM WAVE files with the file extension ".wav". Files must only contain a single audio channel (**Mono audio**) **48kHz is the recommended sampling rate**. Sampling rates used can be 8 kHz, 12 kHz, 16 kHz, 24 kHz, or 48 kHz.

Sampling rates 11.025 kHz, 22.05 kHz and 44.1 kHz are not recommended as they play back approximately 0.227% slower.

Files longer than 5 minutes each are also not recommended. **MP3 files will not work and need to be converted.**

Many free programs are available to convert files to required format. A free program commonly used is called AUDACITY to edit files. Otherwise send file to [brad@evactron.com.au](mailto:brad@evactron.com.au) and we can have it converted.

## EVACTRON SD SERIES EVACUATION UNITS

### SPECIFICATIONS

#### Supply Voltage

22-30vdc

#### Current Draw Max

Standby 120mA

**SD20** 20W output- 1.1 FLA

**SD40** 40W output- 2.0 FLA

**SD60** 60W output- 2.8 FLA

**SD120** 120W output- 5.5 FL A

Add loading of strobes if connected.

#### Speaker Impedance Max using Impedance meter

**SD20** 20W 500 ohms AC

**SD40** 40W 250 ohms AC

**SD60** 60W 166 ohms AC

**SD120** 120W 83 ohms AC

#### Speaker Output

22k end of line resistor (E.O.L.)

Recovery Time from S/C 13 seconds

Recovery Time from O/C 20 seconds

#### Strobe Output

4k7 end of line (E.O.L.)

3amp maximum (can drive strobes directly)

#### Control Output

Open collector transistor 0v switch,

300mA max (to drive relay or multiple LMU4 all call)

#### Common Fault Contacts

1amp rating, selectable N.O or N.C

#### Output Levels

M1 Output 1V (for mic looping)

RCA audio out 1V

#### Input Levels

##### M1 Gain Jumper

Input Level M1 Top -1mV (mic level)

Input Level M1 Bottom -1V (line level)

Input Level M1 Removed 3V (3V line level)

##### M2 Gain Jumper

Input Level M2 Top -1mV (mic level)

Input Level M2 Bottom -1V (line level)

Input Level M2 Removed 3V (3V line level)

#### Frequency Response

Frequency response any channel (-3dB) 50Hz - 15 kHz

#### Dimensions

##### SD20-120

221mmL x 115mmD x 90mmH

(Mounted on hat section including transformer)

PCB only 200mmL x 115mmD x 40mmH (no stand-offs)

Individual Transformers

20watt 65mmR x 30mmH,

40watt 95mmR x 35mmH,

60watt 95mmR 35mmH,

120watt 110mmR x 40mmH

*All specifications are for supply voltage of 24VDC and ambient temperature of 26C unless otherwise stated*

### SD1 INDICATORS

- SPK O/C yellow led on = speaker line open circuit (22K E.O.L.)
- SPK S/C red led on = speaker line short, disables amp (22K E.O.L.)
- STR O/C yellow led on = strobe line open circuit (4K7 E.O.L.)
- STR S/C red led on = strobe line short (4K7 E.O.L.)
- AMP FLT yellow led on = amp fault, flashing = hi-temp.
- AMP CLIP blue led = amp at maximum
- COM FLT yellow led on = common fault, flashing = no action after 10 min.
- P.A/PLAY green led on = P.A active, flashing SD file active.
- ALERT yellow led on = ALERT tone active
- EVAC red led on = EVACUATE tone active

■ AMP green led = amp fuse/power on

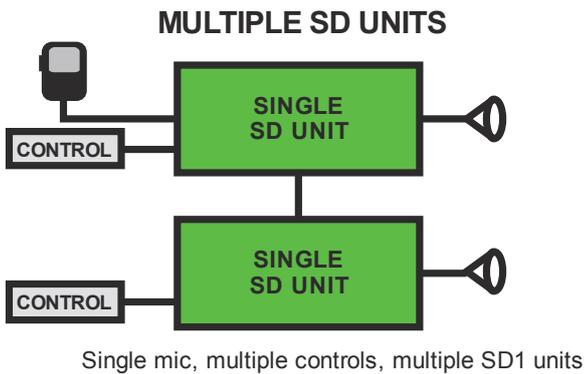
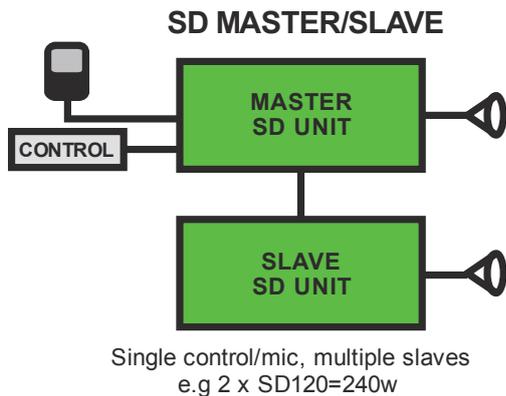
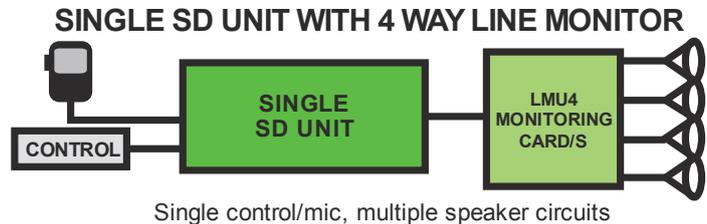
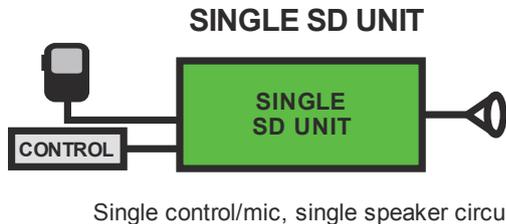
■ STROBE green led = strobe power on



ALARM on = ALARM input activated

## EVACTRON SD SERIES EVACUATION UNITS

### TYPICAL AMPLIFIER CONFIGURATION



### RECOMMENDED TEST PROCEDURE

1. Make sure the PSU is capable of the full load current draw of the installed SD1 unit and ancillaries.
2. Connect all controls and microphone if required. Leave speaker circuit disconnected for now.
3. Connect 24vdc to BATT input, all LEDs except ALARM will momentarily light up on power-up. AMP POWER and STR POWER green leds should remain on at all times whilst power connected. SPK S/C led should stay on for 13 seconds and then clear after power-up, SPK O/C led will come on, if 22K E.O.L. is not across the speaker output terminals.
4. With the speaker circuit disconnected, place an AC meter across the speaker output and turn DSW1-4 to the ON position (TEST TONE) the meter should read 100VAC, adjust **TONE VOL** if required, **return DSW1-4 to OFF**.
5. Connect a test speaker to speaker output (*this allows local testing without disrupting the building occupants*)
6. Press on-board push button "T" (TEST MESSAGE) the green P.A. led should flash. Adjust **MESS VOL** if required.
7. If a microphone is connected. Select P.A; speak into the microphone, green led P.A. should be steady. Adjust **M1 VOL** to required level. (*If key switch fitted, hand microphone will work in AUTO or override EVAC*)
8. Set timer ALERT to EVAC change-over time see *time instructions* (0 min = straight to EVAC) Select AUTO and activate a FIP ALARM, the red ALARM led should light. (ALM requires 24vdc supply to activate) ALERT or EVAC tones will activate with corresponding led. Messages should interrupt the tones and P.A. led will flash whilst messages are playing.
9. Test all other functions as required.
10. Once initial local is complete, disconnect test speaker and connect building speaker circuit. The 22K E.O.L. resistor will need to be moved to the end of the speaker circuit for monitoring to be complete. Test levels and adjust as required, if adjusting TONE VOL again use DS1-4 TEST TONE function to set up to 100V. **Exceeding 100v could result damage to speakers. Check speaker supplier's specifications if required.**

**NOTE POWERING DOWN THE UNIT CAN BE SIMPLY DONE BY UN-PLUGGING 2 WAY "BATT 24V" TERMINAL.**

## EVACTRON SD SERIES EVACUATION UNITS

### TROUBLE SHOOTING

#### FAULT CONDITION

#### CHECKLIST

No leds on but power connected  
AMP POWER green led - off  
STR POWER green led - off

Check Battery/PSU polarity and voltage 22-30VDC.  
Check blade fuse (amplifier fuse only) and replace fuse with same rating.  
Overload on strobe circuit, max 3 amps at one time. Self re-setting poly-fuse.

Alarm input no action

ALM input requires both 0V & +24VDC to activate and in AUTO mode.

SPK S/C red led stays on after 13sec  
SPK O/C yellow led - on  
No SPK S/C or O/C fault function

Speaker Short Circuit, check Disconnect circuit, E.O.L. it should be 22K.  
Open Circuit in speaker line. Disconnect circuit, E.O.L. it should be 22K.  
Check FUNC1 jumper, should be in OFF position (SPK monitoring enabled)

STR S/C red led on  
STR O/C yellow led on  
No Strobe S/C or O/C fault function

Strobe Short Circuit. Disconnect circuit, E.O.L. should be 4K7.  
Open Circuit in strobe circuit. Disconnect circuit, E.O.L. should be 4K7.  
Check FUNC2 jumper, it should be in the OFF position (STR monitoring enabled)

AMP CLIP blue led flashing  
AMP FAULT-yellow led - on  
AMP FAULT-yellow led flashing  
Fan on  
COM FAULT yellow led on  
COM FAULT yellow led flashing

Amplifier close to maximum, **indicator only**.  
Amplifier shut down due to over-load or over temperature, check loading.  
Amplifier High Temperature condition, fan should come on.  
Fan will cycle on as heat sink requires, depending on load.  
Fault condition O/C or S/C, Amp fault, remote fault in, supply voltage under 22VDC.  
Fault condition after 10min with no input e.g. left in OFF position.

No audio out of speakers

Check for any fault condition, Must be in

No SD tones/messages working  
SD C-F not working  
SD C-F not staying on  
SD C-F stays on

Check the SD Card is inserted underneath (pins to top) re-insert.  
SD1 must be in AUTO with no ALARM to operate as SD C-F inputs.  
when using a momentary trigger set DSW1-3 to ON (latched), file should play fully.  
Set DSW1-3 to OFF, file will only play whist input low.  
Adjust M1/M2 VOL to suit (1mV=hi gain, 3V= low gain)  
Press either on-board push buttons to test. If P.A led flashes check MESS VOL.  
Check format of loaded files, try one from library. See SD Card file type instructions  
Check trigger folder if more than one file loaded in it.

Custom message not playing  
Multiple tones/messages playing

M1 level too low/high  
M2 level to low/high

M1 GAIN - **1mV=mic level (default)** 1V=line level & 3V if removed. Adjust M1 VOL.  
M2 GAIN - 1mV=mic level **1V=line level (default)** & 3V if removed. Adjust M1 VOL.

Alert to EVAC Timer issues

BLUE timer switches **with clear power relay**, use the following settings-  
0=EVAC, 1=2min, 2=1, 3=3, 4=8, 5=10, 6=ALERT stays on, 7=11, 8=4, 9=6min.

LMU4/s connection problem

Check 100V to LMU4, it must come from A1 & A2 of step up transformer on SD1, to A1 & A2 on LMU4, matching polarity. SD1 should have 22K across SPK  
*See LMU4 connection drawing for details.*

SRB1's connection problem

SRB1's are used if multiple circuits or more than 3amp switching is required,  
Check FUNC2 jumper, it should be in the **ON** position (STR monitoring disabled)  
*See SRB1 connection drawing for details.*

