



Fire detection and evacuation solutions that save lives.



EV3000

Emergency Warning & Intercommunications System

(2 Wire / S004)

Installation & Commissioning

MAN1813-9

Contents

1	Non Disclosure Agreement	1
2	Certification Information	2
3	Equipment Manufacturing Details.....	2
4	Purpose	3
4.1	Scope	3
4.2	References	3
4.2.1	EV3000 System Manuals:.....	3
4.2.2	Australian Standards.....	3
4.3	System Overview.....	3
5	System Description	4
5.1	Emergency Warning System	4
5.2	Emergency Intercommunication System.....	4
6	ECP & Main Equipment Layout.....	5
7	EWIS Components	6
7.1	The Emergency Control Panel.....	6
7.2	Ancillary Components ECP.....	6
7.2.1	MICROPHONE.....	6
7.2.2	Master EIS Handset and All Call Switch	6
7.2.3	Emergency Alarm Initiating Device (EAID).....	6
8	EWS, EIS And ECP Operation	7
8.1	Emergency Control Panel.....	7
8.1.1	Operating Instructions	7
8.1.2	Automatic / Manual / Isolate Key Switch	8
8.1.3	All Call Facility.....	9
8.1.4	Buzzer	9
8.1.5	Buzzer Mute / Alarm Acknowledge.....	9
8.1.6	Master Reset	10
8.1.7	Lamp Test Facility	10
8.1.8	System Test Facility	10
8.1.9	System Status Indicators.....	10
8.1.10	Zone Status (Fault Diagnostics).....	11
8.2	EWS Zone Control Panel	12
8.2.1	EWS Zone Control Switches and Indicators	12
8.2.2	EWS Zone Fault.....	12
8.2.3	Alarm Origin	12
8.2.4	Zone Labelling	12
8.3	EIS Control Panel	13
8.3.1	WIP Select Switch	13
8.3.2	WIP Select Indicator (Red)	13
8.3.3	WIP Call Buzzer.....	13
8.3.4	Zone Cleared Switch	13
8.3.5	WIP Fault Indicator (Amber)	13
8.4	EIS System Operation	14
8.4.1	WIP Calling ECP	14
8.4.2	Conference Call	14

8.4.3	Completing the Call by the WIP	14
8.4.4	Completing the Call by the ECP	14
8.4.5	ECP Calling WIP	14
8.4.6	ECP To All WIPS (ALL CALL)	14
8.4.7	Completing The All Call	15
8.4.8	EIS Controlling ECP	15
8.4.9	Zone Labelling - Refer to Appendix A	15
8.4.10	Remote Paging Console.....	15
8.5	Main Equipment Description	17
8.5.1	Common Board Frame.....	17
8.5.2	Tone Generator	18
8.5.3	Standby Tone Generator.....	19
8.5.4	Microphone / BGM Mixer Board.....	19
8.5.5	Standby Microphone / BGM Mixer Board	19
8.5.6	FACP Input CPU Board	19
8.5.7	Main CPU	20
8.5.8	Amplifier Rack Frame.....	20
8.5.9	40-Watt Amplifier.....	20
8.5.10	120-Watt Amplifier	21
8.5.11	Warden Intercom Control Frame.....	22
8.5.12	EIS Control CPU.....	23
8.5.13	EIS Selector Board	23
8.5.14	Fan Module.....	23
8.5.15	Power Supply	23
8.5.16	Fault Relay	24
9	Installation.....	25
9.1	Unpacking And Inspection	25
9.2	Anti-Static Precautions	25
9.3	Working on The System.....	25
9.4	Cabinet Installation	25
9.4.1	Surface Mount.....	25
9.4.2	Recess Mount.....	25
10	Connecting The EV3000	26
10.1	FACP Input Connections (Individual inputs).....	26
10.1.1	Connections	26
10.1.2	Fusing	26
10.1.3	Address Setting	26
10.2	Common FACP Input Connections.....	27
10.3	EWS, BGM and EIS Handset Input Connections	27
10.3.1	Connections	28
10.4	100V Line Speaker Connections.....	28
10.4.1	Connections	29
10.4.2	Fusing	29
10.4.3	Field Wiring.....	30
10.5	Visual Indicators Output Connections.....	31
10.5.1	Connections	31
10.5.2	Fusing	31

10.5.3	Field Wiring.....	33
10.6	Warning Sign Driver Board (BRD42WSD)	34
10.7	WIP/EAID Extension Connections.....	35
10.7.1	Connections.....	35
10.7.2	Field Wiring.....	35
10.8	MECP To SECP Data Connections.....	36
10.8.1	Connections.....	36
10.9	CN5 + CN6 Power Supply to Board	36
10.9.1	Fusing	36
10.10	Mains Connection	37
11	Devices.....	38
11.1	Speakers	38
11.2	Visual Warning Devices	39
11.3	Warden Intercommunication Point (WIP).....	40
11.4	EAID.....	41
12	SECP And Remote Console Connections.....	42
13	Placing System Into Operation	43
13.1	System Power Up Sequence.....	43
13.2	Time Out Setting For Automatic Evacuation Sequence	44
14	Faults.....	45
14.1	Fault Indicators	45
14.2	Fault Diagnostics	45
15	Trouble Shooting	46
16	Appendix A: Zone Labelling.....	48
17	Appendix B: Compatible Devices.....	49
18	Appendix C: Amplifier Addressing	50
19	Appendix D: Amplifier Strapping.....	51
20	Appendix E: Information on the Obsolete Tone Generator.....	52
20.1.1	Signal Generator Settings.....	52
21	Glossary Of Terms.....	53
22	Definitions.....	54

1 Non Disclosure Agreement

This contract has been entered into by the person or company user of this document (hereafter called the Trader) and Ampac Technologies (hereafter called Ampac) 7 Ledger Rd, Balcatta, WA 6021, Western Australia 6017. Under terms and conditions as specified hereunder.

Whereas Ampac and the Trader for their mutual benefit and pursuant to a working relationship which may be established, anticipate that Ampac will disclose in the form of this document, information of a secret, or confidential or proprietary nature (hereinafter collectively referred to as Proprietary Information).

Whereas Ampac desires to ensure that the confidentiality of any Proprietary Information is maintained in accordance with the terms of this Agreement;

NOW, THEREFORE, in consideration of the foregoing premises, and the mutual covenants contained herein, the Trader hereby agrees as follows:

1. The Trader shall hold in trust and confidence, and not disclose to any person outside its organisation, any Proprietary information which is disclosed to the Trader by Ampac under this Agreement. Proprietary Information disclosed under this Agreement may be used by the Trader only for the purpose of carrying out work on or with Ampac supplied equipment and may not be used for any other purpose whatsoever.
2. The Trader shall disclose Proprietary Information received by Ampac under this Agreement to persons within its organisation only if such persons are legally bound in writing to protect the confidentiality of such Proprietary Information.
3. The undertakings and obligations of the Trader under this Agreement shall not apply to any Proprietary Information which:
 - (a) is disclosed in a printed publication available to the public, is described in patent anywhere in the world, or is otherwise in the public domain at the time of disclosure;
 - (b) is generally disclosed to third parties by Ampac without restriction on such third parties;
 - (c) is shown by the Trader to have been in its possession prior to the receipt thereof from Ampac;
 - (d) is approved for release by written authorisation of Ampac; or
 - (e) is not designated by Ampac in writing or by appropriate stamp or legend to be of a secret, confidential or proprietary nature.
4. his Agreement will be binding upon and inure to the benefit of the parties hereto, and their respective successors and assigns.
5. This Agreement, and all rights and obligations hereunder, shall expire on the 10th anniversary of the date of issue of this document.

These terms are accepted by the Trader on receipt and retention of this document.

2 Certification Information

**EV3000
EMERGENCY WARNING AND INTERCOMMUNICATION SYSTEM**

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DESIGNED TO: AS2220.1-1989
AS1670.4-2004
AS4428.4-2004

**SSL CERTIFICATE OF
COMPLIANCE NUMBER:** AFP - 603

3 Equipment Manufacturing Details

JOB / SERIAL NUMBER: _____

MANUFACTURE DATE: _____ / _____ / _____

4 Purpose

The purpose of this manual is to assist in the installation and operation of the EV3000 Emergency Warning and Intercommunication System (EWIS).

4.1 Scope

The information within this manual is only available to and for the use of personnel engaged in the installation and operation of the EV3000 EWIS.

4.2 References

4.2.1 EV3000 System Manuals:

Document No. M0010WT1 EV3000 EWIS Technical Manual.

Document No. M0010WI1 EV3000 EWIS Installation, Programming and Commissioning Manual.

4.2.2 Australian Standards

AS2220.1 Emergency Warning and Intercommunication systems in buildings Part 1: Equipment Design and Manufacture.

AS1851 Part 10 Maintenance of Fire Protection Equipment, Part 10: Emergency Warning and Intercommunication systems.

AS1670.4 Fire Detection, Warning, Control and Intercom Systems – System Design, Installation and Commissioning. Part 4: Sound Systems and Intercom Systems for Emergency Purposes.

AS4428.4 Fire Detection, Warning, Control and Intercom Systems – System Design, Installation and Commissioning. Part 4: Intercommunication Systems for Emergency Purposes.

4.3 System Overview

The Ampac EV3000 Emergency Warning and Intercommunication System is a microprocessor-based EWIS system that complies with Australian Standards AS2220.1 and produces Alert and Evacuation signals compliant with AS1670.4

The EWIS comprises of two sub-systems,

1. Emergency Warning System (EWS)

The prime function of an EWS is to transmit via speakers in evacuation zones, alert signals, evacuation signals and public address clearly and reliably.

The EWS can automatically initiate evacuation procedures or be manually operated as well being used for non-emergency functions, e.g. background music and general PA facilities.

2. Emergency Intercommunication System (EIS).

The EIS is a totally independent intercommunication system provided to communicate on a one to one basis from the Master Emergency Control Panel (MECP) to the individual Warden Intercommunication Points (WIP's) within the evacuation zones.

The EWS and EIS are collectively referred to as the Emergency Warning and Intercommunication System (EWIS).

5 System Description

5.1 Emergency Warning System

The EWS subdivides the building into evacuation zones. Each evacuation zone has one or more amplifiers and a number of associated speakers. In sections of a building where the background noise is high, visual warning devices may be used in addition to speakers. Each evacuation zone amplifier may be switched by the system to one of four audio channels. These channels are PA, Alert signal, Evacuation signal and Background music (BGM). The BGM channel to each amplifier can be configured on site by jumper links to one of the following sources:

- Background music 1
- Background music 2
- Silence

During non-emergency situations the evacuation zones can have the PA channel or BGM channel switched to allow the EWS to be used for PA facilities or background music. The background music is disabled;

- in an emergency situation,
- if the EWS is manually operated; or
- if the mains power fails.

The tone generator (TG) is responsible for generating the alert and evacuation signals as well as the alert and evacuation verbal messages.

The EWS has two possible types of alarm signal inputs to indicate that an emergency condition is occurring in the building. These are:

- Emergency Alarm Initiating Devices (EAID's) i.e. manual call points
- Fire Alarm Control Panel (FACP)

These inputs are grouped according to the building evacuation zones. Any number of EAID's and FACP's inputs may be assigned to any one building evacuation zones or group of zones.

When an input, i.e. EAID or FACP initiates an alarm signal the EWS, if in automatic mode, will initiate a preset evacuation sequence. The evacuation sequence will sound the Alert / Evac signals to the evacuation zones within the building and activating the visual warning devices (if installed) according to the pre-programmed evacuation sequence.

The EWS provides full system status and fault indication facilities.

If the EWS has more than one ECP, one ECP is referred to as the Master Emergency Control Panel (MECP) and the remaining ECP's are referred to as Secondary Emergency Control Panels (SECP's).

5.2 Emergency Intercommunication System

The EIS provides an independent communication system between the controlling ECP and a Warden Intercommunication Point (WIP). EIS features are:

- The controlling ECP can call individual WIP's or enter an All Call mode, where all the WIP's are called simultaneously.
- The controlling ECP and up to 5 WIP's can communicate in a conference mode.
- Calls to an individual WIP's have full duplex communication.
- All Call, communication is half duplex from the controlling ECP.
- Any WIP can call the controlling ECP the call is answered at the controlling ECP at the operators' discretion.

6 ECP & Main Equipment Layout

Figure 1: illustrates a typical EV3000 in a 29U floor standing rack equipped with the main equipment, 24 EWS controls and 48 EIS controls.

The standard mechanical construction of the EV3000 is 483mm (19inch) rack mounting frames with EURO Card size plug-in modules.

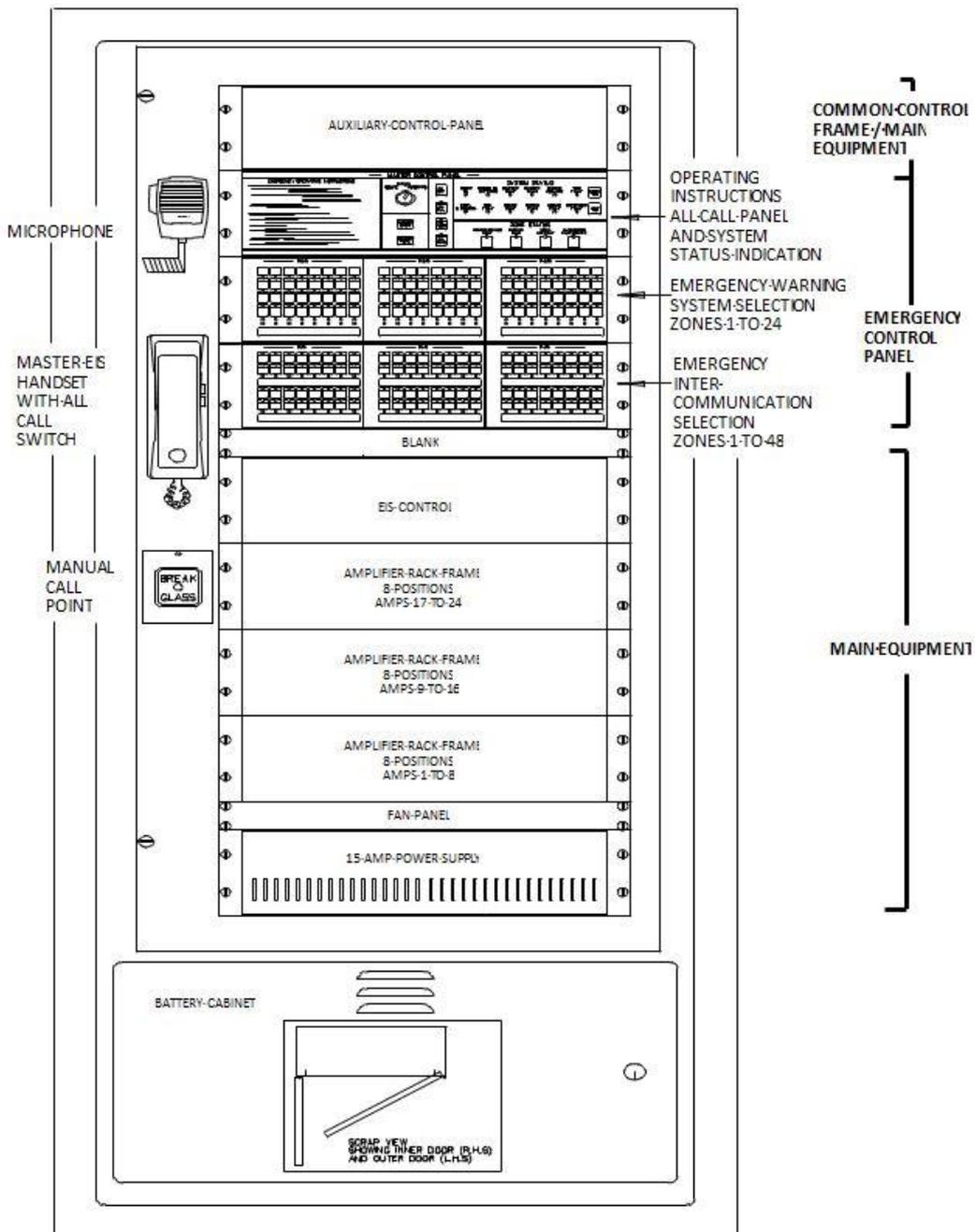


Figure 1: ECP and Main Equipment

7 EWIS Components

The EWIS is broken into three components:

1. Master Emergency Control Panel
2. Cabling
3. Devices

The Master Emergency Control Panels can be further broken down into two sections,

1. Emergency Control Panel
2. Main Equipment

7.1 The Emergency Control Panel

The **ECP** consists of:

A **Control Panel** which contains the Auto/Manual/Isolate facility, the All Call facility, the common System Status and Zone Status controls and indicators.

An **EWS control panel** which controls the manual selection of audible signals to the Evacuation zones and an **EIS control panel** which controls the communication with WIP extensions.

7.2 Ancillary Components ECP

7.2.1 MICROPHONE

The microphone;

- is used for the PA facility;
- has a press to talk (PTT) switch; and
- is normally disabled unless the ECP is in control, i.e. the key-switch is in the MANUAL position and its REMOTE ECP IN CONTROL indicator is NOT illuminated.

7.2.2 Master EIS Handset and All Call Switch

Handset and associated cradle (RED).

7.2.3 Emergency Alarm Initiating Device (EAID)

The EAID on the ECP is one of the Alarm inputs for the evacuation zone that corresponds to the section of the building where the ECP is located.

8 EWS, EIS And ECP Operation

The EV3000 ECP has three sections, the;

1. Emergency control panel,
2. EWS control panel; and
3. EIS control panel.

8.1 Emergency Control Panel

The Emergency Control Panel contains the common system controls and indicators and the common EWS controls and indicators and the operating instructions. The layout of the controls on the Master Control Panel is shown below.

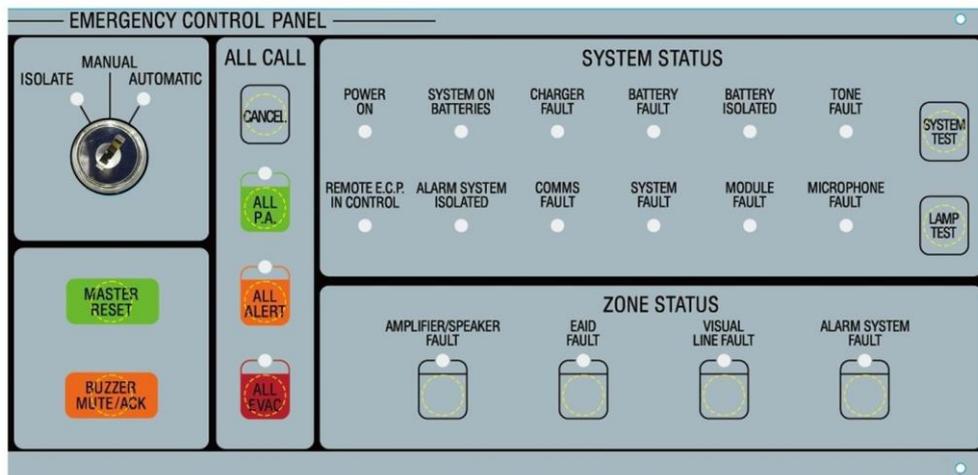


Figure 2: Master Control Panel

8.1.1 Operating Instructions

The EV3000 has a set of emergency operating instructions on the fascia of the Master Control Panel.

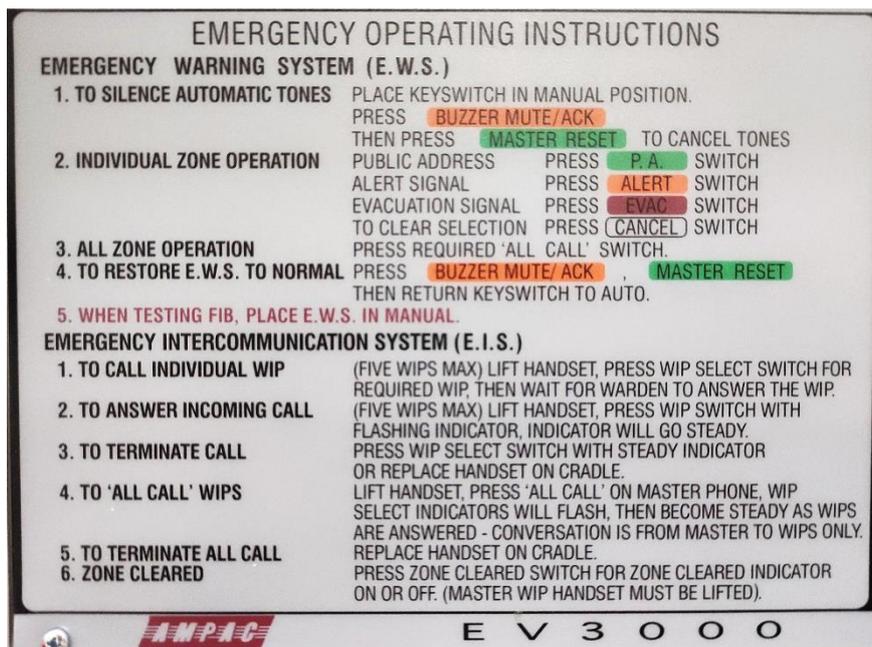


Figure 3: Instructions

8.1.2 Automatic / Manual / Isolate Key Switch

1. Automatic Position

In the Automatic Position the EWS will enter the programmed evacuation sequence when an alarm signal is received from an FACP or EAID.

The switch key is removable only in this position.

A green automatic indicator is illuminated when the switch is in the automatic position.

2. Manual Position

The purpose of this position is to take manual control of the building evacuation, irrespective of the state of the alarm signals. This position also allows routine testing of the building alarm system and EWS.

The automatic initiation of an evacuation sequence is inhibited.

If the EWS has entered the evacuation sequence whilst in the AUTOMATIC position and the EWS is switched to the MANUAL position, the state of the EWS at that instant is held, i.e. each zone's output remains in that state and the sequences are halted.

If Switch 7 of the timeout selection switch (see section 13.2) is OFF, and the Key Switch is switched back to the AUTOMATIC position, all active evacuation sequences are cancelled and the state of the EWS remains unchanged.

If Switch 7 of the timeout selection switch (see section 13.2) is ON, and the Key Switch is switched back to the AUTOMATIC position, all active evacuation sequences (including sequences triggered while the EWS was in manual) resume. Any emergency zones that were manually changed while the EWS was in manual will remain – however the zones maybe changed to a higher priority by an evacuation sequence.

3. Manual Override of SECP's

Where an EWS has more than one ECP, any ECP can take manual control of the EWS by turning the key-switch to the MANUAL position. Only the MECP being switched to the MANUAL position shall override any SECP with its key-switch in the MANUAL position.

Each ECP is fitted with an "REMOTE ECP IN CONTROL" indicator. When an ECP is switched to the MANUAL mode, all other ECP's in the EWS will illuminate their REMOTE ECP IN CONTROL indicator.

If an SECP is in control and the MECP is switched to MANUAL, the MECP will then take control, its REMOTE ECP IN CONTROL indicator will switch off and the SECP which was previously in control will illuminate its REMOTE ECP IN CONTROL indicator.

When the key-switch at a ECP is in the manual position the alarm system isolated indicator will illuminate steady.

4. Isolate Position

This key-switch position is local to the ECP and will not affect any other ECP's. A red indicator is illuminated when the switch is in this position.

The ECP will not recognise the isolated position if selected from the manual position. When selecting the EV3000 to isolate, the switch must be rotated from automatic, through manual, to isolate position

within 1 second. Furthermore the system must be in an inactive state, i.e. fans are not running, no alarms are present etc.

In this position the control switches and front panel indicators only function locally, with no zone outputs, i.e. speakers and visual alarm devices being activated. The indicators selected in this position will flash. This position is used for training purposes.

If an ECP is in the ISOLATE position, and another ECP is switched to manual, the ECP in the ISOLATE position will illuminate its REMOTE ECP IN CONTROL indicator and the control switch indicators will reflect the status of the EWS, not local control switch selections.

If an ECP is in the ISOLATE position, and the EWS receives an FACP input then the EWS will return to the AUTO state and commence the evacuation sequence. The control switch indicators will reflect the state of the EWS, not the local control switch selections. The ALARM ORIGIN INDICATORS will reflect which zone caused the EWS to enter the evacuation sequence.

8.1.3 All Call Facility

Four control switches, i.e. "ALL OFF", "ALL PA", "ALL ALERT" and "ALL EVAC" provide the ALL CALL facility. The selected audio channel is delivered to ALL the evacuation zones. There are three ALL CALL indicators which reflect the all call selection. These are:

- ALL CALL PA
- ALL CALL ALERT
- ALL CALL EVAC

The ALL CALL inputs have priority over the EWS Control switches. Turning the ALL CALL facility OFF (All Call 'CANCEL') will return the EWS to its condition before the use of the All Call facility.

8.1.4 Buzzer

The ECP is fitted with an internal buzzer which is activated by the following conditions:

- amplifier / speaker line fault
- visual alarm line fault
- alarm system fault (FACP, EAID)
- communications fault (to other ECP's)
- system on batteries - local if locally powered, or remote if remotely powered
- battery fault - local if locally powered, or remote if remotely powered
- charger fail - local if locally powered, or remote if remotely powered
- signal generator fault
- module fault
- system fault
- WIP line fault
- visual line fault
- EAID line fault
- microphone pre-amp fault

8.1.5 Buzzer Mute / Alarm Acknowledge

When the BUZZER MUTE button is pressed, all outstanding alarm and fault conditions are acknowledged. All flashing indicators go steady, and the buzzer is muted. For system wide faults, pressing the BUZZER MUTE at any ECP will acknowledge the fault at all ECP's.

System wide faults are:

- amplifier / speaker line fault
- visual alarm line fault
- alarm system fault (FACP, EAID)
- communications fault
- system on batteries - if all ECP's remotely powered
- battery fault - if all ECP's remotely powered
- charger fail - if all ECP's remotely powered
- signal generator fail / microphone pre-amp fault
- module fault
- system fault
- WIP system fault
- visual line fault
- EAID line fault

8.1.6 Master Reset

Master Reset facility is only active when the ECP is in the Manual mode.

When pressed all zone outputs switch to the off channel but only if there are NO unacknowledged EAID or FACP alarm signals in the EWS.

8.1.7 Lamp Test Facility

The LAMP TEST facility causes all the front panel indicators (on the master control panel only) to illuminate and the audible buzzer operates for 3 seconds then resets.

The following indicators are not included;

1. Mains On,
2. System on Batteries,
3. Charger Fault,
4. Battery Fault and
5. Battery Isolated

The LAMP TEST is invoked by momentarily pressing the LAMP TEST button.

8.1.8 System Test Facility

This facility allows the testing of the evacuation sequence fitted without broadcasting signals.

To invoke a test of the sequence:

1. Place key switch into ISOLATE position
2. Press SYSTEM TEST
3. Press the CANCEL button for the EWS zone input to simulate an alarm.
4. System should indicate the sequence but not output any audio signals.
5. To restore system to normal return key switch to AUTO.

The LAMP TEST is invoked by momentarily pressing the LAMP TEST button.

8.1.9 System Status Indicators

There are twelve system status indicators each illuminated when;

- | | | |
|----|----------------------------|--------------------------------------|
| 1. | Power On | Mains power is present at ECP. |
| 2. | System On Batteries | The ECP is operating from batteries. |
| 3. | Charger Fault | The battery charger fails. |

- 4. **Battery Fault** The battery voltage drops below the lower limit.
- 5. **Battery Isolated** The batteries have been isolated from the charger i.e. fuse is blown

or circuit breaker is tripped.

- 6. **Signal Fault** The tone generator has failed.
- 7. **Alarm system Isolated** The alarm system is isolated.
- 8. **Comms Fault** A fault is detected in the loop communications or audio bus.
- 9. **System Fault** Any ECP or RPC has a module fault.
- 10. **Module Fault** A module fault within the ECP's internal communication bus.
- 11. **Microphone Fault** The microphone/BGM mixer has failed.
- 12. **Remote ECP In Control** See MANUAL POSITION for the key-switch.

8.1.10 Zone Status (Fault Diagnostics)

To aid in diagnosing the type of fault on an evacuation zone, four buttons have been included on the Master Control Panel of the ECP. These buttons represent the four types of evacuation zone faults that can occur.

These faults are:

- 1. Amplifier/speaker line faults.
- 2. EAID faults.
- 3. Visual line faults.
- 4. Alarm system (FACP) faults.

When one of these buttons is pressed, only the zones with a fault present as represented by the push button have their EWS fault origin indicators illuminated. This facility is non-latching and therefore the EWS fault origin indicators will return to their former state when the button is released.



Figure 4: Zone Status Indicators and Switches

8.2 EWS Zone Control Panel

8.2.1 EWS Zone Control Switches and Indicators

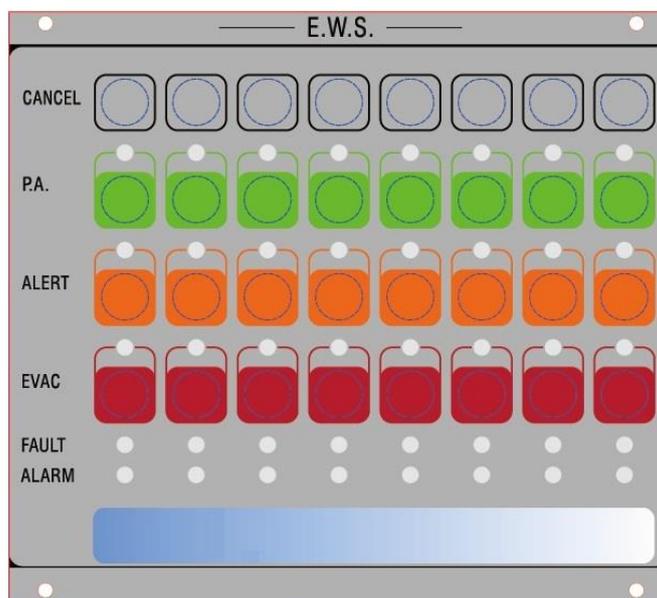


Figure 5: EWS Keypad

The control switches allow any of the four audio channels (BGM, PA Alert or Evac) to be switched to any of the zones. The Control Switches are inhibited when the EWS is in the AUTOMATIC state.

Pressing any of the control switches for an evacuation zone shall automatically cancel the previous selection for that zone, i.e. only one audio channel can be assigned to a zone at any one time.

For each evacuation zone there is a set of control switches and associated indicators:

- **CANCEL** - Control only
- **PA** - Control switch and indicator
- **ALERT** - Control switch and indicator
- **EVAC** - Control switch and indicator

8.2.2 EWS Zone Fault

EWS Zone Fault indicator will flash when a fault is detected by the MAIN EQUIPMENT on any of the wiring or components associated with that zone, and go steady when the fault is acknowledged.

8.2.3 Alarm Origin

Alarm Origin indicator will flash when an input, i.e. FACP or EAID associated with that zone, has been activated and go steady when the alarm is acknowledged.

Fault and Alarm indicators are NOT inhibited by any key-switch operation.

8.2.4 Zone Labelling

Refer to Appendix A.

8.3 EIS Control Panel

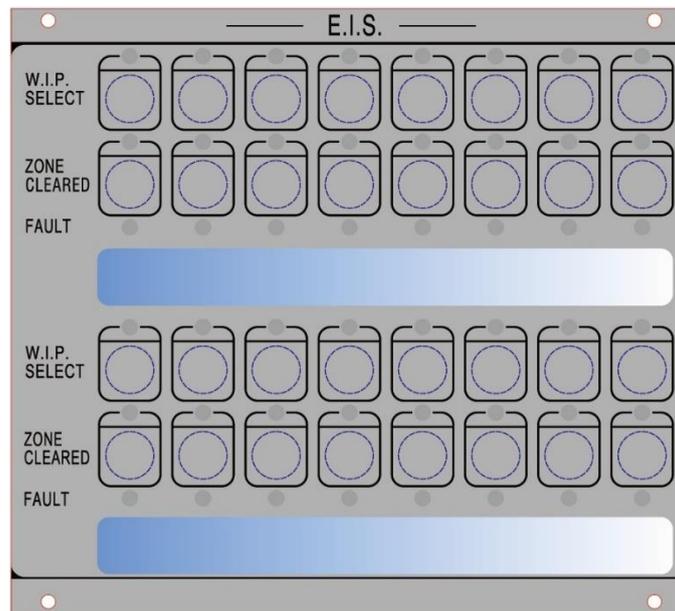


Figure 6: EIS Keypad

8.3.1 WIP Select Switch

(One switch per WIP) - when pressed for the first time will initiate a call to the WIP, or answer a call from a WIP. Pressing the switch a second time will terminate the call to the WIP regardless of who initiated the call.

8.3.2 WIP Select Indicator (Red)

(One indicator per WIP) - will flash when the ECP is calling the WIP and goes steady when the call is answered at the WIP. When the call is terminated, the indicator switches off. The indicator also flashes when the ECP is being called from a WIP and goes steady when the call is answered at the ECP.

8.3.3 WIP Call Buzzer

Sounds when the ECP is being called from the WIP. Buzzer switches off when the handset is picked up or the call is terminated.

8.3.4 Zone Cleared Switch

(One switch per evacuation zone) - when pressed for the first time will cause the Green ZONE CLEARED indicator to illuminate. Pressing the switch a second time will switch off the indicator. To function the MECP handset must be lifted first.

8.3.5 WIP Fault Indicator (Amber)

(One indicator per WIP) - indicator flashes when a fault associated with the WIP has been detected. Indicator goes steady upon acknowledgment.

8.4 EIS System Operation

8.4.1 WIP Calling ECP

The following is the procedure when initiating a call from a WIP to the ECP:

1. Remove the handset from the cradle at the WIP. This will cause the appropriate WIP select indicator to flash at all ECP's and the WIP call buzzer to sound at all ECP's.
2. A confidence tone can be heard at the WIP.
3. The ECP which responds to the call is referred to as the controlling ECP. The call is answered at the ECP by removing the handset from the cradle and pressing the WIP select switch which corresponds to that WIP. A full duplex connection between the two parties is then established.

8.4.2 Conference Call

If a second WIP initiates a call, the select indicator for that WIP will flash and if the WIP select switch corresponding to the second WIP is pressed, the select indicator for that WIP will go steady, and a conference call between the three parties is set up. Up to 5 WIP's can be supported in this fashion. If a sixth WIP calls the ECP, the select switch of the sixth WIP is pressed, nothing will happen, i.e. the select indicator will remain flashing. The only way that the sixth WIP can be answered is if one of the 5 WIP's involved in the conference call is cancelled the sixth WIP can then take its place.

8.4.3 Completing the Call by the WIP

If the WIP handset is placed back onto its cradle after the call is connected. The handset at the controlling ECP will go silent and the WIP select indicator will switch off, completing the call.

8.4.4 Completing the Call by the ECP

The call can be completed at the ECP in two ways. By replacing the handset on the cradle OR by pressing the WIP select switch. In either case the WIP will return to the confidence tone. To be able to call or be calls again the WIP handset should be returned to its cradle.

8.4.5 ECP Calling WIP

The following is the procedure when initiating a call from the ECP to a WIP:

1. The confidence tone can be heard in the handset at the controlling ECP.
2. The WIP select switch corresponding to the WIP to be called is pressed, which causes the WIP select indicator at the ECP's to flash, and the buzzer to sound at the WIP. Up to 5 WIP's can be called using this procedure.
3. Once the handset is picked up at the WIP the connection is established and the WIP select indicator becomes steady.
4. When the ECP is calling more than one WIP, the status of the calls, i.e. WIP answering is reflected in the WIP select indicators.

8.4.6 ECP To All WIPS (ALL CALL)

The following is the procedure when initiating an All CALL from the ECP to all WIP's:

1. The confidence tone can be heard in the handset at the controlling ECP.
2. The All Call button is pressed; this causes all WIP select indicators at the ECP to flash.
3. The WIP's, buzzers sound, with a 3 second or longer ON time and 3 second OFF time. This allows the warden at the WIP to distinguish between a direct call to his WIP and an All Call type call.

4. When any of the WIP handsets are taken off the cradle, a connection is made and the WIP select indicator at the ECP goes steady. Similarly as more WIP handsets are taken off the cradle, their respective select indicators at the ECP go steady.

8.4.7 Completing The All Call

Replacing the ECP handset on its cradle i.e.: hanging up, will cancel the ALL CALL operation. Each WIP will be returned to the confidence tone.

8.4.8 EIS Controlling ECP

With the EWS in auto any ECP can be in control of the EIS by simply lifting the WIP handset at that ECP from its cradle. However, when an EWS is switched to the manual position it then has control of the EIS.

Again the MECP can override an SECP to take control of the EIS.

8.4.9 Zone Labelling - Refer to Appendix A

8.4.10 Remote Paging Console

The Remote Paging Console (RPC) has been designed to provide PA. facilities at locations which may be remote from the E.C.P.

The RPC consists of a sloping front console with an alphanumeric keypad and a gooseneck type microphone. A 3 digit seven segment display is used to display the selected subzone(s) and there are 3 LED indicators for power, system busy and a press to talk indicator which verifies the operation of the push to talk (PTT) switch.

OPERATING INSTRUCTIONS

When the system is powering up the LED display will read In1. After the system powers up the LED display will be blank.

If the system busy LED is on, or the system is powering up, the RPC cannot be used. The system busy LED will be on if any other RPC is using the system or if the EWS system is activated at either the MECP or an SECP.

Note 1. When paging is in progress, fault monitoring on the amplifiers is inhibited.

Note 2. If the EWS overrides the RPC's, the RPC's are disconnected and the system busy LED's are turned on and the buzzer sounds for 3 seconds.

ZONE SELECTION

The RPC can be configured to access EWS zones as follows:

1. Subzones these may be selected zones or parts of zones of the EWS.
2. Groups these may be groups of subzones.
3. All Call this is used to select all subzones configured to a particular RPC.

SUBZONE SELECTION

To select a subzone, key in the required No. and press 'ENTER/CLEAR' e.g. to select subzone 4, press 4 followed by 'ENTER/CLEAR'.

The LED display will show 4 which will flash until the RPC has control of the EWS.

Once the RPC is connected press the 'PUSH TO TALK' button and speak into the microphone (NOTE a pre-announcement chime sounds when the PTT is pressed). To terminate the selection release the 'PUSH TO TALK' button and press 'ENTER/CLEAR'. Once the PTT is released if no other key is pressed, the RPC will automatically disconnect after 10 seconds.

To cancel an incorrect entry press 'ENTER/CLEAR' twice.

GROUP CALL

To select a group of subzones, press the 'GROUP' key followed by the group number key (e.g. 4) followed by 'ENTER/CLEAR'.

e.g. to select group 5 press 'GROUP' key followed by 5 followed by 'ENTER/CLEAR'. The LED display will show A5 which will flash until the RPC has control of the EWS.

ALL CALL

To select the all call facility press 'ALL CALL' followed by 'ENTER/CLEAR'. The display will show ALL which will flash until the RPC has control of the EWS.

WIRING CONNECTIONS

All wiring to RPC's is via pre-wired connectors and modules are addressed / programmed in the factory.

8.5 Main Equipment Description

The MAIN EQUIPMENT consists of the Common Control boards, Main CPU, EIS control cards, Amplifiers, Power Supply and Termination boards.

8.5.1 Common Board Frame

The common board frame is the top frame in the ECP and houses the following boards/modules.

- Main Tone Generator Board (BRDEV3TG)
- Standby Tone Generator Board (BRDEV3TG if installed)
- Main Microphone/BGM Mixer Board (302 484)
- Standby Microphone/BGM Mixer Board (302 484 if installed. 2 x 251-0014 guide rails required)
- FACP Input CPU Board (302 620 if installed)

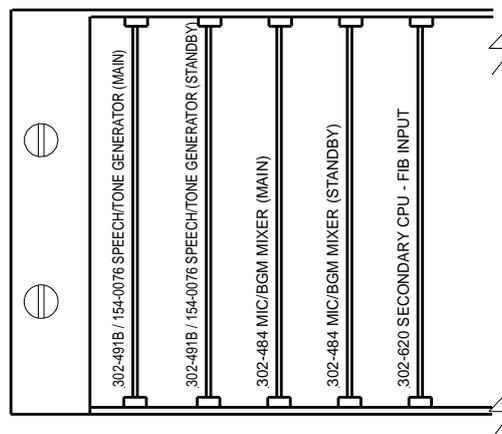


Figure 7: Common Board Frame

8.5.2 Tone Generator

The EV3TG is designed to produce the alert and evacuation tones, play the alert and evac speech messages and produce the test tone for monitoring the operation of the amplifier.

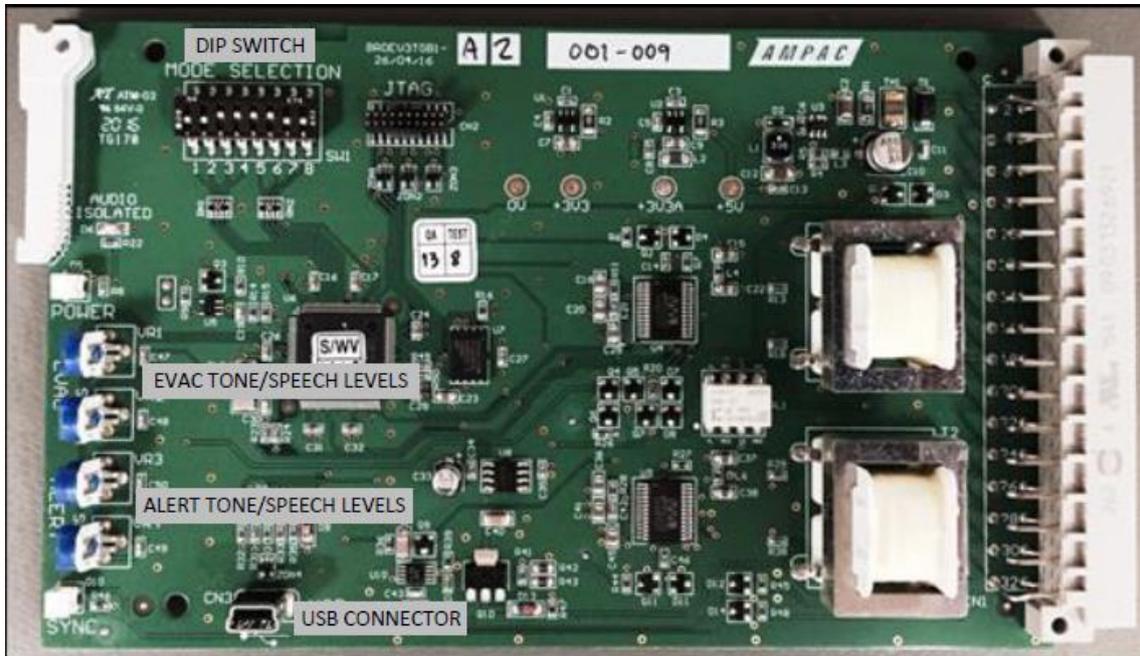


Figure 8 BRDEV3TG Tone Generator Board

The DIP SWITCH settings are:

Function	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Country Code / Standard								
<ul style="list-style-type: none"> AS1670.4:2015 AS 2220.1 NZS 4512 Custom 	OFF ON OFF ON	OFF OFF ON ON						
Alert Tone Enable			ON					
Alert Speech Enable				ON				
Evac Tone Enable					ON			
Evac Speech Enable						ON		
Test Tone (1kHz)							ON	
Synch Alert and Evac								ON

The selections highlighted in YELLOW are the default settings.

The EVAC and ALERT tone/speech levels are factory set, and should not be adjusted on site.

The USB connector is used to download custom speech files. Please refer to internal manual EVTG Tone file conversion V1.2.pdf – available from an Ampac CSO.

Refer to Appendix E for detail on the previous (obsolete) tone generator.

8.5.3 Standby Tone Generator

This board is the STANDBY to the main tone generator board. Should the main board fail, the STANDBY board is automatically switched into circuit and the TONE fault indicator on the front panel is illuminated.

8.5.4 Microphone / BGM Mixer Board

The microphone preamplifier board accepts inputs from the Panel MIC via a microphone preamp (302-475), Remote Paging Console and two BGM Inputs. The microphone inputs operate with a compression circuit to compensate for varying input levels. Level adjustments for both the main and remote microphones are provided to allow the user to set the system up for the specific requirements of the installation. The BGM inputs are provided with level controls and will be muted to all zones when:

- EWS is operating from batteries
- Alarm signal is received in automatic or manual mode
- In manual mode and the zone control switches on the ECP are selected

Note: The background music is restored ONLY following a MASTER RESET operation.

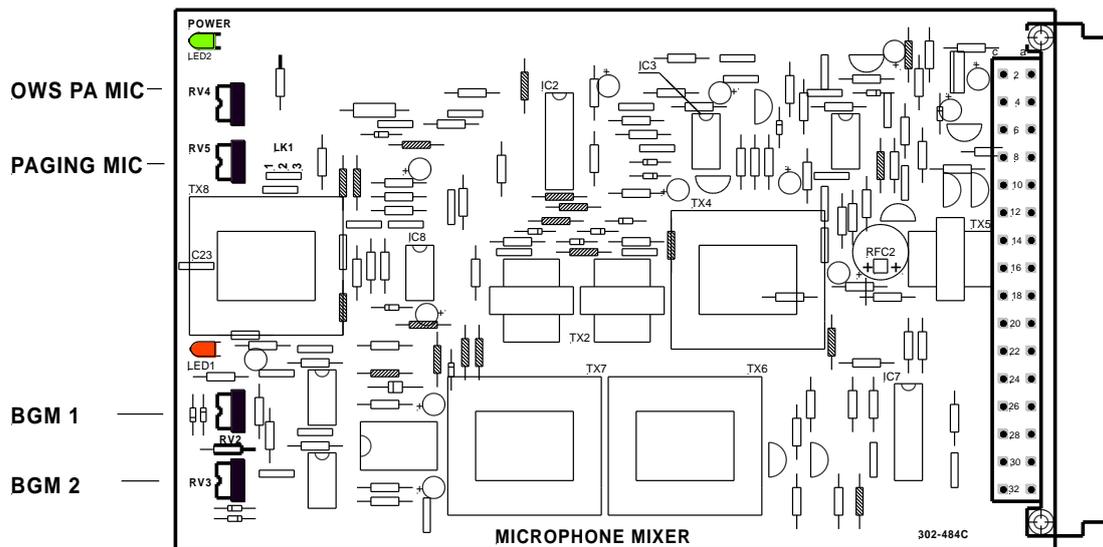


Figure 9: 302-4840 Microphone / BGM Mixer

8.5.5 Standby Microphone / BGM Mixer Board

This board provides a complete duplicate of the main Microphone/BGM board and is automatically switched in when the system detects a failure in the main board. The Microphone fault indicator is also illuminated.

If level adjustments are required first remove the main Microphone/BGM Mixer.

8.5.6 FACP Input CPU Board

This board interfaces all the hard wired FACP inputs into the EV3000 Main CPU. When the EV3000 is installed with an AB3000 this board is not installed. The secondary CPU has an address setting which is factory set and should not be field adjusted.

8.5.7 Main CPU

The Main CPU is responsible for the total control of the EWS and EIS, the communication with other ECP's, remote paging consoles, FireFinder and houses the program module.

The Main CPU has an Address setting that is factory set by way of a dipswitch. It also has another dipswitch which controls the time from alert to evacuation modes whilst in automatic. This time can be adjusted on site if required.

8.5.7.1 Program Eprom's

The EPROM's are located on the Main CPU and are responsible for the zoning of the FACP and EAID inputs and are programmed for each building.

The type of evacuation sequence and the outputs for the visuals are also controlled by the program EPROM's.

8.5.8 Amplifier Rack Frame

Each Amplifier Rack Frame houses eight (8) 40 Watt zone amplifiers or four (4) 120 Watt amplifiers. Each frame has a motherboard (302-4760) which provides all necessary connections for the amplifiers as well as providing the address information required by the amplifiers to allow any zoning requirements. A complete list of all amplifier addresses can be found in Appendix B. Zone numbering is from the bottom frame left hand side upwards.

BGM Linking Options

Each zone amplifier can be connected by way of links to broadcast one of two BGM inputs. The links for this facility are found on the rear of the 302-4760 PCB. Refer to the Table and Figure below

Selection	Un-even LK No's 1-13	Even Link No's 2-14
No Music	Not Fitted	Not Fitted
Music 1	1-2	1-2
Music 2	2-3	2-3

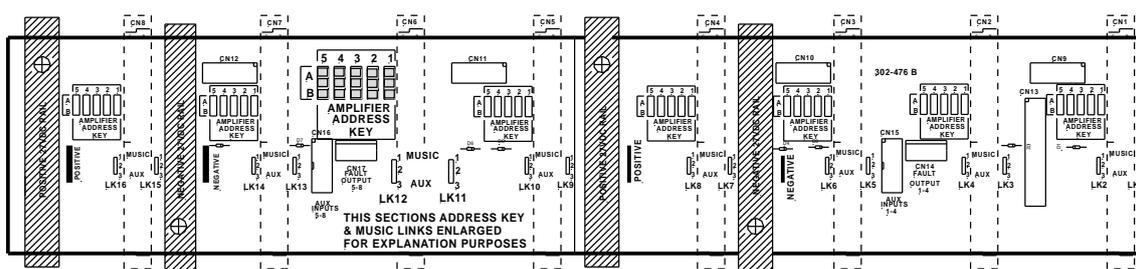


Figure 10: Amplifier Mother Board

8.5.9 40-Watt Amplifier

The 154-0075 (40W) monitored amplifier provides a 100V line output, all necessary circuitry to interface to the EWS and the attenuation for the Alert signal as required in AS2220. Minimum line impedance is 250Ω.

Each amplifier is provided with a level adjustment allowing adjustment of output level to each EWS zone.

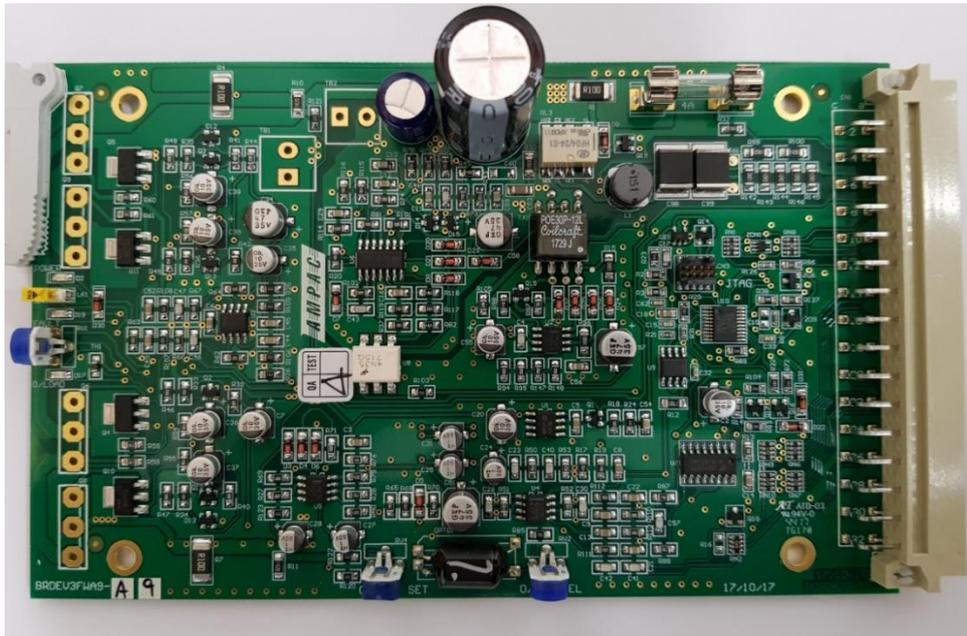


Figure 11: 40-Watt Amplifier with Heatsink / Cover & Transformer Removed

8.5.10 120-Watt Amplifier

The 154-0077 (120W) amplifier option requires two amplifier positions and a minimum line impedance of 83Ω.

As in the case of the 40-Watt amplifier the output level can be adjusted by way of RV2 on the front of the 302 5690 card. RV1 And 2 on both boards are factory set and should not be adjusted.

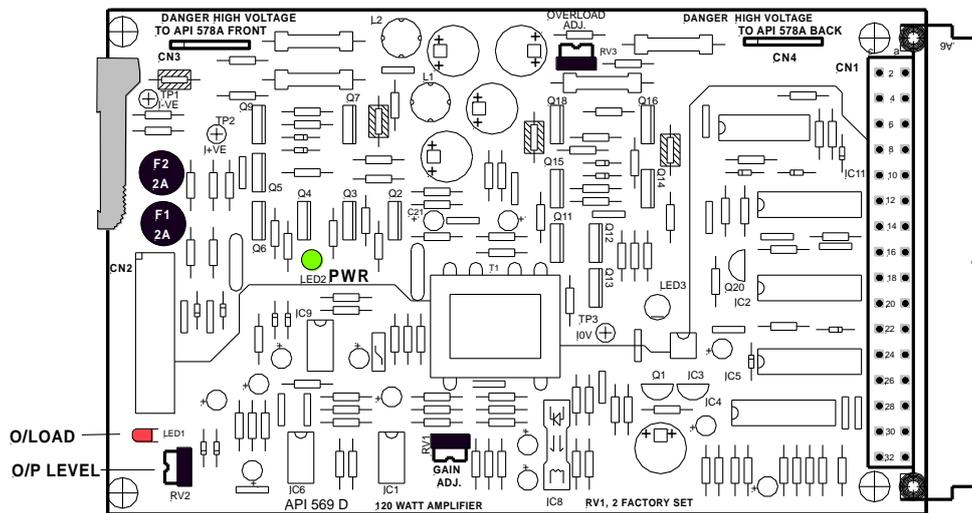


Figure 12: 120 Watt Amplifier

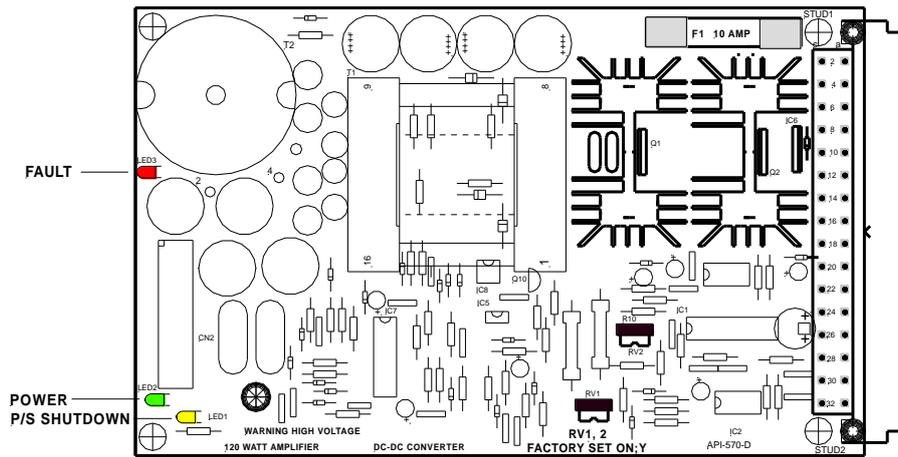


Figure 8: 120 Watt Amplifier DC to DC Converter

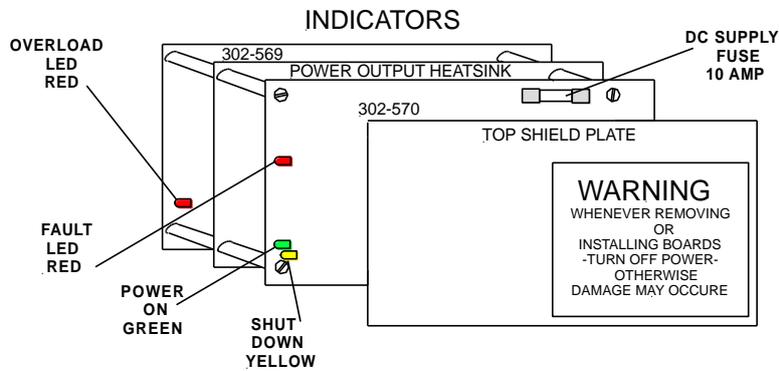


Figure 9: 120Watt Complete Amplifier Assembly

8.5.11 Warden Intercom Control Frame

The Warden Intercom Control Frame houses the following modules:

1. EIS Control CPU
2. EIS Selector Board (up to four boards)

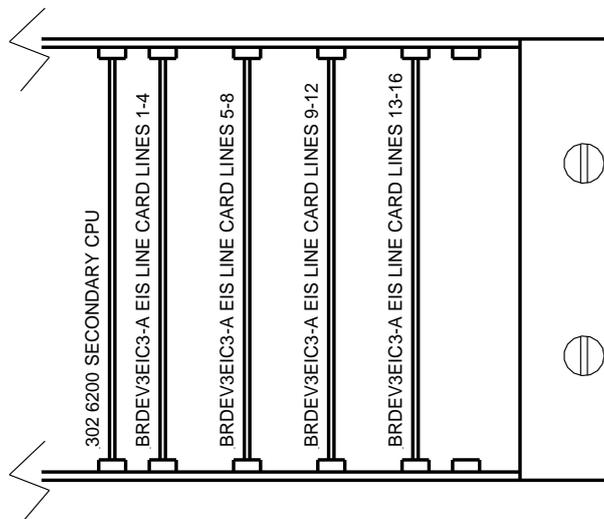


Figure 10: EIS Control Frame

8.5.12 EIS Control CPU

This board provides the interface between the EIS selector board and the main CPU. The secondary CPU has an address setting which is factory set and should not be field adjusted.

Each CPU services four EIS selector boards, i.e. 16 WIP Extensions.

8.5.13 EIS Selector Board

The EIS selector board, BRDEV3EIC3-A, provides the control, audio switching, EAID and ring signal to the WIP extension and services 4 WIP extensions.

8.5.14 Fan Module

The Fan Module is provided to draw air through the cabinet to maintain an acceptable working temperature for all the equipment and is controlled by detecting any temperature increase in the power supply or by receiving a signal or input from the EWS.

8.5.15 Power Supply

The Power Supply is supplied in two possible formats these are:

1. **G0012 Modular Power Supply.**

The G0012 Power Supply is constructed in two sections. These are a rectifier chassis mounted on the backpan and a regulator chassis mounted in the rack frame.

The rectifier chassis provides an unregulated DC which is then regulated by the regulator chassis to provide 27V DC to run the system and charge the batteries. The chassis also houses the 8V regulator required to provide the 8V DC requirement of the system.

The regulator chassis is modular in construction provides for up to four 27VDC modules, each able to deliver 8 A. Each module is adjusted in the factory and no attempt should be made to alter these adjustments.

2. **G0018 Power Supply.**

The G0018 Power supply is used only on smaller systems and SECP's and is mounted on a chassis on the backpan. It contains all componentry required to supply 27V to charge the batteries etc and also provide 8V for the microprocessor circuitry. As in the case of the G0012 all voltages are factory set and no attempt should be made to alter these settings.

3. **Power Supply Supervisory Board**

This board monitors the power supply/s, the battery isolated function, power supply temperature/s and initiates fan forced cooling as required.

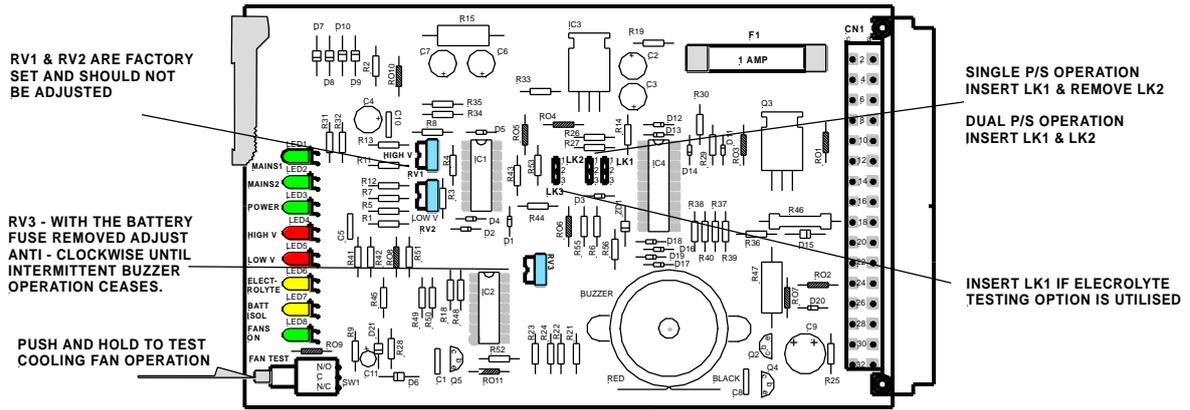


Figure 11: Power Supply Supervisory Board Layout

8.5.16 Fault Relay

The EV3000 has a fault relay which is normally operated. Should a fault occur in the EV3000 the relay releases and the Warning System output of the **FireFinder** recognises and responds to the fault.

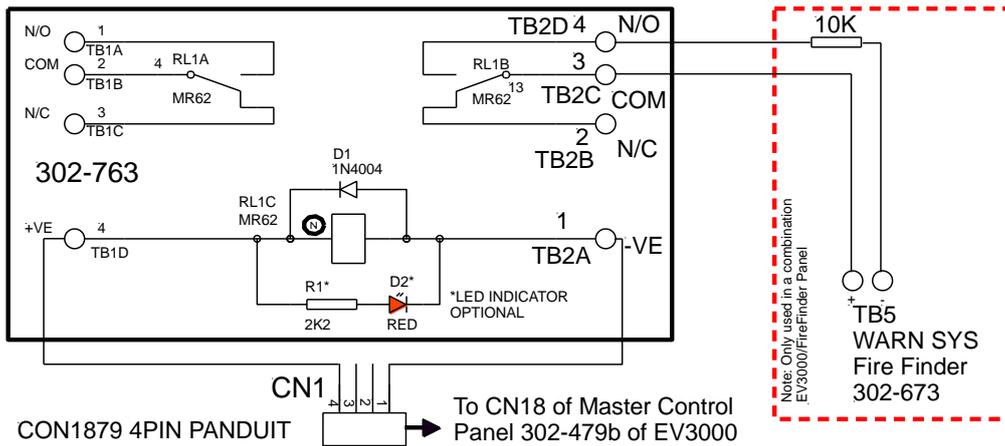


Figure 12: EV3000 Fault Relay Wiring to the *FireFinder*

9 Installation

9.1 Unpacking And Inspection

Carefully check packing prior to unpacking goods for any external transit damage. Unpack the goods and check the goods both externally and internally for any loose or damaged components or any problem which may affect the appearance, installation or operation of the goods.

Ensure all wiring harnesses are secure, all plugs are correctly fitted into their sockets, each circuit board is secure, and that all fixings and earth studs are tight.

If a plug-in type circuit board or ribbon connector becomes dislodged in transit, replace it in its socket and ensure that it is correctly mated.

If any damage has occurred you are to contact Ampac in writing within 14 days of receiving the goods in accordance with the Ampac Terms of Sale.

If the goods are of a nature which are accompanied by an Operators Manual you are requested to complete the Damage Report Form and return it to Ampac (Head Office) within 14 days of receiving the goods, in lieu of the written notification.

9.2 Anti-Static Precautions

To prevent damage to panel components please ensure prior to touching or handling any of the wiring or printed circuit boards within the OWIS that you are correctly earthed. The recommended method for personnel earthing is to use an anti static wrist strap and a flexible lead. Fit the wrist strap to yourself and attach the flexible lead to the cabinet earth bolt located inside the top of the cabinet.

Printed circuit boards removed from OWIS should be immediately placed in the anti static bags provided in the installation and maintenance kit.

9.3 Working on The System

To prevent damage to panel components please ensure prior to unplugging any connector, connecting or disconnecting any wiring, removing or replacing any module or board, that both the Mains and Batteries have been isolated. Batteries can be isolated by removing the system fuse mounted on the backpan.

9.4 Cabinet Installation

The EV3000 Cabinet may be surface or recess mounted. All indicators and controls shall be not less than 750mm and not more than 1850mm from the floor level.

9.4.1 Surface Mount

For surface mount, the EV3000 Cabinet is secured by four bolts or screws through pre-drilled 12mm holes on the rear of the cabinet.

9.4.2 Recess Mount

For a recess mounting EV3000 Cabinet allow a cut-out equal to the size of the Cabinet plus 10mm all round clearance. The standard surround is 50mm wide and is secured with screws from the inside of the cabinet. Seal all unused knockouts and cable entries to prevent water or moisture entering the cabinet.

10 Connecting The EV3000

All the field terminations are accommodated on the back pan of the Main Equipment.

10.1 FACP Input Connections (Individual inputs)

The 302-4940 is the Field Connection board for the FACP Inputs. Each board connection terminates sixteen FACP inputs.

10.1.1 Connections

Field Connections	Use
TB1 - 1, 2, 3, 4	FACP Input 1 to 4
TB2 - 5, 6, 7, 8	FACP Input 5 to 8
TB3 - 9, 10, 11, 12	FACP Input 9 to 12
TB4 - 13, 14, 15, 16	FACP Input 13 to 16
TB6 - 1, 2	COMMON

FACP to provide voltage free, normally open contacts.

Install 10K EOL across each input to COMMON at the FACP end.

Factory Connections	Use
CN1 -	RS485 Communication input cable to FACP Input CPU.
CN2 -	RS485 Communication cable to CN1 of the next FACP input connection board if installed.
CN3, CN4 -	8V and 27V DC supply cables.

10.1.2 Fusing

Fuse	Use	Rating
F1	8V supply	750 ma

10.1.3 Address Setting

Each board is addressed via SW1. The first switch is unused, the remaining seven (i.e. 2 to 8) operate on a binary code. This is factory set and should not be field adjusted.

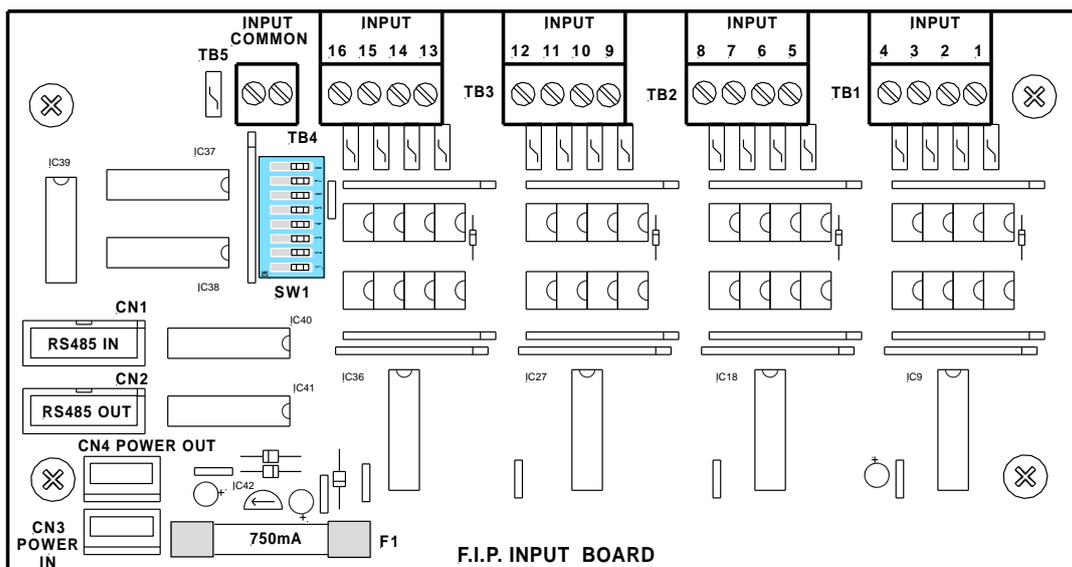


Figure 13: 302-4940 FACP Input Board

10.2 Common FACP Input Connections

Some EV3000 systems are fitted with a Common FACP input. Connection for the FACP input is provided on a 302 5860 Line Isolation Board. The 302 4940 board is not fitted when a Common FACP input is used.

Connections

Field Connection

TB1 - Line FACP input

Factory Connection

TB1 - EAID MECP EAID

(Terminated in 10KΩ if unused)

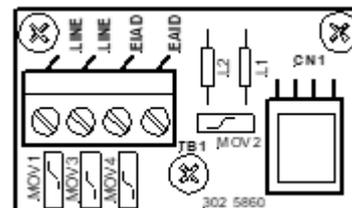


Figure 14: Common FACP Board

10.3 EWS, BGM and EIS Handset Input Connections

The BRDEV3ALM is a termination board to interconnect the EWS and EIS Audio between SECPs and the main equipment, and provide a connection for 2 channels of BGM.

The EWS and EIS audio is monitored (configurable) and wired in a loop (redundant) configuration. If there is a fault (short or interruption) the comms fault (see figure 2 of section 8.1) indicator will flash.

To enable the monitoring – turn switch 8 of the timeout selection switch ON, see section 13.2.

10.3.1 Connections

Field Terminations	Use
TB1: + SHD -	Audio Input A (eg EWS MIC)
TB2: + SHD -	Audio Output A (eg EWS MIC)
TB3: + SHD -	Audio Input B (eg EIS Audio)
TB4: + SHD -	Audio Output B (eg EIS Audio)
TB5 +- SHD +-	BGM Input A and B channel

Refer to FIG32 for wiring between SECPs and the main equipment.

Note: Audio cable must be screened twisted 2 pair.

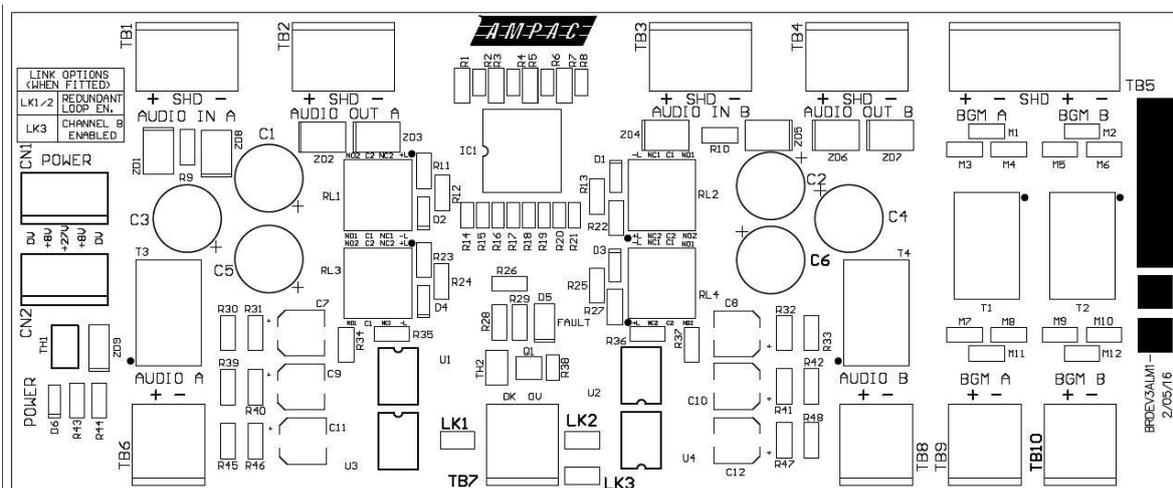


Figure 20: BRDEV3ALM – Audio Line Monitor

10.4 100V Line Speaker Connections

Two termination boards are available for termination of the field speaker circuits. Both boards have the same terminal designations.

The 302-490X was the original board and has been replaced by the BRDEV3FTB2. The BRDEV3FTB2 has filter circuitry for each speaker circuit. The filter circuit suppresses any unwanted noise from the speakers when the speaker circuit is not in use (generally only an issue in apartment type installations – especially at night when there is low ambient noise)

10.4.1 Connections

Field Connections

	Use
TB1 - 1, 2	Output Evac Zone 1
TB1 - 3, 4	Output Evac Zone 2
TB2 - 1, 2	Output Evac Zone 3
TB2 - 3, 4	Output Evac Zone 4
TB3 - 1, 2	Output Evac Zone 5
TB3 - 3, 4	Output Evac Zone 6
TB4 - 1, 2	Output Evac Zone 7
TB4 - 3, 4	Output Evac Zone 8
TB5 - 1, 2	Volume Control Override

Factory Connections

	Use
CN1	Outputs from amplifiers 1 and 2
CN2	Outputs from amplifiers 3 and 4
CN3	Outputs from amplifiers 5 and 6
CN4	Outputs from amplifiers 7 and 8
CN5	Individual zone volume control outputs
TB7 - 1	0V
TB7 - 2	Common volume control
TB7 - 3	27V

10.4.2 Fusing

Fuse	Use	Rating
F1	Volume Control Override	1 Amp = 302-4900 3 Amp = BRDEV3FTB2

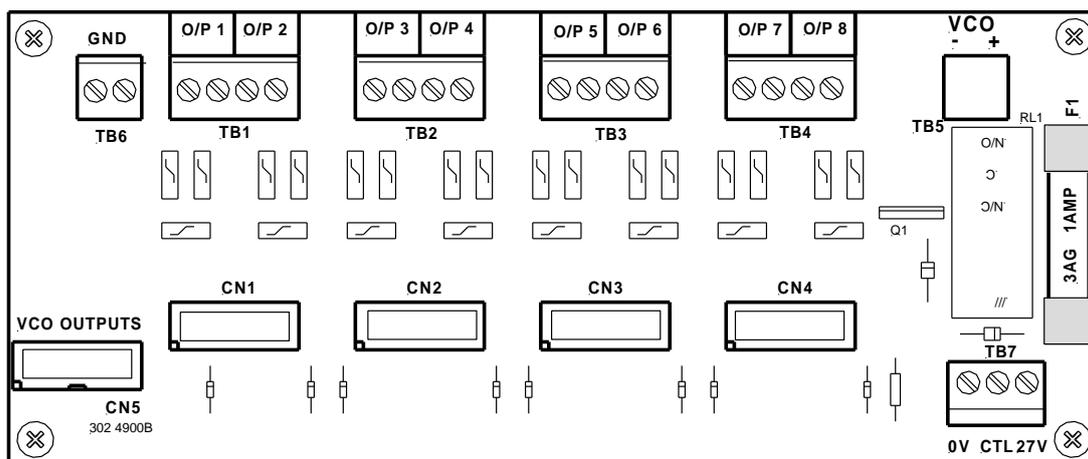


Figure 15A: 302-490X 100V Line Termination Board

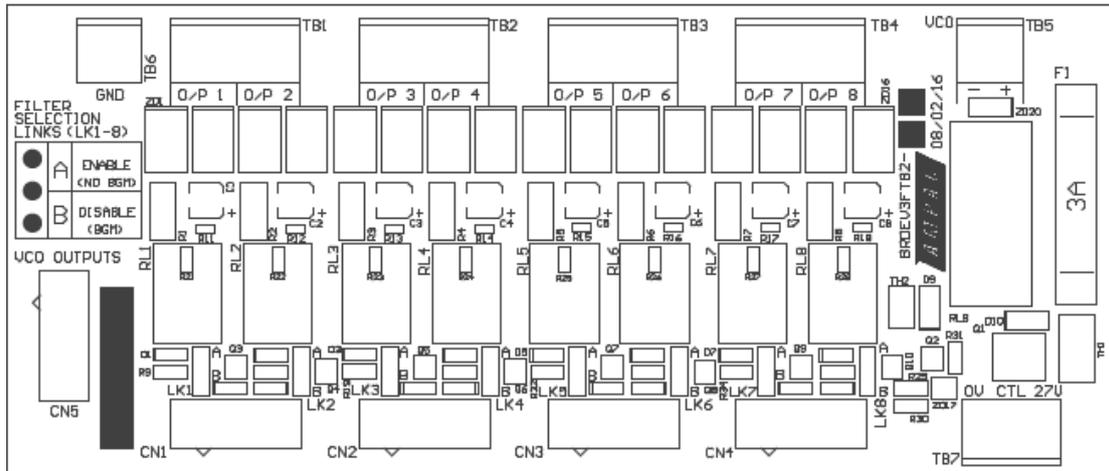


Figure 16B: BRDEV3FTB2 100V Line Termination Board with Filters

10.4.3 Field Wiring

The following table details audio load, wire size and length of cable runs.

Calculations are based on a 1 dB of loss (approx. 10V attenuation at the end of the cable run)

Amp Size	Load Impedance	1.0mm ² Field Wiring	1.5mm ² Field Wiring	2.5mm ² Field Wiring	4.0 mm ² Field Wiring	6.0mm ² Field Wiring
40Watt	250Ω	760m	1136m	1855m	2982m	4464m
120Watt	83.3Ω	253m	379m	618m	994m	1488m
240Watt	41.7Ω	127m	189m	309m	497m	744m

Max capacitance must be below 100nF and max inductance must be below 1mH

10.5 Visual Indicators Output Connections

The 302-623B / 302-623C or the BRDEV3VOB3-A / BRDEV3VOB3-B are the field connection boards for the visual indicators. Each board will terminate four (4) zones of visual indicators.

Each zone output can cater for up to:

- 40 pair LED strobes (4107-1005/6)
- 16 pair XENON strobes (208-0011)

The EV3000 visuals operate with a two-core cable to a pair of visual indicators, i.e. Alert (Amber), Evac (Red). Visuals are connected in reverse polarity to each other (See Figures 27 and 28).

NOTE: Circuit to visual indicators are polarised refer to section 11.2 for more detail.

10.5.1 Connections

Field Connections	Use
TB1 - 1, 2	Output Pair Zone 1
TB2 - 1, 2	Output Pair Zone 2
TB3 - 1, 2	Output Pair Zone 3
TB4 - 1, 2	Output Pair Zone 4
Factory Connections	Use
TB5-1,2	+24V
TB5-1,2	0V
CN1	Control Cable to 302 4220 board.
CN2	Control Cable to next 302-623B/C board or BRDEV3VOB*-A/B

10.5.2 Fusing

302-623B / C

Fuse	Use	Rating
F1 - 4	+24V Output 1 - 4	3 amp 3AG

BRDEV3VOB*-A / B

Fuse	Use	Rating
F1 - 4	+24V Output 1 - 4	3 amp M0205

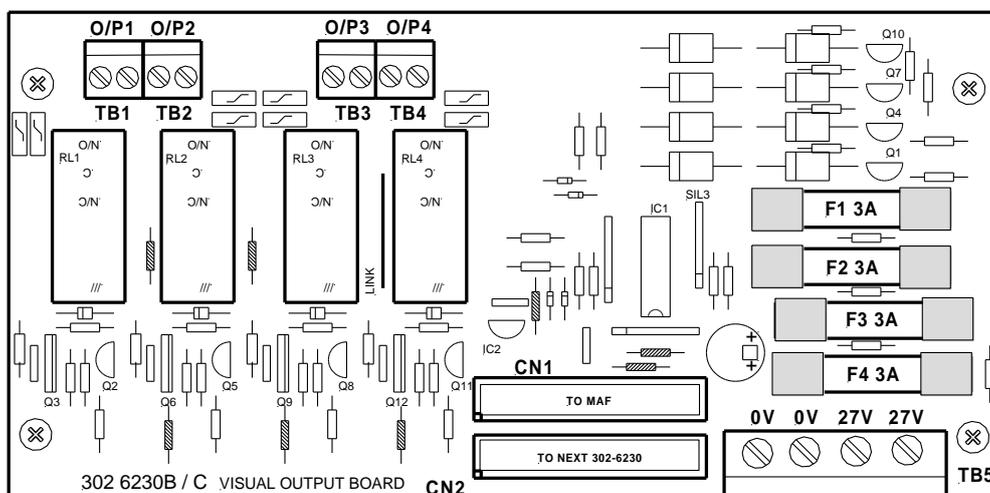


Figure 17: 302-623B Visual Output Board (XENON STROBES) / 302-623C Visual Output Board (LED STROBES)

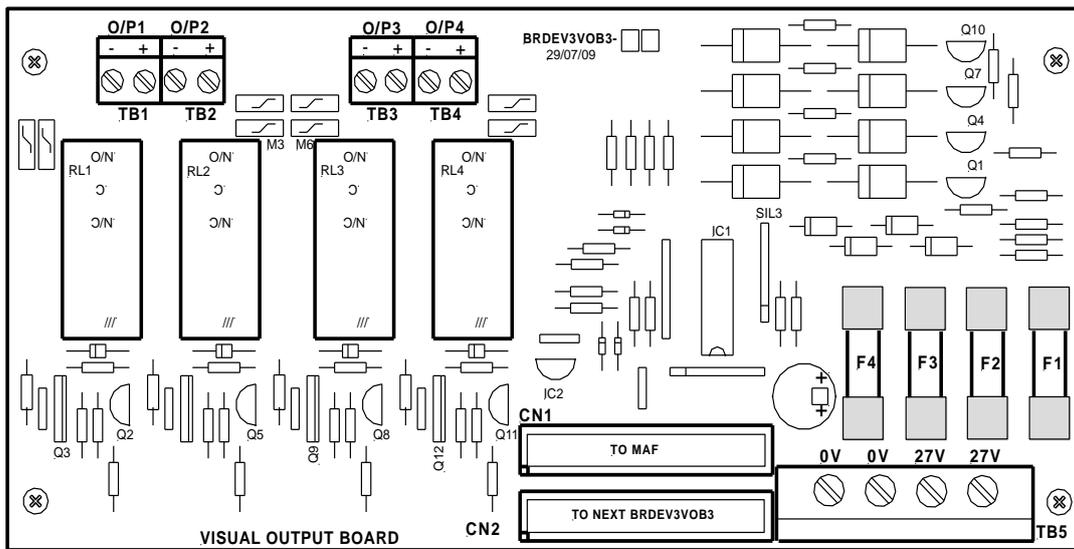


Figure 18: BRDEV3VOB3-A Visual Output Board (LED STROBES) / BRDEV3VOB3-B Visual Output Board (XENON STROBES)

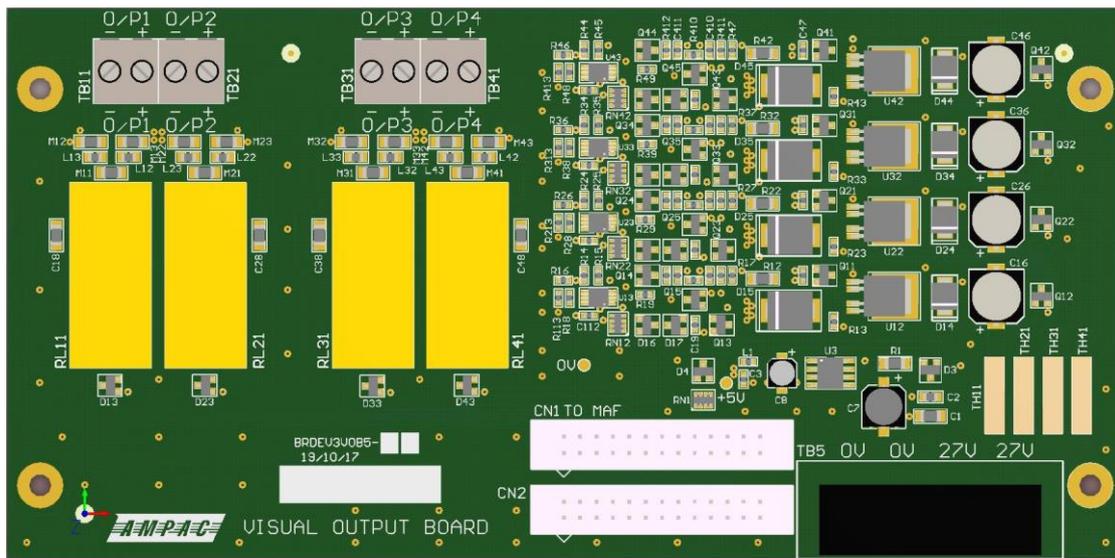


Figure 19: BRDEV3VOB5-A EV3000 Visual Output Board (UNIVERSAL)

BRDEV3VOB5-A

EOL – 4K7

MAX O/P Ratings – 2A

Each visual zone output can cater for up to:

- 40 pairs VAD strobes
- 16 pairs XENON strobes (208-0011)
- 40 pairs of LED strobes

The **Universal Visual Output Board (BRDEV3VOB5-A)** is designed to accommodate all the dual combination strobes Ampac have supplied to date.

A **Halma** company

Supported strobe types:

- VAD (NEW) (4107-11**)
- XENON (208-0011)
- SONOS (208-0063, 208-0066)
- LED STROBES (4107-1005,4107-1006)

10.5.3 Field Wiring

The following table details visual load, wire size and length of cable runs for the LED and XENON strobes.

For LED strobes – Max 40 per circuit

No. of Devices	1.0mm ² Field Wiring	1.5mm ² Field Wiring	2.5mm ² Field Wiring	4.0 mm ² Field Wiring	6.0mm ² Field Wiring
10	921m	1377m	2249m	3615m	5411m
20	460m	689m	1125m	1808m	2706m
30	307m	459m	750m	1205m	1804m
40	230m	344m	562m	904m	1353m

For XENON strobes – Max 16 per circuit

No. of devices	1.0mm ² Field Wiring	1.5mm ² Field Wiring	2.5mm ² Field Wiring	4.0mm ² Field Wiring	6.0mm ² Field Wiring
4	331m	496m	810m	1301m	1948m
8	166m	248m	405m	651m	974m
12	110m	165m	270m	434m	650m
16	83m	124m	202m	325m	487m

For VAD Strobes – **UNIVERSAL VISUAL OUTPUT BOARD**

No. of Devices	1.0mm ² Field Wiring	1.5mm ² Field Wiring	2.5mm ² Field Wiring	4.0 mm ² Field Wiring	6.0mm ² Field Wiring
10	444m	620m	1124m		
20	222m	310m	562m		
30	148m	207m	375m		
40	111m	155m	281m		

10.6 Warning Sign Driver Board (BRD42WSD)

The warning sign driver board (BRD42WSD) can be used to extend the total wiring length of the visual output cable run. The following table can be used as a reference when used with VAD strobes.

The Warning Sign Driver Board can only be connected to the Universal Visual Output Board (BRDEV3VOB5-A) and should not be used with the older termination boards.

No. of Devices	1.0mm ² Field Wiring	1.5mm ² Field Wiring	2.5mm ² Field Wiring	4.0 mm ² Field Wiring	6.0mm ² Field Wiring
10	887m	1240m	2248m		
20	444m	620m	1124m		
30	296m	413m	749m		
40	222m	310m	562m		

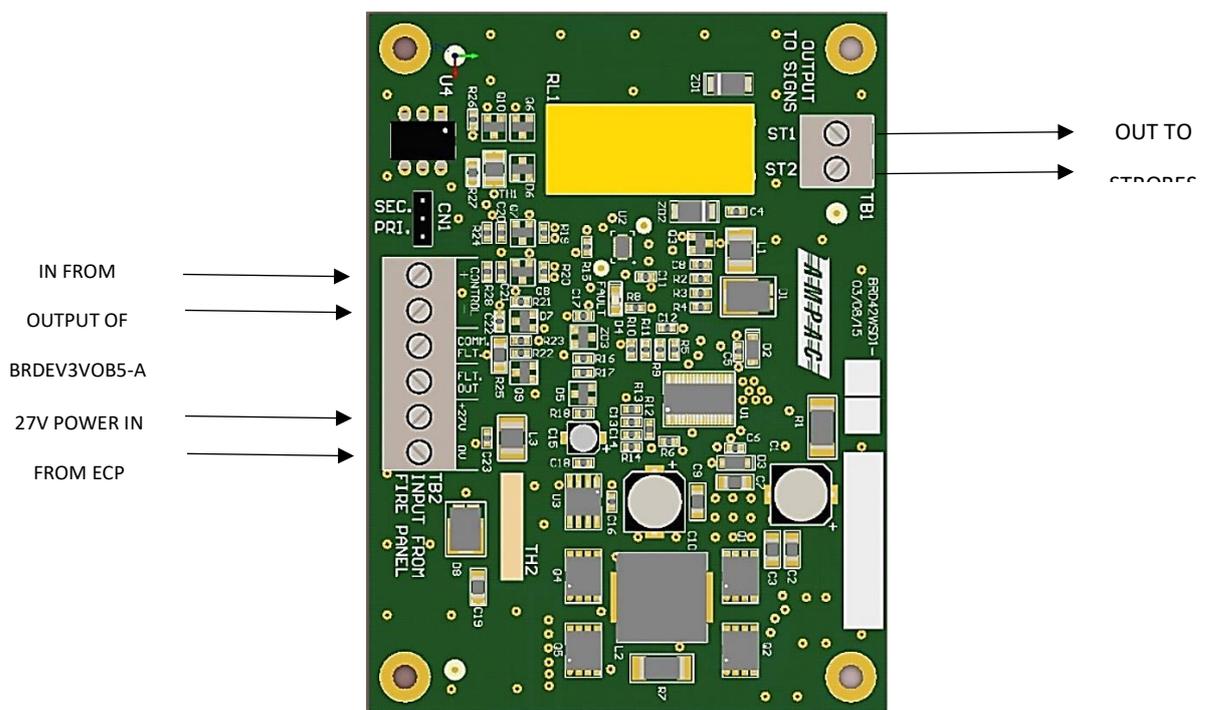


Figure 20 Warning Sign Driver Board (BRD42WSD)

10.7 WIP/EAID Extension Connections

The 302-6270 is the field connection board for the WIP extensions. Each board terminates sixteen WIP and EAID extensions.

10.7.1 Connections

Field Connections	Use	Field Connections	Use
TB1 - 1 (W)	WIP No 1	TB3 - 1 (W)	WIP No 9
TB1 - 2 (C)	WIP / EAID Common No 1	TB3 - 2 (C)	WIP / EAID Common No 9
TB1 - 3 (E)	EAID No 1	TB3 - 3 (E)	EAID No 9
TB1 - 4 (W)	WIP No 2	TB3 - 4 (W)	WIP No 10
TB1 - 5 (C)	WIP / EAID Common No 2	TB3 - 5 (C)	WIP / EAID Common No 10
TB1 - 6 (E)	EAID No 2	TB3 - 6 (E)	EAID No 10
TB1 - 7 (W)	WIP No 3	TB3 - 7 (W)	WIP No 11
TB1 - 8 (C)	WIP / EAID Common No 3	TB3 - 8 (C)	WIP / EAID Common No 11
TB1 - 9 (E)	EAID No 3	TB3 - 9 (E)	EAID No 11
TB1 - 10 (W)	WIP No 4	TB3 - 10 (W)	WIP No 12
TB1 - 11 (C)	WIP / EAID Common No 4	TB3 - 11 (C)	WIP / EAID Common No 12
TB1 - 12 (E)	EAID No 4	TB3 - 12 (E)	EAID No 12
TB2 - 1 (W)	WIP No 5	TB4 - 1 (W)	WIP No 13
TB2 - 2 (C)	WIP / EAID Common No 5	TB4 - 2 (C)	WIP / EAID Common No 13
TB2 - 3 (E)	EAID No 5	TB4 - 3 (E)	EAID No 13
TB2 - 4 (W)	WIP No 6	TB4 - 4 (W)	WIP No 14
TB2 - 5 (C)	WIP / EAID Common No 6	TB4 - 5 (C)	WIP / EAID Common No 14
TB2 - 6 (E)	EAID No 6	TB4 - 6 (E)	EAID No 14
TB2 - 7 (W)	WIP No 7	TB4 - 7 (W)	WIP No 15
TB2 - 8 (C)	WIP / EAID Common No 7	TB4 - 8 (C)	WIP / EAID Common No 15
TB2 - 9 (E)	EAID No 7	TB4 - 9 (E)	EAID No 15
TB2 - 10 (W)	WIP No 8	TB4 - 10 (W)	WIP No 16
TB2 - 11 (C)	WIP / EAID Common No 8	TB4 - 11 (C)	WIP / EAID Common No 16
TB2 - 12 (E)	EAID No 8	TB4 - 12 (E)	EAID No 16

NOTE: WIP cabling is not polarity conscious.

Factory Connections	Use
CN1, CN2, CN3, CN4	Control Cable to EIS Selector boards

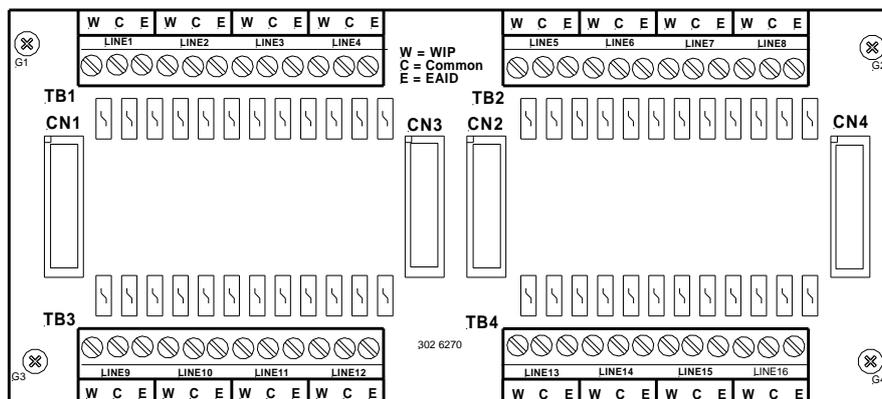


Figure 21: 302-6270 WIP Termination Board

10.7.2 Field Wiring

WIP wiring has been verified with 2kms of 0.75mm² with capacitance of <200nF and Inductance < 1mH.

10.8 MECP To SECP Data Connections

The 302-4580 is the serial loop interface RS-485 connection board which provides communication via a redundant loop from the MECP to the SECP's.

10.8.1 Connections

Field Connections	Use
CN3 - +	COMMS Cable IN
CN3 - -	COMMS Cable IN
CN3 - Shield	SHIELD
CN4 -	+COMMS Cable OUT
CN4 - -	COMMS Cable OUT
CN4 - Shield	SHIELD

NOTE: The polarity of the communication cable must be maintained.

Factory Connections	Use
CN1	Internal COMMS Bus Out: CN13 (MAF 302 – 4220)
CN2	Internal COMMS Bus In: CN14 (MAF 302 – 4220)

10.9 CN5 + CN6 Power Supply to Board

10.9.1 Fusing

Fuse	Use	Rating
F1	8V DC Input	1 A (T) Pico
F2	Control Voltage	500 mA (T) Pico
F3	Control Voltage	500 mA (T) Pico

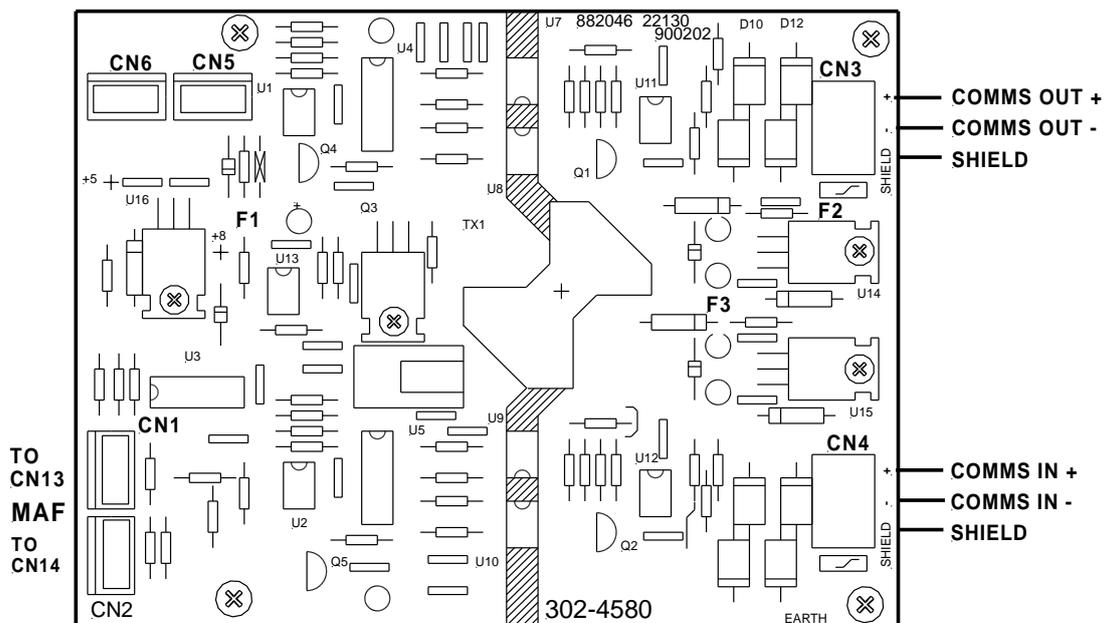


Figure 22: 302-4580 Serial Isolation Board

Note: Comms cable must be screened twisted 2 pair.

10.10 Mains Connection

Mains supply shall be 240VAC (+6%, -10%) at 50HZ and installed in accordance with AS3000 and AS1670-1986.

Ensure Mains is isolated at the building distribution board prior to the connection of the Mains cable.

Terminate the 240VAC mains supply cable to the 240VAC switch block located on the back pan.

11 Devices

All field devices shall be of an approved type and installed in accordance with the manufacturers specifications.

Field devices are considered to be:

- Speakers
- Visual Warning Devices
- WIP's
- EAID's

11.1 Speakers

All speakers are to be fitted with a 100V line transformer and DC isolation capacitor. Use only Ampac recommended speakers. See Appendix D for a list of compatible devices.

The speaker at the end of a speaker circuit shall be terminated with a 47K Ω resistor where the outgoing 100V Line would normally terminate.

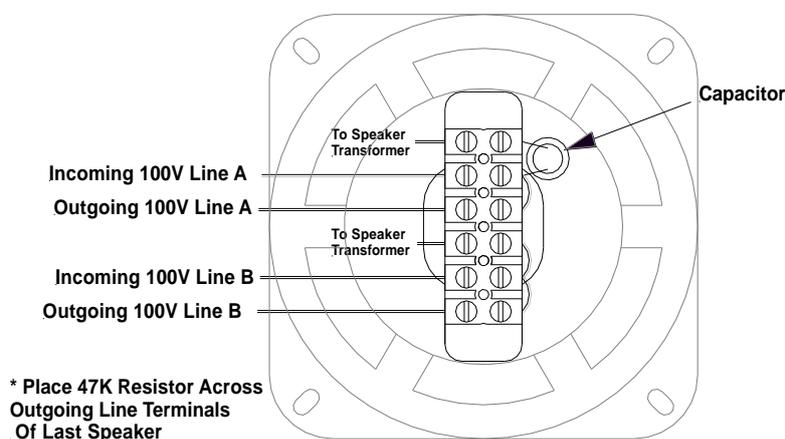


Figure 23: Typical Speaker Connection

11.2 Visual Warning Devices

Visual warning devices must be capable of operating on 24V DC (nominal). See Appendix D for a list of approved types.

Each visual output from the EV3000 will operate a pair of indicators, i.e. an Alert and Evac indicator. Visual pairs are fitted in reverse polarity.

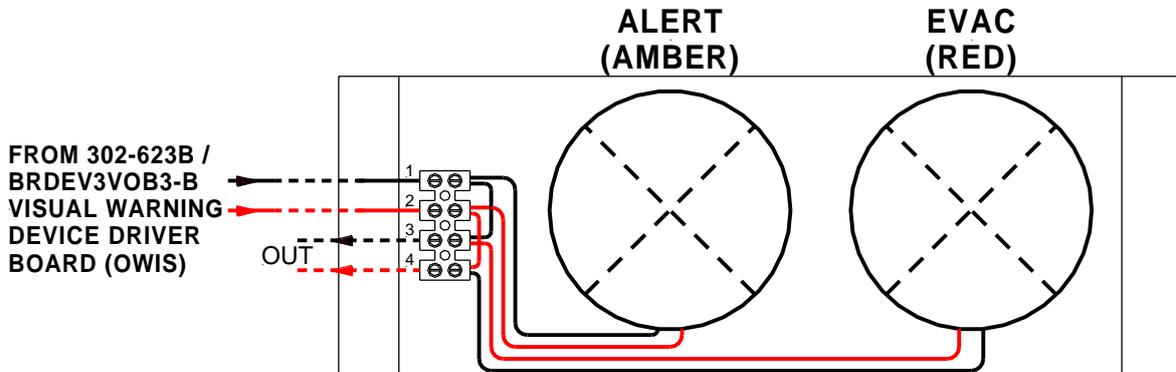


Figure 24: Visual Indicator Connections (XENON STROBES) 208-0011

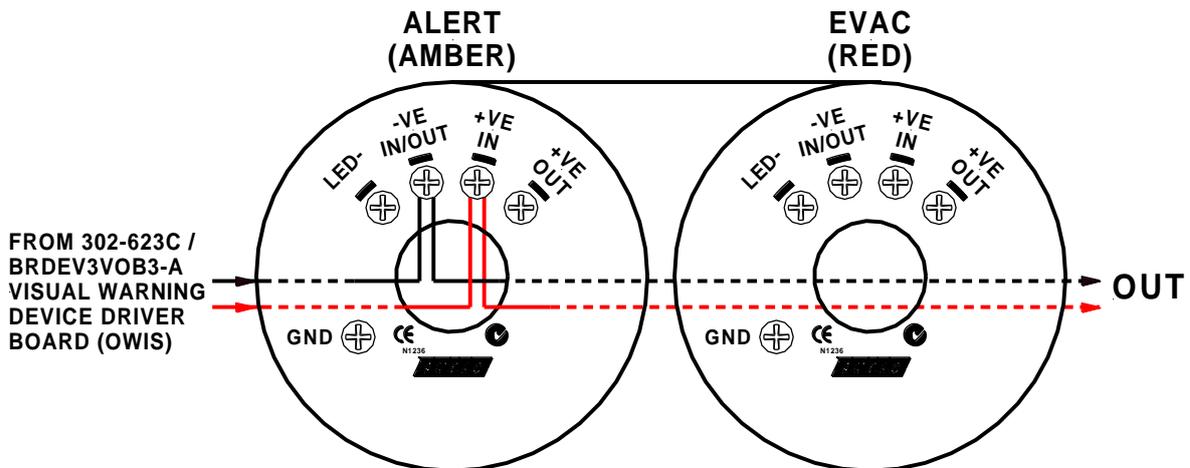


Figure 25: Visual Indicator Connections (LED STROBES) 208-0063

11.3 Warden Intercommunication Point (WIP)

Each WIP is cabled individually from the main equipment.

The preferred method for cabling into the WIP is via the entry hole in the base of the WIP.

Terminate WIP cabling from the ECP into:

TB1-1 labelled "W"

TB1-2 labelled "C".

If it is not possible to pass the cables through the rear of the case, the entry may be made by removing one or more of the "knockouts (Arrows)" as shown below. In no instance should cabling enter the case via the left top of the case, neither should cabling (or any other obstruction) foul the buzzer.

There is a remote buzzer output which be used to connect a buzzer externally in the case of the WIP being mounted inside a cabinet or cupboard.

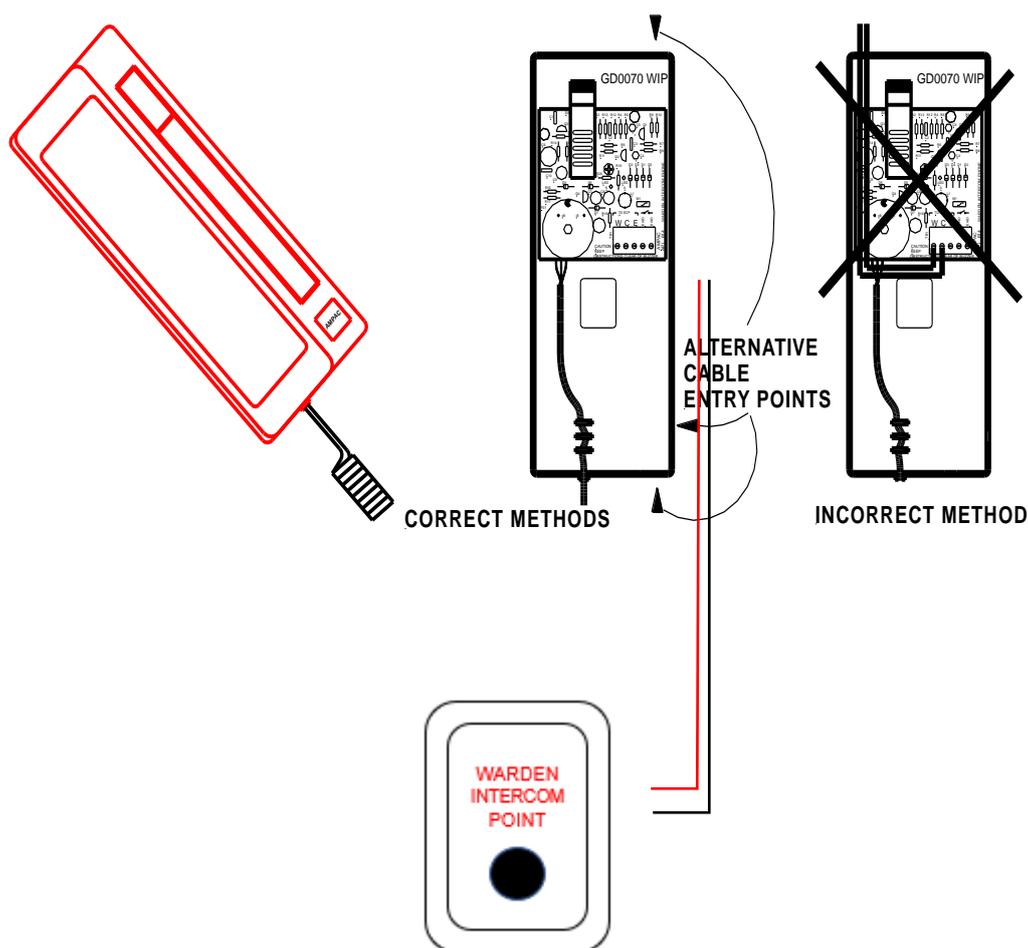


Figure 26: Wiring of WIP and Remote buzzer

11.4 EAID

If EAID's are cabled to the main equipment they will be connected to the FACP input connection board.

EAID's are connected to the OWIS and not the Fire System. This means that the manual operation of an EAID will trigger the Emergency Warning System and NOT indicate on the Fire System or signal the Fire Services.

IF the EAID is in close proximity to a WIP, then wiring can be reduced by connecting the EAID to the WIP as shown below. Wiring in this manner requires that the following criterion is met.

- Cabling from the WIP to the ECP must be by fire rated two-core cable.
- No spurs or T junctions, cables must be a single run come individual lines.
- EAID must be between ECP and WIP as shown below (2 wire).

The following units are only suitable for connection to the 2 Wire TS004 AMPAC EV3000 Systems

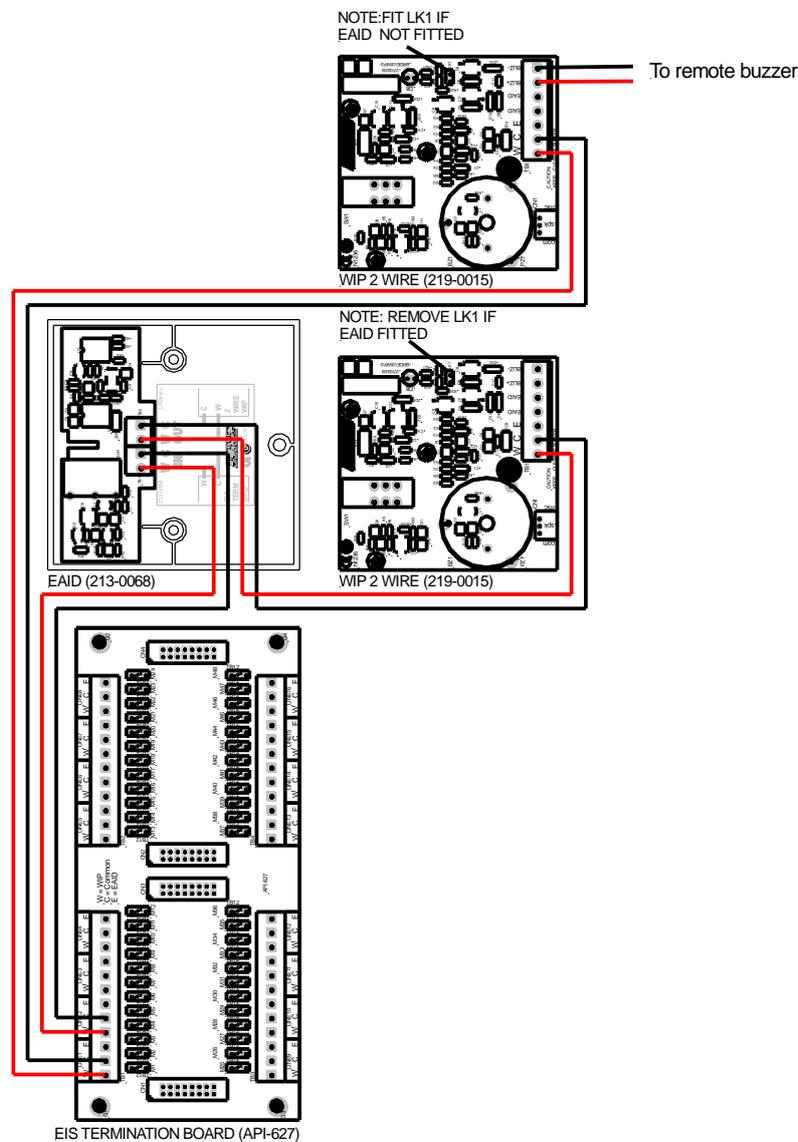


Figure 27: ECP to EAID to WIP Wiring

12 SECP And Remote Console Connections

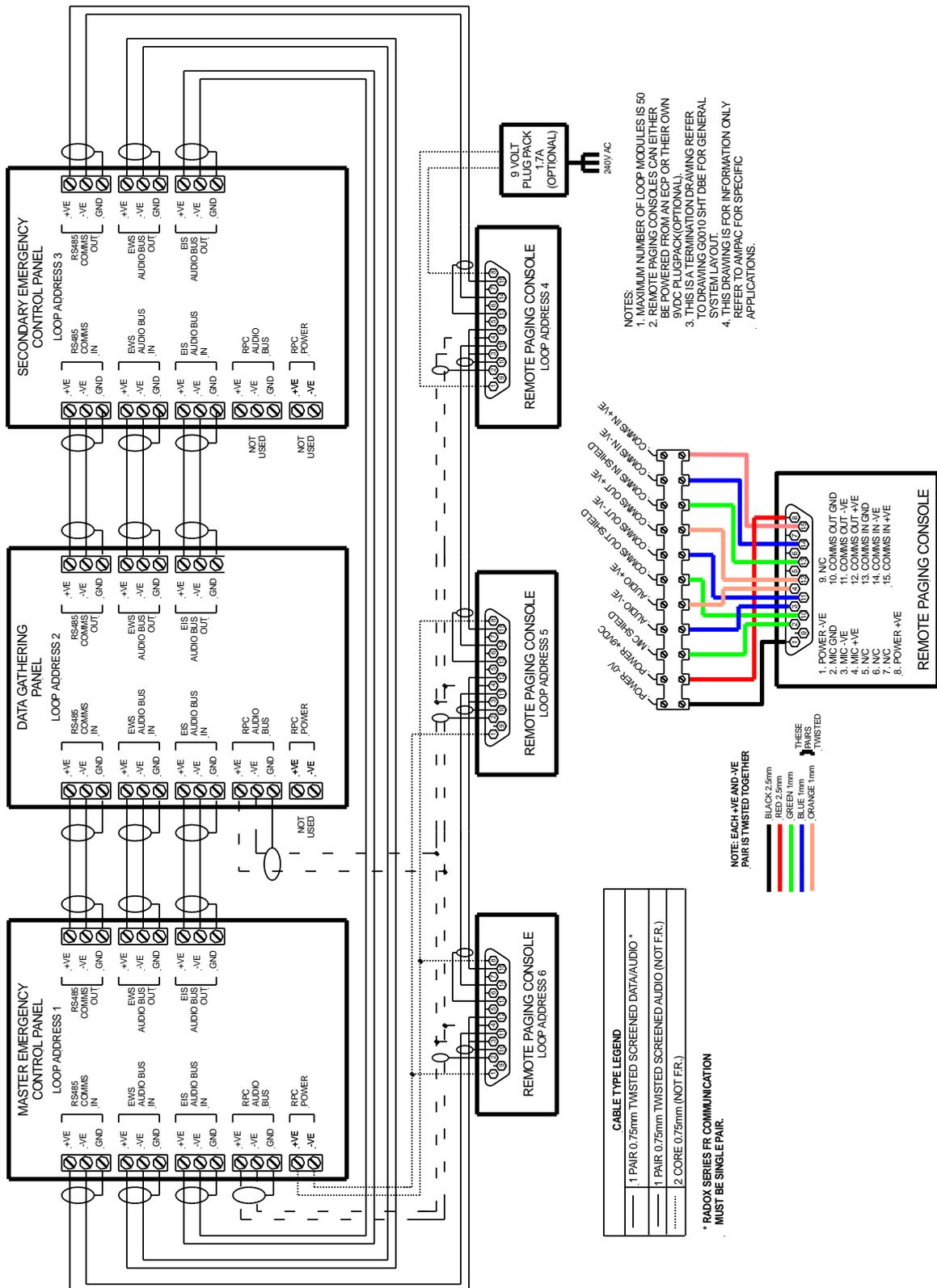


Figure 28: SECP and Paging Console Setup

13 Placing System Into Operation

Prior to system power up ensure that:

- All field connections are completed and free of faults.
- Remove the foam transit packing in and around the connectors of boards 302-422 & 302-479
- All modules are securely mounted.
- All boards are plugged in (including power amplifier modules).
- Auto Manual Isolate switch is in the Manual position.
- All EOL resistors are fitted.
- No alarm signals exist at FACP if connected to the EV3000.
- Complete checks as per EV3000 Commissioning Report.

13.1 System Power Up Sequence

The system is now ready for power up.

Turn the Mains power, switch ON.

Normal power up sequence shall:

- Turn the indicators on the “Emergency control panel” ON momentarily for 2 to 4 seconds.
- Turn ON all the indicators on the EWS and EIS control panels, then switching them off again in a running sequence.
- Turn ON the auto (LED) indicator.
- Activate the internal buzzer (the buzzer can be muted with Buzzer Mute during system power up).

On completing the power up sequence the:

- Comms fault/system fault/module fault indicators are OFF.
- EWS and EIS control indicators are OFF.

Note: The duration of the power up sequence is on average from two to five minutes.

- System batteries can now be connected observing correct polarity.

The system is now ready for operation.

13.2 Time Out Setting For Automatic Evacuation Sequence

The selection of the time can be achieved either before or after the power up sequence.

The time base is ten (10) seconds, i.e. the minimum time out possible is 10 seconds to a maximum of 10 minutes in 10 second increments. An eight position DIL switch located on the rear of the 302-4220 main CPU Board (refer Figure 27) is provided to select the required time out.

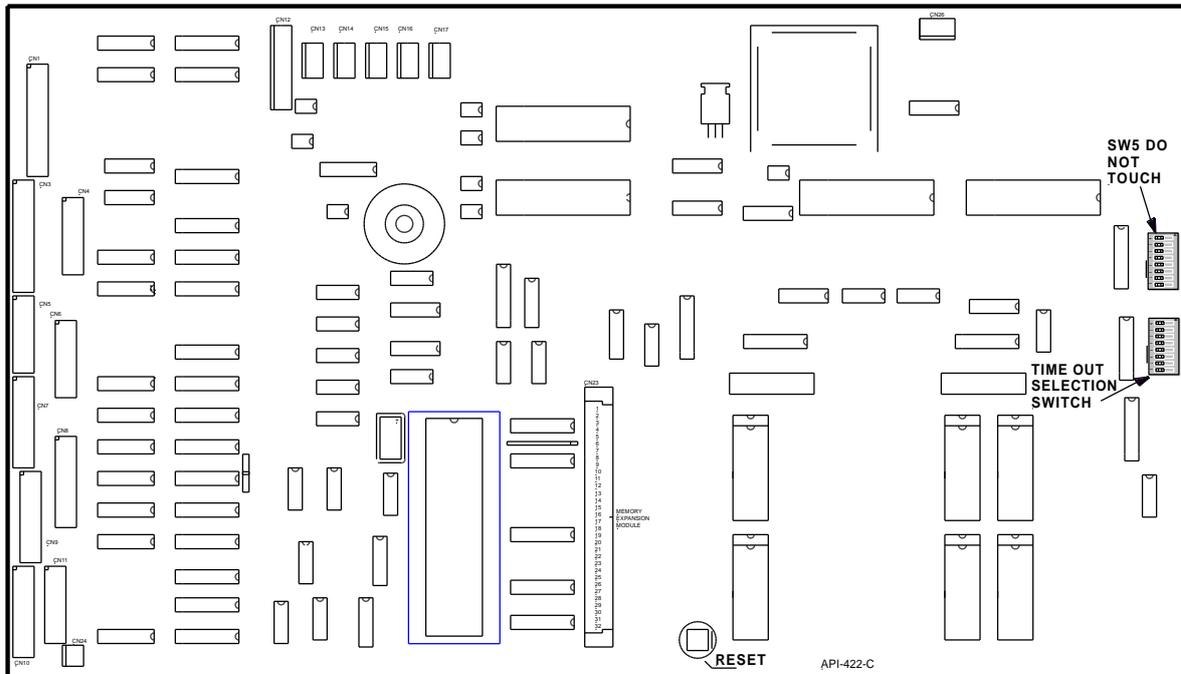


Figure 29: Switch settings

SETTING THE TIME OUT

The total time out is calculated by adding the count of the switches that are “ ON “ as shown below, PLUS one (1) and then multiplying this total by the base time. The base time is usually ten seconds unless stated otherwise.

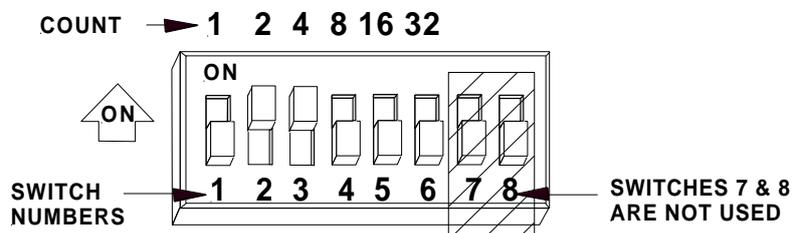


Figure 30: Switch Settings

Example: Switches numbered 2 + 3 are ON, all others are OFF

The count for the Timeout is therefore = (2 + 4 + 1) x 10 = 70 seconds

Switch 7 (if ON) halts evacuation sequences when the key switch is in the Manual position. See section 8.1.2 for further detail.

Switch 8 (if ON) enables monitoring of the EIS and EWS audio bus. See section 10.3 for further detail.

14 Faults

14.1 Fault Indicators

In normal operation the LED indicators illuminated are the "power on" and the "auto" LED.

There are five types of fault LEDs.

1. "Module Fault" LED.

A Module Fault indicates that a local module is either disconnected or faulty.

2. "System Fault" LED.

A System Fault indicates that a module or Main CPU has failed anywhere in the system.

3. "Communications Fault" LED.

A Communications Fault indicates that the one of the communication lines between ECP's/RPC's is faulty or there is an interruption or short on the EWs or EIS audio bus.

4. "Auxiliary Fault" LEDs.

The Auxiliary Fault LED's indicate that a non-processor module is not functioning.

5. "Zone Fault" LEDs.

The Zone Fault LED's allow detection of faults within EWS and EIS zones.

Note: The Fault Sounder will operate, sounding one second pulses every two seconds, if a fault condition exists on any circuit or its associated module.

Refer to Section 8.1.9 for more information.

14.2 Fault Diagnostics

To help with fault diagnosis the MECP will identify zone fault types.

To this end four zone fault diagnosis buttons are included on the Emergency Control Panel.

Refer to Section 8. for the operation of these switches.

15 Trouble Shooting

Prior to conducting any trouble shooting checks it is desirable that the status of any abnormal condition is recorded.

Fault/Status	Cause	Solution
Mains On Indicator Is Off	Mains At Dist Board Off. Mains Switch Off. Cn1 On M.C.P. Cn6 On PSU Mother Brd Discon'd. Mains Fuse Blown.	Turn Power On. Turn Mains Switch On. Plug In Correctly. Plug In Correctly. Replace Fuse.
System Batteries. On	Mains At Dist Board Off. Mains Power Failure. Mains Switch Off. Mains Fuse Blown.	Turn Power On, Check For Main On Indicator When Power Is Returned. Turn Mains Switch On, Replace Fuse.
Charger Fault	Mains Fail. High Volts: Charger Output Volts Above 28.5 Volts. Voltage Normal At 28.5 Volts. Low Volts: Charger Output Volts Below 24.5 Volts. Batteries Fault. Voltage Normal At 24.5 Volts.	Ref Mains On Ind And System On Batteries. Fault Status. Replace Charger Module On Power Supply. Replace Supervisory Card On P/S. Replace Charger Module On Power Supply. Replace Batteries. Replace Supervisory Card On P/S.
Battery Fault Indicator On After 24 Hours.	Battery Disconnected OR Battery Isolate. Battery Voltage Below 24.5 Volts. Low Electrolyte.	Connect Batteries. Replace Batteries. Top Up Batteries.
Battery Isolate.	Main D.C. System Fuse. Battery Cable Loose Or Disconnected.	Plug In Correctly Or Replace Fuse. Check Connections.
Signal Fault.	PCB Signal Gen Not Plugged In Correctly. DC Distribution Fuse Blown On Rear Of Common Board Frame. Synthesiser Fault. Signal Levels Too Low.	Plug PCB In. Replace Fuse 1 Amp. Replace BRDEV3TG / 154-0076 Tone Generator. Adjust Signal Levels.
Signal Fault Comes On Intermittently	Code Set On Dip Switch On Signal Generator For Message Length Incorrect Evac Or Alert Signal Levels Too Low	Set Dipswitch To Correct Code. Readjust Signal Levels.
Comms (Steady) Fault	Section Of The RS 485 Loop Bus Faulty Or Disconnected From Module. (Cn13 And Cn14 Of Processor Brd)	Check Section And Termination Or Field Wiring. Check Internal Comms Connections. Ensure All Modules Are Plugged In. Ensure Modules Installed In Correct Order.
Comms (Flashing) Fault	Interruption or short on the EWS or EIS audio bus	Inspect wiring and rectify as required

System Fault	Module Or Cpu Within Entire System Faulty.	Identify MECP Or SECP Displaying Module Or Cpu Fault. Ref Module Fault Or Cpu Fault Instructions.
Module Fault. Module Containing RS485 Comms Is Faulty. Local To That MECP Or SECP.	DC Fuse On Module Is Blown. DC Distribution Fuse Blown On Rear Or Common Board Frame. Faulty Module. Faulty Cabling (CN15 & CN17).	Replace Fuse. Replace Fuse. Replace Module.
Microphone Fault	302 4840 Brd Not Plugged In Correctly. Dc Distribution Fuse Blown On Rear Of Common Board Frame. Faulty Pre-Amplifier Section.	Plug In Correctly. Replace Fuse 1amp. 302 4840 Faulty Replace Module.
EWS Zone Fault. Amplifier/Speak.	Speaker Cabling Faulty: Short Or Open Circuit Cable. No Eol Resistor. No DC Isolation Capacitors Fitted, (Incorrect Speaker Type). Amplifier Faulty: Blown Fuse On Amplifier. Faulty Amplifier. Amplifier Not Plugged In Correctly.	Check As Per Clause 4.2 In EV3000 Commissioning Report. Fit 47k Eol Resistor. Fit Capacitors Or Change Speakers Replace Fuse 5amp. Replace Amplifier. Plug In Correctly.
EWS Zone Fault. Amp/Spkr Fault - All Zones.	Mic Mixer 302 4840 Unplugged. Test Signal Generator On 302 4840 Faulty. Amplifier Bus Cable Unplugged Or Faulty.	Plug 302 4840 Back In. Replace 302 4840. Reconnect Or Replace
EWS Zone Fault. EAID.	EAID Cabling Faulty. Open Cable Between EAID and WIP. No EOL Resistor At EAID.	Check Cable And Connections. Install 10k EOL.
EWS Zone Fault. Visual.	Visual Cabling Faulty. Open Or Short Circuit Cable To Visual Line Fuse On Visual Output Connection Board Down.	Check Cabling And Connections. Replace Fuse 1amp.
EWS Zone Fault. Alarm System.	Alarm System Cabling Faulty. Open Circuit Cable To Alarm System. No EOLResistor At Alarm System Faulty FACP Input Connection Board.	Check Cable And Connections. Install 10k Resistor At Alarm System End Of Cable. Replace Board.
EIS Zone Fault.	WIP Cabling Faulty. Line Fuse On EIS Selector Board Blown 302-615.	Check Cable And Connections. Replace Fuse Pico 1 Amp. Check As Per Clause 3.3 In EV3000 Commissions Report.
EWS Zone Fault. No Fault Indication In Zone Status.	Faulty Common BGA On Panel.	Check 10k EOL Installed. Check BGA Ok. Check Wiring From Panel BGA To 302-4790 Master Keyswitch Panel.

16 Appendix A: Zone Labelling

ECP ZONE LABELLING

Normally AMPAC panels are supplied with labelling installed as per the customers requirements. These are supplied in the format shown below for both the EWS and EIS.

Each zone identifier can contain up to four (4) lines of text each being nine (9) characters long.

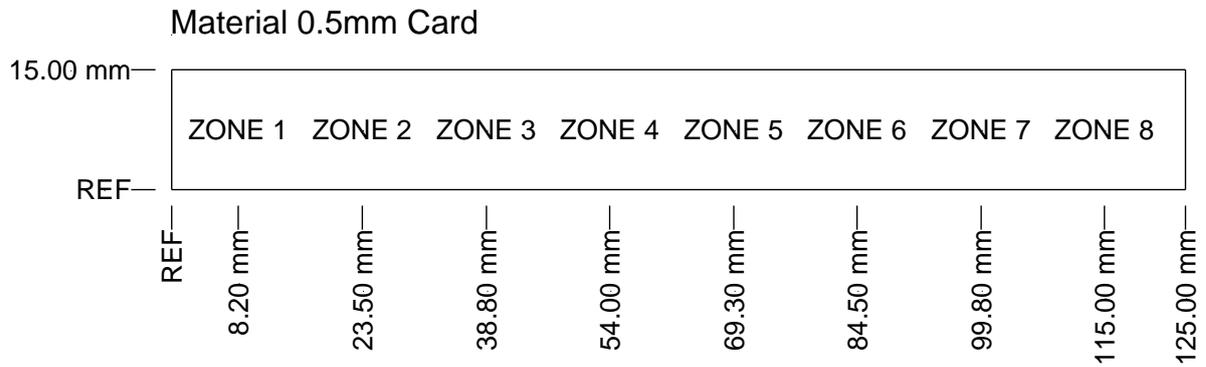


Figure 31: EV3000 Label Requirements

(ACTUAL WINDOW USEABLE SIZE 120mm x 10mm)

17 Appendix B: Compatible Devices

LIST OF COMPATIBLE DEVICES

SPEAKERS:

218-0003	100mm Low Profile Grill
218-0008	100mm Speaker Recess Ceiling Mount
218-0009	200mm Speaker Recess Ceiling Mount
218-0021	200mm Low Profile Grill
218-0022	Surface Speaker – 100mm (white)
218-0026	Ceiling Speaker – 100mm One –Shot (white)
218-0031	Ceiling Speaker – 100mm One –Shot (black)
218-0032	Ceiling Speaker – 200mm One –Shot (white)
218-0041	Ceiling speaker – Easy Fit 5W 4” (EVAC)
218-0042	Ceiling speaker – Easy Fit 5W 5” (brilliant white)
218-0043	Ceiling speaker – Easy Fit 5W 5” (white)
218-0045	Ceiling speaker – Easy Fit 15W 8” (white)
218-0046	Ceiling speaker – Easy Fit 30W 8” (white)
218-0051	Ceiling speaker – Easy Fit 5W 4” (white)

EAIDS:

213-0068	ACP-04 MCP SQUARE WHITE
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VISUALWARNING DEVICES:

208-0011	24V STROBE LIGHT COMBINED RED/AMBER
4107-1001	Red LED Beacon White Shallow Body
4107-1002	Amber LED Beacon White Shallow Body
4107-1003	Red LED Beacon White Deep Body
4107-1004	Amber LED Beacon White Deep Body
4107-1009	Red LED Beacon Red Deep Body
4107-1010	Amber LED Beacon Red Deep Body
4107-1011	Clear Lens Red LED Beacon White Shallow Body
4107-1005	Dual LED Beacon Shallow Base
4107-1006	Dual LED Beacon Deep Base

WIPS:

219-0013	EV3000 EIS 2W + 3W TS004 WIP MASTER HANDSET
219-0015	EV3000 EIS 2W + 3W TS004 SLAVE WIP HANDSET

18 Appendix C: Amplifier Addressing

BINARY ADDRESS SETTING

ADDRESS DATA

DIL SWITCH: ON = 1 OFF = 0

ADDR	DIL SWITCH						
	1234567		1234567		1234567		1234567
1	1000000	33	1000010	65	1000001	97	1000011
2	0100000	34	0100010	66	0100001	98	0100011
3	1100000	35	1100010	67	1100001	99	1100011
4	0010000	36	0010010	68	0010001	100	0010011
5	1010000	37	1010010	69	1010001	101	1010011
6	0110000	38	0110010	70	0110001	102	0110011
7	1110000	39	1110010	71	1110001	103	1110011
8	0001000	40	0001010	72	0001001	104	0001011
9	1001000	41	1001010	73	1001001	105	1001011
10	0101000	42	0101010	74	0101001	106	0101011
11	1101000	43	1101010	75	1101001	107	1101011
12	0011000	44	0011010	76	0011001	108	0011011
13	1011000	45	1011010	77	1011001	109	1011011
14	0111000	46	0111010	78	0111001	110	0111011
15	1111000	47	1111010	79	1111001	111	1111011
16	0000100	48	0000110	80	0000101	112	0000111
17	1000100	49	1000110	81	1000101	113	1000111
18	0100100	50	0100110	82	0100101	114	0100111
19	1100100	51	1100110	83	1100101	115	1100111
20	0010100	52	0010110	84	0010101	116	0010111
21	1010100	53	1010110	85	1010101	117	1010111
22	0110100	54	0110110	86	0110101	118	0110111
23	1110100	55	1110110	87	1110101	119	1110111
24	0001100	56	0001110	88	0001101	120	0001111
25	1001100	57	1001110	89	1001101	121	1001111
26	0101100	58	0101110	90	0101101	122	0101111
27	1101100	59	1101110	91	1101101	123	1101111
28	0011100	60	0011110	92	0011101	124	0011111
29	1011100	61	1011110	93	1011101	125	1011111
30	0111100	62	0111110	94	0111101	126	0111111
31	1111100	63	1111110	95	1111101		
32	0000010	64	0000001	96	0000011		

20 Appendix E: Information on the Obsolete Tone Generator

The original version is the 302-491B, which is designed to produce the alert and evacuation tones and speech messages required for an evacuation system to Australian Standards AS1670.4 or NZS4512. Tones are digitally produced by microcontrollers for high stability and accuracy. Speech messages, which may be installed on either or both tones, are microprocessor controlled but stored using the Information Storage Devices (ISD) Direct Analogue Storage Technology (DAST). Outputs from the card are low impedance to allow the card to drive 100 AMPAC EV3000 amplifiers (i.e. 40W and 120/240W).

20.1.1 Signal Generator Settings

SW 1 settings

Switch	Off	On
1-1	Evacuation message off	Evacuation message on
1-2	Standard = AS1670.4	Standard = NZS4512

SW 2 settings

Switch	Off	On
1-1	Alert message off	Alert message on
1-2	Standard = AS1670.4	Standard = NZS4512

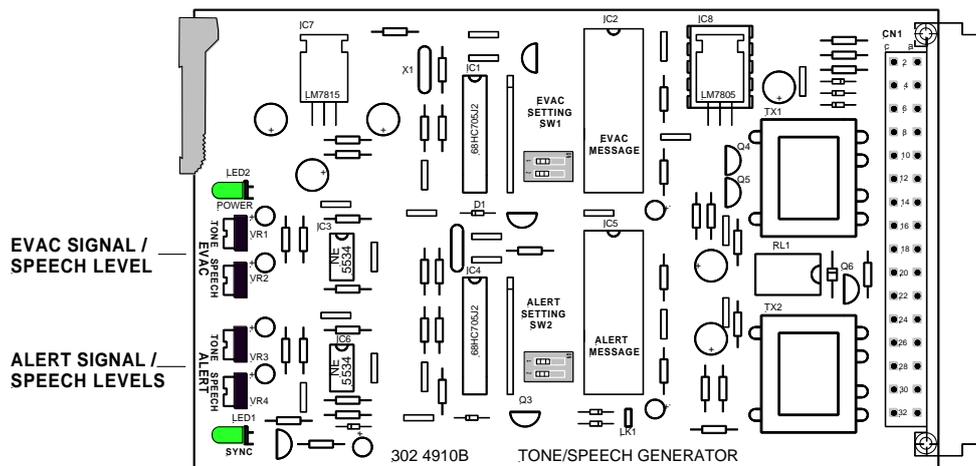


Figure 32: 302-491B / 154-0076 Signal / Speech Generator

21 Glossary Of Terms

ACKD	:	ACKNOWLEDGED
ALM	:	ALARM
BGM	:	BACKGROUND MUSIC
C	:	RELAY COMMON CONTACT (WIPER)
CN	:	CONNECTOR
CPU	:	COMMON PROCESSOR UNIT
DCV	:	DIRECT CURRENT VOLTS
EAID	:	EMERGENCY ALARM INITIATING DEVICE
EARTH	:	BUILDING EARTH
ECP	:	EMERGENCY CONTROL PANEL
EIS	:	EMERGENCY INTERCOMMUNICATION SYSTEM
EOL	:	END OF LINE
EWIS	:	EMERGENCY WARNING AND INTERCOMMUNICATION SYSTEM
EWS	:	EMERGENCY WARNING SYSTEM
FACP	:	FIRE ALARM CONTROL PANEL
FLT	:	FAULT
GND	:	GROUND (0 VOLTS) NOT EARTH
GPO	:	GENERAL PURPOSE OUTLET
I/O	:	INPUT/OUTPUT
ISOL	:	ISOLATED
MAF	:	MASTER ALARM FACILITY
MCB	:	MASTER CONTROL BOARD
MCP	:	MANUAL CALL POINT
MECP	:	MASTER EMERGENCY CONTROL PANEL
MOV	:	METAL OXIDE VARISTOR (TRANSIENT PROTECTION)
N/C	:	NORMALLY CLOSED RELAY CONTACTS
N/O	:	NORMALLY OPENED RELAY CONTACTS
PA	:	PUBLIC ADDRESS
PCB	:	PRINTED CIRCUIT BOARDS
PRIN	:	PRINTER
P/S	:	POWER SUPPLY
PSM	:	POWER SUPPLY MODULE
REM	:	REMOTE
SECP	:	SECONDARY EMERGENCY CONTROL PANEL
TB	:	TERMINAL BLOCK
SGM	:	SIGNAL GENERATOR MODULE
VDU	:	VIDEO DISPLAY UNIT
WIP	:	WARDEN INTERCOM POINT

22 Definitions

Activating device - a device capable of being operated automatically or manually to initiate an alarm signal, e.g. a detector, a manual call point, or a pressure switch.

Alarm system - facility provided in a building to give an alarm in the event of fire, civil commotion, bomb threat, leakage of toxic or noxious fumes, structural damage, or other emergency.

Alarm signal - a signal given by fire alarm, or other alarm system, at the fire indicator panel (FACP) or other panel to alert wardens and other nominated personnel as necessary to commence prescribed actions.

Alarm zone - the specific portion of a building or complex identified by a particular alarm zone facility.

Alert signal - an audible signal, or combination of audible and visible signals, from the Emergency warning system to alert wardens and other nominated personnel as necessary to commence prescribed actions.

Approved and approval - approved by, or the approval of, the Regulatory Authority concerned.

Control and indicating equipment (CIE) - a combination of control equipment and indicating equipment.

Control equipment - equipment which controls the receipts and transmission of signals within the fire detection and alarm system or initiates other action.

Emergency alarm initiating device - a manually operated device by which an alarm is given to indicate an emergency.

Emergency condition - is a condition which requires the evacuation of the building or zone.

Emergency control panel (ECP) - a panel by means of which the emergency warning and intercommunication system (if any) in the building may be operated [NOTE: see also definition of master emergency control panel (MECP)].

Emergency intercommunication system (EIS) - a two-way system which provides voice communication between the controlling emergency control panel (ECP) and the warden intercommunication points (WIPS).

Emergency warning and intercommunication system (EWIS) - a combined emergency warning and intercommunication system.

Emergency warning system (EWS) - a system to provide a distinctive audible signal, verbal address, and visible signals as required, during an emergency condition.

Evacuation sequence - a pre-programmed sequence initiating alert and evacuation signals to evacuation zones as required by the Regulations Authority.

Evacuation signal - an audible signal, or combination of audible signals, from the emergency warning system to indicate to wardens and building occupants generally that an evacuation or other prescribed actions are necessary.

Evacuation zone - a specific portion of a building or complex, in which the evacuation procedures are managed by one zone warden. [NOTE: this term should not be confused with the concept of 'fire alarm zone'. Fire alarm zone may or may not cover the same area as an evacuation zone.]

Factory connections - are connections made during manufacture and should not require any field alterations.

Field connections - are connections made to FACP or ancillary equipment at the project during installation.

Firmware - the basic operating program which is not intended to be field changeable.

House warden - a person who, during an emergency, assumes control over the building and its occupants and is the prime contact with the appropriate emergency services(s).

Interface - The interconnection between equipment which permits the transfer of data.

Main equipment - equipment essential to the operation of the system including, control equipment, amplification equipment and power supply modules.

Master alarm facility (MAF) - that part of the control and indicating equipment which receives alarm and fault signals from any alarm zone facility and initiates the common signal (alarm and/or fault) for transmission to the fire control station where appropriate. Bells and other ancillary functions may be initiated from this facility.

Master emergency control panel (MECP) - a specially designated emergency control panel (ECP) that on manual operation of its key switch, takes full control of the emergency warning and intercommunication system, and overrides all other ECP's in the building.

Power Supply - that portion of the control and indicating equipment (CIE) which supplies all voltages necessary for operation of the CIE.

Regulatory Authority - an authority administering Acts of Parliament or Regulations under such Acts.

Remote auxiliary supply - power supply DC24VDC max from a remote source.

Verbal address - the mode of operation whereby verbal instruction is given from the controlling emergency control panel (ECP) to the building occupants via the loud speaker systems.

Warden intercommunication point (WIP) - the location on a floor or evacuation zone, where equipment is provided through which instructions can be received from the controlling emergency control panel (ECP) via the emergency intercommunication system.

Zone (floor) warden - a person who, during an emergency, assumes control over a particular floor or evacuation zone under the direction of the house warden.

UNCONTROLLED DOCUMENT

NOTE: Due to Ampac's commitment to continuous improvement specifications may change without notice.