



QE90 EWIS OPERATOR'S MANUAL

QE90 EWIS PRODUCT MANUAL
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The Tyco QE90 EWIS is a product of

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END USER LIABILITY DISCLAIMER

The QE90 Emergency Warning and Intercommunications Panel provides a configuration programming facility which may be accessed via the front panel keyboard.

Because this programming facility allows the user to define aspects of the operation of the QE90 System, changes can be made by the user that prevent this installation from meeting statutory requirements.

Tyco Safety Products, therefore cannot accept any responsibility as to the suitability of the functions defined by the user using the programming facility.

AMENDMENT LOG

September 1990	Issue 1	Original
20 January 1992	Issue 1.1	Revised Completely
25 March 1992	Issue 1.2	Amended for S/W Ver 1.3x
20 October 1992	Issue 1.3	Amended for Evac ECP S/W Ver 1.4x
18 November 1993	Issue 1.4	Amended for Evac ECP S/W Ver 1.7x
20 November 1995	Issue 1.5	Amended for Software V2.x
1 December 1998	Issue 1.51	AS3548 Class A note added (page ii). WIP Earpiece Ring Warning (pages 2-5, 5-9).
27 October 2000	Issue 1.60	Deleted Chapter 7 (Programming). Added fault information for ECM networked systems.
4 November 2004	Issue 1.70	Moved details of cascade to LT0088. (Default cascade was changed for AS1670.4 compliance) Added details of WIP Program key. Added reference to AS1670.4. Changed description of tones in 2.2. Reworded 2.4.

1 INTRODUCTION

1.1 USING THIS MANUAL

This Manual provides operator information on the QE90 EWIS Panel to allow the operator to manually control the operation of the system.

The Manual is structured as follows:

Chapter 1, Introduction, describes the manual, explains the format and terminology used and lists associated QE90 product manuals.

Chapter 2, System Description, provides an overview of the physical and operational concepts of the QE90 system.

Chapter 3, Auto/Manual/Isolate Modes, describes the Auto, Manual and Isolate modes of operation as controlled by the keyswitch. The automatic cascade sequence is also described.

Chapter 4, Master Module Functions, provides a description of the operator controls on the master display/keyboard module.

Chapter 5, Zone Function Keys, describes the operation of the controls and indications of the zone display/keyboard modules.

Chapter 6, Fault Indicators, describes the various fault indications and the action the operator should carry out in the event of a fault occurring.

Chapter 7, Placing Into Operation, provides a set by step procedure for the operator to carry out an initial run up of a new system.

Chapter 8, Maintenance, provides step by step maintenance procedures that should be carried out at various time intervals.

Appendix A, Contract And System Details, contains charts for the recording of the contract, system and installation details along with the on-site programmed values.

1.2 ASSOCIATED DOCUMENTATION

1.2.1 PRODUCT RELATED

The following QE90 product manuals are available:

- LT0087** **QE90 Operator's Manual**, provides a complete guide to the operation, programming and maintenance of the QE90 EWIS panel, according to Australian Standards AS2220 Part 1. This manual is provided as standard with QE90 EWIS panels.
- LT9002** **QE90 Technical Manual**, provides complete technical details on the QE90 system and Hardware/Software components, according to Australian Standards AS2220 Part 1, for servicing purposes.
- LT0088** **QE90 Installation and Commissioning Manual**, provides complete details for correctly installing and placing into operation the QE90 system.

1.2.2 STANDARD RELATED

- AS2220.1** Emergency warning and intercommunications systems in buildings. Part 1 - Equipment design and manufacture.
- AS2220.2** Emergency warning and intercommunications systems in buildings. Part 2 - System design, installation and commissioning. (Now obsolete)
- AS1670.1** Fire detection, warning, control and intercom systems – System design, installation and commissioning. Part 1 : Fire
- AS1670.4** Fire detection, warning, control and intercom systems – System design, installation and commissioning. Part 4 : Sound systems and intercom systems for emergency purposes.
- AS1851.10** Maintenance of fire protection equipment. Part 10 - Emergency warning and intercommunications systems.

1.3 TERMINOLOGY

BGA	Break Glass Alarm manual call point
BGM	Background music
CPU	Central processing unit
ECP	Emergency control panel (MECP or SECP)
EIS	Emergency intercommunications system
EVAC	Evacuate
EWIS	Emergency warning and intercommunications system
EWS	Emergency warning system
FIP	Fire indicator panel
FRC	Flat ribbon cable
LED	Light emitting diode (Visual indicator)
MECP	Master emergency control panel
NC	Normally closed
NO	Normally open
O/C	Open circuit
PA	Public address
PCB	Printed circuit board
PROM	Programmable read only memory
PTT	Press to talk
RAM	Random access memory
ROM	Read only memory
RTC	Real time clock
SECP	Secondary emergency control panel
S/C	Short circuit
WIP	Warden intercommunication point

2 SYSTEM DESCRIPTION

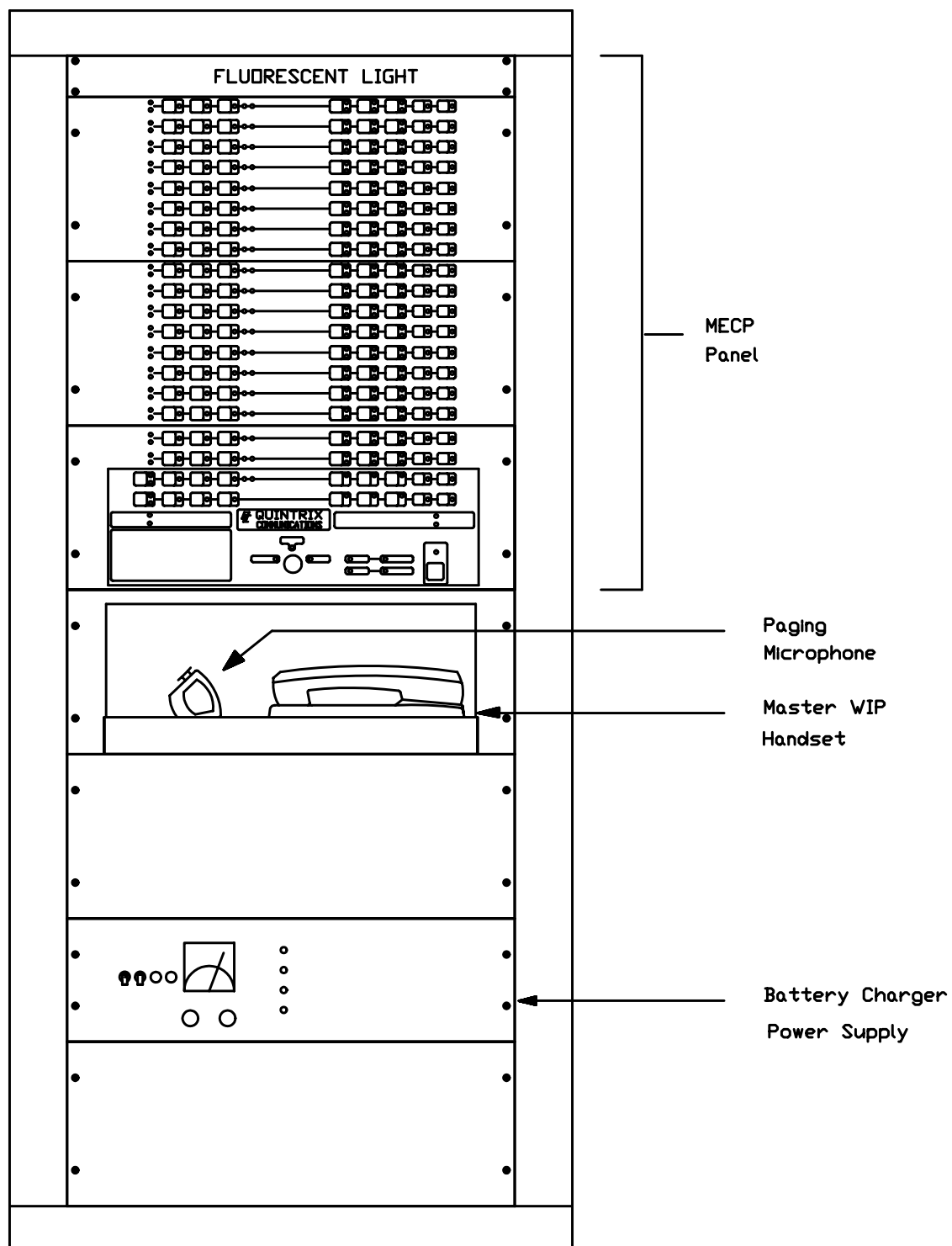


FIGURE 2.1
QE90 EWIS PANEL

2.1 GENERAL

The purpose of an emergency warning and intercommunication system (EWIS) is to enable the orderly evacuation of a building in the event of an emergency.

The QE90 EWIS panel achieves this by providing the following facilities in an integrated and flexible system which complies with the Australian Standard AS2220.1:1989 and can be installed to comply with AS2220.2 or AS1670.4.

- i) An Emergency Warning and Evacuation System
- ii) An Intercommunication System
- iii) Automatic Evacuation Mode.

A typical QE90 EWIS front panel layout is shown in Fig 2.1.

2.2 EMERGENCY WARNING SYSTEM

The Emergency Warning (Evacuation) System generates audible and/or visible signals to:

- i) alert the occupants of an emergency situation
- ii) instruct the occupants to evacuate the building.

The building is divided up into evacuation areas or zones, with at least one zone per floor of a building.

Zones may be selected independently, in groups, or all together for one of three independent warning signals.

These are, in increasing priority:

- 1) **ALERT** A pulsed on/off tone of 420Hz that rises in volume through six levels after its initial activation. This alerts the occupants to the existence of an emergency situation and that they should standby for the evacuation tone or verbal instructions. It also serves to alert the floor wardens to take up their designated positions and prepare for evacuation.
For systems installed to AS1670.4, there may be **no** alert tones automatically generated in the event of an alarm; however they can still be selected manually from the keyboard.
- 2) **EVACUATE** The evacuate signal is the signal for occupants to leave the building.

For systems installed to AS2220.2, the evacuate signal consists of :
 - four tones, each rising in frequency from 500Hz to 1200Hz over 4 seconds, then
 - a voice message (possibly spoken twice).This pattern repeats indefinitely. In the manual mode of operation the voice message is usually not included in the evacuate signal.

For systems installed to AS1670.4, the evacuate signal consists of:

- three tones, each rising in frequency from 400Hz to 1200Hz, in a total period of 2.5 seconds (as per ISO 8201), then
- the word "Emergency", then
- three more tones in 2.5 seconds as above, then
- the words "Evacuate Now", then
- a longer more specific voice message may be played.

This pattern repeats indefinitely.

- 3) P/A SPEECH Voice announcements can be made manually from the front panel mounted microphone.

Visible warning lights, used to supplement the audible tones, are coloured amber for alert and red for evacuate. They can be used in areas where the background noise level is high or when deaf or impaired hearing people may be present.

The EWS system includes equipment to monitor the wiring cables to speakers, visible warning lights, etc and will indicate when a fault condition is found.

The EWS system may also be used as a paging and/or background music system under non-emergency conditions. If an alarm or a mains power supply failure occurs then these functions are disabled until the cause is removed.

2.3 INTERCOMMUNICATIONS SYSTEMS

The intercommunications system allows the House Warden to communicate via telephone type handsets to Zone or Floor Wardens located at exit points on each floor or zone. The system comprises the master phone, zone selection switches and slave handsets on each zone of the building.

Facilities are provided on the ECP to monitor the status of all calls including the reception, origination and progress of all incoming and outgoing calls as well as fault monitoring of the WIP lines.

LED indicators mounted on the ECP display the operational status of each zone and, in conjunction with an internal fault sounder, are used to alert the operator to any abnormal conditions.

The QE90 intercommunications system is available in 1 WIP per zone or 3 WIP per zone configurations. The keyboard/display units are different for these configurations and reflect the number of WIPs per zone on the keyboard. On 3 WIP/zone systems the 3 WIPs can be called, answered and fault monitored on an individual basis.

- WARNING -

Do not manually operate the hook switch of any WIP or ECP phone while holding the earpiece close to your ear. Always replace the handset to operate the hook switch. Some makes/models/configurations of WIP phones use the earpiece to generate the ring sound and this may be uncomfortably loud if it is close to your ear.

2.4 OPERATING MODES

The EWIS system can be operated in any one of three modes, AUTO, MANUAL or ISOLATE. The system is normally operated in the AUTO mode. In this mode the system is connected to the Fire Indicator Panel enabling automatic operation of the evacuation system in the event of a fire alarm. In addition, Break Glass Alarm (BGA) manual call points can also be connected to the EWIS system to initiate automatic operation in the event of an emergency alarm.

The system continually monitors the FIP and BGA inputs for an alarm signal. On detection of an alarm signal, it begins to evacuate the occupants of the building according to a predefined plan to ensure that the building is evacuated in a safe and orderly manner.

Refer to section 3.5 for more information.

In MANUAL mode the operator at the ECP has control of the system and can manually select the alert, evacuate or public address functions for each of the zones.

In ISOLATE mode the keyboard of the ECP is effectively isolated from the rest of the system so that operator training can be carried out without activating the various tones in each zone. The system is still operational in that field faults or FIP/BGA activations will be shown on their respective indicators on the keyboard.

2.5 EMERGENCY CONTROL PANELS

The Master Emergency Control Panel (MECP) contains all the controls, status indicators, microphone and handset for the complete operation of the system.

The MECP is usually installed in a convenient, safe and quiet location to enable authorised personnel to control the system in the event of an emergency. This facility can be an integral part of the Main Equipment Rack or it can be remote. When installed remotely, the MECP is connected to the Main Equipment Rack by a serial data communication link.

Additional Secondary Emergency Control Panels (SECP) can be similarly connected to the Main Equipment Rack for increased operational flexibility. These units are assigned a lower priority to the MECP so that the MECP can always take manual control and override an SECP.

2.6 MAIN EQUIPMENT RACK

The Main Equipment Rack houses the electronic equipment necessary for the generation of the tones, flashing lights, WIP intercommunications, FIP/BGA inputs and other ancillary equipment.

The equipment is laid out in a modular fashion, allowing flexible configuration and system sizes of up to 100 zones to be achieved. The primary variation between systems of different sizes is the cabinet size, the number of modules fitted and the power supply capacity.

The system has an associated standby battery supply which is usually contained in the equipment cubicle. In the event of failure of the 240V mains electricity supply the EWIS system will automatically be powered from its standby battery.

3 AUTO / MANUAL / ISOLATE MODES

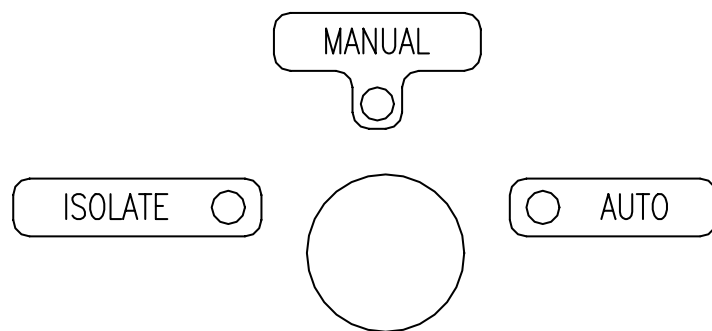


FIG 3.1
AUTO/MANUAL/ISOLATE KEYSWITCH

3.1 GENERAL

The AUTO/MANUAL/ISOLATE keyswitch on the front of the ECP module allows the operational mode of the system to be set. The resulting mode is indicated on the LEDs next to each position of the keyswitch. As the LEDs are under software control it is possible for the LEDs not to follow the keyswitch.

For example, setting an SECP to manual may not result in the Manual mode being obtained. This would be because another SECP or MECP is already in MANUAL mode and thus has control of the system.

Switching an MECP to Manual will always result in Manual mode being obtained. Switching an SECP to Manual will only work if the MECP is in Auto mode. Only one SECP can be in Manual mode at a time, generally this will be the first SECP to be switched to Manual. If the MECP is switched from Manual to Auto and two or more SECPs are switched to manual, then one of the SECPs will switch to Manual mode.

If any ECP is in Manual, then its MANUAL LED will be steady, and the MANUAL LEDs at all other ECPs will flash with a flash-flash-pause cadence. The AUTO LEDs of these other ECPs will be steady.

The AUTO/MANUAL/ISOLATE keyswitch is shown in Fig 3.1.

Refer to Section 4.4.2 for additional information applicable to networked systems.

3.2 AUTO MODE

The AUTO mode is the standard operating position, whereby the Evacuation System is ready to carry out its principle function, i.e. automatic evacuation of the building in the event of alarm. The way in which the EWIS carries out the evacuation is dependent on the cascade sequence programmed during manufacture and the on-site programmed parameters. The automatic cascade sequence is described in Section 3.5.

Also while in AUTO mode control is allowed to be passed to any ECP that may be requesting Manual mode. If all ECPs are in AUTO then the controlling ECP will enable the automatic generation of alert and evacuate tones throughout the building if an alarm is detected. If any ECP is in MANUAL mode then the automatic cascade operation is overridden and the operator can manually select zone functions. Refer to Section 3.3 for the manual mode description.

Note that after an alarm has occurred it is possible to switch an ECP to Manual, select or de-selected tones for various zones and then return to AUTO mode, whereupon the automatic cascade will continue from the new setting if there is still an active FIP or BGA input

It is therefore important that all zone FIP, BGA, Alert and Evacuate indications are cleared before switching to AUTO unless the cascade function is to be continued.

3.3 MANUAL MODE

When the ECP is in the MANUAL mode, all buttons on the Evacuation System keyboard are enabled except for the PROGRAM button.

This stops the automatic cascading of the alert and evacuate tones and allows the operator to have manual control of the system. The various tones or functions can be selected for each or all of the zones as required.

Ensure all FIP and BGA alarm conditions and all zone alert and evacuate commands have been removed before switching to AUTO from the MANUAL mode.

3.4 ISOLATE MODE

Switching an ECP to ISOLATE will have a different effect depending on whether the ECP is the MECP or an SECP.

At the MECP the ISOLATE mode will cause the whole system to be isolated. I.e. alarms occurring on the FIP or BGA inputs will not cause zones to be placed into alert and evacuate, although the FIP and BGA LED indicators on the keyboard/display will continue to show the correct FIP/BGA status. Furthermore, the keyboard is isolated from the system, so that, for example, selecting a zone for evacuate will cause the zone EVACUATE LED to turn on but no evacuate tone will be generated in the zone. However if the MECP is switched to MANUAL with zones selected, then tones will start on those zones.

Note that if an MECP is powered down when it is in ISOLATE, the SECP will not take over control of the system.

Placing an SECP into ISOLATE will not affect the automatic cascade operation of the system, it will only isolate the SECP keyboard from the system. Pressing keys will light the appropriate indicators but will not result in the tones being generated in the zones. The MECP will control the system while the SECP is in ISOLATE. If the MECP fails while the SECP is in ISOLATE, the SECP will not take over control.

Switching an SECP from MANUAL to ISOLATE will result in the MECP taking control and changing the mode of the system from MANUAL to AUTO (as the MECP must be in AUTO for the SECP to have been in MANUAL). Ensure all FIP and BGA alarm conditions and all zone alert and evacuate commands have been removed before switching an SECP from MANUAL to ISOLATE.

The ISOLATE mode is meant as a training position and is best performed at an SECP, if present. This is because the rest of the system will then still be operational and ready to act if an alarm is detected. Note that in this situation the isolated SECP indicators will show the result of the alarm and cascading functions.

When an SECP is switched out of ISOLATE all functions selected by the operator will be automatically cancelled, and the MECP will then transfer to the SECP the current status of the system. This may take a few seconds, and during this time the SECP will not go into the MANUAL mode even though the keyswitch may be in the MANUAL position.

3.5 AUTOMATIC CASCADE SEQUENCE

When an alarm occurs in Automatic mode, the system begins to evacuate the occupants of the building according to a predefined plan to ensure that the building is evacuated in a safe and orderly manner.

In New Zealand typically the zone with the alarm and often some nearby zones receive the Evacuate signal, with the rest of the building receiving the Alert signal. Over time the Evacuate signal spreads through the rest of the building.

A system installed to AS2220 in Australia typically starts with the Alert signal in the alarm zone. Thereafter at intervals, zones currently receiving the Alert signal change to the Evacuate signal and nearby zones receive the Alert signal, until the whole building is receiving the Evacuate signal.

A system installed to AS1670.4 typically starts with the Evacuate signal in the alarm zone. Over time the Evacuate signal spreads through the rest of the building.

This “cascade” strategy can be specially configured, during manufacture, to meet the particular building or regulatory requirements.

The Automatic cascade sequence can be enabled or disabled on-site by your service company. (This does not apply to ECM Networked systems, for these systems the cascade is usually more complex and is fixed by factory programming.) When the cascade sequence is disabled, a simpler and much more rapid sequence than that described above will occur.

There are three time delays that can be programmed on site by your service company. These time delays are referred to as “Delay Before Action”, “Initial Delay”, and “Subsequent Delay”. Note that the programmable time delays have different effects depending on whether cascade is enabled or disabled.

When switching from Manual to Auto there is a 5 second delay during which no cascade related functions will be carried out. After powering up in Auto there is a 30 second delay before any cascade functions begin.

4 MASTER MODULE FUNCTIONS

4.1 KEYSWITCH

The AUTO/MANUAL/ISOLATE keyswitch selects the operational mode of the **Evacuation** system. Refer to Section 3 for a description of the operating modes and Section 4.4 for a description of the indications.

The **Fire Phone** system will function regardless of the keyswitch position, however for systems with SECPs shipped before November 1995 (ie fitted with version 1.xx software, not 2.xx), it is necessary to "take control" at the ECP at which you want to use the WIP system (by briefly switching to Manual). For systems with SECPs shipped after November 1995, the WIP keyboard is always active. See the next section, 4.2.1 Operating LED.

4.2 SYSTEM INDICATORS

4.2.1 OPERATING LED

There are two system LEDs for each of the Evacuation and Fire Phone systems, one labelled OPERATING and the other labelled FAULT. The green LED labelled OPERATING is used to indicate the operating status of the ECP. It flashes at 2Hz to indicate that the ECP is operating and that it has control of the system. When another ECP has control (e.g. at an SECP when the MECP is in MANUAL) then the LED will flash with a flash-flash-pause cadence.

Under normal conditions if only one ECP is in Manual it will have control of the system and any other ECPs will be in slave mode. If all ECPs are in Auto, the one which was last in Manual will have control of the system. An ECP will take control when it is switched to MANUAL and all other ECPs are in AUTO. If the MECP and an SECP are both switched to MANUAL, the MECP will take control. However, if any SECP is unable to communicate with the MECP it will attempt to take control of the system as it is possible the MECP has failed.

To be able to use the Evacuation System keyboard of an ECP the keyswitch must be switched to MANUAL or ISOLATE and the appropriate LED must be on. (Refer section 3.1)

For the Fire Phone System, changes were introduced in November 1995 with Version 2.xx of the software.

For systems shipped before November 1995, the keyboard is not affected by the AUTO/MANUAL/ISOLATE position, but rather, whether the ECP has control or not. Therefore, to use the Fire Phone System in a system with more than one ECP it may be necessary to switch the keyswitch to MANUAL (wait for the Fire Phone Operating LED to flash continuously) and then switch back to AUTO.

Verify that the Fire Phone Operating LED continues to flash continuously at 2Hz as control may be passed back to another SECP or MECP that is requesting Manual Control.

For systems shipped after November 1995 with Version 2.xx software the WIP keys can be used at any time and the ECP at which a wip key was last pressed will indicate that it is in control.

For ECM Networked Systems:

The EVACUATION SYSTEM OPERATING LED for flashes continuously if the ECP has manual or isolate control of any or all zones, otherwise it flashes with a flash-flash-pause cadence.

The FIRE PHONE SYSTEM OPERATING LED will flash continuously when there is no call in progress, or when there is a call between that ECP phone and a WIP connected to that panel. The LED will flash with a flash-flash-pause cadence when there is a call between a WIP connected to that panel and a remote ECP phone, indicating that the call has been initiated or answered at a remote ECP.

If the OPERATING LED is permanently off, permanently on or flashing at a rate or cadence different to that described above then a fault exists with the ECP module.

4.2.2 FAULT LED

The yellow FAULT LED for each of the Evacuation and Fire Phone Systems indicates when there is a system fault present. A system fault is when a module or piece of equipment required by the system is faulty or not responding to communications from the controlling ECP module. This type of fault is different to a zone fault which is only present on the wiring of a particular zone.

If only some zones are affected by the module failure, then those zones are also put into fault. So it is necessary to check the Evacuation System Fault LED and the Fire Phone System Fault LED to see if the zone fault indication is caused by a zone fault or module failure. Refer to Section 6 for further information on system faults.

4.3 COMMON INDICATORS / SWITCHES

The MAINS LED (green) is on when mains power is applied to the system and the battery charger is operating correctly.

If the mains supply (or charger) develops a fault then the MAINS LED will turn off and the CHARGER FAIL LED will flash. If the system has one or more SECPs then the CHARGER FAIL LED will flash with a flash-flash-pause cadence if there is a mains or charger failure at **another** ECP.

The BATTERY LED (green) is on when the battery is operating within its correct voltage range. If the battery voltage drops below the minimum operating voltage then the BATTERY LOW LED will flash with the SYSTEM FAULT LED to indicate that the battery voltage is too low for the system to work properly.

The common SYSTEM FAULT LED will flash and the beeper alarm will sound whenever a new fault or alarm condition is detected. There will also be another flashing FAULT or ALARM LED that shows the cause of the beeping.

When the fault or alarm is acknowledged, by pressing the SILENCE button, all the flashing LEDs will go steady and the pulsing audible sound will cease.

If a CPU watchdog failure occurs or CPU power is lost, then the SYSTEM FAULT LED and beeper will be on continuously. By pressing the SILENCE button the audible alarm will be silenced but the LED will stay continuously on.

The fault (and alarm) indications are latching so it is possible to determine the cause of intermittent conditions. To clear the latched fault and alarm indications press and hold the SILENCE button in for 2 seconds. For those faults and alarms that have cleared the LED will turn off but any still present will have the appropriate LED remain on. It will be necessary to fix the fault or alarm before the indication can be cleared.

The beeper will sound a short, quiet pulse every time a valid key is pressed to provide audible feedback that the key was recognised. If no sound is heard when pressing a key it means that the key is invalid at that point in time.

The beeper will generate a loud, pulsating sound whenever a new alarm or fault is detected and requires acknowledgement.

The beeper will generate a loud, continuous sound if either of the CPUs on the ECP module fail.

4.4 AUTO/MANUAL/ISOLATE LEDS

4.4.1 NON-NETWORKED SYSTEMS

The AUTO, MANUAL, and ISOLATE LEDs normally indicate the position of the keyswitch, with the following exceptions -

The MANUAL LED may be flashing with a flash-flash-pause cadence. This indicates another ECP has Manual control of the system.

At an SECP the keyswitch may be in the Manual position, but the AUTO LED may be on and the Manual LED flashing. This indicates that the MECP or another SECP is switched to Manual, over-riding this SECP.

At an SECP switched to Manual or Auto, the ISOLATE LED may be on. This indicates that the MECP (and hence the whole system) is switched to Isolate.

4.4.2 ECM NETWORKED SYSTEMS

For ECM Networked Systems the AUTO, MANUAL, and ISOLATE LEDs on the ECP display in various combinations to indicate various conditions:

AUTO	Some or all zones are in AUTO.
Steady MANUAL	All zones are under manual control at this ECP.
Steady ISOLATE	All zones are in ISOLATE and under the control of this ECP.
Continuous flash MANUAL	Some zones are under manual control at this ECP.
Continuous flash ISOLATE	Some zones are in ISOLATE and under the control of this ECP.
Flash-flash-pause MANUAL	Some zones are in manual control of another ECP.
Flash-flash-pause ISOLATE	Some zones are in ISOLATE and under the control of another ECP.

It is possible for there to be more than one LED on at a time. For example if this ECP is in AUTO but some zones are under manual control at another ECP, the AUTO LED will be steady and the MANUAL LED will be flashing with a flash-flash-pause cadence.

5 ZONE FUNCTION KEYS

5.1

GENERAL

The ECP must be in the MANUAL or ISOLATE modes for the Evacuation keyboard to work. The ECP keyboard contains function selection keys for each zone and also "All Zone" and programmable "Group" keys.

The "All Zone" keys cause all zones to be selected (or de-selected) for the appropriate function while the Group keys only work on the programmed group of zones.

All keys act with a toggle action, i.e. if the appropriate LED is off then pressing the key will select the function and turn the LED on. Similarly, if the LED is on, pressing the key will de-select the function and turn the LED off. This toggle action works on the ALL and GROUP keys as well so that a combination of single, group and all-zone functions will produce a variety of zone selections.

For example, pressing the ALL ALERT key (with the ALL ALERT LED off) will turn all zones to Alert and turn on the ALL ALERT and GROUP ALERT LEDs. Pressing individual zone ALERT keys will turn off the Alert tone to those zones while pressing the GROUP ALERT will turn off the programmed group of zones. Pressing the GROUP ALERT again will turn the group back to alert as the group had been turned off.

Each keypress should result in a short audible beep being heard. If no beep is heard then this may be due to the key being invalid at the that point in time (eg during programming), or the system is still trying to process the last keypress, or the ECP is in Auto mode. Therefore if keys are pressed in quick succession, it may be noticed that the second keypress has no effect or is not beeped until sometime after pressing. This is sometimes evident on large systems and in particular with the All and Group functions.

The Evacuation System Alert, Evacuate and PA Speech functions have an increasing prioritisation. I.e. the Evacuate tone will be generated for the zone if both the ALERT and EVACUATE LEDs are on. Similarly, if PA SPEECH is on and the Microphone PTT switch is pressed in, then speech will override any alert and evacuate tones selected.

On an ECM networked system the Alert, Evac and/or PA indicators for a zone will flash if that zone is mapped to multiple zones at another ECP, and the Alert, Evac/PA function is on for some but not all of the mapped zones. Do not confuse this with Zone Isolate function (not available on ECM networked systems) where Alert/Evac and PA will flash continuously on an isolated zone.

With networked systems, there are times when Alert/Evac/PA for some zones will not be able to be controlled because those zones are under control by a higher priority ECP. Operating ALL or GROUP functions will not affect these zones, and the zone keys themselves will not be able to be operated. However the zones which are controllable will operate as usual. In these cases (some zones uncontrollable) the Manual or Isolate LED will be flashing continuously indicating only partly manual or partly isolated. However the WIP controls will always be active for all zones.

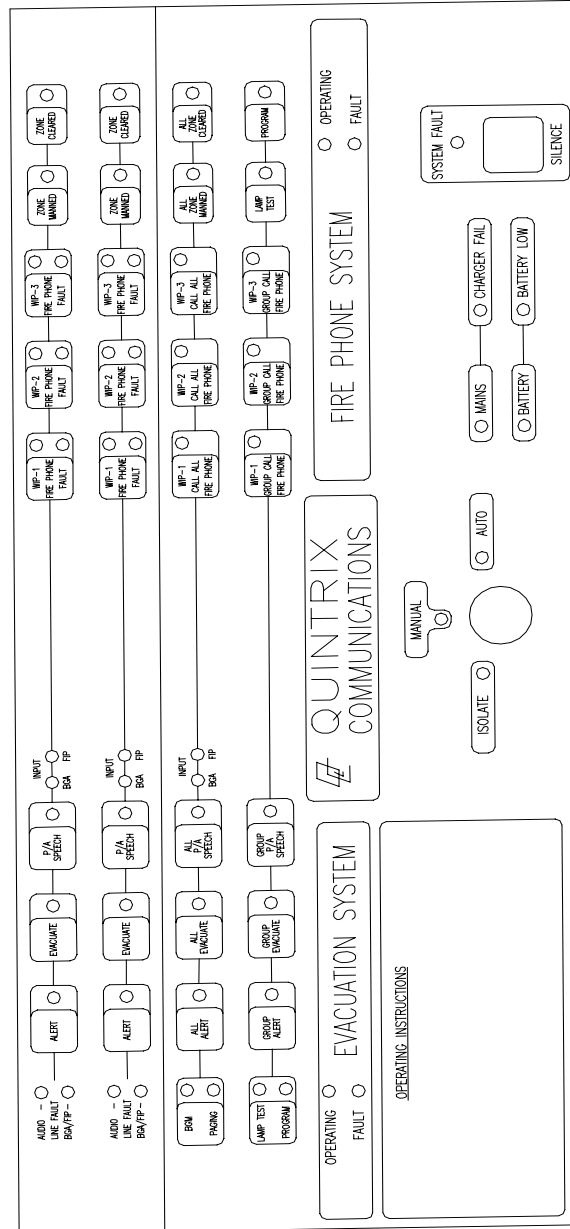


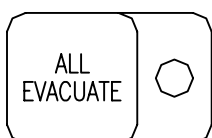
FIG 5.1
MASTER KEYBOARD/DISPLAY MODULE

5.2 ALL, GROUP & PROGRAM KEYS

The Master Keyboard/Display Module incorporates the ALL, GROUP and PROGRAM key features along with the keys for the first two zones. This is shown in Fig 5.1.



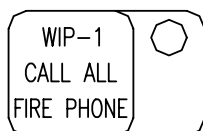
When ALL ALERT is pressed all zones will be placed in the alert mode and the ALL ALERT LED will be turned on. Each zone ALERT LED will turn on as well to indicate it is in the alert mode. If this key is pressed when the ALL ALERT LED is already on, then the function will be reversed and all zones in alert will be turned off.



When ALL EVACUATE is pressed all zones will be placed in the evacuate mode and the ALL EVACUATE LED will be turned on. Each zone EVACUATE LED will turn on to indicate it is in the evacuate mode. If this key is pressed when the ALL EVACUATE LED is already on, then the function will be reversed and all zones in evacuate will be turned off.



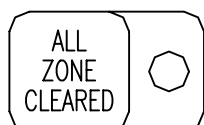
When ALL PA SPEECH is pressed all zones will be placed in the PA SPEECH mode and the ALL PA SPEECH LED will be turned on. Each zone PA SPEECH LED will turn on to indicate it is in the PA SPEECH mode. When the "press-to-talk" (ptt) button is pressed on the front panel microphone then speech will be directed to the zones and any alert or evacuate tones will be overridden. Releasing the ptt button will revert the zones to the next highest function selected. If this key is pressed when the ALL PA SPEECH LED is already on, then the function will be reversed and all zones in PA SPEECH will be turned off.



When WIP CALL ALL key is pressed, all WIP phones in every zone will ring simultaneously and every WIP LED (except GROUP LED) will flash continuously. As each WIP is answered its LED will change to steady. The operator can talk to all answered WIP phones but will hear nothing back. Pressing the key again will cancel the all call. If any WIP phones remain off hook the LED will start flashing as they are then calling the ECP.



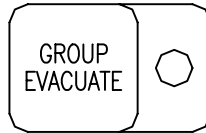
When ALL ZONE MANNED is pressed the ZONE MANNED LED for all zones will turn on. This is basically a log indicator and has no control over system operation. It provides helpful information to the operator. Pressing again will turn off all ZONE MANNED LEDs.



When ALL ZONE CLEARED is pressed the ZONE CLEARED LED for all zones will turn on. This is basically a log indicator and has no control over system operation. It provides helpful information to the operator. Pressing again will turn off all ZONE CLEARED LEDs.



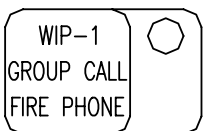
When GROUP ALERT is pressed all zones in the programmed group will be placed in the alert mode, their ALERT LED will turn on, and the GROUP ALERT LED will be turned on.
If this key is pressed when the GROUP ALERT LED is already on, then the function will be reversed and all zones in the group in alert will be turned off.



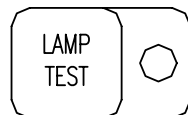
When GROUP EVACUATE is pressed all zones in the programmed group will be placed in the evacuate mode, their EVACUATE LED will turn on, and the GROUP EVACUATE LED will be turned on.
If this key is pressed when the GROUP EVACUATE LED is already on, then the function will be reversed and all zones in the group in evacuate will be turned off.



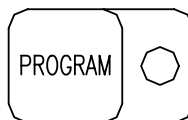
When GROUP PA SPEECH is pressed all zones in the programmed group will be placed in the PA SPEECH mode, their PA SPEECH LED will turn on, and the GROUP PA SPEECH LED will be turned on.
When the "press-to-talk" (ptt) button is pressed on the front panel microphone then speech will be directed to these zones and any alert or evacuate tones will be overridden.
Releasing the ptt button will revert the zones to the next highest function selected.
If this key is pressed when the GROUP PA SPEECH LED is already on, then the function will be reversed and all zones in the group in PA SPEECH will be turned off.



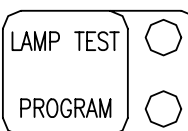
When the WIP GROUP CALL key is pressed no action will occur as this function is currently not implemented.



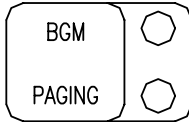
While LAMP TEST is pressed in all indicators for the Fire Phone System will be turned on and the fault buzzer will pulse.



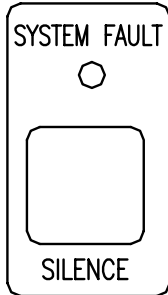
After the PROGRAM key is pressed you can then press another WIP key to program that WIP as a duplicate "Master WIP". I.e. the programmed duplicate Master WIP will ring for incoming calls together with the MECP WIP. Incoming calls can then be answered simply by picking up the duplicate Master WIP, **or** at the MECP by pressing the calling WIP button and picking up the MECP WIP. To cancel this operation, press PROGRAM (turning the LED on), wait a second, then press it again (turning the LED off). Note – on ECM networked systems, the alternative WIP must be wired to the panel you are programming.



While the LAMP TEST/PROGRAM key is pressed and held on the Evacuation System all indicators on the Evacuation System will be turned on and the fault buzzer will sound.



The BGM/PAGING key is used in programming mode and in fault analysis.



When SILENCE is pressed the buzzer will be turned off if it is on and any flashing alarm or fault indicators will become steady. If it is pressed in and held for two seconds then any latched alarm or fault indicators will be cleared. The LED will remain on for any alarm or fault still present.

The alarm or fault must be rectified before the LED can be turned off. Refer to Section 6 for more details on the alarm and fault indications.

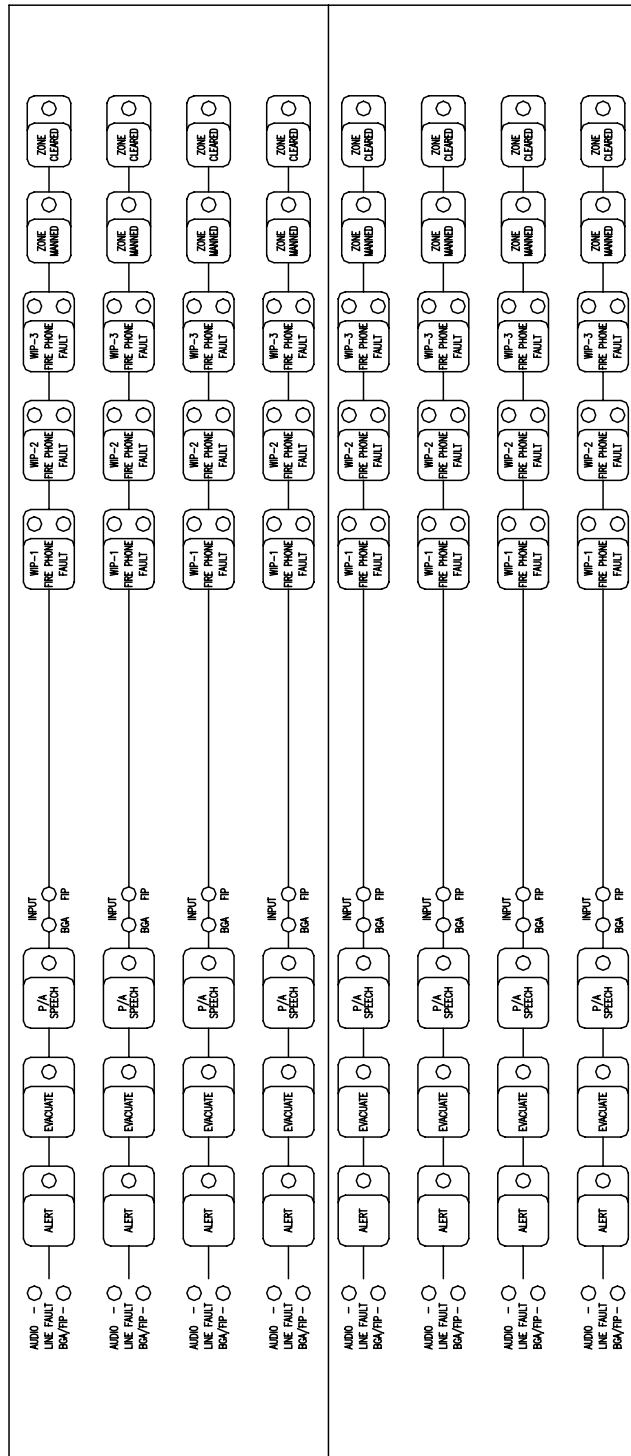


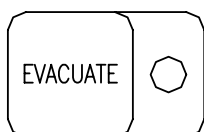
FIG 5.2
8 ZONE, 3 WIP/ZONE KEYBOARD DISPLAY

5.3 INDIVIDUAL ZONE KEYS

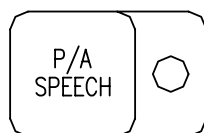
The Master Keyboard module contains the first two zones and further zones are provided by the addition of 8 zone Keyboard/Display Expansion modules. An 8 zone, 3 WIP per zone keyboard display layout is shown in Fig 5.2.



When ALERT is pressed the alert tone will be generated in the particular zone. Pressing the key again will turn off the alert tone.



When EVACUATE is pressed the evacuate tone will be generated in the particular zone. Pressing the key again will turn off the evacuate tone.



When PA SPEECH is pressed PA SPEECH will be generated in the particular zone if the press-to-talk (ptt) button is held down on the front panel microphone. Pressing the key again will turn off the PA SPEECH.

The Evacuation System Alert, Evacuate and PA Speech functions have an increasing prioritisation. I.e. the Evacuate tone will be generated for the zone if both the ALERT and EVACUATE LEDs are on. Similarly, if PA SPEECH is on and the Microphone PTT switch is pressed in, then speech will override any alert and evacuate tones selected.)



When the WIP button is pressed it can be used to call or answer a remote WIP phone on the associated zone.

To Call A WIP: Press the button for the relevant WIP. The associated LED will flash and the remote WIP phone will ring until the WIP is answered (LED goes steady). The voice connection is then automatically established. If the WIP button is pressed while voice connection is present then the remote fire phone will change to a calling status and the associated LED will return to flashing (this will mimic a hold facility). If the remote fire phone is placed back on hook the connection is broken and the LED indicator will turn off (automatic cancellation).

To Answer a call: When the remote fire phone is lifted off hook a confidence tone is heard in the earpiece, the ECP is signalled and indicates the WIP by flashing the appropriate WIP LED and ringing the Master phone if it is not already in use. When the WIP button is pressed a voice connection with the remote WIP is established and the LED changes to steady. If the button is pressed again then the remote fire phone will return to the calling status and the LED will flash indicating the phone is off-hook. If the remote fire phone is put back on hook at any time then communication is disconnected and the LED will turn off (automatic cancellation).

At the remote fire phone a confidence tone will be heard whenever the phone is off-hook and the talk mode is not established at the ECP.

Notes

1. It is possible to call and talk to a number of WIPs at the same time. However, as each additional WIP is selected for talk mode then the quality of the voice connection may be degraded.
2. It is not possible to call or answer a WIP while the FAULT LED is flashing or on. The fault must be rectified and cleared before a call can be made or answered.

WARNING

Do not manually operate the hook switch of any WIP or ECP phone while holding the earpiece close to your ear. Always replace the handset to operate the hook switch. Some makes/models/ configurations of WIP phones use the earpiece to generate the ring sound and this may be uncomfortably loud if it is close to your ear.



When ZONE MANNED is pressed it will toggle the LED on or off as appropriate. This is a log indicator and has no effect on system operation. The operator can use it to record when the zone is manned or not.

The LED can also be turned on from a pushbutton on the WIP line. It can only be turned off by pressing ZONE MANNED when the LED is on.



When ZONE CLEARED is pressed it will toggle the LED on or off as appropriate. This is a log indicator and has no effect on system operation. The operator can use it to record when a zone has been cleared.

6 FAULT / ALARM INDICATORS

6.1 GENERAL

Both the Evacuation and Fire Phone systems have built-in fault monitoring to detect faults on the zone wiring or the failure of an essential module within the EWIS system. Fault indication is given for the following faults:

1. Audio/Visual output line fault or amplifier failure
2. FIB/BGA line fault
3. WIP line fault
4. Mains/Charger fault
5. Battery Fault (circuit breaker tripped or low voltage)
6. Evacuation System CPU watchdog fault
7. Fire Phone CPU watchdog fault
8. Power supply failure on ECP module
9. Cable fault between ECPs and/or remote equipment racks
10. Loss of communications with or failure of a necessary module in the Evacuation or Fire Phone System. This includes SECP units if part of the system.

When a fault is detected the associated LED is set flashing and the fault buzzer sounds. The SILENCE button can be pressed momentarily to silence the fault buzzer and turn all flashing indicators to steady. The flashing indication will also change to steady and the buzzer automatically silence if the fault goes away. However, the flashing LED and buzzer will restart if the fault recurs, even if it has previously been silenced.

Fault indications are latched so that the cause of transient faults can be determined. To clear the latched fault indications it is necessary to rectify the fault condition and then press and hold the SILENCE button for two seconds.

When a FIP or BGA alarm is detected the buzzer and LED operate in the same way as a fault i.e. they flash (or beep), and require silencing and clearing once the alarm condition has been removed. Note that in a system with any SECPs, when a second ECP is powered up the system will copy the current status, including latched faults, from the ECP which was already running. Be sure not to interpret these latched faults as current faults.

6.2 LINE FAULT INDICATORS

AUDIO LINE FAULT

This indicates a fault in the audio output stages of the zone amplifier or a short or open circuit on the speaker or strobe light wiring. If the fault is a strobe line fault then the Strobe Master Module within the equipment rack will have its red fault LED flashing. (For systems with the STRM9502 strobe relay module, its Red LED will be flashing if the fault is still present, or steady if the fault has returned to normal. In the latter case, the red LED can be extinguished by switching the MECP to ISOLATE and back to MANUAL or AUTO.)

If many audio line fault LEDs are on and the Evacuation System FAULT LED is also on then the fault is probably due to failure of the EMUX9002 or STRM9502 modules for these zones.

FIP/BGA LINE FAULT

This indicates a fault on the wiring for the FIP or BGA inputs or failure of the FIP/BGA module if the FIP or BGA ALARM LEDS on the "ALL" zone and the Evacuation System FAULT LED are also on.

FIRE PHONE LINE FAULT

This indicates a fault on the wiring for the WIP line or failure of the appropriate WIPS9004 module if the master module Fire Phone FAULT LED is also on.

6.3 SYSTEM FAULT INDICATORS

Loss of communication with, or failure of, one of the essential modules in the EWIS, or failure of an essential cable connecting an SECP or remote equipment rack to the MECP, will result in flashing of the EVACUATION SYSTEM FAULT LED and/or WIP SYSTEM FAULT LED. If the fault is a module fault and only some zones are affected then the fault LEDs for those zones will also flash.

The way in which system faults are shown differs between the various software versions. Refer to the appropriate following sections.

Version 1.xx Software System Faults

Figure 6.1 shows the system fault indications for systems with version 1.xx software, ie for systems without SECPs and for systems with SECPs shipped before November 1995.

Note that when the EVAC, PA, ZONE MANNED and ZONE CLEARED LEDs are indicating module faults, they will flash regardless of whether or not the fault is still present or has been acknowledged. Zone functions can still be carried out on zones that are indicating module faults. The zone function indication will take precedence but when turned off will re-indicate the module fault.

"Module failure" as used in the diagram includes failure of the module and/or a cable failure which prevents communication with the module.

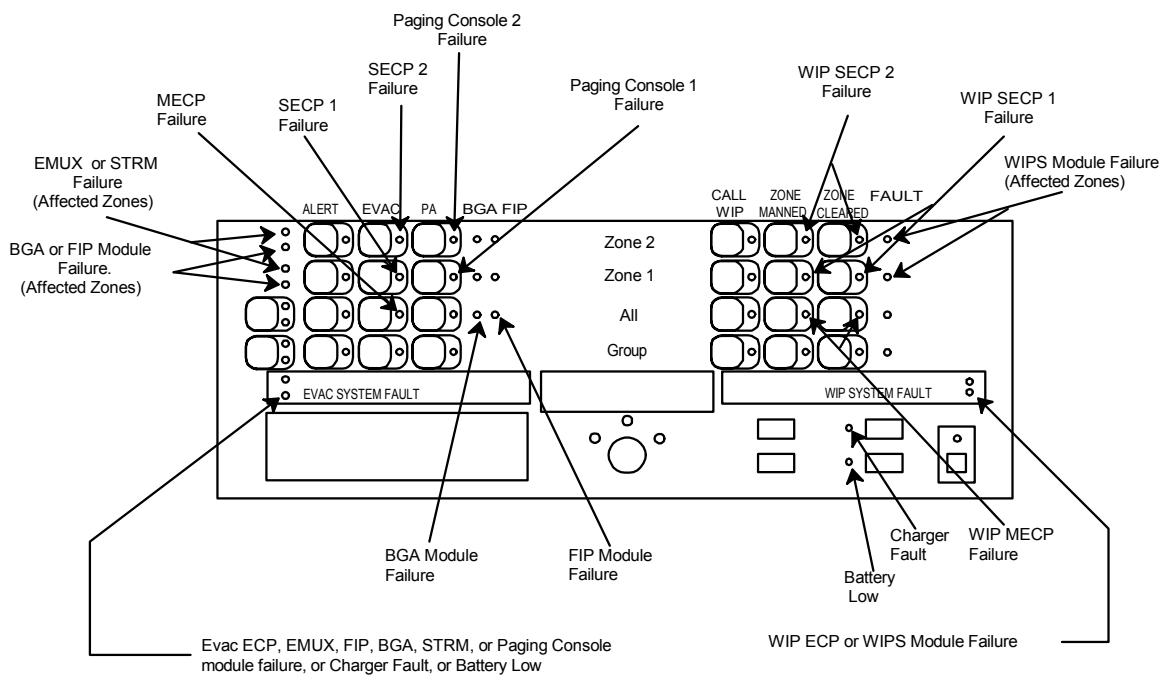


Figure 6.1 QE90 Version 1.xx Software System Fault Display

Version 2.xx/4.xx Software System Faults

Figure 6.2 shows the system fault indications for systems with version 2.xx/4.xx software, ie for systems with an SECP, remote equipment, or a Paging Console shipped after November 1995.

Note that it is necessary to switch to manual and press and hold the BGM key to display the faults shown on those LEDs which are normally used for other purposes (Alert, Evacuate, PA, Zone Manned and Zone Cleared).

"Module failure" as used in the diagram includes failure of the module and/or a cable failure which prevents communication with the module. Note that sometimes a module failure will also cause a communications cable failure to be indicated, if that module is used to switch communications cables, eg any ECP or a remote FIP module. A module failure is indicated if a module cannot be communicated with over both communication cables. A communications cable failure is indicated if a module can be communicated with over one bus but not the other. The PA Speech, WIP Speech, and Spare Speech cables are monitored a little differently - an ECP at one end of the cable checks for the presence of an End Of Line device at the other end of the cable.

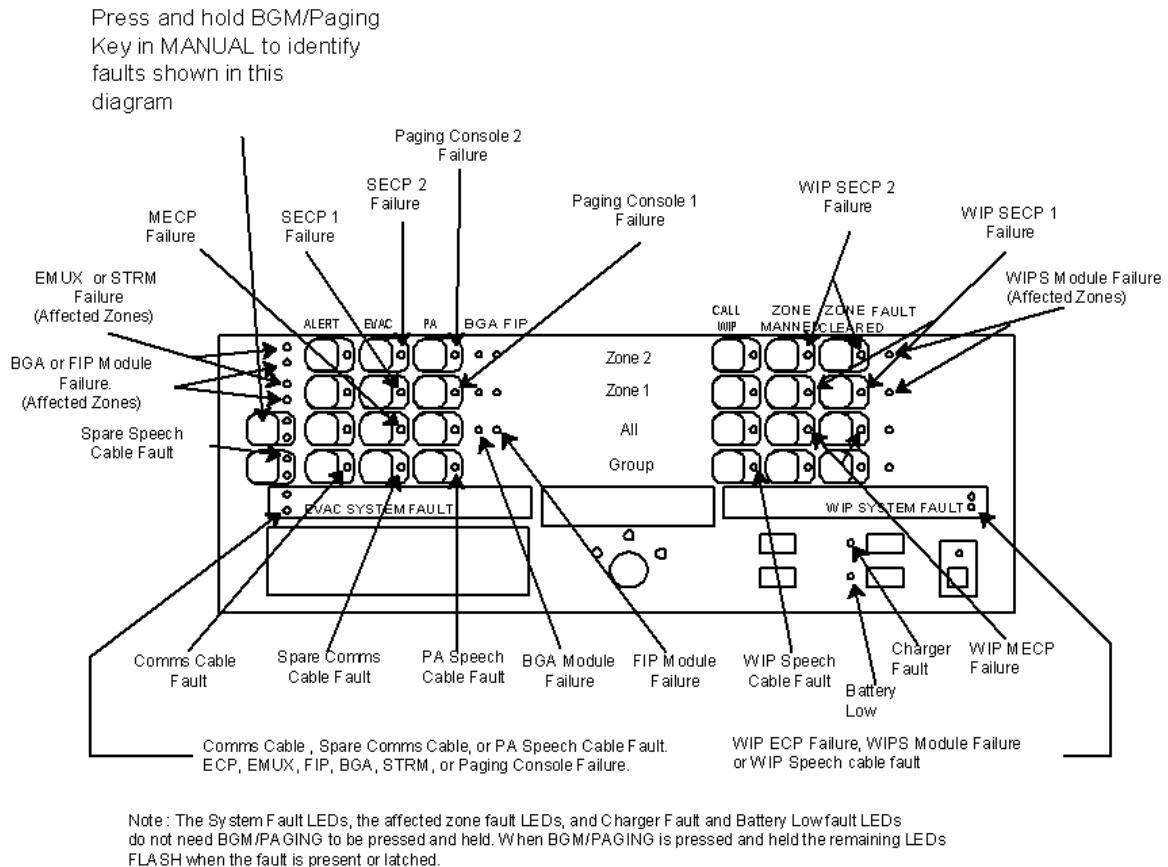
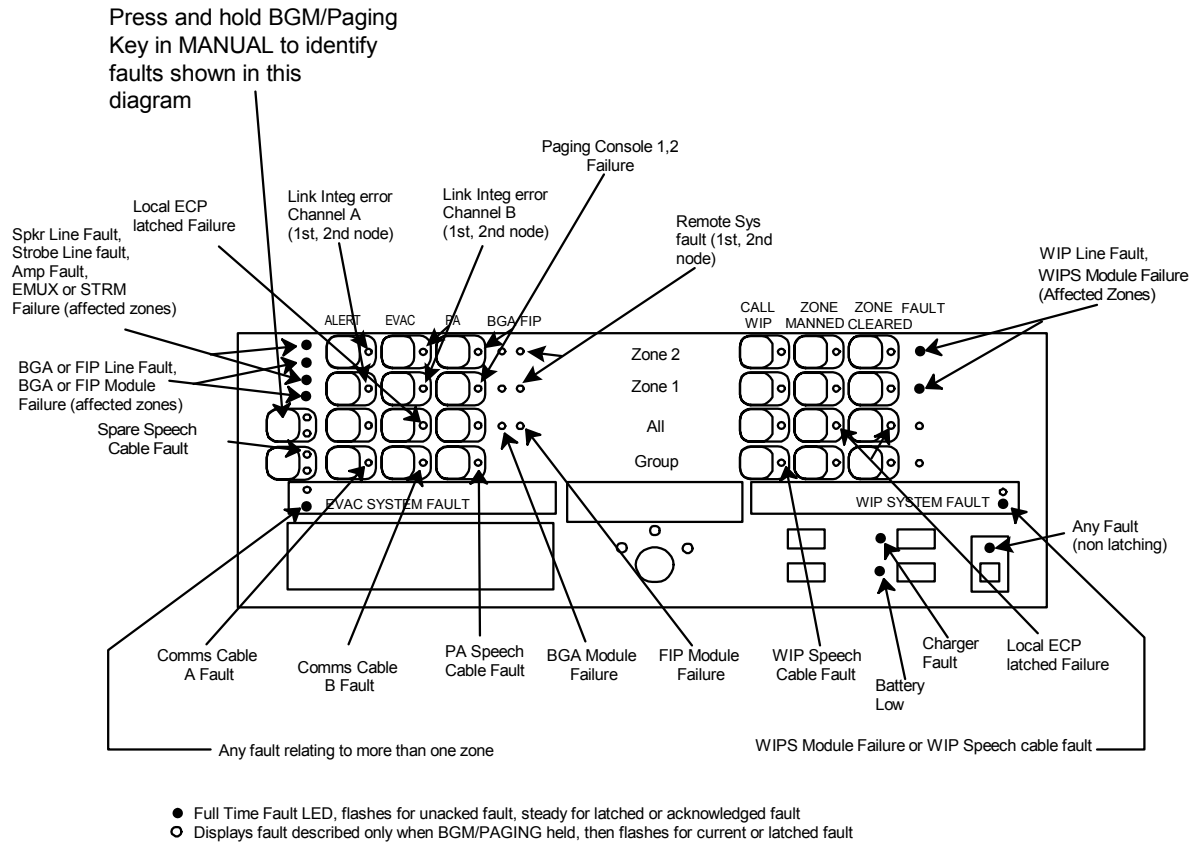


Figure 6.2 QE90 Version 2.xx/4.xx Software System Fault Display

ECM Networked Systems

In an ECM networked system the fault LEDs on the ECP function in a similar manner to those for non networked software, with some additions. Refer to Figure 6-3 for more details.

All these faults are displayed as flashing indications for current or latched faults. Further more detailed diagnostic facilities are available to a service technician using a laptop connected to the ECM module.



QE90 ECM Networked System : System Fault Display

Figure 6-3 QE90 ECM Networked System Fault Display

6.4 ACKNOWLEDGING FAULTS/ALARMS

To acknowledge faults or alarms and silence the buzzer, press the SILENCE button briefly. The flashing fault or alarm LEDs will become steady and the pulsing audio alarm will be silenced. At an ECP which is not in control, this will silence the buzzer only briefly, to acknowledge the fault or alarm the ECP must be switched to MANUAL.

6.5 CLEARING LATCHED FAULTS/ALARMS

To clear latched fault or alarm indicators once the fault or alarm condition has been rectified, press and hold the SILENCE key for a 2 second period, with the keyswitch in the MANUAL or ISOLATE position. The SYSTEM FAULT LED, the zone FAULT LEDS, and the zone FIP/BGA ALARM LEDS should turn off.

If any faults or alarms have not been rectified then the LED will remain on indicating the fault or alarm is still present.

6.6 ISOLATED ZONES

Zones that have been isolated by the service person will be shown with the ALERT, EVACUATE and PA SPEECH LEDs all flashing together. When a zone is isolated, FIP/BGA inputs will still indicate but will not generate any fault or alarm conditions, manual controls will not work and the automatic cascade will not generate ALERT and EVACUATE tones for that zone. However the automatic cascade will illuminate the ALERT LED and/or the EVACUATE LED for isolated zones as they are stepped over. This does not result in tones being sent to those zones. These LEDs can be reset from the keyboard when the system is switched to MANUAL.

6.7 SYSTEM FAULT LED

The SYSTEM FAULT LED above the SILENCE button will flash and the beeper will sound when a fault or alarm occurs on either the EVACUATION SYSTEM or the WIP SYSTEM. When the fault or alarm is acknowledged by briefly pressing SILENCE, the beeper will stop and the LED will change to steady.

If a fault or alarm is transient, then when it goes away the beeper will stop and the LED will go out even though other acknowledged or latched faults may remain. If other unacknowledged faults remain, the beeper will continue sounding and the LED will continue flashing.

This LED will also go out on completion of a LAMP TEST, unless unacknowledged faults remain present.

7 COMMISSIONING CHECKLIST

7.1	CHECKLIST
------------	------------------

MULTIZONE EWIS PANEL:

JOB NAME:

JOB NUMBER:

PANEL SERIAL NUMBER:

Panel Checklist

Please place a tick in the space provided, if check is correct, if not give details in the space provided.

	Y	N
Cabinet colour - Oatmeal/Cream Wrinkle - Other: specify	<input type="checkbox"/>	<input type="checkbox"/>
Cabinet undamaged (No paint chips, doors aligned OK)	<input type="checkbox"/>	<input type="checkbox"/>
Key lock type - Standard 003 or similar - Other: specify	<input type="checkbox"/>	<input type="checkbox"/>
Cabinet sealed - To dust level only - To other: specify	<input type="checkbox"/>	<input type="checkbox"/>
Power Supply fitted and output wired correctly	<input type="checkbox"/>	<input type="checkbox"/>
Mains switch fitted and wired correctly	<input type="checkbox"/>	<input type="checkbox"/>
All cabinet earths wired correctly and securely fitted	<input type="checkbox"/>	<input type="checkbox"/>
Display FRC cable neat and plugged firmly into modules	<input type="checkbox"/>	<input type="checkbox"/>
Battery Capacity :	_____	
Power supply fuse - fitted and rated at :	_____	
WIP slave boards fitted correctly	<input type="checkbox"/>	<input type="checkbox"/>
Rating label completed	<input type="checkbox"/>	<input type="checkbox"/>

Power Up

Y N

Charger output voltage at BATT + 27.3VDC (@ 20DEG)

Quiescent panel current from battery (Mains Isolated) :

System Operating LEDs flash (2Hz)

LAMP Test OK

Display LEDs aligned and all intensities similar

Function keys aligned and operate easily

MANUAL Mode Test - Each Zone

Alert Tone OK

Evac Tone OK

PA Speech OK

Visual Output OK

FAULT MODES operating correctly

- WIP lines - O/C & S/C

- Speaker lines - O/C & S/C

- Strobe lines - O/C & S/C

- FIP lines - O/C

- BGA lines - O/C

AUTO MODE Test

Cascading of zones correct

Time delays operate as programmed

Passed 24 hour burn-in period

TEST COMPLETE, passed Q/A check

Name of Tester:

Signature:

Date of Test:

8 SYSTEM MAINTENANCE

8.1 MONTHLY TESTING

The QE90 EWIS Panel is designed for high reliability and minimum maintenance. However, in order to comply with the requirements of AS1851.10, the owner/occupier (or nominated representative) must carry out periodic inspections and maintenance checks.

The recommended procedure for monthly testing is :

- STEP 1: Inform all building occupants that testing is to take place. Inform the local fire control authority, if required, that testing of the EWIS is to take place and that simulated fire alarm calls may be generated from the Fire Indicator Panel.
- STEP 2: Visually inspect the cabinet and panel to ensure it is clean, operable and that system components are free from damage. Inspect the dust seal and ensure that it is undamaged.
- STEP 3: Place the panel in the MANUAL operating mode and perform a lamp test for both the Evacuation and Fire Phone Systems. Check that all LEDs operate.
- STEP 4: Check the operation of each zone by selecting each of ALERT, EVACUATE and PA SPEECH tones and verifying that the speakers and warning lights are operational.
- STEP 5: Check the operation of the Warden Intercom function for each installed WIP by calling each WIP and requesting that they call the Master back.
- STEP 6: Where the system is connected to a Fire Indicator Panel, place the EWIS panel in AUTO mode and simulate a fire alarm at the associated FIP. Check that the alarm is indicated at the MECP as well as any connected SECP. Check that the ALERT tone is automatically distributed to the appropriate zones with the correct time delay.

When the time delay has expired, the tone should automatically change to the EVACUATE tone interspersed with the digitised voice message.

If the EWIS is fitted with a cascade sequence, check that the automatic evacuation sequence is initiated from the alarm zone and that it spreads throughout the building.

Return the keyswitch to MANUAL and turn off all selected tones and remove the simulated fire alarm.

- STEP 7: Return all panel switches and controls to their normal operating position.
- STEP 8: Inform the building occupants and the local fire control authority that testing is concluded.
- STEP 9: Record the results of these tests in the logbook and ensure that the owner signs the logbook.

8.2 SIX MONTHLY TESTING

In addition to the monthly testing described above, perform the following additional tests at six monthly intervals.

- STEP 1: Visually check the location, installation and siting of all equipment against the system installation record contained in the operator handbook or installation drawings. Check for any building or occupancy alterations that may alter the effectiveness of the audible or visual warnings. Report and record any discrepancies.
- STEP 2: Check that the battery float voltage and currents are within the specified tolerance.
- STEP 3: Disconnect the AC mains and check that the standby battery voltage under full load conditions is not less than 95% of the nominal battery voltage (not charge voltage).
- STEP 4: Measure and record the audible sound level in each zone. Check that it is in accordance with previous measurements.
- STEP 5: If visual warning lights are installed, check that they operate and the flash rate is between 60 and 120 flashes per minute.
- STEP 6: Record the results of these tests in the log book and ensure that the owner signs the test report.
- STEP 7: Inform the building occupants and the local fire authority that testing is concluded.

8.3 YEARLY TESTING

In addition to the six monthly test, the following additional tests are to be performed yearly:

- STEP 1: Remove the battery from the system and replace it with one of the same or greater capacity.
- STEP 2: Discharge the removed battery at the current as specified in AS1851.10.
- STEP 3: Check that the time taken to reach the battery flat level is greater than 90 minutes.
- STEP 4: Recharge the battery to a capacity greater than 95% of its initial charge and reconnect.
- STEP 5: Record the results of these tests in the log book and ensure that the owner signs the test report.
- STEP 6: Inform the building occupants and the local fire authority that testing has concluded.

APPENDIX A**CONTRACT & SYSTEM DETAILS**

For operator reference please complete the following charts on the location, installation and configuration of the QE90 Panel.

CONTRACT DETAILS

PANEL SUPPLIED BY	
INSTALLATION LOCATION	
CONTRACT/JOB NUMBER	
SERIAL NUMBER	
SYSTEM DRAWING NUMBER (AS INSTALLED)	ISSUE
DATE PANEL INSTALLED	
DATE PANEL COMMISSIONED	
MAINTENANCE COMPANY	
TELEPHONE	B.H. A.H.
SERVICE CONTRACT	
SITE CONTACT OR REGISTERED USER (INCLUDE TITLE)	
COMPANY/ADDRESS	
TELEPHONE	B.H.

TABLE 1**PANEL CONFIGURATION**

CASCADE ENABLED Y / N	SPECIAL CASCADE Y / N
DELAY BEFORE ACTION	
INITIAL TIME OUT	
SUBSEQUENT TIME OUT	

TABLE 2

