QE90
INSTALLATION & COMMISSIONING MANUAL

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The QE90 is a product of

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EMC COMPLIANCE

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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AMENDMENT LIST

Issue 1	17 October 1990	Original.
Issue 2.0	1 March 1996	Rewritten.
Issue 2.1	12 August 1996	Section 15 updated - EMUX9601 added.
Issue 2.2	7 March 1997	Chapter 20 added - ECM9603. Pages i - vi, 13-4,16-2 modified.
Issue 2.3	27 August 1997	TRAN9705 / 9706 added to Chapter 4. Chapter 21 (ALIM9706) added. Numerous other amendments - all pages reprinted
Issue 2.4	11 November 1997	Preface – changed Table of Contents. Chapter 3 – added description of HLL etc in config printout. Chapters 6 & 7 - added details of WIP circuits used as FIP/BGA inputs. Chapter 9 – added SPIF9709 to 9.1. Chapter 13 - added new sentence to 13.1. Chapter 16 – added SPIF9709 to 16.2, added 16.6 master phone termination. Chapter 18 - added DIN rail and standoff mounting versions of modules. Chapter 20 – inserted 20.4 isolated WIP/PA Bus segments. Chapter 22 – new chapter.
Issue 2.5	Issue 2.5	19 June 1998 19 June 1998 Chapter 6 - RWIF9803 added.
Issue 2.6	3 November 1998	Added further details of LEDs and links. Added Power Supplies to Chapter 12. Added 200W amplifier. Added AS/NZS3548 Class A notice. Chapter 23 added (Printer / terminal connection).
Issue 2.7	9 February 1999	Chapter 2- added earth warning 2.4. Chapter 7 - updated for FIB8910 Issue E. Chapter 18 - added Mylar keyboards to spare parts list, explained metal / plastic DIN rail mounting hardware.
Issue 2.8	5 July 1999	Chapter 6 - Added MWIP9903 Chapter 14 - Fix DIP switches for ccts 180-199 Chapter 18 - Add MWIP9903 part numbers
Issue 2.9	8 May 2000	Chapter 6 - MWIP9903 - added 10k to 24V
Issue 2.91	15 August 2000	Section 9.4 and Chapter 24 added
Issue 2.92	9 July 2001	Chapters 6/14 - WTRM2000/WIPS2000 detail added. Figure 20.4 added, Section 13.5 added, Section 16.3, 18.1 amended. System Wiring Diagrams updated.
Issue 2.93	19 May 2003	Chapter 12 – PSU2406/12 ratings corrected.
Issue 3.00	12 Nov 2003	Added maximum cable lengths (Chapters 4,6,7,8). Added script interpretation (Chapter 3). STRM module (Chapter 8) - Added note re too short wiring, specified cable for 10% drop not 5%. Added DIP switch settings for flashing incandescent lights. Expanded battery sizes which will fit. (Chapter 12) Expanded network wiring (Chapters 13 and 20). Updated Spare Parts List (Chapter 18) Expanded ECM programming and Off Normal Conditions. (Chapter 20)
Issue 3.01	19 August 2004	Added 1.3 Safety Precautions. Added typical battery arrangements. (Chapter 12) Added ISO tone selection (Chapter 15) Expanded details of interconnecting ECMs via IHUBs. (Chapter 20) Added Simplex High Level Link. (Chapter 22) Added Widget board fitting and programming. (Chapter 25) Other minor corrections.
Issue 3.02	29 November 2004	Added new speech message options to Chapter 15. Added details of Widget Board ECP Interchangeability. (16.3) Recommended amplifier volume controls set to maximum. (17.4) Moved cascade sequences from LT0087. (24.3) Added reference to AS1670.4 (1.1) Removed reference to KT0465 (25.2).

1 INTRODUCTION

1.1 MANUAL CONTENTS

This manual contains the information needed to install and commission a QE90 system.

Related documents are -
LT0087 : QE90 Operators Manual
LT9002 : QE90 Technical Manual
LT0114 : QE90 Paging Console Operation and Installation Manual
LT0132 QE90 Training Manual : Installation and Commissioning
AS2220 : Emergency warning and intercommunication systems in buildings…
AS2220.1 : Equipment design and manufacture
AS2220.2 : System design, installation, and commissioning
AS1670.4 : Fire detection, warning, control and intercom systems – System design, installation and commissioning. Part 4: Sound systems and intercom systems for emergency purposes.

LT0087 is supplied with every QE90 system, LT0114 is supplied with every Paging Console. LT9002 and LT0132 can be ordered separately when required.

This Manual also contains reference information about DIP switch and link settings. This information is usually not needed when installing a new system as it will have been set up correctly in the factory, but is included here for completeness and for reference when fitting spare parts or upgrading systems.

1.2 GLOSSARY

BGA	Breakglass Alarm (Emergency Call Point)
DIP	Dual Inline Package
ECP	Emergency Control Panel
EWIS	Emergency Warning and Intercommunication System
FIP	Fire Indicator Panel
GP	General Purpose
PCB	Printed Circuit Board
MECP	Master Emergency Control Panel
SECP	Secondary Emergency Control Panel
WIP	Warden Intercommunication Point

1.3 EQUIPMENT HANDLING PRECAUTIONS

Basic precautions should be observed at all times when working with any electronic circuits. Ensure you are earthed before touching any components or connections. Never plug or unplug cards from a rack when power is applied. Remove power from any module before making any changes to the module.

2 CABINET INSTALLATION

2.1 CABINET MOUNTING

The important aspects of mounting the cabinet are :

- To allow easy access for wiring.
- To allow easy access for operation. AS2220.2 (Figure 2.1) requires at least 600mm of clear space either side of the control panel and 1000mm of clear space in front of it.
- To ensure the controls are mounted as per AS2220.1 section 4.1.1 i.e. between 750mm and 1850mm from floor level.

In general 18U, 21U and 28U Cabinets will need to be wall mounted to achieve the control heights. 40U cabinets can be floor mounted, but if more than 34 display zones are fitted to a 40U cabinet it may need to be fitted on a plinth.

2.2 MAINS WIRING

Mains must be permanently wired by an electrician to the GPO outlet inside the QE90 cabinet. See AS2220.2 section 4.2 - no other load may be connected to the circuit, and the circuit must be separately fused.

2.3 INTER-CABINET CONNECTIONS

If the system comprises more than one cabinet (at a given location), then some of the factory fitted wiring between the cabinets will need to be restored at installation.

- Connect the 26 way ribbon cable supplied between all the SIGNALS IN connectors on the backplanes of all the cardcages.
- If only one power supply is fitted, connect the backplane power in the second cabinet to the unused heavy red and black cables from the power supply in the first cabinet.
- If two or more power supplies are fitted it is recommended that you wire the power supplies and batteries as shown in Figure 12-5.
- If there are FIB8910 input modules or STRM9502 output modules in the second cabinet, their power and comms connections will need to be daisy chained off power and comms terminals on a similar module in the first cabinet. Refer to drawing 699-177 at the end of Chapter 19.
- If there are keyboard/display modules in the second cabinet, connect the 20 way ribbon cables supplied from the connectors on each side of the bottom of the lowest display module in the second cabinet to the connectors on each side of the top of the highest display module in the first cabinet.

2.4 EMC COMPLIANCE

WARNING This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

To maintain EMC compliance when replacing modules, ensure that module earthing arrangements are maintained. Refer to Section 18.3 for details.

3 PANEL CONFIGURATION

3.1 SYSTEM DESIGN

3.1.1 GENERAL

The cabinet layout will depend on the particular system's configuration, and depending on the number of modules of various types required, the modules will be located differently.

Although the inputs and outputs will be identified with labels attached to each system during manufacture, subsequent reconfiguration may override that information. It is very important to retain the printout of the system configuration supplied by Tyco with each new system and with any re-configured software, as it is the only place where complete information about the panel's currently correct configuration is to be found.

3.1.2 CONFIGURATION PRINTOUT (NOT NETWORKED)

A typical example of a configuration printout follows-

```
qe0900.cfg dated 16/11/1995   10:57:06
qe0900.bin dated 16/03/1995   10:59:28  Version 4.10
Seg 4614 K$fdd7 Ver 1.92 QE0900 Murphy's Irish Bar        10:59 16/11/95


;     QE0900 : Murphy's Irish Bar

 Zone Amps      Pwr  Tfr  Strobes     FIP I/Ps    BGA I/Ps    WIP ccts
  1   1         100W 1                  1         F25           1   2   3
  2   5         100W 2                  2         F26           4   5   6
      38        10W  10
  3   9         50W  3      1  2  3     3         F27           7   8
  4   10        50W  3                  4         F28           9  10
  5   13        50W  4                  5         F29          11
  6   17:18     25W  5                  6         F30          12  13  14
  7   21        10W  6                  7         F31          15
  8   19:20     25W  5                  8         F32          16  17  18
  9   22        10W  6                  9         F33          19
 10   23        10W  6                 10         F34          20
 11   24        10W  6                 11         F35          21
 12   25        10W  7                 12         F36          22
 13   26        10W  7                 13         F37          23
 14   27        10W  7                 14         F38          24
 15   28        10W  7                 15         F39          25
 16   29        10W  8                 16         F40          26
 17   30        10W  8                 17         W37          27
 18   31        10W  8                 18         W38          28
 19   32        10W  8                 19         W39          29
 20   33        10W  9      4          20         W40          30
 21   34        10W  9                 21         W41          31
 22   35        10W  9                 22         W42          32
 23   36        10W  9                 23         W43          33
 24   37        10W  10     5  6       24         W44          34  35  36

FIP inputs Normally Open    BGA inputs Normally Open
1 SECP
FIP     Relay 1 :Any Alert/Evac/PA/Page
FIP     Relay 2 :Fault or Alarm

CASCADE SCRIPT
An|=An-2|An-1|An+1
En|=An
```

The first line gives the creation/modification date of Tyco's configuration file for the system. The second line gives the creation date of Tyco's copy of the software EPROM for the Evacuation ECP, and the version used to create it. The third line is from Tyco's history file and gives the job number (QE0900) and name (Murphy's Irish Bar), the software version (1.92), CRC (fdd7) and Segment number. All this information is also printed on the label of the EPROM and may be used to conclusively match an EPROM with its printout. It should also be noted that the segment number of a later configuration will always be higher than an earlier configuration.

The zone table lists the equipment assigned to each zone. (A zone is a row of indicators and controls on the MECP control panel, where the bottom row is zone 1, the next row above is zone 2 etc). For example Zone 2 controls amplifier 5 (100W on amplifier and transformer module 2) and 38 (10W on amplifier and transformer module 10). Zone 2 alarm inputs are on the FIP module with circuit 2 being designated a FIP input and circuit 26 being designated a BGA input. WIP circuits 4, 5, and 6 are assigned to the three buttons on zone 2. Zone 3 controls amplifier 9 (50W on module 3), and strobe circuits 1, 2, and 3. Its alarm inputs are circuit 3 on the FIP module (designated as a FIP input) and circuit 27 on the FIP module (designated as a BGA input). WIP circuits 7 and 8 are assigned to the two left WIP buttons on zone 3.

If there is more than one amplifier for a zone, or too many other circuits to list on one line, multiple lines of printout will be used for a single zone.

WIP circuits used for BGA and/or FIP inputs are listed as Wxx (where xx is the WIP circuit number) under the headings BGA I/Ps or FIP I/Ps.

High level RZDU inputs will be listed as RZDUxxx (where xx is the Fire Panel zone number). As from November 1997, FIP module inputs used as BGA inputs are listed as Fxx where xx is the FIP module circuit number. Also as from November 1997, if there are multiple FIP and/or BGA modules with not all inputs used on each (for example on a distributed system), the inputs are listed as My xx where y is the module number and xx the circuit on that module.

In the BGA column, numbers listed by themselves are circuits on a BGA input module. In the FIP column, numbers listed by themselves are circuits on a FIP input module.

3.1.3 GENERAL SCRIPT INTERPRETATION

Overview
The following information about the QE90 script language is given so that you can understand some of the simpler logic equations in the scripts. e.g. Fault Outputs and other relay outputs. It is not meant to be a complete reference or a tutorial for the QE90 script language. For more information on the functions of a particular system, refer to the specifications that you supplied to Tyco Safety Products.

Operators. The following are the operators in order of priority (highest first)

(..) Forces evaluation of the enclosed sub-expression at higher priority. May be nested - innermost brackets are evaluated first.

~ Negates the variable or sub-expression in brackets to its right

& Logical AND of the variables or sub-expressions to its left and right

| Logical OR of the variables or sub-expressions to its left and right

= sets output if result of expression is true (1)
clears output if result of expression is false (0)

|= sets output if result of expression is true (1); does nothing if the expression is false;

&= clears output if result of expression is false (0), does nothing if the expression is true;

Multiple Outputs in one statement. This is best described by example -

An : evaluate expression for all values of n from 1 to MAX_ZONE, assign to An
An5-30 : evaluate expression for all values of n from 5 to 30, assign to An
V1n1-30 : evaluate expression for all values of n from 1 to 30, assign to V1

This latter could be used for example to find if any zone from 5 to 25 was in alert -
V1=0
V1n5-25|=An

IF statements
If the expression after the IF is true, statements between IF and ELSE are executed and statements between ELSE and ENDIF are not executed. If the expression is false statements between IF and ELSE are not executed and statements between ELSE and ENDIF are executed.

The ELSE statement is optional. If it is not present it is considered to be immediately before the ENDIF.

These statements may be nested to any level. ELSE and ENDIF statements relate to the most recent IF statement which has not already been matched.

3.1.4 NON-ECM SCRIPT INPUTS AND OUTPUTS

Destinations (the items on the LHS of assignments)

Ax	Alert for zone x x is constant or 'n'
Ex	Evacuate for zone x
Px	PA for zone x
Mx	Music for zone x
Gx	PABX for zone x
Vx	user variable x (Reset to 0 in Manual or Isolate)
Ux	another user variable x, not reset to 0 in manual or isolate
SAx	Speech msg x to be spliced with alert tones
SEx	Speech msg x to be spliced with evac tones
SMx	Speech msg x to be played once to music zones (or all zones see Misc options) (Note to play the message again, 0 must be assigned before 1 is assigned again)
SCx	Speech msg x to be played continuously to music zones (or all zones see Misc options)
RF1	FIP Relay 1
RF2	FIP Relay 2
RB1	BGA Relay 1
RB2	BGA Relay 2
RG1	GP Relay 1 (Also Paging Console active LED)
RG2	GP Relay 2
MA	Select manual if keyswitch in auto for switch based "SECP"
IS	Select isolate if keyswitch in auto for switch based "SECP"
PT	Select PTT on for switch based "SECP"
SI	Silence buzzer (actioned on true going edge of SI)
RES	Reset latched faults & alarms (actioned on true going edge of RES)

LI Fluorescent light output on ECP
TA - TZ are timers, for example
TA30=1 (re)start timer TA for 30 secs,TA30=0 no effect
TC0=1 terminate timer TC immediately (run for 0 secs)

Timers must use = form of assignment (NOT |= or &=). They are retriggerable and the timer will be restarted every time the statement is executed.

Script INPUTS (items which may appear on the rhs of assignments)

Ax Alert for zone x x is constant or n, n+const, n-const
Ex Evacuate for zone x
Px PA for zone x
Vx Set of user variables, cleared in MANUAL.
Ux Another set of user variables, not cleared in MANUAL.
Zx FIP or BGA alarm for zone x in AUTO only. Latching in AUTO.
Fx FIP input x (Not necessarily assigned to a zone)
Bx BGA input x (Not necessarily assigned to a zone)
Ix GP input x

Wx WIP cct x off hook, or switch input is closed
WBx BGA is active on two wire WIP/BGA, switch input is closed, or 4 state switch input has 1200 ohms connected
WQx WIP cct x switch input is closed, or 4 state switch input has 600 ohms connected. Presence of WQx also signifies that cct x operates as a “quick” switch input.
Hx High level link (RZDU) FIP zone x (Not necessarily assigned to an EWIS zone)
AM Any alarm input in AUTO only. Latching in AUTO. (for non-latching use FA|BA)

ZA Any zone active (Alert/Evac/PA+PTT/PABX
BA Any BGA alarm input
FA Any FIP alarm input
FL Any Evac Fault (see also WIP fault below)
KA Keyboard Auto
LF Any evac line fault
MF Any Module fault
CF Charger fault including a remote charger fault if one is configured
BZ Unacked fault/alarm (buzzer operating)
IS Isolate
MA Manual
AU Auto
WF Wip Fault

WM Wip Master Ringing for longer than timeout
T Press to talk
RES Faults have been reset by pressing mute for 2 seconds Note RES is returned as true once only.
TA - TZ Timer A - Z running

The user variables Vx are all cleared in MANUAL, but the variables Ux are not.

Default Relay Programming
The default programming for FIP, BGA, and GP relays (if you program none of them) is
RF1=ZA
RF2=FL|FA|BA
RB1=FL

RB2=FA|BA
RG1=ZA
RG2=IS|MA
If you program any relay, there are no defaults and you must program all the relays you need.

3.1.5 CONFIGURATION PRINTOUT (NETWORKED WITH ECM MODULES)

A typical example of a configuration printout for a single location of a system networked with ECM modules follows-

```
============ V1.50 QE9501 Queenstown Casino MECP Jun 24 1997 ============

                 LOCAL EQUIPMENT                                Zones at SIDs
 Zone Amps    Pwr Tfr Strbs FIPs   BGAs  WIP ccts  S/B GRP 21  22
+ 1   9       50W   3       1             1   2   3  10   0      1
  2                         3             4   5   6       0      2
+ 3   1       10W   1    1  4             7   8   9  10   0      3
  4                                    10  11           0      4
  5   2       10W   1       5            12  13  14  10   0      5
+ 6   5:6     25W   2       2            15  16  17  10   0      6
+ 7                         S1/50        18  19  20       0      7
+ 8                                W22  21               0      8
+ 9                                W24  23               0      9
+10                                W26  25               0     10
 11                                W28  27               0     11
 12   10      50W   3                                    0     12
 13                                                      0     13
 14                                                      0     14
 15                                                      0     15
 16                                                      0     16
 17                                                      0     17
 18                                                      0     18
 19                                                      1  1  19
+20                                                      1  2  20
 21                                                      1  3  21
+22                                                      1  4  22
 23                                                      1  5  23
+24                                                      1  6  24
 25                                                      1  7  25
+26                                                      1  8  26
 27                                                      1  9  27
+28                                                      1 10  28
 29                                                      1 11  29
+30                                                      1 12  30
 31                                                      1 13  31
+32                                                      1 14  32
+33                                                      1 15  33
 34                                                      1 16  34
+35                                                      1 17  35
 36                                                      1 18  36
+37                                                      1 19  37
 38                                                      1 20  38
 39                                                      1 21  39
 40                                                      1 22  40
+41                                                      1 23  41
 42                                                      1 24  42
+43                                                      1 25  43
```

```
 44                                                          1 26  44
+45                                                          1 27  45
 46                                                          1 28  46
+47                                                          1 29  47
 48                                                          1 30  48
+49                                                          1 31  49
 50                                                          1 32  50
 51                                                          1 33  51
 52                                                          1 34  52
 53                                                          1 35  53
 54                                                          1 36  54
+ Evac zone works together with next zone


--------------- CASCADE AND LOGIC SCRIPTS---------------
Special Functions Script
    SE5=1
    SA9=1
    SC12=1
    En1-11&=~F10|F9
    An1-11&=~F10|F9
    En1-11|=F9
    SV=(F9|F10)&~U3
    RE=U3&~(F9|F10)
    U3=F9|F10
    U1=(Z1|Z2|Z3|Z5|Z6|Z7)&AU|F9
    V2=Z2&AU

Alarm Script
    En1-2|=(F1|F3)&~F10
    En3-4|=(F3|F4)&~F10
    E5|=(F1|F3|F5)&~F10
    En6-11|=(F2|F5|F6)&~F10

Cascade Script

--------------- NETWORK INTERFACE -------------------
Network SID 20
--------------- MANUAL CONTROL ARBITRATION--------------

Group  Arbitrating_SID Rem_Group Control_Priority
  0        HERE                  20 21 22
  1          21         0

--------------- MISCELLANEOUS -------------------
Speech messages controlled by script
```

There will be a separate listing for each location on the network. The table is much the same as the table for a non-networked panel, with the following additional information. Each amplifier uses amplifier 10 as a hot standby amplifier. The SID for this location is 20. Each zone at this location corresponds to a zone with the same number at the network location with SID 22. Zones 19 to 54 at this location correspond to zones 1 to 36 at the network location with SID 21. As there is no equipment (amplifiers etc) for these zones at this location, it is likely that these zones have amplifiers at SID 21 or SID 22 - refer to the configuration listings for those location. Zones 1 to 18 are in group 0, and this control for group 0 is “arbitrated” by this location ie SID 20. Control for group 0 will be allocated to SID20 if it is requesting Manual or Isolate, otherwise control will be allocated to SID 21 if it is requesting Manual or Isolate otherwise control will be allocated to SID 22 if it is requesting Manual or Isolate, otherwise these zones will be automatically controlled by this location SID20. (The “arbitrating node” arbitrates manual control or isolate, and takes automatic control if no manual control or isolate is requested. The arbitrating node for a zone should be the zone where the amplifiers are, and the zones are arranged into groups so that this is the case.) Group1 is arbitrated by SID 21.

High level Panel Link FIP inputs will be listed as Sxx/yy where xx is the System ID (SID) and yy the zone or ACZ number. BGA and FIP inputs using WIP circuits are listed as Wxx where xx is the WIP circuit number. BGA inputs using FIP circuits are listed as Fxx where xx is the FIP circuit number.

3.1.6 ECM SCRIPT INPUTS AND OUTPUTS

Script Inputs

AM	latched alarm
AUg	auto for group g
An	alert zone n
As/n	alert sid s zone n
BA	any BGA alarm
BZx	BGA zone x active
BZLx	BGA zone x latched or acked
Bn	BGA alarm circuit n
CF	charger fault
CLg	control currently local for group g
CLg,s	control for group g currently at SID s
Cn	modbus bgm zone n
Dn	modbus pabx zone n
EBn	EMUX n busy (still playing "once" messages) (If no "n", any EMUX)
ET	ECM PTT Input active
En	evac zone n
Es/n	evac sid s zone n
ESF	external (doubletalk) speech generator fault
ES	external speech generator is playing speech
FA	any fip alarm
FL	any fault excluding WIP line faults and Charger faults
FZx	FIP zone x active
FZLx	FIP zone x latched or acked
Fn	fip alarm circuit n
Gn	pabx zone n
Hs/n	high level input sid s zone n (RZDU = sid 0)
JP	join the other pa bus segment
JW	join the other wip bus segment
ISg	isolate group g
In	gp / paging input n

ICn paging input n has changed due to keypress
(returned TRUE only once for each keypress on paging console.
Requires paging console V1.10+)
LF "line" fault - any zone fault
MAg manual group g
MF module fault
Mn music zone n
NFn node fail for SID n
PBU PA Bus used
PBF PA Bus fault
PHR Phone is ringing
PHC Phone has call tone
Pn pa zone n
Ps/n pa zone n at sid s
PIn parallel input n (1..16). Use of this also sets the pins direction to an input.
PT local ptt
PTn ptt for group n
STAn strobe alert circuit n
STEn strobe evac circuit n
SWB WIP / PA busses have swapped due to fault
SWKn special wip key n //1=ALL_CALL2, 2=ALL_CALL3, 3=GROUP1, 4=GROUP2, 5=GROUP3
TA..TZ timers a-z
Tx>y timer x (1..200) has been running for more than y secs
Tx<y timer x (1..200) has been running for less than y secs
T ptt from local ECP or colour graphics
Tx ptt for group x
Un U variable n
Us/n U variable n at sid S
Vn V variable n
Vs/n V variable n at sid S
WBU Wip Bus used
WBF Wip Bus fault
WF wip line fault
WC0 any wip connected on 1st SPIF
WC1 any wip connected on 2nd SPIF
WMR0 wip master ringing due to wip on 1st SPIF group
WMR1 wip master ringing due to wip on 2nd SPIF group
WA wip auto answer mode selected
Wx.y WIP zone x column y (y = 1,2, or 3)"off hook"
WRx.y WIP zone x column y (y = 1,2, or 3)"ringing" (Being called or calling)
WAx.y WIP zone x column y (y = 1,2, or 3) active "off hook" OR "ringing"
Wn wip circuit n off hook, or closed
Xn X zone set zone n
ZA any zone active (alert/evac/pa&ptt/pabx
ZCx zone x cleared
ZMx zone x manned
Zn zone n has latched alarm
Zn<x This is less than the nth time cascade script has been run with zone n in alarm
Zn=x This is the nth time cascade script has been run with zone n in alarm
Zn>x This is greater than the nth time cascade script has been run with zone n in alarm

Script Outputs

AM force alarm processing to begin even though no alarm in a zone at this node.
An alert zone n

Cn modbus music zone n
CI use initial timeout
CM force connect microphone
CTx=1 within cascade script, change timeout to NEXT to x secs
DC disable slave wip confidence tone
DR disable master wip ring
Dn modbus pabx zone n
En evac zone n
ES set to 1 to start external (doubletalk) speech generator. It will reset by itself when finished.
Gn pabx zone n
ISg request isolate for group g
LI ECP fluorescent light output (requires ECP V3.19)
MAg request manual for group g
Mn music for zone n
MSn log (print) message n
PBU Force PA Bus to appear used
PBF Force PA Bus to appear faulty
Pn PA for zone n
PCn Controls LED n for paging console (V1.10+). For consoles other than first, add the number of for previous consoles to n
POn parallel output n (1..16)
PHR Force Phone to ring
PHC Force call tone in Phone
PJ force PA join to other buss segment
PX force PA external connection
RFn FIP relay n (relays 1,2 1st module, 3,4 2nd module etc)
RBn BGA relay n (relays 1,2 1st module, 3,4 2nd module etc)
RGn GP / Paging console relay n (relays 1,2 1st module, 3,4 2nd module etc)
RE restore saved alert/evac if 1 assigned
SAn enable msg n with alert tones if 1 assigned
SEn enable msg n with evac tones if 1 assigned
SMn play msg n once to Music zones if 1 assigned
SCn play msg n continuously to Music zones if 1 assigned
STAn strobe alert circuit n
STEn strobe evac circuit n
SV save current alert and evac state (for RE)
SWB swap WIP / PA busses due to fault
SWF show WIP faults on fault leds default TRUE. When false shows wip manned

SXAa=1 - Play msg a with alert tones to X zone set. To stop set zone set all false.
SXEa=1 - Play msg a with evac tones to X zone set. To stop set zone set all false.
SXOa=1 - Play msg a once to X zone set
SXRa=1 - Play msg a repeatedly to X zone set. To stop set zone set all false.
SXO0=1 - break once messages, wait for EMUX to be ready or 20secs
In all cases if the expression on the rhs evaluates to 0, the statement has no effect.
In all these cases it is the X zone set at the time which counts - the X zones can be changed between the above statements.

TAn(-TZn)=1 start timer A (-Z) running for n seconds
Tn=1 allow timer n (1..200) to run (increment)
Tn=0 reset timer n
Un U variable n
Vn V variable n

WA enable WIP auto answer mode
WBU Force Wip Bus to appear used
WBF Force Wip Bus to appear faulty
WEx WIP_ENABLE for modbus group x
WMAx Wip manned for WIP circuit x
WX Force WIP external connection
Xn X zone set, zone n
ZS enable zone faults/alarms to be simulated
ZBn zone bga alarm simulation
ZFn zone fip alarm simulation
ZAn zone audio fault simulation
ZIn zone input fault (fip/bga fault) simulation
ZWn wip 1 off hook simulation
ZXn wip 2 off hook simulation
ZYn wip 3 off hook simulation
ZCn zone cleared (use only for zone which has local arbitration)
ZMn zone manned (use only for zone which has local arbitration)
ZTn wip 1 fault simulation
ZUn wip 2 fault simulation
ZVn wip 3 fault simulation

3.1.7 FAULT OUTPUT AND OTHER RELAY OUTPUTS

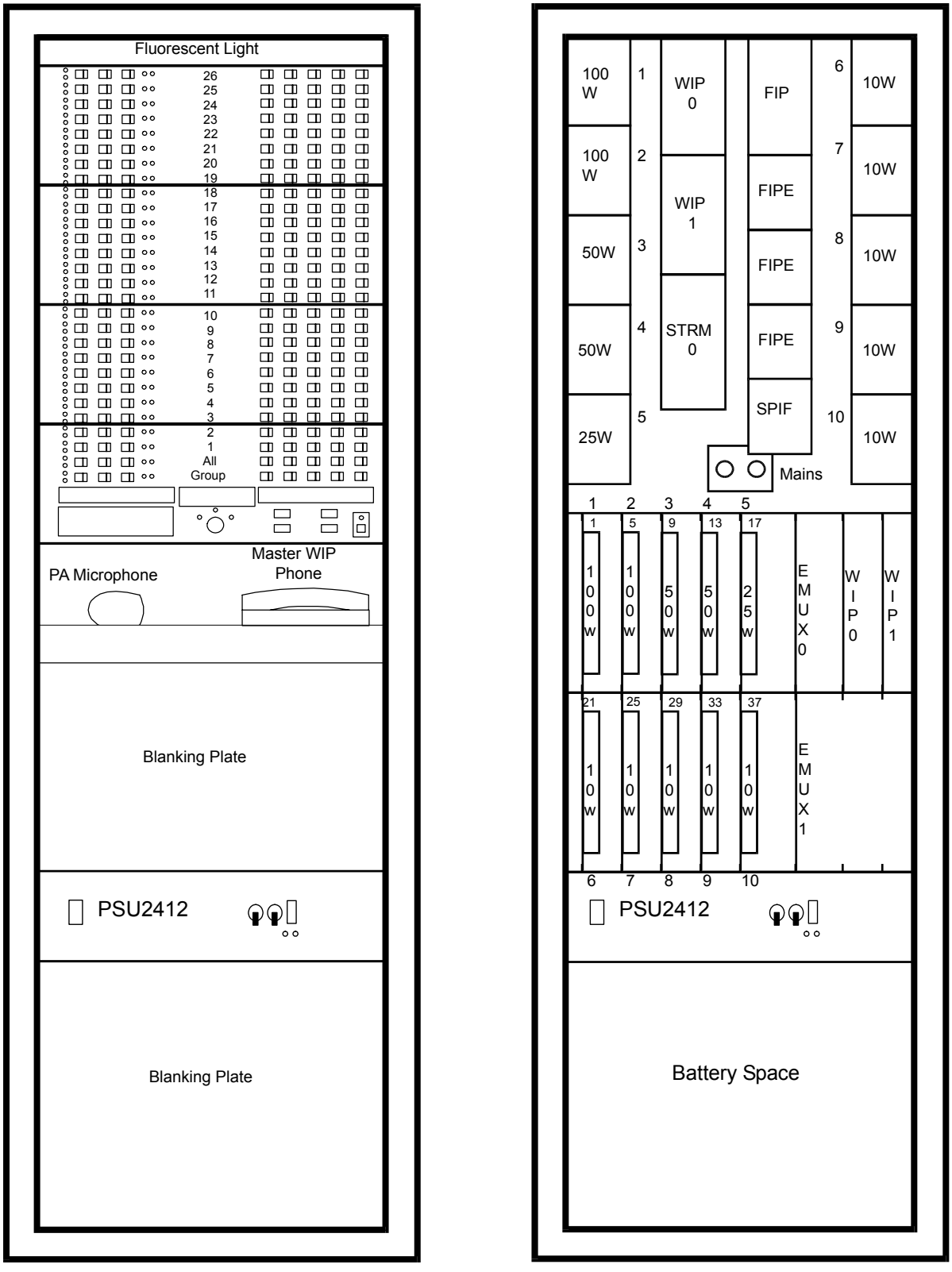
A fault output will be provided by default (if there is hardware available). This will use FIP / BGA module relay output, a spare STRM output, or a relay connected to the ECP fluorescent light output if it is otherwise unused.

Other relay outputs will be provided if specified on the panel's configuration sheet.

3.2 TYPICAL CABINET LAYOUT

Figure 3-1 shows a typical cabinet layout. This system corresponds to the system listed as “Murphy’s Irish Bar”. The diagram shows 26 display zones although the system only has 24 zones. The last two display zones are unused, but are available for future expansion.

Note that the transformer modules are numbered down the left side of the cabinet, then down the right side. The amplifier modules are numbered from left to right across the upper card cage, then from left to right across the lower card cage. Also note that each amplifier module has four amplifier numbers assigned to it, regardless of the actual number of amplifiers on the module. See section 15.3 for more details on amplifier numbering.



Exterior

Interior

Larger numbers beside modules are module numbers.
Smaller numbers are circuit or amplifier numbers.

Figure 3-1 - Typical Cabinet Layout

4 TRANSFORMER MODULES

4.1 PANEL TERMINATION

The speaker line transformer modules, TRAN9705, TRAN9706, HTRN9308, and TRAN200 are located down the inner wall on each side of the cabinet(s) and contain the 100V line transformers and monitoring circuits, as well as providing termination points for speaker zone wiring. (Older transformer module types are TRAN8872 and TRAN9304.)

Speaker zone wiring must be terminated to the correct zone number designated by Tyco on the label on the speaker line transformer module at the time of manufacture. If subsequent modifications are made to the configuration you must consult the latest configuration printout to locate the correct output terminals to connect a given zone's speaker line(s).

If a zone has more than one amplifier assigned, all amplifiers must have separate cables to separate groups of speakers. It is not possible to parallel amplifier outputs.

Please note that the 26 way ribbon cables which run from the transformer modules to the Backplane have Pin 1 at one end connected to pin 26 at the other end. This is different to the 26 way cable which runs from the backplane to the signals interface module. Be careful not to mix these two cable types.

TRAN9304-2, TRAN9304-4, TRAN9705-2, TRAN9705-4, and TRAN9706-2 have relays fitted and can switch in one or more standby amplifiers to replace any faulty amplifier(s). TRAN9304-2 and TRAN9304-4 can only be used in systems with standby amplifiers. TRAN9705-2, TRAN9705-4, and TRAN9706-2 can be used in systems with or without standby amplifiers, with appropriate link settings. The HTRN9308 and TRAN200 always have standby relays fitted but do not require jumpers to select whether or not they are used.

4.2 CONNECTION POINTS

Figure 4-1, Figure 4-2 and Figure 4-3 show the connection points for the speaker wiring on the different transformer modules.

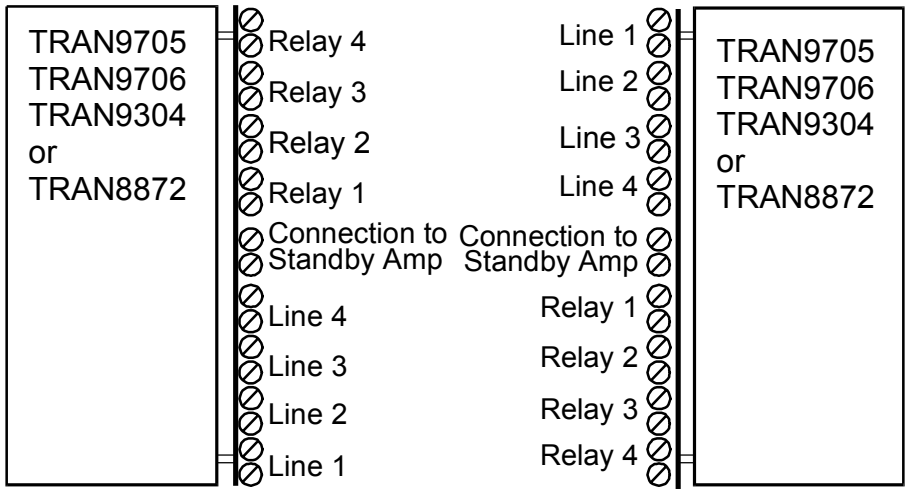
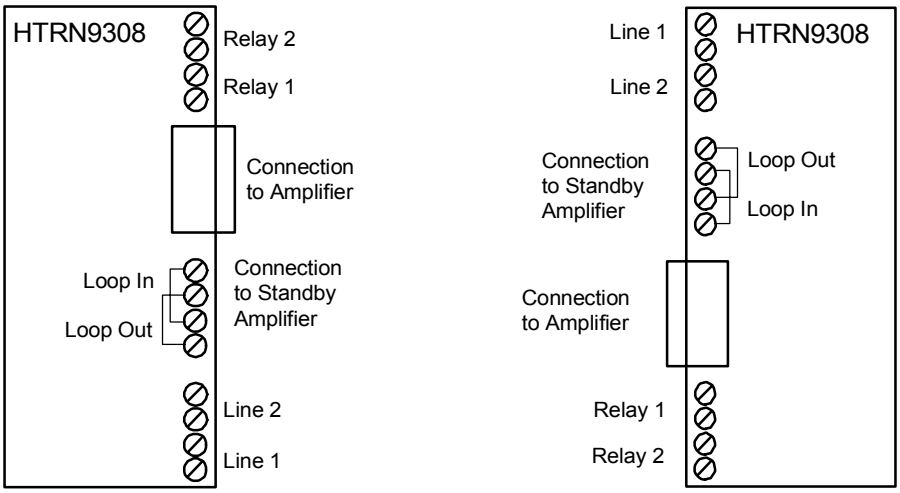


Figure 4-1 : 10 Watt and 25 Watt Transformer Modules



(Note for 100W Modules, use Line 1 and Relay 1)

Figure 4-2 : 50W and 100W Transformer Modules

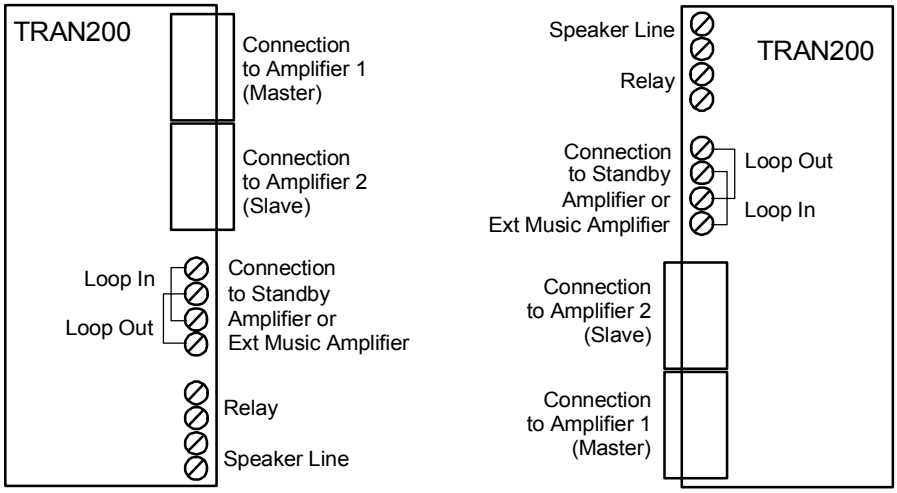


Figure 4-3 : 200W Transformer Module

The following table shows the signal outputs and relay outputs available on each model.

Model	Configuration	AMP Modules	Signal Outputs	Relay Outputs
TRAN8872-1 TRAN9304-1	4 * 10W	1 * EAMP	1,2,3,4	1,2,3,4
TRAN9304-2	4 * 10W with relays	1 * EAMP	1,2,3,4	None
TRAN8872-2 TRAN9304-3	2 * 25W	1 * EAMP	2,4	1,3
TRAN9304-4	2 * 25W with relays	1 * EAMP	2,4	1,3
TRAN9706-1 or TRAN9706-2 with LK1 - LK4 removed	4 * 10W	1 * EAMP	1,2,3,4	1,2,3,4
TRAN9706-2 with LK1 - LK4 inserted	4 * 10W with relays	1 * EAMP	1,2,3,4	None

TRAN9705-3 or TRAN9705-4 with links LK1 - LK2 removed	2 * 25W	1 * EAMP	1,2	1,2
TRAN9705-4 with links LK1 - LK2 inserted	2 * 25W with relays	1 * EAMP	1,2	1,2
TRAN9705-1 or TRAN9705-2 with links LK1 - LK2 removed	4 * 25W	2 * EAMP	1,2,3,4	1,2,3,4
TRAN9705-2 with links LK1 - LK2 inserted	4 * 25W with relays	2 * EAMP	1,2,3,4	1,2,3,4
HTRN9308-1	2 * 50W	1 * HAMP	1,2	1,2
HTRN9308-2	1 * 100W	1 * HAMP	1	1
TRAN200	1 * 200W	2 * AMP200	1	1

The connections to the Amplifier (and Standby Amplifier if any) will be wired in the factory. However if you are extending a system by adding more amplifiers, note the following required connections.

10W and 25W modules
Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the related amplifier and the transformer module. If you are adding a 4 * 25W TRAN9705-1 or TRAN9705-2, you will need two ribbon cables if both amplifier modules are used, one for each amplifier module.

50W and 100W modules
Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the related amplifier and the transformer module. Also wire the 4 pin removable plug on the amplifier to the similar plug on the related transformer module, pin 1 to pin 1, pin 2 to pin 2, pin 3 to pin 3 and pin 4 to pin 4. Use 2.5mm^2 wire and keep the length as short as possible.

200W modules
Fit a 26 way ribbon cable (LM0047) between the connector on the backplane behind the “master” amplifier module and the 200W transformer module. Also wire the 4 pin removable plug on the ”master” amplifier module to the HAMP1 IN plug on the 200W transformer module, and the 4 pin removable plug on the ”slave” amplifier module to the HAMP2 IN plug on the 200W transformer module. Both these cables should be connected pin 1 to pin 1, pin 2 to pin 2, pin 3 to pin 3 and pin 4 to pin 4. Use 2.5mm^2 wire and keep the length as short as possible.

4.3 STANDBY AMPLIFIERS

If you are extending a system with standby amplifiers, note that the LINE OUTPUT of the standby amplifier transformer module loops through the STANDBY terminals of all other transformer modules. If there are multiple groups of amplifiers each with their own standby amplifier, the LINE OUTPUT of each standby amplifier transformer module connects to the STANDBY terminals of all transformer modules belonging to amplifiers in the same group. (The connector is labelled STBY/MUSIC on the TRAN200.)

4.4 LINK SETTINGS

On the TRAN9705-2, TRAN9705-4 and TRAN9706-2 there are links to select whether the system has standby amplifiers or not. Links LK1 and LK2 on the TRAN9705-2 and TRAN9705-4 and links LK1, LK2, LK3, and LK4 on the TRAN9706-2 must be inserted if the system has standby amplifiers and removed if the system has no standby amplifiers.

On the TRAN200, there are 3 links LK1, LK2, and LK3 which must all be installed in the S position unless the transformer module is used to switch in the output of an external “Music” power amplifier under non-emergency conditions. Refer to section 4.12.

4.5 AMPLIFIER NUMBERING

In order to find the termination point for a given amplifier it is necessary to relate the amplifier numbers shown on the configuration printout with the amplifiers and transformer modules in the panel. There are always 4 amplifier numbers per amplifier module. If the module is 4 * 10W, each amplifier has a single number. If the module is 2 * 25W, each 25W amplifier is given 2 successive numbers so that the two amplifiers make up a group of four numbers. If the module has 2 * 50W, the two amplifiers are given the first two numbers of a group of four, and the last two numbers in the group of four are unused. If the module has 1 * 100W, the amplifier is given the first number of a group of four, and the last three numbers in the group of four are unused. With a 200W amplifier the first amplifier number on the “master” amplifier module is used, with the remaining 3 numbers on the master module and all 4 numbers on the slave module being unused.

The amplifiers are numbered from left to right in each card cage, and the card cages are numbered from top to bottom within each cabinet. Thus there are 20 amplifier numbers for each card cage.

With most transformer modules, there are 4 amplifier numbers per module. However with the 4 * 25W TRAN9705 modules, there are two amplifier modules corresponding to it and there are eight amplifier numbers per transformer module. With the 200W transformer module, there are 8 corresponding amplifier numbers, unless the slave module is installed in a card cage with NO EMUX module, in which case the slave amplifier module does not have any numbers and the master module has 4 numbers corresponding to the 200W transformer module.

The transformer modules are arranged in order down the left side of the gear plate then down the right side. It is possible to locate a given amplifier number by counting down the left side of the cabinet, then down the right side, counting eight for each 4 * 25W transformer module and four for each other type of transformer module.

4.6 CABLE SIZE

The speaker cable cross section required can be obtained from the following table. This table is calculated to keep voltage drops at about 5%. It is not recommended that cables longer than 1000m are used.

Cable Length	10 Watt Load	25 Watt Load	50 Watt Load	100 Watt Load	200 Watt Load
100m	0.75 mm^2	0.75 mm^2	0.75 mm^2	1 mm^2	1.5 mm^2
200m	0.75 mm^2	0.75 mm^2	1 mm^2	1.5 mm^2	4 mm^2
300m	0.75 mm^2	0.75 mm^2	1.5 mm^2	2.5 mm^2	6 mm^2
500m	0.75 mm^2	1 mm^2	2.5 mm^2	4 mm^2	10 mm^2
700m	0.75 mm^2	1.5 mm^2	4 mm^2	6 mm^2	15 mm^2
1000m	1 mm^2	1.5 mm^2	4 mm^2	10 mm^2	20 mm^2

4.7 TERMINATION TO EACH SPEAKER

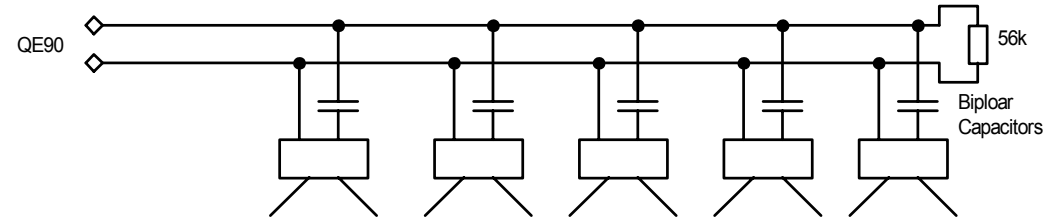
Speakers must be wired in a parallel connection across the 100V zone speaker line as indicated in Figure 4-4. The speakers must be designed for a 100 Volt line. This normally means the speakers will have transformers fitted. Usually these transformers have tappings to select different power ratings. You must select the tapping required to give the required sound level. The total load of all the speakers on a given amplifier must not exceed the amplifier's rating. For example if there are 50 speakers on a 50 watt amplifier, each one must be tapped at no more than 1 watt (or they may be tapped at a mixture of different ratings so that the total load is less than or equal to 50 watts).

Each speaker must have a Bi-polar capacitor fitted in series with the speaker as indicated in Figure 4-4. (Some speakers designed for EWIS systems come with capacitors already fitted). A suitable value is 1 - 5uF per watt of speaker power rating, e.g. for a speaker set to 0.5W a capacitor of 0.5uF to 2.5uF is required, while for a speaker of 10W a capacitor of 10uF to 50uF is suitable. Values up to 1uF may be obtainable in a polyester foil type, while for larger values Bi-polar Electrolytic types are required. The capacitor's voltage rating must be 10V or higher. It is possible to use a higher value capacitor for all speakers, e.g. 33uF, but if you do and there are a large number of low powered speakers on the circuit, the DC voltage on that circuit will be slow to stabilise and the panel may indicate a line fault shortly after power up. The fault will be able to be cleared when the voltage has stabilised after a few minutes.

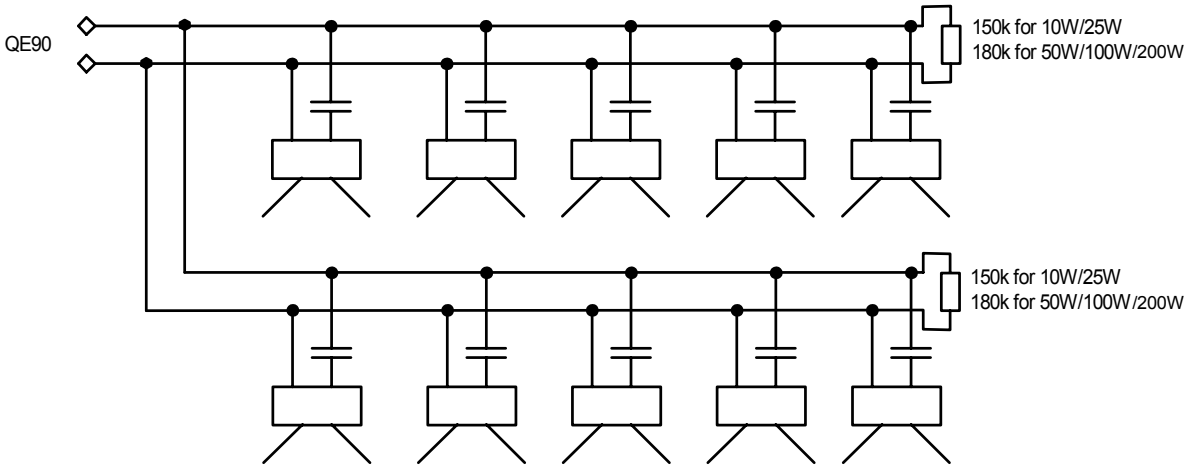
A 56k ohm 1/4W end-of-line resistor must be placed across the 100V line at the end of the speaker line.

It is also possible to have two branches on the speaker lines, with each one terminated in 150k for 10W and 25W amplifiers, or 180k for 50W, 100W and 200W amplifiers. These values are higher than 2 * 56k to ensure that a fault is generated if only one branch is open circuit.

This wiring is shown in Figure 4-4



Circuit with single branch



Circuit with 2 branches

Figure 4-4 : Speaker Wiring showing Capacitors and End Of Line Resistor

4.8 CHECKING SPEAKER LOADINGS

It is strongly recommended that you check the impedance of each speaker line once all the speaker taps have been set, and before connecting to the QE90. A suitable impedance meter is the TOA ZM-104. The minimum impedance measurement must be as follows -

Amplifier Size	Minimum impedance
10 Watts	1000 ohms
25 Watts	400 ohms
50 Watts	200 ohms
100 Watts	100 ohms
200 Watts	50 ohms

If the measured impedance is less than that specified above, you will need to reduce the power tapping on some speakers, or upgrade the amplifier power rating. Failure to observe these ratings can result in overheating and/or damage to the QE90.

4.9 CHECKING SPEAKER WIRING

A quick check can be made of the speaker wiring by measuring the DC resistance across the speaker lines at the MECP end. The resistance measured must be within 5% of 56 kΩ for a single branch circuit, or within 5% of 75 kΩ for a two branch circuit on a 10W / 25W amplifier, or within 5% of 90 kΩ for a two branch circuit on a 50W / 100W / 200W amplifier. (This DC resistance has nothing to do with the AC impedance of the load discussed above.)

Note that due to the capacitors connecting to the speakers, the reading may be slow to stabilise. To perform this check, each speaker line must be removed from its respective QE90 termination point and a multimeter placed across the unconnected line.

Also check that both sides of the line are isolated from ground.

Alternatively once the system has been powered up, measure the DC voltage across the line. It should be 2.5V ± 0.1V. This voltage will be slow to stabilise immediately after power up or after removal of a fault.

NOTE - If you have two branches wired as shown, the DC voltage across the line should be 2.86V ± 0.1V for 10W and 25W amplifiers, and 3.08V ± 0.1V for 50W, 100W and 200W amplifiers.

4.10 ZONE RELAYS

The zone relay termination points provide a switched 24V DC output for emergency override control of local zone background music volume controls when fitted, or for silencing external non emergency amplifiers.

This 24V output is normally energised and is switched off whenever the zone is emitting emergency tones or emergency public address or non-emergency paging. The zone relay output is wired to the override relay of the local volume control so that when the relay output switches off the relay de-energises and bypasses the local volume control. Figure 4-5 shows how this can be arranged with an autotransformer type volume control. This arrangement preserves the line monitoring regardless of whether the control is in circuit or not.

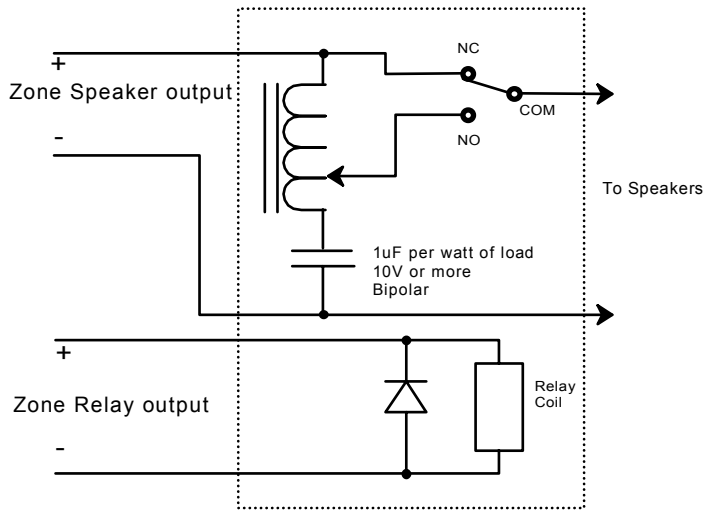


Figure 4-5 : Override relay for Music volume control

4.11 LEDS

The HTRN9308 modules have two red LEDs. Each LED, when ON, indicates that one of the amplifiers relating to that module has failed and that a standby amplifier is switched in to replace it. This will only occur on systems with one or more standby amplifiers configured.

The TRAN200 module has 1 red LED. This indicates that the circuit has a standby amplifier switched in due to amplifier failure, or if the module is set up to switch in an external “music” power amplifier under non-emergency conditions, the external amplifier is switched in.

4.12 MUSIC SWITCHING TRANSFORMER MODULES

Special models of transformer module (HTMS9408-1 and HTMS9408-2) are available for 50W and 100W amplifiers, which have the feature that a third party amplifier output may be connected to the terminals on the module labelled AUX MUSIC. These modules will route the third party amplifier to the speakers at all times except for when there are emergency tones being generated by the QE90. However these module will allow the QE90 to monitor the speaker lines regardless of which amplifier is “connected” to the speakers.

This module is wired up as a normal 50W / 100W module, except that the external amplifier is connected to the AUX MUSIC 1 terminal pair (if 100W) , or the AUX MUSIC 1 and 2 terminal pairs if 2 * 50W.

Standby Amplifiers cannot be used with these modules.

The 200W transformer module (TRAN200) can be configured to switch in the third party amplifier as above, by setting all three links LK1, LK2, and LK3 on the module to the “M” position. In this case a Standby Amplifier cannot be used for the circuit.

5 AMPLIFIERS - EAMP9001, HAMP9308 AND AMP200

5.1 AMPLIFIER TYPES

There are three kinds of amplifier modules –

- EAMP9001 which can be configured as 4 * 10W or 2 * 25W (or now unused 1 * 50W)
- HAMP9308 which can be configured as 2 * 50W or 1 * 100W
- AMP200 which can be used in pairs as 1 * 200W per pair

All have a similar set of options which can be selected by links on the module.

5.2 LINKS

5.2.1 POWER SELECTION

The number and power of the amplifiers are set with the links on the module.

EAMP9001		
Link	**Position**	**Description**
5	Fitted	4 * 10 Watt
	Removed	2 * 25 Watt
6	1-2	4 * 10 Watt
	3-4	2 * 25 Watt
7	Fitted	4 * 10 Watt
	Removed	2 * 25 Watt
8	1-2	4 * 10 Watt
	3-4	2 * 25 Watt
9	1-2	4 * 10 Watt OR 2 * 25 Watt
	3-4	Obsolete 1 * 50Watt

HAMP9308		
Link	**Position**	**Description**
3	50W+50W	2 * 50 Watt
	100W	1 * 100 Watt
5	Fitted	2 * 50 Watt
	Removed	1 * 100 Watt
8	Removed	2 * 50 Watt
	Fitted	1 * 100 Watt

5.2.2 AMP200 MASTER / SLAVE SELECTION AND INTERCONNECTION

The AMP200 has three links LK12, LK13, and LK14 which must all be fitted in the M position on the master amplifier module, and in the S position on the slave amplifier module.

- All the remaining link settings apply to the master module only. (The remaining link settings on the slave module are immaterial.)
- Any local input must be connected to the master module.
- The ribbon cable to the transformer module (TRAN200) must come from the backplane behind the master module. The ribbon cable connection behind the slave module is not used.
- The volume control to be used is on the master module. The setting of the volume control on the slave module is immaterial.
- Only the master module is listed on the configuration listing.
- The slave module may be in a card cage with no EMUX module.
- The master module and slave module are connected with a four wire cable connecting to connector J4 on each module.

5.2.3 DEFAULT INPUT SELECTION

Each amplifier has a link to select the default input to be used when no other signal is selected, i.e. none of Alert Tone, Evacuate Tone, PA Speech, Non-emergency Paging (PABX) or Music are selected.

These are LK1 - 4 for the EAMP9001, LK1-2 for the HAMP9308 and LK1 for the AMP200. The following are the options for each of these links.

Position	Selection
SILENCE	No Audio Signal
AUX – BUS	AUX input on the signals interface module. (Refer to Chapter 9 and to Chapter 13.
Removed	Local Input connector on the amplifier module. (Refer to 5.2.5.)

Amps Affected					
Link	**4 * 10W**	**2 * 25W**	**2 * 50W**	**1 * 100W**	**1 * 200W**
1	Amp 1	Amps 1 + 2	Amp 1	Amp 1	Amp 1
2	Amp 2		Amp 2		
3	Amp 3	Amps 3 + 4			
4	Amp 4				

5.2.4 AMPLIFIER MONITORING DISABLE

Links 10 and 11 on all types of amplifier module may be removed to disable the amplifier fault monitoring in the software (but not the speaker line supervision). If the monitoring is disabled, you can also turn off the test tone by removing LK5 and LK7 and resistors R2 and R30 on the EAMP9001, removing LK4 and LK5 on the HAMP9308, or removing LK4 on the AMP200. This is intended for very special purposes only, when it is done the system does not fully comply with AS2220.

5.2.5 LOCAL INPUTS

Each amplifier has its own local input which may be selected when no other signal is active. (See Default Input Selection above). These are terminated on the 6 way connectors on the inside edge of the module. Mating Connectors are available, Tyco part code CN0256 CONNECTOR,PHOENIX,6W,MSTB 1.5/6-ST,SNGL HT,FEMALE.

These inputs can be used for non-emergency Music or PA Signals from third party PA equipment, or non-emergency PA signals from the Tyco PA0688 Microphone Preamp module, when a number of different channels are required for different zones, groups of zones, or sub zones. To have different non-emergency signals fed to different parts of an Evacuation zone, it is necessary for that zone to have more than one amplifier configured.

As these inputs are unbalanced they should normally be connected with line isolating transformers. Refer to section 21.2 and Figure 11-2.The signal required at these inputs is 300mV RMS.

The Pin connections are as follows-

Input Pin	EAMP9001		HAMP9308		AMP200
	4 * 10W	**2 * 25W**	**2 * 50W**	**1 * 100W**	**1 * 200W**
1(Bottom)	Input 1	Input 1	Input 2		
2	Ground	Ground	Ground	Ground	
3	Input 2				
4	Input 3	Input 2	Input 1	Input 1	Input 1
5	Ground	Ground	Ground	Ground	Ground
6 (Top)	Input 4				

5.3 LEDS

EAMP9001 LEDs			
Led	Colour	Position	Indication when ON
D5	Red	Top	Power Available for amplifiers 1 and 2
D6	Red	Bottom	Power Available for amplifiers 3 and 4

HAMP9308 LEDs			
Led	**Colour**	**Position**	**Indication when ON**
LD1	Green	Top	Power Available for amplifier 1
LD2	Red	Top	Amplifier 1 switched off due to overload
LD3	Red	Bottom	Amplifier 2 switched off due to overload
LD4	Green	Bottom	Power Available for amplifier 2

AMP200 LEDs			
Led	**Colour**	**Position**	**Indication when ON**
LD1	Green	Top	Power Available
LD2	Red	Top	Amplifier switched off due to overload

The red LEDs on the HAMP9308 and AMP 200 indicate that the speaker load is greater than the amplifier's rating, or the output is short circuited, and the amplifier has briefly switched off to prevent damage. Both LEDs of the HAMP9308 will operate in unison in 1 * 100W mode, and the LEDs on both amplifier modules will operate in unison on the AMP200.

5.4 ADJUSTMENTS

Both amplifier types have controls to adjust the power output. Note however in terms of efficiency and battery capacity that it is preferable to reduce the volume by adjusting the speaker taps to a lower setting and leaving the controls turned right up (fully clockwise), rather than by using the volume controls.

EAMP9002 Controls			
Control	**Location**	**Amps affected 4 * 10W**	**Amps affected 2 * 25W**
VR1	Top	1	1 & 2
VR2	Second Top	2	
VR3	Second Bottom	3	3 & 4
VR4	Bottom	4	

HAMP9308 Controls			
Control	**Location**	**Amps affected 2 * 50W**	**Amps affected 1 * 100W**
VR1	Top	1	1
VR2	Bottom	2	

AMP200 Control		
Control	**Location**	**Amps affected**
VR1	Top of Master	1

6 WIP PHONE TERMINATION MODULES

6.1 GENERAL

The **WTRM2000** WIP termination module is the latest module and is used for terminating up to 30 WIP phones with an optional BGA device at the phone connected across the same two wires. It may also be used for FIP and general purpose inputs. The WTRM2000 connects to a WIPS2000 module in the card cage.

The older **WTRM9007** WIP termination module is primarily used for terminating up to 30 WIP phones, but as of November 1997 it can also be used for terminating FIP, BGA, and general purpose switch inputs. The WTRM9007 connects to a WIPS9004 module in the card cage.

The **MWIP9903** terminates up to 8 circuits and is described in section 6.8.

With appropriate software the WTRM9007 and MWIP9903 modules may be used for terminating a mixture of WIP phones and FIP and/or BGA inputs. This is used mainly in small systems where there are spare WIP circuits which would otherwise be unused. This feature also allows a collocated WIP phone and BGA device to share a 3 wire cable. Using WIP circuits in this manner requires WIPS9004 software version 1.50 or higher, and for a system with no ECMs, ECP software version 4.10 or higher, or for a system with ECMs, ECM software version 1.50 or higher.

The WTRM2000 / WTRM9007 WIP Phone Termination module is usually located on the left hand mounting rail inside the system. Depending upon the number of WIP phones required, up to 6 WIP termination modules may be fitted.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

Remote WIPs can be connected over derived signalling systems by using two **RWIF9803** modules (refer Section 6.6).

6.2 WTRM2000 WIRING

6.2.1 GENERAL

Each WTRM2000 termination module provides terminations for up to 30 WIP phones and/or switch circuits. Compatible types are Aiphone TBRC, Aiphone TB-SE RED T, Altronics A2095 Firephone, and Altronics A2096 Firephone. The first module provides circuits 1 - 30, the second module circuits 31 - 60, and so on.

There may be 1, 3, or a variable number of WIPs per evacuation zone. The configuration printout supplied with the system has details of which circuits are assigned to which zones.

It is recommended that a 0.75mm^2 shielded pair be used for each WIP circuit, however for short cable runs unshielded cables can be used with slightly higher susceptibility to induced hum and noise. The shields must be connected to the metal chassis at the MECP. Cables should be no longer than 1000m.

Refer to Figure 6-1 which shows the wiring for a normal WIP circuit (with an optional zone manned pushbutton), a FIP circuit, a WIP and BGA sharing a 3 wire cable, a WIP and BGA sharing a 2 wire circuit, and a two wire circuit which provides 2 General Purpose inputs.

The terminals labelled 0V will be wired in the factory. When expanding a system wire one of them to the 0V terminal on the Backplane. Note that although the connections on the Termination Modules are shown as + and -, both the compatible phones can be connected either way around.

Note that the 3 wire WIP / BGA circuit is wired with the – terminal common on the WTRM2000. (The + terminal is common on the WTRM9007.)

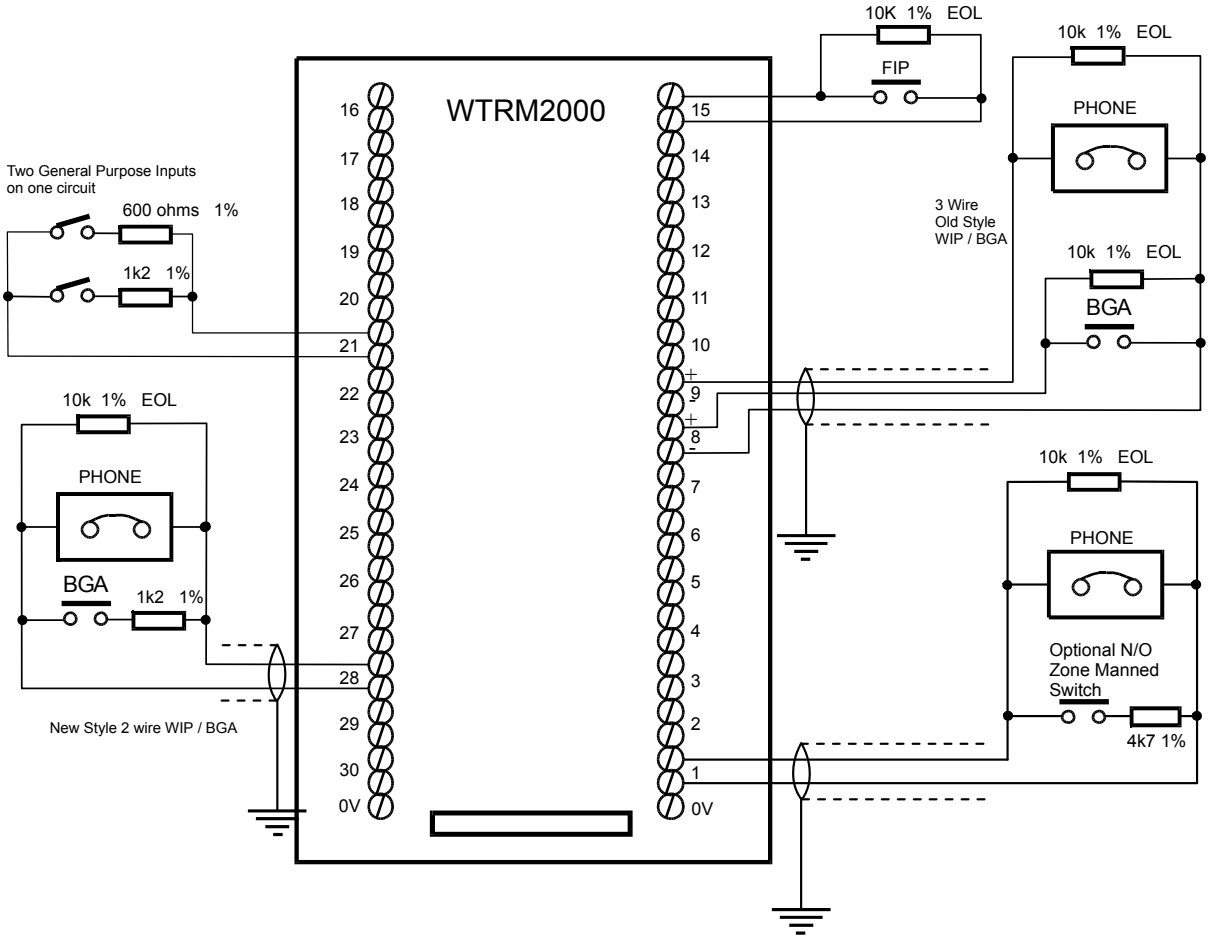


Figure 6-1 WTRM2000 Wiring

6.2.2 WTRM2000 END OF LINE TERMINATION

When terminating the wiring to each remote device, the 10k ohm resistor fitted across each WIP terminal block must be removed and fitted across the line connection point at the remote phone or FIP/BGA switch. 1% resistors should be used in new installations (included on WTRM2000) (Tyco part number RR0045).

6.2.3 WTRM2000 TWO WIRE WIP / BGA CONNECTION

With the WTRM2000 one normally open BGA device may be connected across the WIP circuit. A 1.2K 0.25W 1% resistor (Tyco part number RR0034) must be wired in series with the BGA. These resistors will be provided with QE90 systems with WTRM2000 modules.

A two wire BGA device may not be used with a zone manned pushbutton on the same circuit.

Two wire WIP / BGA functionality must be programmed into the QE90 by Tyco.

6.2.4 WTRM2000 ZONE MANNED PUSHBUTTON

A pushbutton or switch can be fitted to a remote WIP phone so that when the switch is closed while the WIP is on hook, the appropriate ZONE MANNED indicator on the MECP front panel will light. Wiring of the switch is shown in Figure 6-1. It requires a 4k7 ohm, 0.25W Watt resistor to be wired to one side of the switch such that when the pushbutton is operated, the 4k7 resistor is switched in parallel across the WIP line. 1% resistors (Tyco part number RR0041) should be used in new installations. Unlike the WTRM9007 which requires a pushbutton, a toggle switch may be used with the WTRM2000. However note that operation of the switch cannot be detected when the phone is off hook.

6.2.5 WTRM2000 GENERAL PURPOSE INPUT

A general purpose switch input may be wired like a FIP input. The 10k EOL resistor is optional.

On the WTRM2000 **two** general purpose input switches may be wired to a single circuit. One should be wired with a 600 ohm 1% resistor (2 x 1k2 Tyco part number RR0034 in parallel) in series and the other with a 1.2k 1% ohm resistor in series (Tyco part number RR0034).

The function of the inputs is determined by the software programmed into the QE90 by Tyco.

6.3 WTRM9007 WIRING

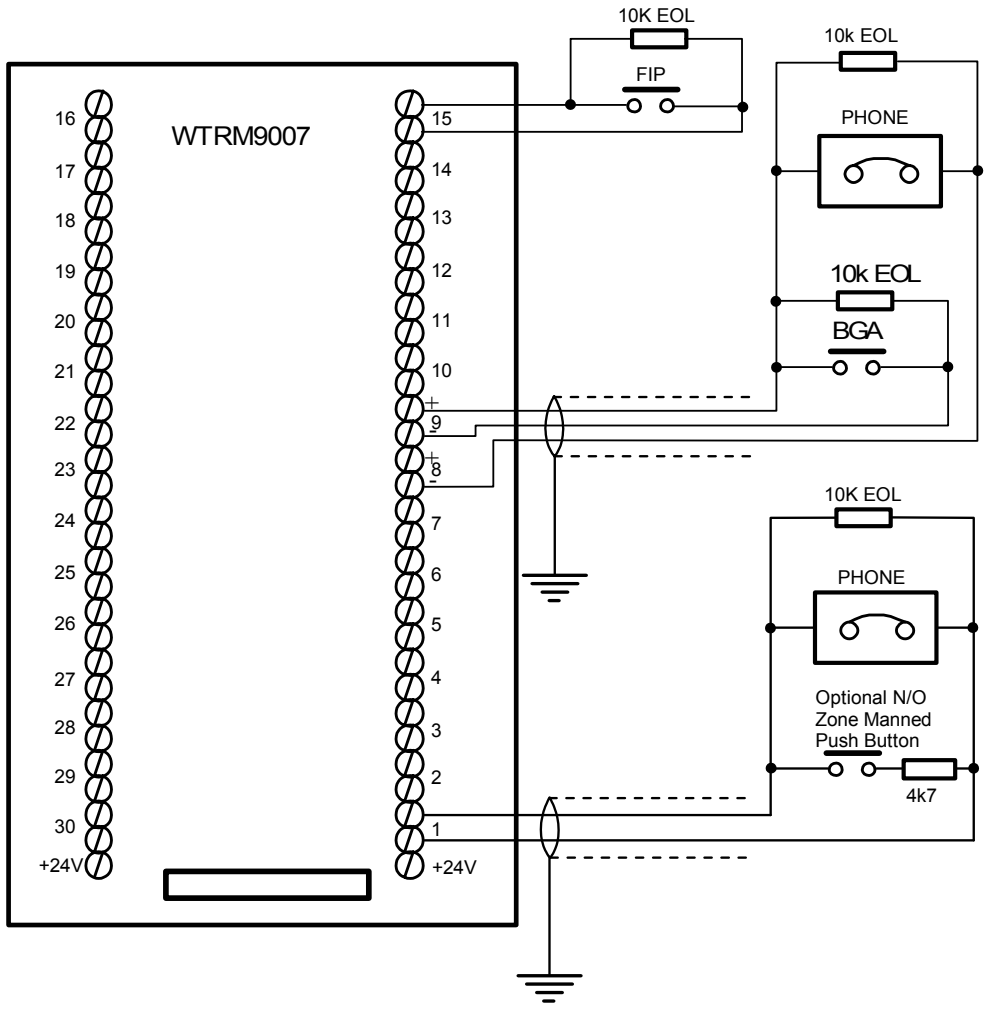


Figure 6-2 : WTRM9007 Wiring

6.3.1 GENERAL

Each WTRM9007 termination module provides terminations for up to 30 WIP phones and/or switch circuits. Compatible types are AIPHONE TBRC and Altronics A2095 Firephone. The first module provides circuits 1 - 30, the second module circuits 31 - 60, and so on.

There may be 1, 3, or a variable number of WIPs per evacuation zone. The configuration printout supplied with the system has details of which circuits are assigned to which zones.

It is recommended that a 0.75mm^2 shielded pair be used for each WIP circuit, however for short cable runs unshielded cables can be used with slightly higher susceptibility to induced hum and noise. The shields must be connected to the metal chassis at the MECP.

Refer to Figure 6-2 which shows the wiring for a normal WIP circuit (with an optional zone manned pushbutton), a FIP circuit, and a WIP and BGA sharing a 3 wire cable.

Note that the 3 wire WIP / BGA circuit is wired with the + terminal common on the WTRM9007 (and the - terminal common on the WTRM2000).

The terminals labelled +24V will be wired in the factory. When expanding a system wire one of them to the +24V terminal on the backplane. Note that although the connections on the Termination Modules are shown as + and -, both the compatible phones can be connected either way around.

6.3.2 WIPS9007 END OF LINE TERMINATION

When terminating the wiring to each remote phone, the 10k ohm resistor fitted across each WIP terminal block must be removed and fitted across the line connection point at the remote phone or FIP/BGA switch. 1% resistors should be used in new installations.

6.3.3 WIPS9007 ZONE MANNED PUSHBUTTON

A pushbutton can be fitted to a remote WIP phone so that when it is pressed while the WIP is on hook, the appropriate ZONE MANNED indicator on the MECP front panel will light. Wiring of the pushbutton is shown in Figure 6-2. It requires a 4k7 ohm, ¼ Watt resistor to be wired to one side of the switch such that when the pushbutton is operated, the 4k7 resistor is switched in parallel across the WIP line. 1% (Tyco part number RR0041) resistors should be used in new installations. It is not possible to use a toggle switch instead of a pushbutton, as when the switch is in the operated position it is not possible for the QE90 to detect when a WIP which has been off hook is placed on hook.

6.3.4 WIPS9007 GENERAL PURPOSE INPUT

A general purpose switch input may be wired like a FIP input. The 10k EOL resistor is optional. The function of the inputs is determined by the software programmed into the QE90 by Tyco.

6.4 ALTRONICS A2095/A2096 WIRING

The A2095/A2096 WIP should normally have its two internal jumpers in their default positions (i.e. JP1 1-2 and JP2 1-2).

However, link JP1 may be moved to position 2-3 to change ringing from using the speaker mounted on the body to use the handset speaker. This results in a lower volume ring, but loads the line less and allows a WIP to be used when there is a second WIP on the same cable. **When using this option, the user should never hold the earpiece to their ear while holding down the "hook switch" on the phone body, as if the phone rings a very loud sound is emitted by the earpiece.**

NOTE - It is NOT recommended that you have more than one phone on a circuit.

The QE90 connection is made to the external screw terminals labelled 1 and 2 (either polarity). The external screw terminals labelled 3 and 4 are normally joined, but can be separated for a lower volume ring.

If, once the WIP has been installed the ring is not loud enough (e.g. it has been installed in a cupboard), then an external speaker can be used to boost the ring volume. Disconnect the wires labelled EXT-SP from the internal speaker and re-connect to the screw terminals S1 and S2 instead. The external speaker (>20Ω) should then be wired to these screw terminals and positioned to give adequate ring volume. Note this is not possible if more than one WIP is connected on the line.

6.5 WLED9307 WIP FLASHING LED PCB

The WLED9307 PCB can be used to provide visual indication that a WIP phone is ringing. The LINE+ and LINE- terminals are connected across the WIP line (either way around) and a LED is connected to the LED+ and LED- terminals. The anode of the LED must be connected to the LED+ terminal. About 10mA will be passed through the LED when the phone is ringing. If you also want to stop the WIP from ringing, remove capacitor C6 from the circuit board inside the AIPHONE, or remove JP1 from the A2095.

6.6 WIP SYSTEM EXPANSION

If you are expanding an existing system and adding a new WTRM module and WIPS module, note the following

- The WIPS module will need its jumpers set as described in Chapter 14.
- Connect the WIP 1 OUT or WIP 2 OUT connector on the backplane adjacent to the new WIPS module to the WTRM module with the 34 way ribbon cable provided.
- With a WTRM9007 module, connect +24V from the screw terminals on the backplane near the WIPS module to a +24V terminal on the WTRM module.
- With a WTRM2000 module, connect 0V from the screw terminals on the backplane near the WIPS module to a 0V terminal on the WTRM module. If you have an older backplane with no 0V terminals near the WIPS module, use the 0V power terminal on the backplane.

Within a panel, or even a within a card cage, WIPS9004 / WTRM9007 module pairs may be mixed with WIPS2000 / WTRM2000 module pairs. **However the WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.**

6.7 RWIF9803 REMOTE WIP INTERFACE

6.7.1 GENERAL DESCRIPTION

The wiring to a field WIP is normally via a single copper cable pair. However where the WIP must be remotely located, or a derived signalling system is used, then two Remote WIP Interface Modules (RWIF9803) can be used to convert the QE90's WIP circuit to a suitable format for signalling over the derived circuit.

The RWIF9803 modules can be fitted to any WIP circuit without reprogramming the QE90 or its configuration, unless the Master WIP redirection feature is to be used.

The connection to the Remote WIP is supervised by the QE90 only as far as the ECP end RWIF9803 module. To check the rest of the connection, lift the Remote WIP - check for confidence tone, and call the remote WIP from the QE90 - ringing should be heard.

The RWIF9803 is available as either a stand-off mountable circuit board (PA0821) or a DIN Rail mounted module (PA0621).

6.7.2 WIRING ARRANGEMENT

Two RWIF9803 modules are required for each remote WIP, one at each end of the connection. Link settings configure the RWIF for operation at each end.

The module at the QE90 end converts the QE90's WIP connection into 2 outputs and 1 input - the outputs are a 2-wire full duplex audio path and a contact closure to indicate ringing, and the input is to receive the WIP on/off hook status.

The module at the remote end has the opposite connections to the master - one contact closure input to control the ring generation to the WIP and a 2-wire full duplex input for the audio, while a contact closure output indicates WIP off-hook.

At the remote end a 24Vdc power supply is required to power the module.

Figure 6-2 shows the wiring arrangement of the RWIF. For the connection between the two RWIF modules three circuits are required:

Audio	A 2 wire full duplex (bi-directional) audio path with unity gain.
Ring	A contact closure input from the QE90 end should cause a contact closure output at the remote end.
Off Hook	A contact closure input at the remote end should cause a contact closure output at the QE90 end.

The audio connections should be made using screened cable, and the connection between the RING and RING IN terminals should be kept short (<15m).

Even though 3 circuits are described, it is sometimes possible for these to be combined into 2 physical cable pairs - “E + M signalling” is a typical way this can be achieved. Refer to the technical details for the derived system you are using to determine the particular wiring arrangement necessary.

6.7.3 LINK SETTINGS

The mode of operation of the RWIF9803 is configurable for where it is placed in the WIP circuit. The link settings are shown below:

Operation Mode	Lk1	Lk2
WIP End	1-2	Fitted
ECP End	2-3	Not Fitted

6.7.4 INDICATORS

The RWIF9803 has a single 3mm red LED which is used to indicate when the relay is energised.

The function of the relay depends on the link settings. At the QE90 end the relay is activated when the RWIF9803 detects ring voltages from the QE90. At the WIP end the relay is activated when the WIP is lifted off-hook.

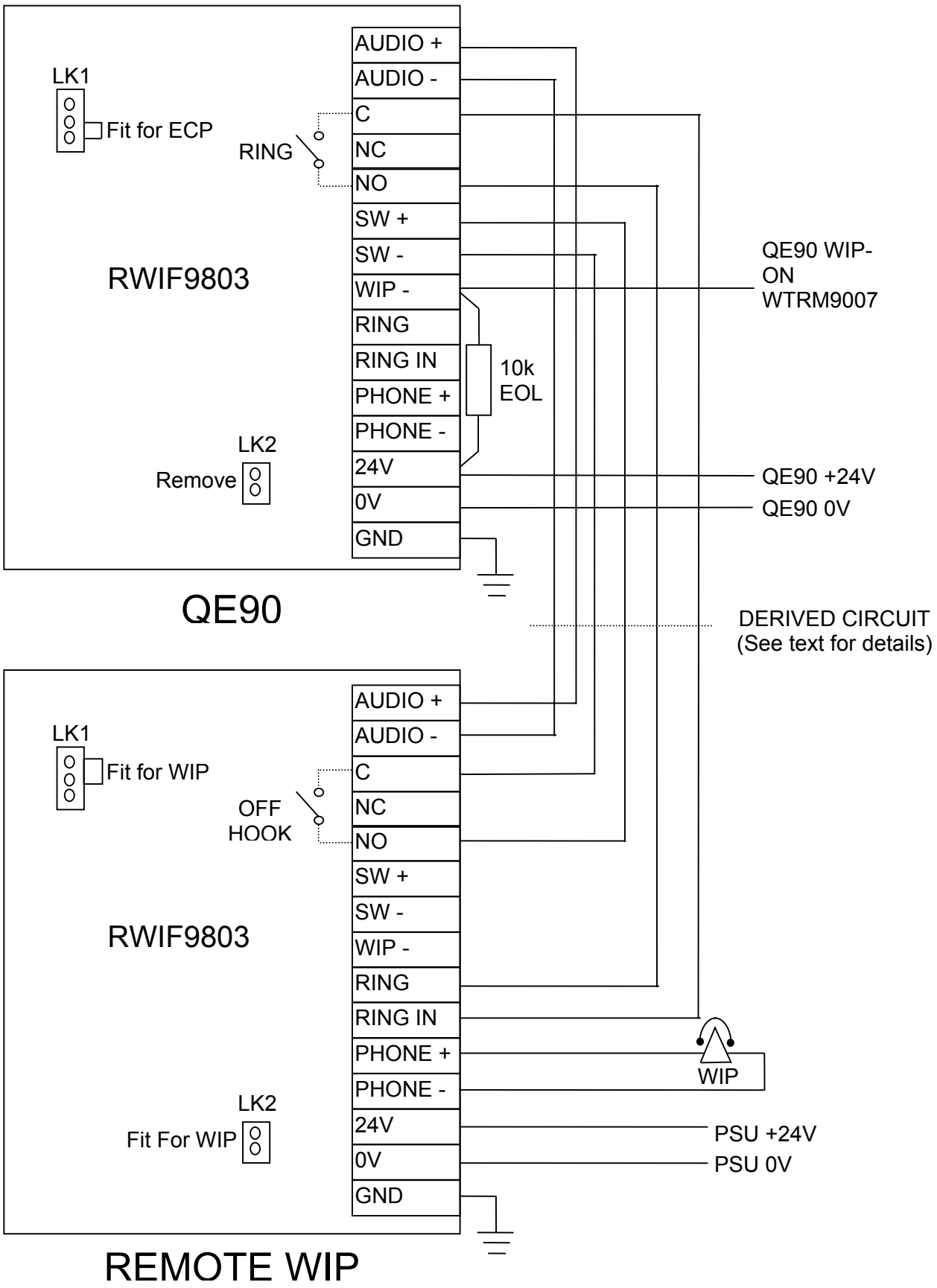


Figure 6-3 : Wiring of RWIF9803 Modules for Remote WIP on QE90

6.8 MWIP9903 8 CIRCUIT WIP MODULE

6.8.1 GENERAL

The MWIP9903 is an 8 circuit WIP module which may be used in small QE90 systems where there are fewer than 8 WIP circuits plus FIP, BGA, and GP inputs. The information in sections 6.2 to 6.5 also generally applies to the MWIP9903 module.

Refer to Figure 6-4 for details of wiring to the MWIP9903 module.

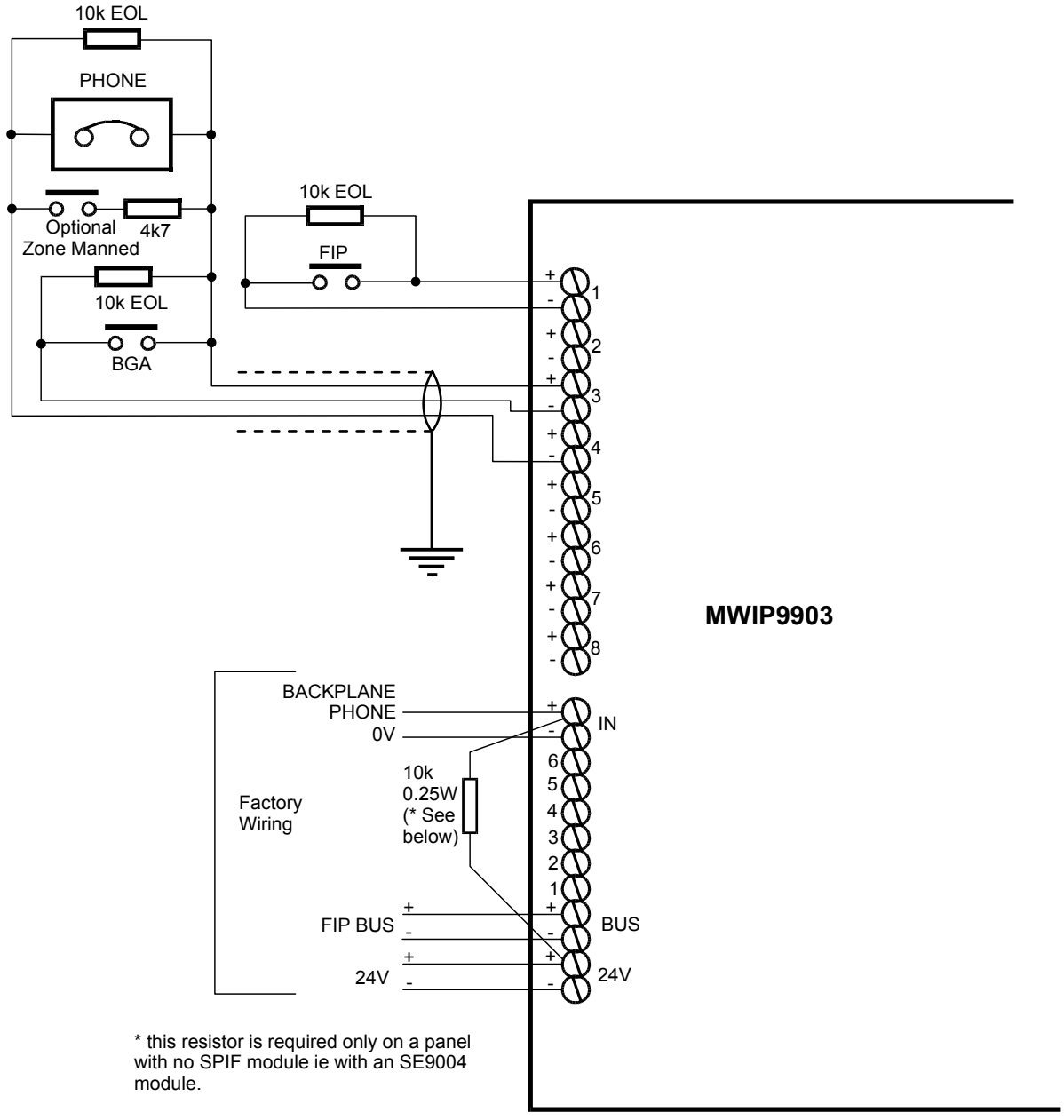


Figure 6-4 MWIP9903 Wiring

6.8.2 LED INDICATORS

Six LED Indicators are located on the MWIP9903 module and their functions are as follows:

LED	NORMAL STATUS	CONDITION INDICATED
+24V	ILLUMINATED	+24V SUPPLY OK
+12V	ILLUMINATED	+12V SUPPLY OK
+12VREF	ILLUMINATED	+12V REFERENCE SUPPLY OK
RUN	ILLUMINATED	MICROPROCESSOR RUNNING OK
COMMS	PULSING	COMMS OK, MODULE RESPONDING
FAULT	OFF	WHEN ON, A LINE FAULT EXISTS

6.8.3 DIP SWITCH 1 SETTINGS

Switch 1 is normally OFF in a QE90 system. The 8 circuits are then individually addressable by the MECP. When switch 1 is ON, the circuits will be arranged into sets, with circuits 1-3 as one set, circuits 4 and 5 as another set, and circuits 6-8 as the third set. Each of these 3 sets will behave as a single circuit to the MECP. This option could be used to have multiple WIPs per ECP control, with each WIP wired individually back to the MWIP9903 module.

Switch 2 must be ON in a QE90 system.

Switch 3 must be ON to enable all 8 circuits. When OFF only circuits 1–3 will be enabled.

Switches 4–8 must be OFF.

6.8.4 DIP SWITCH 2 SETTINGS

Note that in a QE90 system, each MWIP9903 will address the first 8 of each multiple of 30 circuits.

MODULE	WIP CIRCUITS	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1	1-8	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
2	31-38	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
3	61-68	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
4	91-98	ON	ON	OFF	OFF	OFF	OFF	ON	ON
5	121-128	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
6	151-158	ON	OFF	ON	OFF	OFF	OFF	ON	ON
7	181-188	OFF	ON	ON	OFF	OFF	OFF	ON	ON

6.8.5 SYSTEM EXPANSION

If a MWIP9903 board is to be added to a system, you will need to wire 24V DC Power, Comms, and the "Backplane Phone" circuit to the new module. Power is wired in RED (+24V) and BLACK (0V) 1.0mm^2 wire and Comms in YELLOW (+) and BLUE (–)1.0mm^2 wire.

POWER can be obtained from –

- The +24V / 0V terminals of another MWIP9903 module
- The +24V / 0V terminals of a FIB8910 module
- The +24V / 0V terminals of a STRM9502 module or STBM9008 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

BUS +/– can be wired from

- The BUS +/– terminals of another MWIP9903 module
- The COMMS +/– terminals of a FIB8910 module
- The COMMS +/– terminals of a STRM9502 module or STBM9008 module
- The FIP BUS +/– terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

The IN + / – terminals will need wiring to

- The IN + / – terminals of another MWIP9903 module
- The MASTER PHONE +/- terminals of a SE9004 module
- The BACKPLANE PHONE testpoint and 0V terminal of a SPIF9506 or SPIF9709 module.

7 FIP / BGA / GP INPUT MODULES

7.1 FIP / BGA /GP INPUTS - GENERAL

The FIP input and expansion modules are usually located on the right hand mounting rail inside the system.

These modules may be used for FIP inputs, BGA inputs, or General Purpose inputs. Although originally a separate FIB8910 module was necessary for each type of input, this is now rarely used. One FIB8910 module, with FIPE9004 expansion modules as necessary, can provide FIP inputs, BGA inputs, and GP inputs.

As from November 1997 WIP circuits can also be used to provide FIP / BGA /GP inputs - refer to Chapter 6 for details. Also FIP inputs are available using a high level link from Tyco and selected other models of Fire Panels – refer to Chapter 22.

The FIB8910 module provides up to 10 inputs. Additional inputs are provided by FIPE9004 expansion modules and sometimes additional FIB8910 modules. See 7.4.

A separate FIB8910 module for BGA inputs is now used only when there are too many inputs for one FIB8910 plus the 3 expansion modules i.e. more than 58 inputs in total.

GP inputs are typically used to control zones for Music or Paging as an alternative to the Tyco FP0539 Paging Console.

FIP inputs may also be used for various input functions, e.g. to accept clean contact outputs from a time switch to invoke a different cascade sequence out of normal hours.

The connection for FIP or BGA inputs is for normally open contact closing for alarm. The line is terminated with an end of line zener diode, type BZT03-C10, to maintain line monitoring. The diode must be connected with the cathode (i.e. the end marked with a band) to the positive input. Refer to Figure 7-1.

The termination diodes factory fitted to each input must be relocated to the end of the line when terminating field wiring to the input. The termination diodes must remain on all inputs assigned to zones in the system configuration (refer configuration printout), even if there is no connection from the FIP or a BGA to those inputs.

Inputs programmed as GP inputs do not need the zener diode end of line.

Cables should have a wire gauge of at least 0.75mm^2 and should not be longer than 1000m.

Refer to Chapter 25 for information on the “Widget Board” used to replace the microprocessor on the FIB8910 from late 2004.

7.2 RFIB9511 REMOTE RACK FIP / BGA INPUT MODULE

A related module is the RFIB9511 which is fitted to distributed equipment racks without ECPs. It provides FIP and/or BGA inputs as usual, and also controls the SPIF module fitted in the rack. The RFIB9511 does not have Relay Outputs. Refer to drawing 699-198 for details of the wiring between the RFIB and SPIF modules.

Issue E of the FIB8910 module (available January 1999) has a set of links so that it may be used as an RFIB module. This replaces the RFIB9511 product.

An RFIB9511 module, or a FIB8910 module set up as an RFIB, requires version 2.xx software. Version 1.xx or version 2.xx software may be used for a FIB8910 not set up as an RFIB.

7.3 SINGLE FIP INPUT CONNECTION

When there is a common alarm for all zones from the FIP, this output from the FIP must be terminated to Input 1 on the FIP input module and the system programmed for no cascade and a zero initial delay. (See programming section in LT0087, QE90 Operator's Manual.) This will result in all zones generating ALERT tones, and after a time delay EVACUATE tones, on receipt of a FIP alarm.

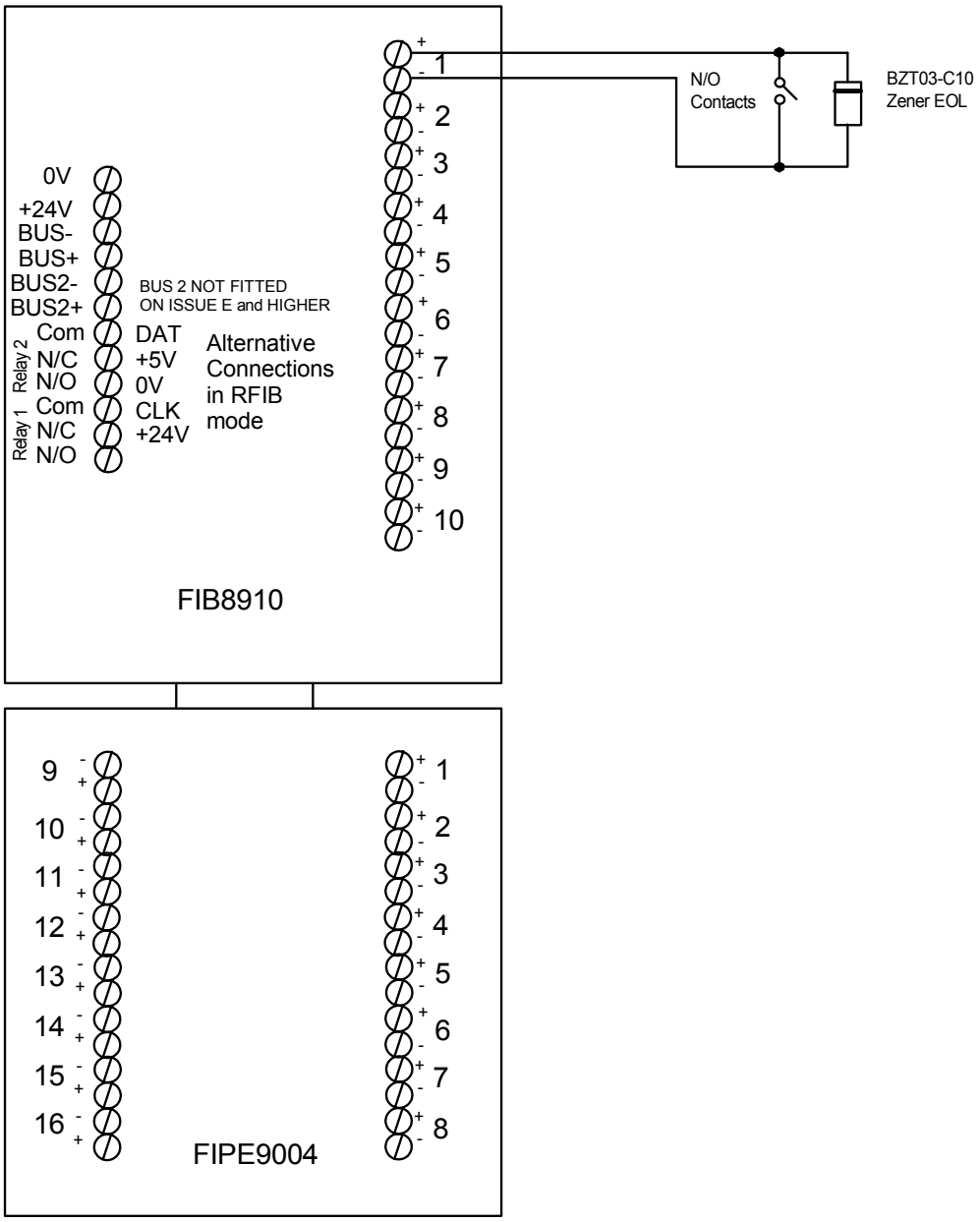


Figure 7-1 : FIB8910, FIPE9004 Showing termination points and example wiring

7.4 MULTIPLE FIP AND BGA INPUT CONNECTIONS

For staged evacuation, individual outputs for each evacuation zone must be provided by the FIP and be terminated to their programmed inputs on the relevant FIP input module. If BGA inputs are used they must also be terminated to their programmed inputs on the FIP input module or BGA input module if fitted.

This will allow for a cascading or spreading evacuation sequence to be implemented, usually starting with the initial zone on which the FIP alarm is detected or where the BGA is operated.

The first 10 inputs are on the first FIB8910 module, and the next 16 on the first FIPE9004 module, the next 16 on the second FIPE9004 module, and the next 16 on the third FIPE9004 module. If there are more than 58 inputs the sequence starts again with a second FIB8910 modules and possibly further FIPE9004 modules.

The inputs are normally assigned to zones on a one to one basis, but sometimes this will not be the case e.g. if some equipment is located remotely. The configuration printout supplied with the system shows the assignment of inputs to zones.

7.5 SWITCH AND LINK SETTINGS

FIB8910 Switches

Module Number / Input numbers	FIP Inputs Only OR Combined FIP/BGA/GP Inputs	BGA Inputs Only	GP Inputs Only
1 / 1 - 58	7 On, Rest Off	7,5 On, Rest Off	7,6,5 On, Rest Off
2 / 59 - 116	7,1 On, Rest Off	7,5,1 On, Rest Off	7,6,5,1 On, Rest Off
3 / 117 - 174	7,2 On, Rest Off	7,5,2 On, Rest Off	7,6,5,2 On, Rest Off
4 / 175 - 232	7,2,1 On, Rest Off	7,5,2,1 On, Rest Off	7,6,5,2,1 On, Rest Off
5 / 233 - 290	7,3 On, Rest Off	7,5,3 On, Rest Off	7,6,5,3 On, Rest Off

Settings for the RFIB9511 and FIB8910 in RFIB mode are the same as in the table except that switch 8 must be ON.

FIB8910 (Issue E or later) Links

	Not RFIB mode	RFIB mode
LK1 - LK6	“FIB” position	“RFIB” position

Fit the links in the “FIB” position unless the module is being used in the RFIB mode in an equipment rack with no ECP or ECM, i.e. when connecting to the SPIF module to control the SPIF relays.

FIPE9004 Switches

FIPE9004	Input range	Module Switches
1st	11-26,68-83,126-141	1,2 On, Rest Off
2nd	27-42,84-99,142-157	3,4 On, Rest Off
3rd	43-58,100-116,158-174	5,6 On, Rest Off

7.6 RELAYS

There are two relays on each FIP or BGA module except the RFIB9511 and FIB8910 Issue E and later in RFIB mode. These relays are usually available for General Purpose Outputs (normally closed contacts which open for fault or alarm) for connection to external equipment. These and other functions of the relays are configured by the software in the ECP module. The functions are listed in the system's configuration printout, and can be changed only by Tyco.

Each relay is normally energised whenever the system is powered up and the programmed function is not true. The terminals are connected to the relays as shown in Figure 7-2. The two relays are wired similarly.

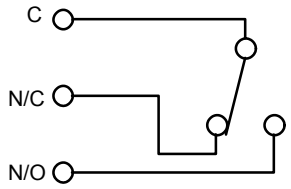


Figure 7-2 FIB8910 Relay

The Relay is shown in the energised position i.e. the position it will be in when the system is powered up and the programmed function is false. When the programmed condition is true or the system is powered down, the relay will be in the opposite position to that shown.

The relay functions which can be programmed can include (but are not limited to) the following, and logical combinations thereof -

- Any Alarm
- Any Fault
- FIP Alarm
- BGA Alarm
- Line Fault
- Module Fault
- Manual
- Isolate
- Any zone has tones or paging active
- Particular inputs or outputs active

If you require a relay to be normally de-energised this can also be programmed by Tyco. (For example an "Alarm" relay which did not indicate an alarm in the powered down state.)

The relays are rated at 30V 1A.

7.7 LEDS

The FIB8910 and RFIB9511 modules both have two LEDs, the functions of which are as follows –

LED	Colour	Normal State	Indication
LD1	Green	ON	+5V supply OK when on steady
LD2	Yellow	Flashing	Responding to Comms when flashing

7.8 SYSTEM EXPANSION

When adding a FIB8910 module to expand an existing system you will need to wire 24V DC Power and Comms to the new module. Power is wired in RED (+24V) and BLACK (0V) 1.0mm^2 wire and Comms in YELLOW (+) and BLUE (–)1.0mm^2 wire. POWER can be obtained from –

- The +24V / 0V terminals of another FIB8910 module
- The +24V / 0V terminals of a STRM9502 module or STBM9008 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

COMMS +/– can be wired from

- The COMMS +/– terminals of another FIB8910 module
- The COMMS +/– terminals of a STRM9502 module or STBM9008 module
- The FIP BUS +/– terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

8 STROBE RELAY DRIVER MODULE

8.1 GENERAL

The STRM9502 Strobe Relay Driver Module provides two type of outputs -
(1) Powered & supervised outputs designed to drive a pair of strobe lights (red and amber).
(2) General purpose unsupervised relay outputs (clean contacts).
The two types of outputs can be mixed on a module. It is necessary to distinguish between the two types of outputs by links on the module. These are identified on the silk-screen.

Programming of which evacuation zones control which outputs, and whether each output is a strobe output or a general purpose output is done by Tyco according to customer requirements. The details are listed on the configuration printout.

The module is also compatible with the older STBM9008 module and can be used as a direct replacement. It is compatible with STBT9008 strobe terminator modules which can be used in place of the diodes shown in Figure 8-1.

Refer to Chapter 25 for information on the “Widget Board” used to replace the microprocessor on the STRM9502 from late 2004.

8.2 STROBE OUTPUT WIRING

Strobe lights must be wired to the A and B terminals as shown in Figure 8-1.

The 2k7 resistor connected to each terminal pair when the system is shipped must be removed and connected to the end of the strobe line.

The maximum load on each output is 2.0 Amps. Higher loads than this could blow the fuses.

The following table shows the cable sizes required to keep the voltage drop at approximately 10%, for various loads and cable lengths -

Cable Length	100mA Load	250mA Load	500mA Load	1A Load	2A Load
100m	0.75 mm^2	0.75 mm^2	1.5 mm^2	2.5 mm^2	6 mm^2
200m	0.75 mm^2	1.5 mm^2	2.5 mm^2	4 mm^2	10 mm^2
300m	1 mm^2	2.5 mm^2	4 mm^2	6 mm^2	16 mm^2
500m	1.5 mm^2	4 mm^2	6 mm^2	10 mm^2	25 mm^2
700m	2.5 mm^2	4 mm^2	6 mm^2	16 mm^2	25 mm^2
1000m	2.5 mm^2	6 mm^2	10 mm^2	25 mm^2	40 mm^2

It is recommended that cables are no longer than 1000m.

Do not use a wire gauge appreciably heavier than the gauges in the above table – there may be problems with high inrush currents (which are required to charge the large electrolytic capacitors in some strobe lights) welding the relay contacts. It is also recommended that you don't use cables shorter than 100m, or if you do then add resistor(s) to make enough total resistance to give about 10% voltage drop at the intended load current.

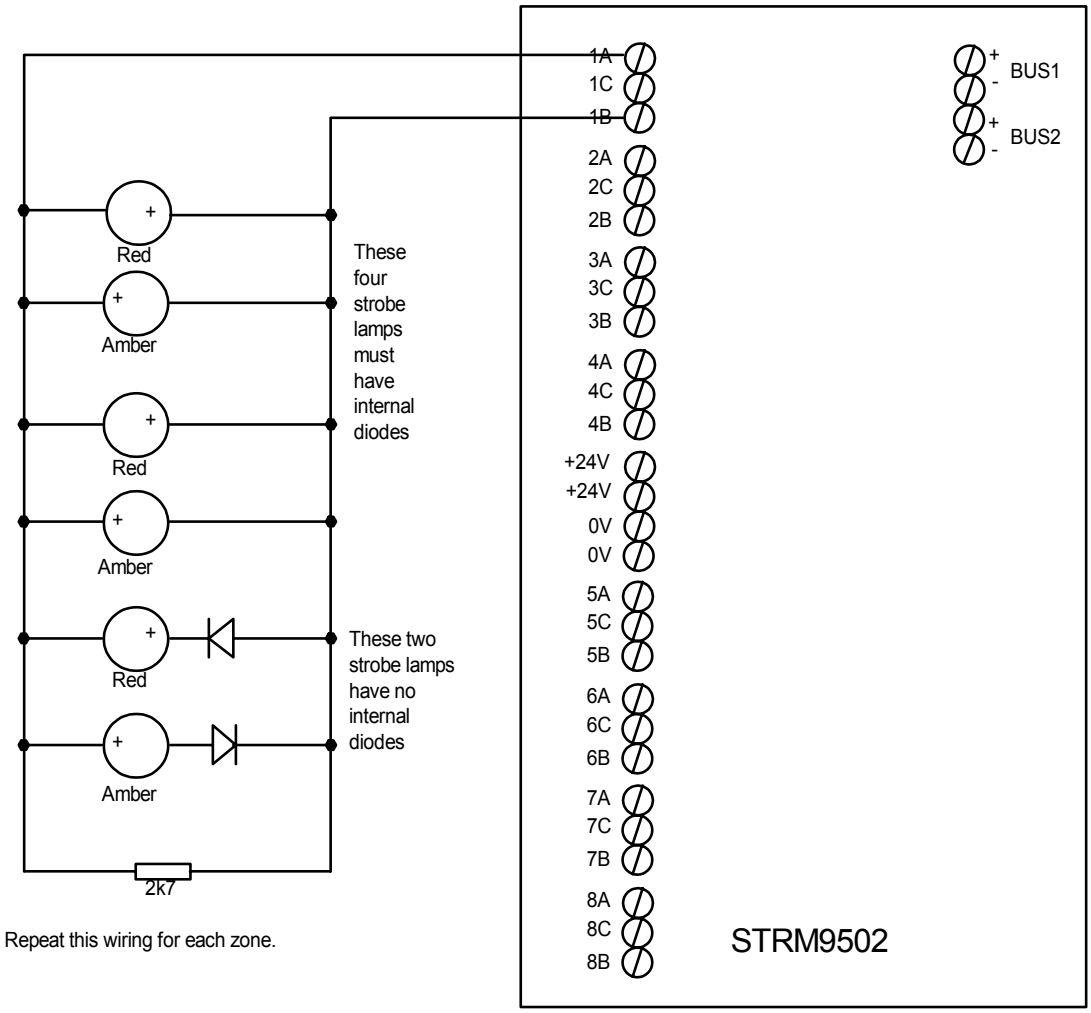


Figure 8-1 : Strobe Relay Driver Module and Strobe Light Connection

Many strobe lights have internal diodes to prevent damage if they are connected around the wrong way. If the strobe lights you are using do have an internal diode connected in series with the supply, then you will not need the diodes shown in Figure 8-1, and you can just wire every strobe light directly across the output of the STRM9502. Wire the alert strobe light positive terminal to A, and the evacuate strobe light positive to B.

8.3 GENERAL PURPOSE OUTPUT WIRING

If you are using some or all of the outputs as general purpose relay outputs, each unused strobe output can provide two separate relay outputs (with a shared common connection). For example, if output 8 is used for general purpose relay outputs, there will be two relay contacts, one between 8A and 8C and the other between 8B and 8C. The programming of these outputs must be done by Tyco.

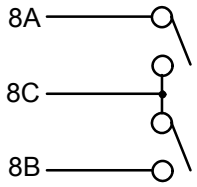


Figure 8-2 Internal Wiring of STRM9502 for pair of Relay Outputs

These relays are rated at 30V 1A, or 30V 2A for a resistive load.

8.4 LINKS AND DIP SWITCH SETTINGS

The link settings for each output are shown in the following table.

Strobe Output or GP output Pair	Links installed if strobe output	Links if GP output pair
1	1,9,17=2-3	1 removed, 9 removed, 17=1-2
2	2,10,18=2-3	2 removed, 10 removed, 18=1-2
3	3,11,19=2-3	3 removed, 11 removed, 19=1-2
4	4,12,20=2-3	4 removed, 12 removed, 20=1-2
5	5,13,21=2-3	5 removed, 13 removed, 21=1-2
6	6,14,22=2-3	6 removed, 14 removed, 22=1-2
7	7,15,23=2-3	7 removed, 15 removed, 23=1-2
8	8,16,24=2-3	8 removed, 16 removed, 24=1-2

The DIP switches must be set as follows. Note the alternate settings you can use to flash incandescent strobe lights (with strobe module firmware version 1.49 or later). Do NOT use these special settings for normal self-flashing Xenon strobe lights.

Strobe Module number	Address (hexadecimal) for reference	Normal DIP Switches ON (Rest Off)	Flash Incandescent Load. DIP Switches ON (Rest Off)
1	60	7,6	8,7,6,5
2	61	7,6,1	8,7,6,5,1
3	62	7,6,2	8,7,6,5,2
4	63	7,6,2,1	8,7,6,5,2,1
5	64	7,6,3	8,7,6,5,3
6	65	7,6,3,1	8,7,6,5,3,1
7	66	7,6,3,2	8,7,6,5,3,2
8	67	7,6,3,2,1	8,7,6,5,3,2,1
9	68	7,6,4	8,7,6,5,4
10	69	7,6,4,1	8,7,6,5,4,1
11	6a	7,6,4,2	8,7,6,5,4,2
12	6b	7,6,4,2,1	8,7,6,5,4,2,1
13	6c	7,6,4,3	8,7,6,5,4,3
14	6d	7,6,4,3,1	8,7,6,5,4,3,1
15	6e	7,6,4,3,2	8,7,6,5,4,3,2
16	6f	7,6,4,3,2,1	8,7,6,5,4,3,2,1

8.5 STROBE CIRCUIT COMMISSIONING

Note that the strobe line is monitored at a voltage of 0.2 volts. The module will not attempt to put voltage on a line which is in fault (i.e. is shorted or open or does not have a 2k7 resistor connected.) If a short circuit occurs when an output is ON the fuse for the particular output on the module could blow. After repairing the short circuit, the fuse must be replaced by a 20mm x 5mm 2 Amp standard fuse (NOT slow blow).

8.6 LEDS

LED	Colour	Normal State	Indication when ON
LD1	Green	ON	Microprocessor running when on steady
LD2	Yellow	Flicking	Responding to Comms when flicking on
LD3	Green	ON	+5V supply OK
LD4	Red	OFF	Flashing – current line fault Steady – latched line fault

If a fault was present but all strobe outputs are now normal, the Red LED will be steady. This feature is designed to assist in determining if an "Audio fault" indication on the ECP is/was an amplifier fault/speaker line fault or a strobe line fault. To extinguish the steady red LED, switch the ECP to Isolate and back to Manual or Auto (all software versions) or press and hold SILENCE for 2 seconds (ECP Version 2.0 and later).

8.7 SYSTEM EXPANSION

When adding a STRM9502 module to expand an existing system you will need to wire 24V DC Power and Comms to the new module.

Power is wired in RED (+24V) and BLACK (0V) wire from –

- An unused or lightly used AMP RACK output of the power supply. In the case where the total strobe load exceeds 25A with the PSU308, 4A with the PSU2403, or 10A with the PSU2406 this is the only allowable source.
- The +24V / 0V terminals of another STRM9502 module or STBM9008 module
- The +24V / 0V terminals of a FIB8910 module
- The two pin Molex connector on a flying lead of the PSU2403 or PSU308
- The +24V FIP and 0V screw terminals inside a PSU2406.

The wire used should be at least 1.0mm^2 per 10 amps of strobe load. Ensure that this thickness continues right back to the power supply.

Comms can be wired in YELLOW (+) and BLUE (–)1.0mm^2 wire from

- The COMMS terminals of another STRM9508 module or STBM9008 module
- The COMMS terminals of a FIB8910 module
- The FIP BUS terminals of a Signals Interface Module (SE9004 or SPIF9506 or SPIF9709).

Polarity is important for both Power and Comms.

9 BACKGROUND MUSIC INPUT FACILITY

9.1 SINGLE CHANNEL MUSIC INPUT

This chapter refers to the “signals interface module”. This module will be the SE9004 on a basic QE90 system, the MEXP9103 on an older QE90 with a SECP, or the SPIF9506/SPIF9709 on a newer QE90 with an SECP or remote equipment rack.

Where a single channel of background music is required, the outputs from the background music source must be terminated to the "MUSIC" terminals on the signal interface module. Minimum line level required is 300mV RMS for full power output.

Zones can be programmed for background music by using the programming facility described in section 24.2. In a system with ECM modules, the background music zones are programmed with a laptop/terminal as described in section 20.7.

9.2 MULTIPLE CHANNEL MUSIC INPUTS

If multiple channels of music are required for various zones the following methods may be used to achieve this -

- One or more channels can be fed to the local inputs of individual amplifiers, as described in Chapter 5. These inputs are selected using the links on the amplifier module and NOT selecting background music for the corresponding zones in programming mode.

- Another channel can be fed to the AUX input of the signals interface module. This input is selected using the links on the amplifier module and NOT selecting background music for the corresponding zones in programming mode.

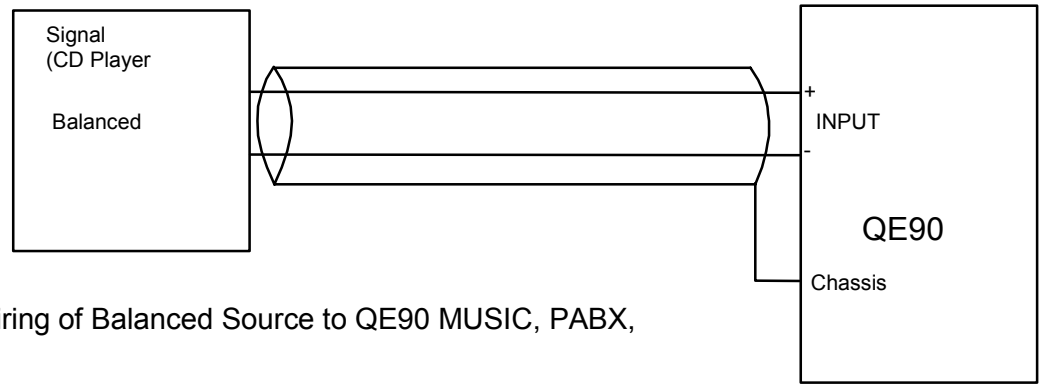
If there are no Paging Consoles and no other dynamic control of which zones have the PABX input activated, another music or Paging channel can be fed to the PABX input on the signals interface module. The zones for this input must be selected for paging in programming mode as described in section 24.2. In a system with ECM modules, the paging zones are programmed with a laptop/terminal as described in section 20.7.

9.3 NON-EMERGENCY ZONES

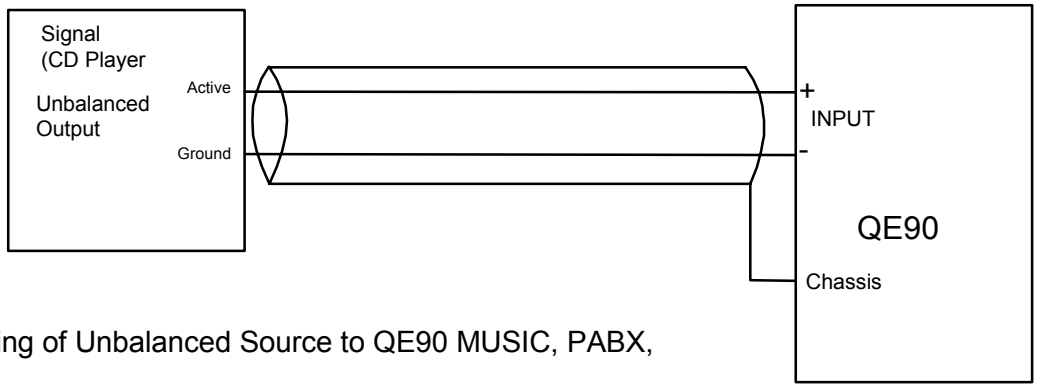
The zones for the PABX input and optionally the MUSIC input may contain different sets of amplifiers from the evacuation zones. Thus a building may be split up in different ways for Emergency and Non-emergency functions. This facility will be programmed by Tyco according to customer requirements.

The system can be configured by Tyco so that the zones which are fed from the MUSIC and/or PABX inputs on the signals interface module can be controlled by switch inputs to the QE90, or by a Paging Console, thereby providing a “run time” assignment of one or two channels of music to various zones.

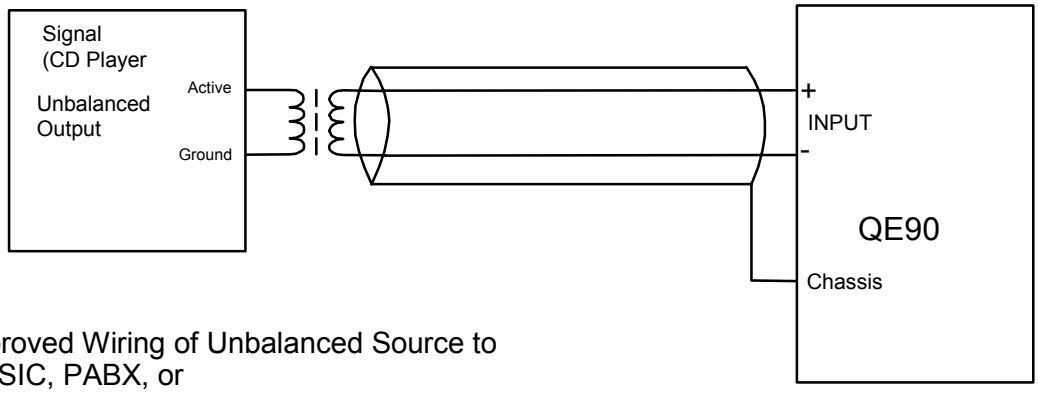
The MUSIC, AUX, and PABX inputs are balanced inputs and must be wired as shown in Figure 9-1. An audio line isolating transformer may be used to obtain a balanced output from the source, if it is unbalanced. The ALIM9706 module may be used for this. This will reduce noise induced into the cables.



Wiring of Balanced Source to QE90 MUSIC, PABX,



Wiring of Unbalanced Source to QE90 MUSIC, PABX,



Improved Wiring of Unbalanced Source to
MUSIC, PABX, or

Figure 9-1 Wiring to QE90 MUSIC, PABX, and AUX Inputs

9.4 MUSIC INPUT FROM STEREO SOURCE

The stereo output from a source such as a CD Player may be fed into the mono BGM input of a QE90 using the wiring as given in Figure 9.2.

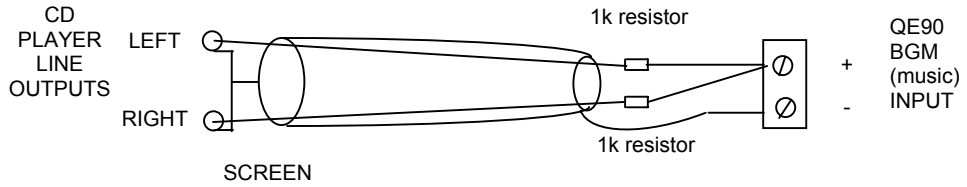


Figure 9.2 Suggested Wiring For Connection
Of Stereo CD Player to QE90 Music Input

10 PAGING CONSOLE

10.1 PAGING CONSOLE WIRING

One or more Tyco FP0539 Paging Consoles may be used with a QE90 system. Each console gives selective zone paging to up to 30 zones. These zones do not need to be the same as evacuation zones. Programming of any combinations of amplifiers into paging zones can be done by Tyco. Refer to the configuration printout for details of the current configuration.

If the system has more than 30 paging zones, then more than one Paging Console can be used at the same location to address the zones. Only one microphone is required.

Figure 10-1 and Figure 10-2 show how to connect various systems. The top of the Paging Console is removed to obtain access to the terminations.

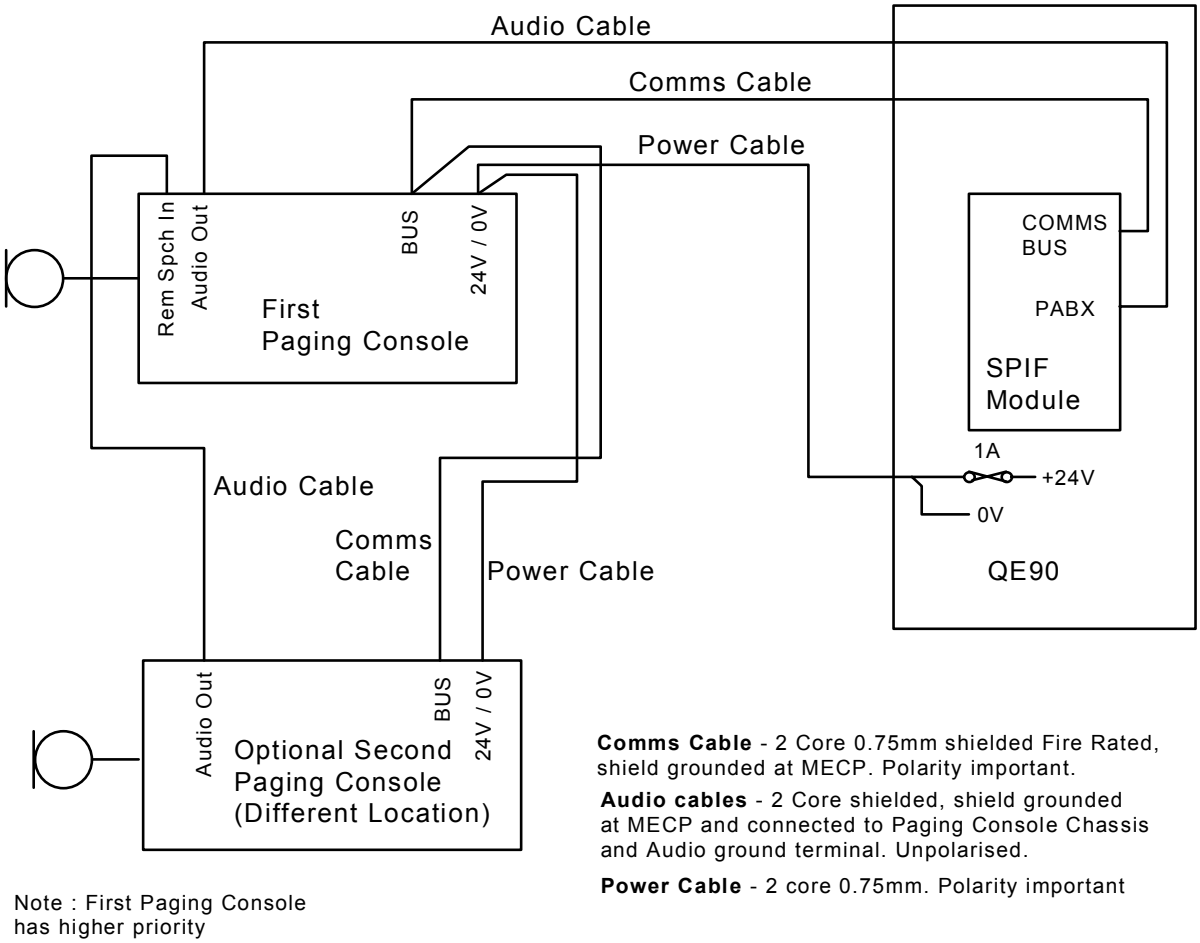
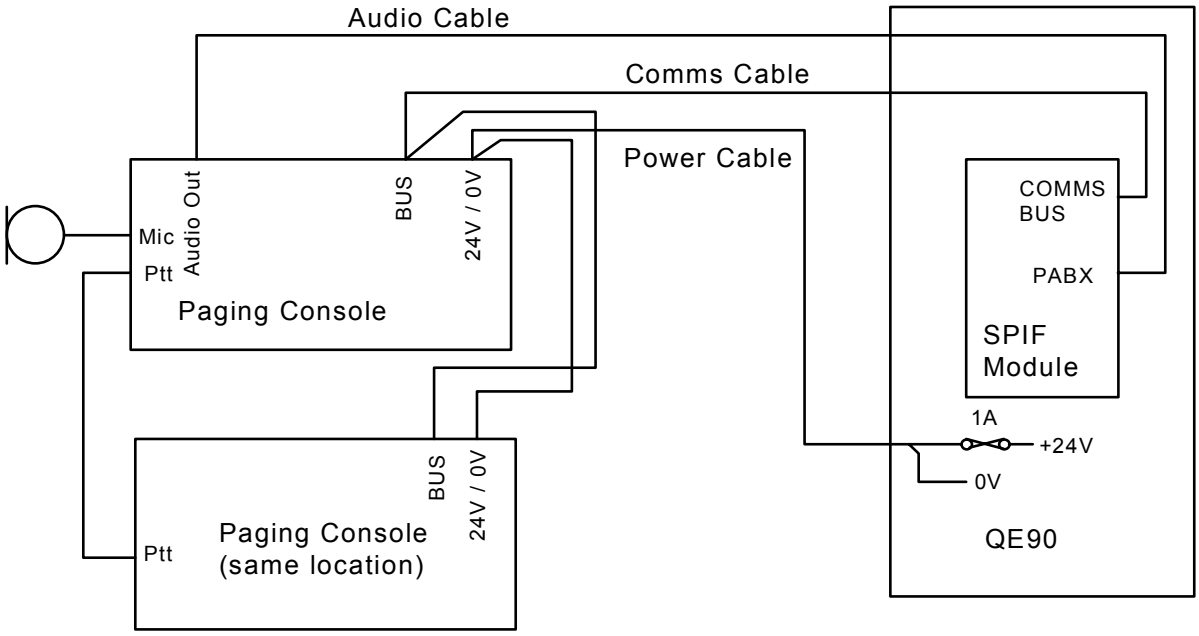


Figure 10-1 : Paging Console Wiring : Less than 30 Paging Zones



Comms Cable - 2 Core 0.75mm shielded Fire Rated, shield grounded at MECP. Polarity important.

Audio cables - 2 Core shielded, shield grounded at MECP and connected to Paging Console Chassis and Audio ground terminal. Unpolarised.

Power Cable - 2 core 0.75mm. Polarity important

Figure 10-2 : Paging Console Wiring : More than 30 Paging Zones

It is also possible to have multiple paging consoles at multiple locations where there are over 30 paging zones. The wiring can be obtained by combining the above two diagrams.

Note that if the system has amplifiers in more than one location (e.g. remote equipment racks), it is necessary to connect the audio output of the Paging Console to the PABX input at each location with amplifiers that require the paging function. The COMMS BUS of the Paging Console can be connected to COMMS BUS of any SPIF module. It must not be connected to COMMS BKUP.

The DIP switches on the paging consoles must be set as follows

Paging Console number	Address (hexadecimal) (for reference)	DIP Switches ON (Rest Off)
1	70	7,6,5
2	71	7,6,5,1
3	72	7,6,5,2
4	73	7,6,5,2,1
5	74	7,6,5,3
6	75	7,6,5,3,1
7	76	7,6,5,3,2
8	77	7,6,5,3,2,1
9	78	7,6,5,4
10	79	7,6,5,4,1

11 MICROPHONE PREAMPLIFIER MODULE

11.1 PA0688 OVERVIEW

The PA0688 Microphone Preamplifier board is designed for use with Tyco EWIS systems; QE90 and Microvac. It contains a microphone preamplifier with automatic level control, and two relays which are operated by the PTT switch on the microphone. The first relay switches the line level output between line level input terminals and the output of the preamplifier and can be used to allow several PA0688 preamps to be connected to the same QE90 input. The second relay is a two pole changeover relay which can for example be used to disconnect speakers in close proximity to the microphone when the microphone is in use, (to prevent audio feedback) but can also be used for various other functions, e.g. to provide a switch input to the QE90 to indicate that Paging is required.

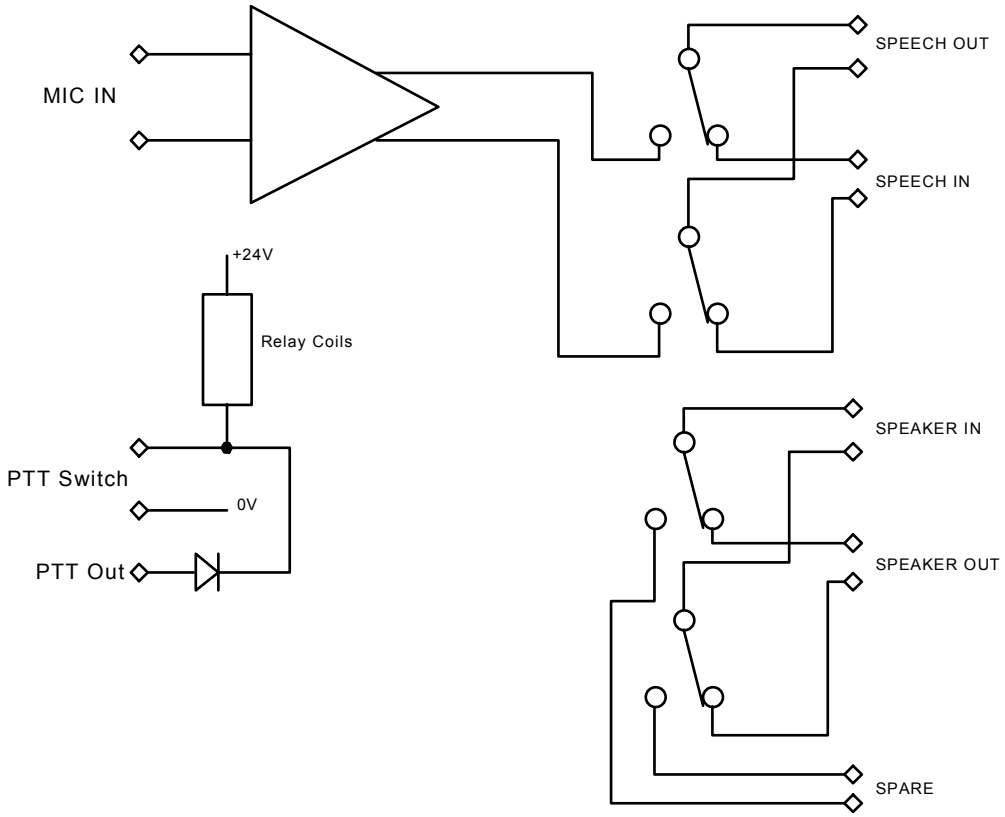


Figure 11-1 PA0688 Preamp Block Diagram

11.2 PA0688 WIRING

The PA0688 microphone preamplifier can be connected to the QE90 in many ways. One example is to provide local paging to several QE90 amplifiers, using the QE90 amplifier local inputs. Refer to Section 5.2.5 and Figure 11-2.

Note that in this diagram, there are two preamps connected in a daisy chain so that either may be used. In the event of PTT being pressed on both at the same time, the one closest to the QE90 will have priority. The connection to the QE90 amplifier local inputs has been isolated by a transformer as these inputs are unbalanced and the use of the transformer will provide a reduction in hum and noise. The SPKR IN+ and SPARE+ terminals on the PA0688 have been used to obtain clean contacts which close when PTT is operated, and these have been wired to a GP input (or spare FIP input) which could be programmed by Tyco to disable background music to the relevant amplifiers when the local paging is in use. Note that all audio cables should be shielded and the shields connected to ground at the QE90.

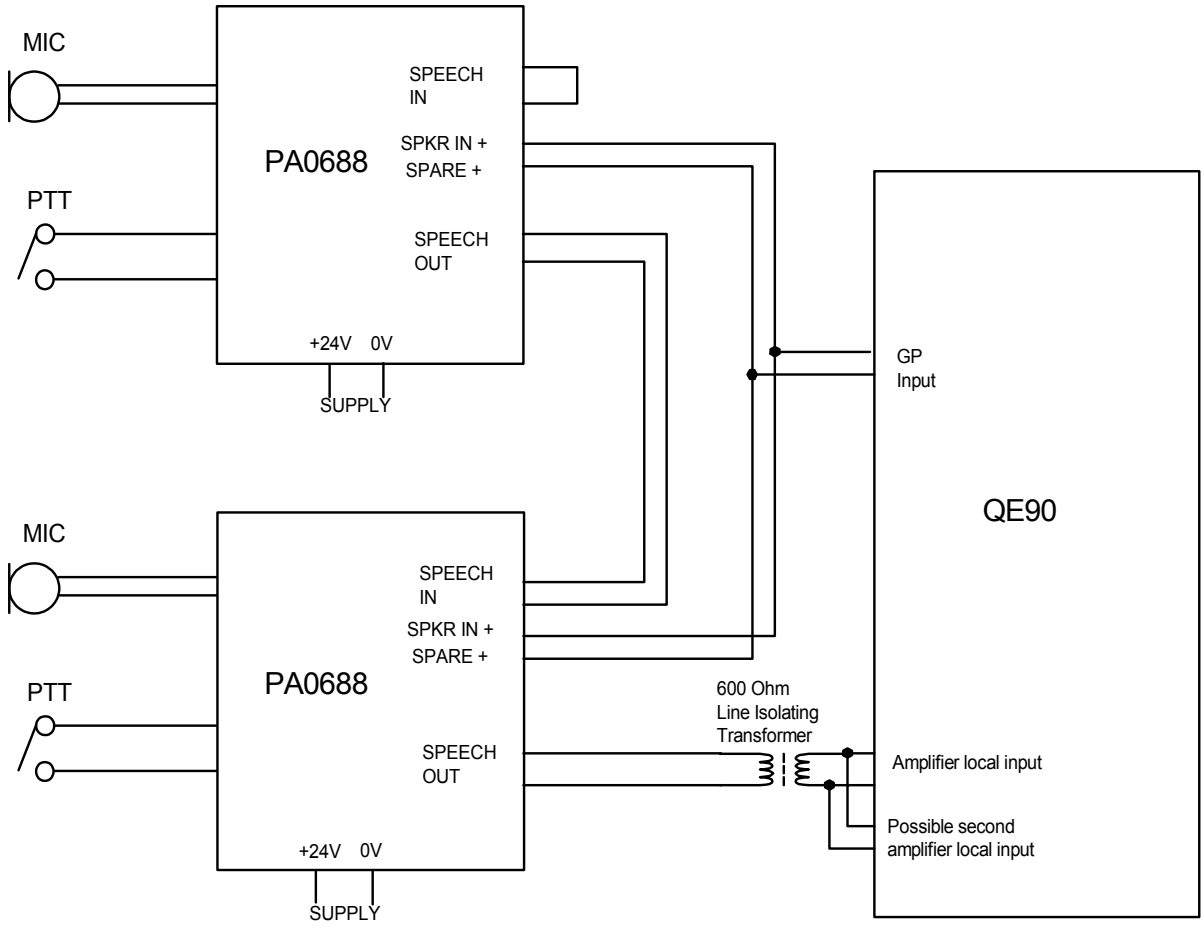


Figure 11-2 Using PA0688 Preamp with QE90 Local Inputs

Note - An ALIM9706 could be used for the 600 Ohm Isolating Transformer. Refer to section 21.2.

Another example is shown in Figure 11-3. In this case the output of the preamp is connected to the QE90 MUSIC input. This example also shows how the PA0688 can be used to disconnect speakers near the microphone to prevent feedback.

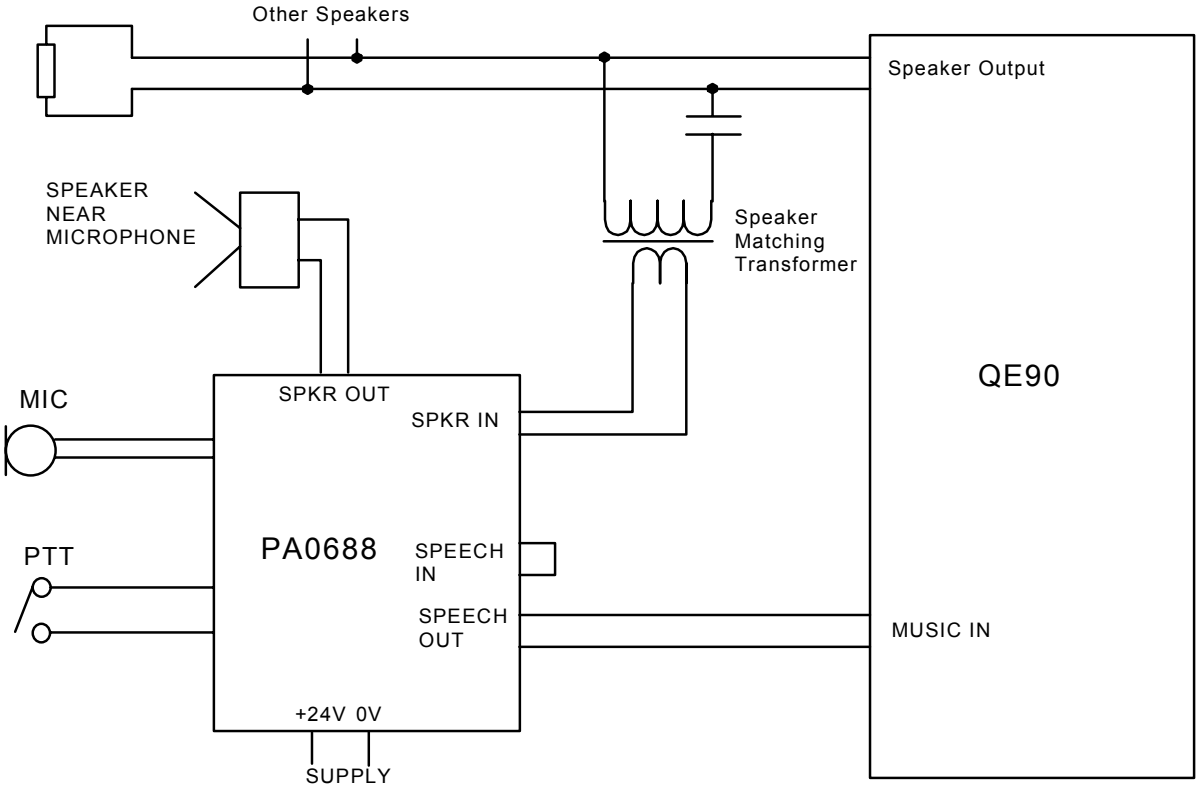


Figure 11-3 : Using PA0688 Preamp with QE90 Music Input

11.3 PA0688 POWER SUPPLY

In both the above examples, the 24V supply required by the PA0688s could be obtained from the QE90 or from local power packs with isolated outputs.

12 BATTERIES AND POWER SUPPLIES

12.1 BATTERY REQUIREMENTS AND WIRING

The QE90 requires 24 Volt sealed lead acid batteries. Normally 2 x 12 Volt batteries will be connected in series to give 24V. In many cases it may be useful to connect four or more batteries in series/parallel as four smaller batteries will often fit in the cabinet better than two larger batteries.

The recommended battery capacity can be calculated as described in the Technical Manual (LT9002) or by the QE90 Costing / Design program QECOST. The Technical manual assumes all amplifiers are loaded to their rating, if your system has less loading you may allow for this and choose smaller batteries. QECOST allows you to enter an average load percentage for amplifiers and load current for strobes and bases the battery capacity on these figures.

12.1.1 BATTERY ARRANGEMENTS – DEEP CABINETS

The following diagrams show typical battery configurations for various sized cabinets. QECOST Version 3.2 or later can be used to obtain recommendations for particular systems. The QECOST recommendations are tailored for the exact battery capacity required and the space available in each system, and may not exactly match any of the configurations shown below. The QECOST recommendations will always be made up of layers which appear somewhere in Figure 12-1 through Figure 12-4.

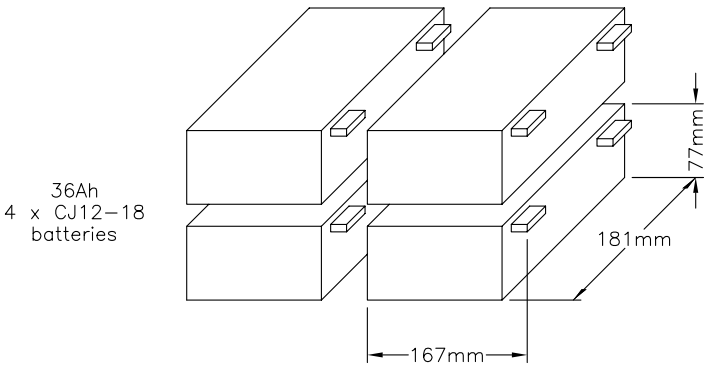


Figure 12-1 Typical battery arrangement for an 18U Cabinet

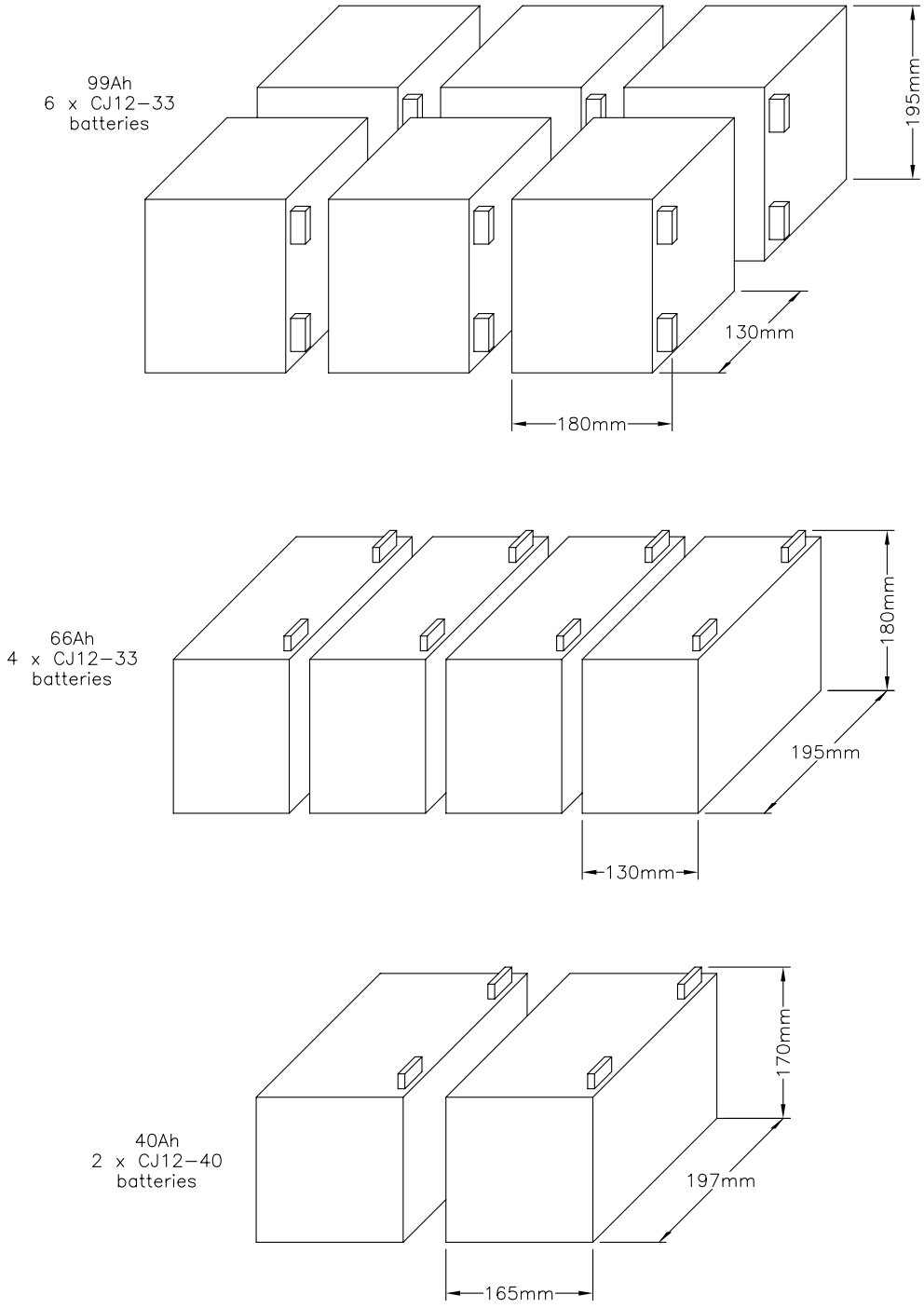


Figure 12-2 Three typical battery arrangements for a 21U Cabinet

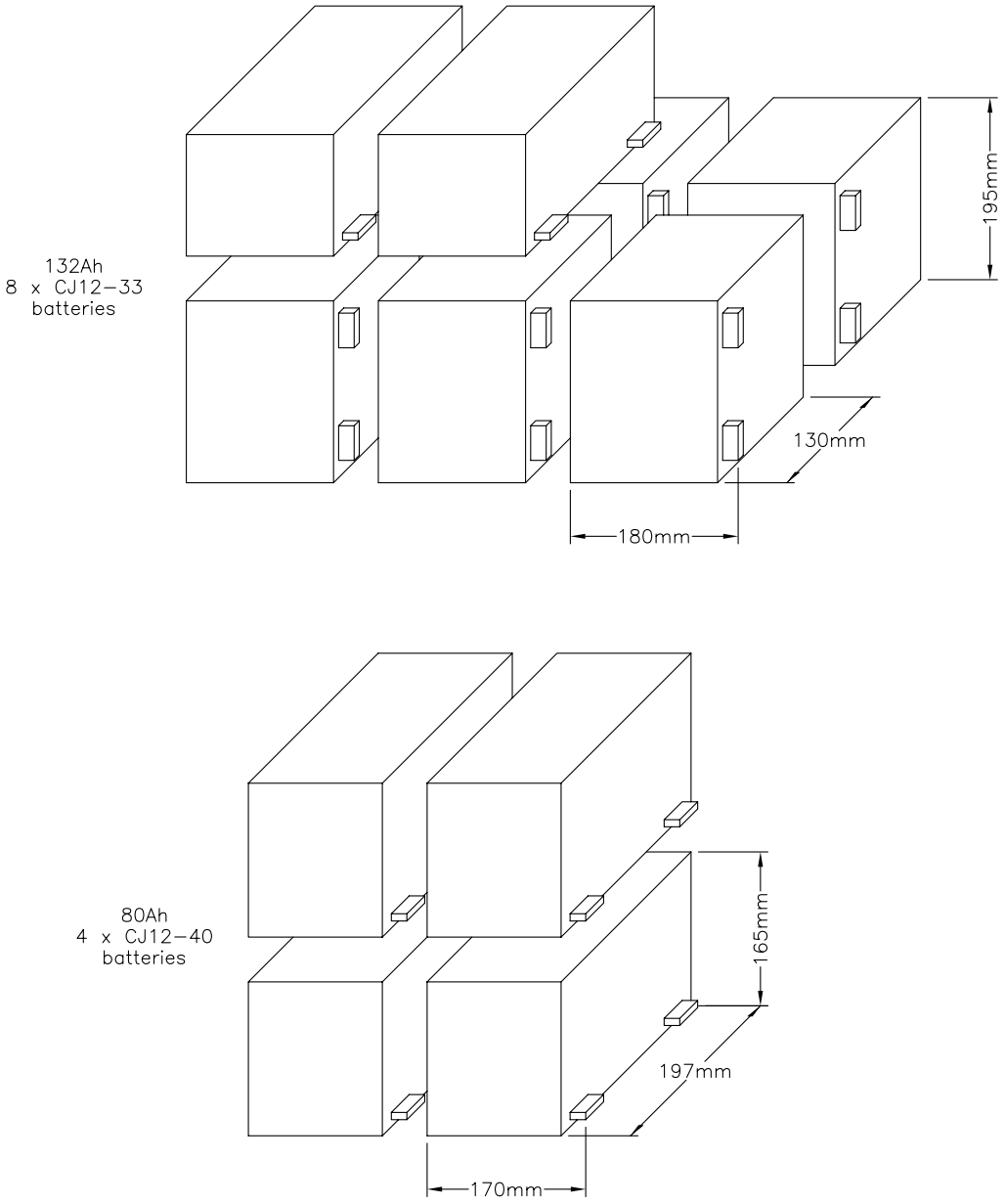


Figure 12-3 Two typical battery arrangements for a 28U cabinet

Note – the arrangements for smaller cabinets may also be used in a 28U cabinet.

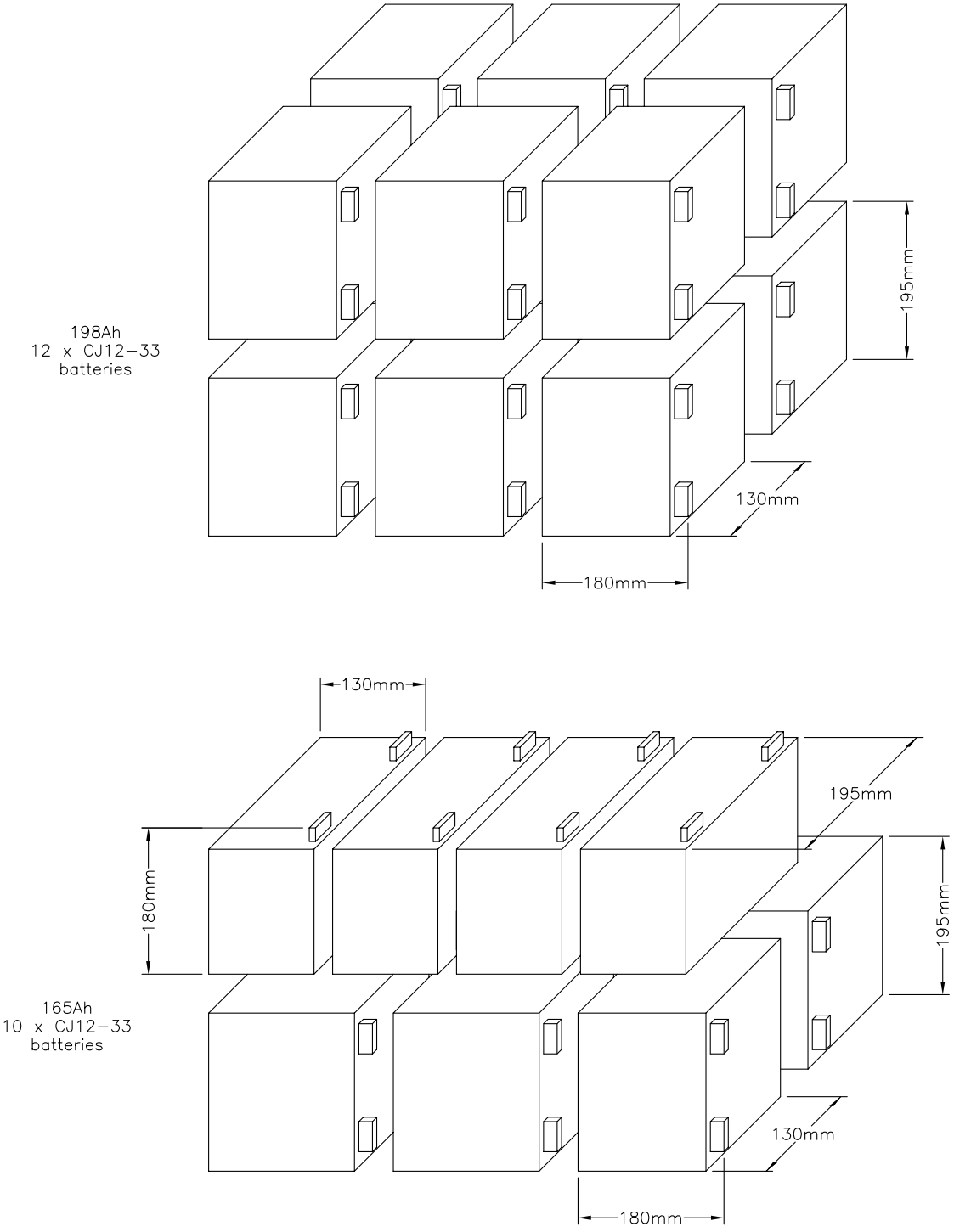


Figure 12-4 Two typical Battery Arrangements in a 40U Cabinet

Note – the arrangements for smaller cabinets may also be used in a 40U cabinet.

In some cases, especially if all outputs are heavily loaded and/or there is a lot of strobe current load, the recommended batteries will not fit in the standard cabinet and you will need to use a larger cabinet or obtain a separate battery box.

12.1.2 BATTERY ARRANGEMENTS – SHALLOW CABINETS

In shallow cabinets (typically used for SECPs), a bracket or brackets will be provided on which to fit 2 (or more) 18AH batteries. QECOST will define the number of batteries required, usually it will be only two, but may be more if there is some load supplied from the panel, e.g. strobe outputs.

12.1.3 BATTERY WIRING

The batteries are connected to the heavy red and black cables from the charger(s). In a large system with more than one charger, it is recommended that the chargers are connected in parallel, as shown in Figure 12-5

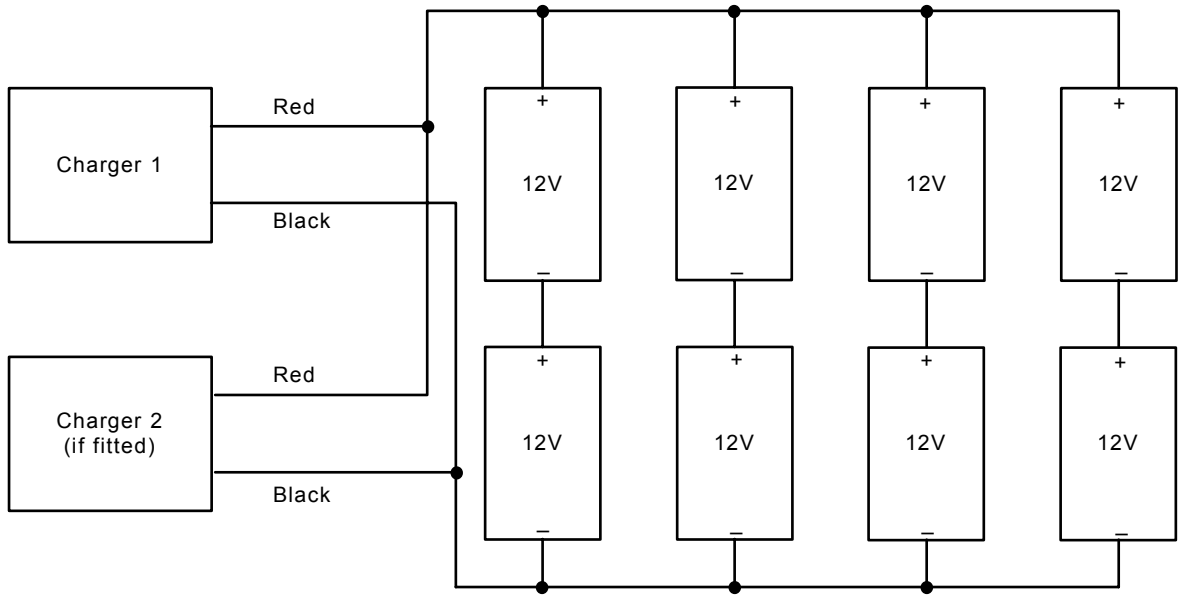


Figure 12-5 : Battery Connections

In a situation like this where there are multiple chargers, refer to drawing 699-180 at the end of Chapter 19 for details on wiring the fault outputs.

The capacity of batteries connected in series MUST be the same for both batteries.

12.2 POWER SUPPLIES

The following power supply models are currently in use –
- ME0211 24V 12A PSU308 3U Rack Mounting
- ME0330 24V 6A PSU2406 Brick
- ME0331 24V 6A PSU2406 2U Rack Mounting
- ME0333 24V 12A PSU2412 2U Rack Mounting

The following power supply models have been used previously –
- ME0212 24V 3A PSU2403 2U Rack Mounting
- ME0210 SECP Power Supply 5U rack Mounting
- ME0201 Original QE90 Power Supply.

For details of these older supplies please refer to LT9002, QE90 Technical Manual.

When multiple power supplies are fitted in a cabinet, the AMP RACK outputs of the supplies connect individually to the amp racks in the panel. However the battery connections of all the supplies are wired in parallel. Refer to Section 12.1 for further details of how the power supplies should be wired to the batteries.

12.3 PSU2406 AND PSU2412

12.3.1 REPLACING OLDER SUPPLY WITH PSU2406 OR PSU2412

The ME0331 can be used to replace an ME0212 in the field, or to replace an ME0211 in the case where 6 amps is sufficient for the system. The ME0333 can always be used to replace an ME0211. The ME0331 and ME0333 have a lead with a 6 pin Phoenix connector which connects directly to the ECP module. If the system has one or more FIP, STRM, or ECM modules, the 24V supply for these modules can be obtained from the +24V FIP and 0V screw terminals in the PSU. It will be necessary to remove the cover of the ME0331 or ME0333 to gain access to these terminals. With the ME0211 and ME0212 this supply could be obtained from a flying lead terminated with a Molex connector.

Note that the continuous rating of the PSU2406 is 5A and the PSU2412 is 10A. However, these units will safely deliver 6A and 12A respectively for a short period, e.g., when recharging batteries.

12.3.2 LINKS.

Link	Function
1	Fit to disable self timed “Battery Disconnected” and “Battery Low Capacity” tests.
2	**Fit to select NZ mode -** Charger High, Charger Low, Mains Fail do not activate the general fault output. Self timed battery tests every 24 hours after 72 hours with no externally initiated tests. Battery Low capacity is non-latching. **Remove to select Australian mode -** All fault conditions contribute to general fault output. Self timed battery tests every hour until failure then every half hour. Battery Low capacity is latching.
3	Fitted in PSU2412, removed in PSU2406

Note QE90 systems currently shipping have Link 1 fitted to disable automatic testing of Battery Disconnected and Battery Low Capacity, as these faults if discovered will cause a misleading “mains fail” indication on the ECP module. A later version of ECP module may be able to show these conditions as “battery fail”, in which case Link 1 can be removed to enable Battery Disconnected and Battery Low Capacity testing. These tests are primarily to comply with AS4428.5, which is not yet required for EWIS systems.

12.3.3 BATTERY TESTING

“Battery Disconnected” (when enabled by link 1 being removed) is checked at least every 30 seconds. In the case of an extremely flat battery or one which is of insufficient capacity for the load, “Battery Disconnected” may be indicated even though the battery **is** connected.

“Battery Low Capacity” is checked automatically as described in the table above (when enabled by link 1 being removed). It is also checked when the “battery test” terminals are shorted regardless of link 1. A latched “Battery Low Capacity” fault can be updated by shorting the “Battery Test” terminals for at least 1 second, or by briefly selecting NZ mode by inserting link 2.

12.3.4 ADJUSTMENTS.

To adjust the float voltage ensure that the load is minimal, eg by disconnecting the battery and load, and adjust VR1. This voltage should be set to the battery manufacturer’s recommended float voltage at the current temperature. The factory set voltage is 27.3V at 20°C.

To adjust the battery low threshold, disconnect the battery and load and wait until the output voltage stabilises if it is changing, then short the BATTERY TEST terminals, and adjust VR2 so that the output voltage is 0.5V less than the threshold you want. For example for a threshold of 24.0V, set the output voltage to 23.5V. Note – for compliance with AS4428.5 and NSZ4512 the threshold voltage should be set to the 50% discharge point assuming an end point of 19V, with a load equal to the alarm load. You will need discharge graphs from the battery manufacturer to determine this voltage. The factory set battery low threshold is 24.2V.

12.3.5 LEDS

LED	Colour	Function	Indications
1	Green	Operating / Current	This will flash at about 1.2 Hz. The amount of current the power supply is delivering is indicated by the duty cycle of the flashes - about 10% for 0 amps up to about 80% for the rated current of the supply.
2	Yellow	Fault	When a fault is present, this will flash seven times then pause, repeatedly. Each flash will be short if a particular fault is not present, or long if the fault is present, indicating the following in order - Charger High, Charger Low, Battery Low, Battery Fail, Battery Disconnected, Battery Low Capacity, Mains Failed. A thermistor open or short circuit is indicated by Charger High and Charger Low at the same time

12.4 PSU308

12.4.1 ADJUSTMENTS

To adjust the float voltage ensure that the load is minimal, eg by disconnecting the battery and load, and adjust VR2. This voltage should be set to the battery manufacturer's recommended float voltage at the current temperature. The factory set voltage is 27.3V at 20°C.

12.4.2 LEDS

LED	Colour	Function	Indications
1	Green	Mains On	Mains voltage is On.
2	Yellow	Charger High	The Charger Voltage is HIGHER than normal.
3	Yellow	Charger Low	The Charger Voltage is LOWER than normal. This may be due to a fault or a heavy load exceeding the current rating of the charger
4	Yellow	Battery Low	The Battery Voltage is lower than the 50% discharge point.

12.5 ADDING AN AMP RACK TO AN EXISTING SUPPLY

When an amp rack is added to an existing system, and no additional power supply is used, it will be necessary to fit a further circuit breaker to the power supply if it is a PSU308 or PSU2412.
The circuit breaker should be wired as shown in Figure 12-6.

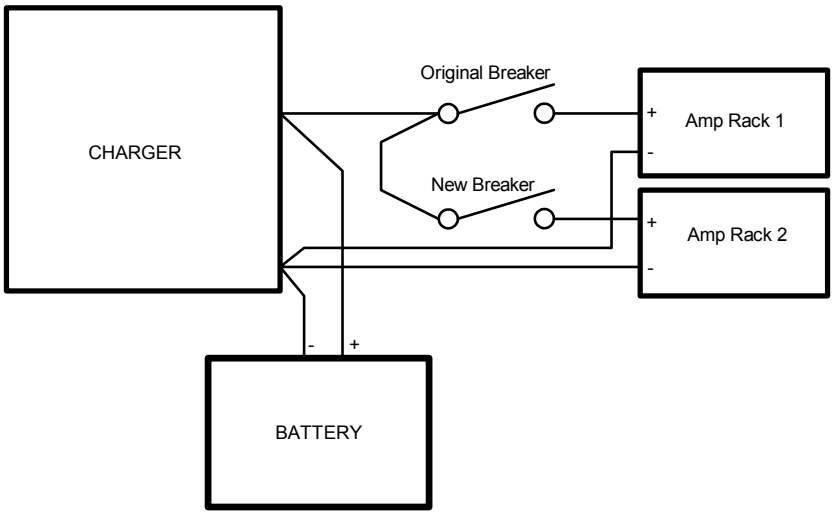


Figure 12-6 Addition of Circuit Breaker to PSU

Adding an amp rack to a system with a PSU2406 should only be done if the total amplifier load current is less than 50A, and then the supply to the two amp racks would be wired in parallel.

12.6 ADDING AN ADDITIONAL POWER SUPPLY

When an additional power supply is added to a system, the following points should be noted

- Each Amp Rack should be wired to a separate AMP RACK circuit breaker.
- The ECP, ECM if any, and any FIP Input modules should be wired to the ECP output of the first Power Supply.
- Strobe Modules should be distributed across the power supplies, using the FIP/STROBE output of each supply, such that no output is loaded at more than its rating (10A for PSU2406, 25A for PSU2412 and PSU308).

The CHARGER FAULT– outputs from each power supply need to be combined to a single CHARGER FAULT– signal to feed to the ECP. This is done as shown in Drawing 699-180 at the end of Chapter 19.

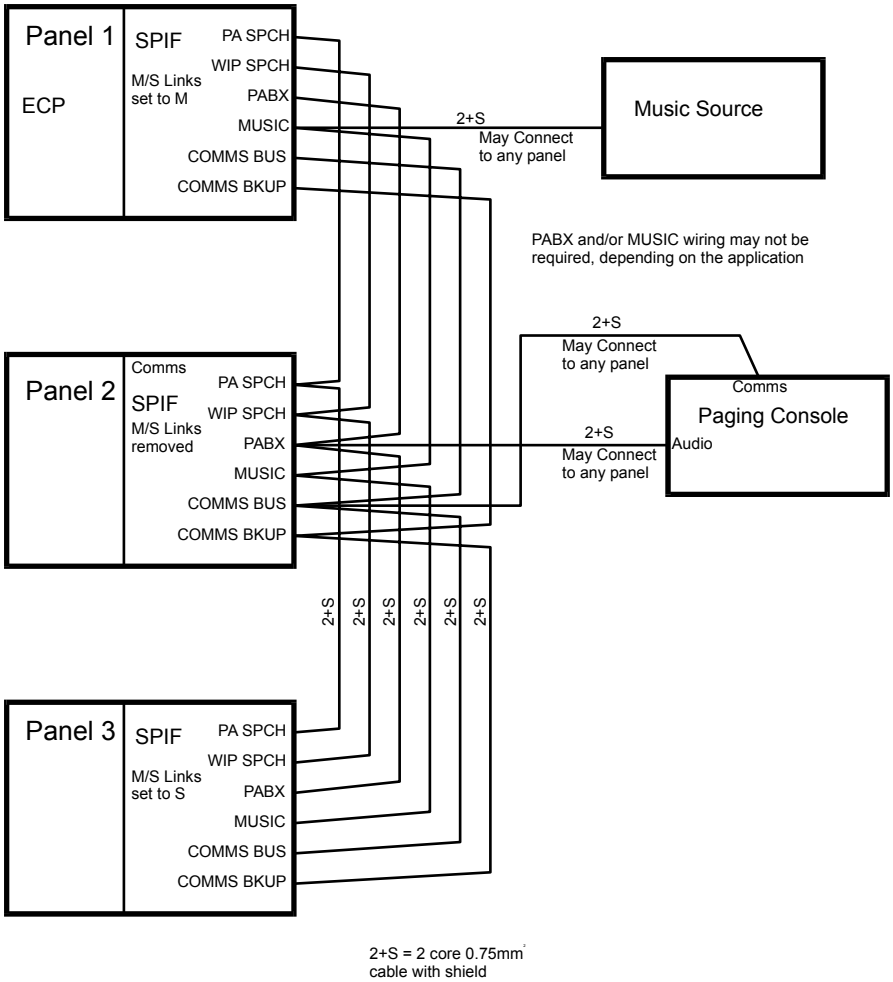
13 SECP & REMOTE EQUIPMENT RACK INTERFACE

13.1 WIRING

Between ECPs and equipment racks it is necessary to run a minimum of four cables, each consisting of a fire rated shielded pair with each conductor 0.75mm^2. There is a primary Comms cable, a spare Comms cable, a PA speech cable, and a WIP speech cable. In the event of failure of one of the speech cables, the remaining speech cable will be used for either PA or WIP as required. If both PA and WIP are used at the same time (e.g. two operators are using the ECP), PA will have priority and WIP communications will be temporarily suspended. If this is unacceptable, and it is necessary to have PA and WIP fully functional at the same time even when one of the cables is faulty, a fifth cable will need to be fitted. This is the Speech Backup cable.

If there are amplifiers at more than one location, and the system has Background Music or Paging Consoles, then additional cables may need to be run between all locations with amplifiers (one additional shielded pair per function).

Figure 13-1 shows the wiring for a typical system (without ECMs). For a system with ECMs, refer to Figure 20-2.



Audio Monitoring
The panel with the M/S links in the M position (and no others) should have "Monitor Analog busses" set to with the ECP DIP switch.

Maximum cable length
The total bus length from Panel 1 to Panel 3 **plus** the length from Panel 2 to the Paging Console must be less than 1000m.

Figure 13-1 ECP / SPIF InterPanel Wiring

Note that there is an advantage in running two sets of cables by different routes, so that if the cables in one route are completely broken by structural damage to the building, the system can continue to operate. This is shown in Figure 13-2.

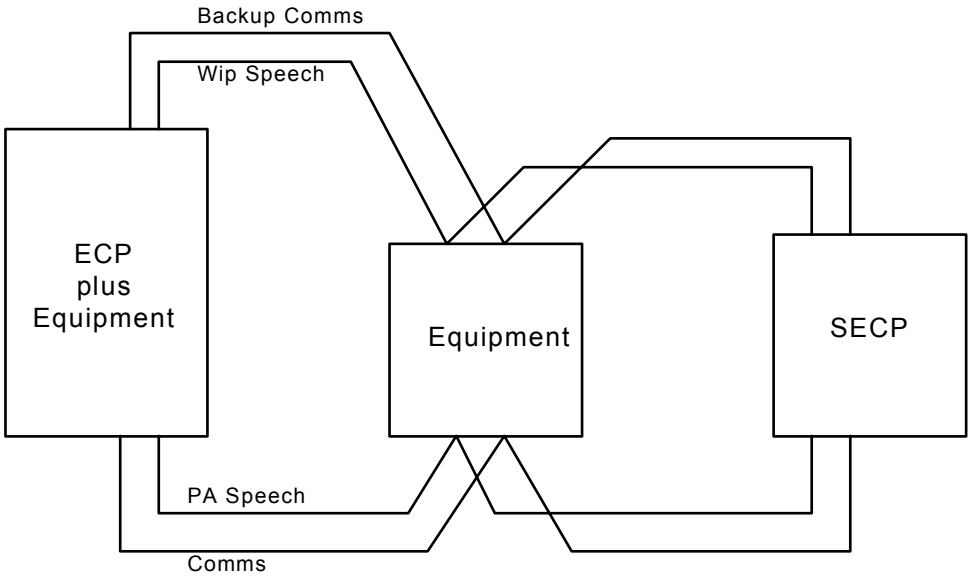


Figure 13-2 : Wiring between ECPs and/or Equipment Racks

Figure 13-3 shows the connections to the SPIF9506/SPIF9709 Interface module which will be located at each ECP and equipment rack in a multiple location system. The connections are bussed between like terminals on the interface modules. Note that although the comms wiring can be wired in a star or with spurs as desired, speech wiring must be bussed between locations - star / spur wiring or looping is not permitted. Also one end of the speech cables must be an ECP module, and that ECP module and its SPIF module must be set up to monitor the cables. Refer to sections 13.2 and 16.2.

For networked systems with ECM modules at each location refer also to Chapter 20 and Figure 20-5.

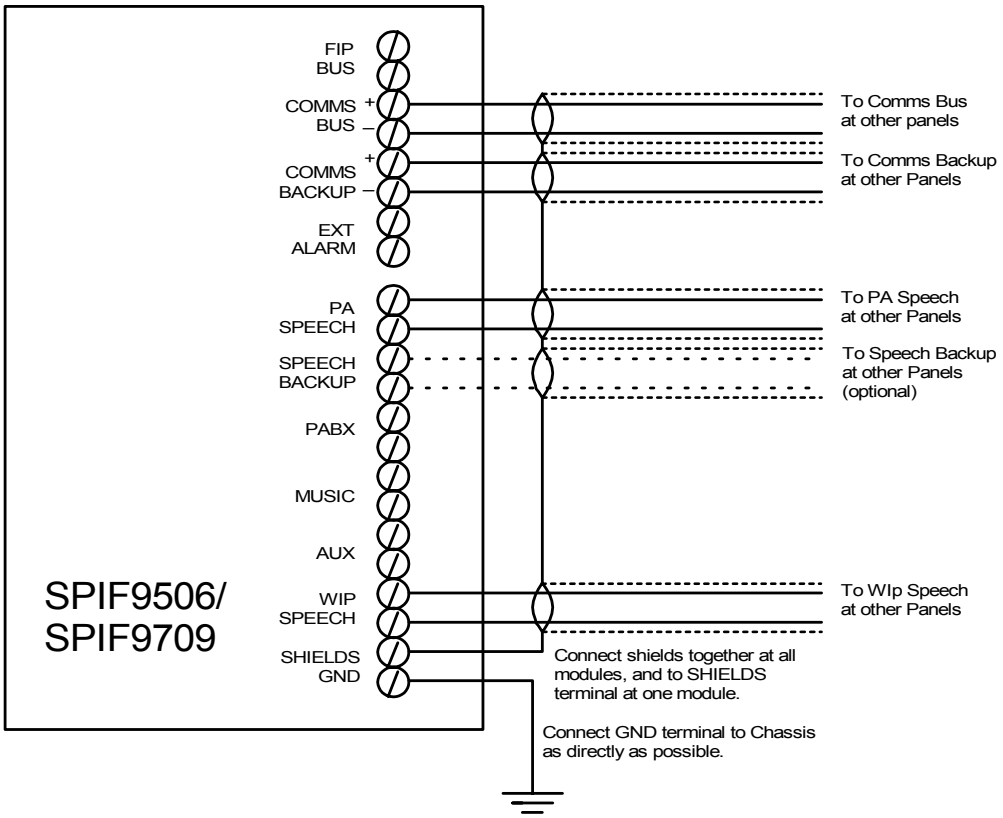


Figure 13-3 : SPIF9506 / SPIF9709 Wiring

Notes -
The shields of all cables should be connected together at each ECP or equipment rack. At one of these locations they should be connected to the SHIELDS terminal. The GND terminal should be connected to the chassis at every ECP or equipment rack with a 2.5mm^2 wire of maximum length 300mm.

If there are amplifiers at more than one location, and Music or Paging Consoles or other audio inputs are used, audio signals from these sources must be wired to all the locations with amplifiers that require the function. However the communications cable for the Paging Console can be wired to the most convenient SPIF9506/SPIF9709 module.

The EXT ALARM terminals provide a 24VDC 10mA output which operates in synchronism with the internal beeper. This may be connected to a 24V DC external beeper, or a relay with suppressor diode, as required.

13.2 LINK AND SWITCH SETTINGS

On the SPIF modules, fit the links as follows -

13.2.1 SPEECH BACKUP BUS FITTED / NOT FITTED

LK1, LK2, LK3, LK4 : Fit in SPEECH BACKUP BUS FITTED position if the speech backup bus is wired, and in the BACKUP = WIP / PA SWAP position if the speech backup bus is not wired.

13.2.2 SPEECH BUS MONITORING POINT

Choose one end of the speech busses as a monitoring point. This end must have an ECP or ECM.

Links	Monitoring End	Other End	Intermediate Points
LK5, LK7, LK9	"M"	"S"	Removed
LK6, LK8, LK10	Fitted ("M")	Removed	Removed

In a system with no ECMs and with no ECP at either end of the bus -

Links	Monitoring Point	All Other Points	Bus Ends
LK5, LK7, LK9	"M"	Removed	Fit 120kΩ resistor across PA Speech and WIP Speech Busses
LK6, LK8, LK10	Fitted ("M")	Removed	

For systems without ECMs it is also necessary to set some DIP switches on the ECP modules -
Set DIP switch 7 of the Evac ECP DIP switches ON at all ECPs in the system, if the speech backup bus is fitted, OFF otherwise.
Set DIP switch 8 of the Evac ECP DIP switches ON at the one ECP with the links on the SPIF module in the M position, OFF otherwise.
Refer also to Chapter 16 for more details of setting up the ECP module.

For systems with ECM modules, the ECM at the end of the bus with the links in the M position must be programmed to monitor the analog busses, and all other ECMs programmed NOT to monitor the busses.

If you have multiple segments of the PA SPEECH and WIP SPEECH busses, isolated by having two SPIF modules at one node or by an ALIM module, then **each segment** must be monitored as described above ie M link settings at one end of the segment and monitoring enabled in Programming mode at that node, and S link settings at the other end of the segment. (Note you can't monitor at the ALIM end of a segment, the ALIM end must have a 56kΩ resistor installed in lieu of the S link setting.)

13.2.3 NORMAL / ISOLATE / ADVANCED LINKS

Links LK11, LK12, and LK13 are used to select normal, isolator or advanced modes as follows.

Link	Normal Mode	Isolate Mode	Advanced Mode
LK11	Removed	I	A
LK12	A,N	I	A,N
LK13	N	A,I	A,I

Normal Mode should be selected in all systems without ECMs, and in all ECM systems where no other instructions are given. Isolate mode or Advanced mode (as required) should be selected when noted in the node's configuration listing supplied by Tyco or printed by the ECM "Display Factory Configuration" command. (Nodes with a local ECP and local equipment will generally require Isolate mode. Nodes with two SPIF modules which join multiple bus segments will generally require Advanced mode for SPIF 2.)

13.3 RS232 (PRINTER) INTERFACE

Connector J4 on the SPIF9506/SPIF9709 module (and connector J15 on the SE9004 module after early 1999) provides a connection point for a printer or terminal.

Refer to Chapter 23 for details of terminal and printer connection.

By default this port will log events, but if a terminal or laptop with terminal emulator software is connected it may also be used to set the time and date, set cascade on or off, set the cascade timeouts, and change the baud rate. To use the port in this manner follow the following instructions -

- Connect the terminal with settings as above.
- Press <Enter>.
- You should see a prompt, "Enter Password". If you do not, it is possible the baud rate has already been set to something other than 9600. Try various settings.
- Enter QUINTRIX <Enter>. (This is the default password. You can change it, but if you do be sure to record your new password.)
- Enter HE <Enter>. This will give you help, i.e. a list of commands, including commands to set the cascade timeouts and baud rate.
- Enter the commands you require and follow the prompts.
- When you have finished, enter QU <Enter>. This will switch the port back to event logging mode.

13.4 LEDS

LED	Colour	Indication when ON	Normal State
LD1	Red	Relay 1 operated (Spare Comms Bus in use)	No ECM – alternates every 60 seconds if no paging console, or flicks on briefly once every 60 seconds if there is a paging console. In ECM system – On if Comms bus short.
LD2	Red	Relay 2 operated (ECP Microphone selected)	No ECM – On if ECP in manual In ECM System – On if this ECP's microphone is required to drive local or remote amplifiers and PTT is pressed.
LD3	Red	Relay 3 operated (Switched PA speech Buss)	PA Speech Buss faulty and switched to spare, Or PA and WIP speech busses swapped due to fault on required function.
LD4	Red	Relay 4 operated (Switched WIP speech Buss)	WIP Speech Buss faulty and switched to spare, Or PA and WIP speech busses swapped due to fault on required function.
LD5	Red	Relay 5 operated (Master phone enabled in Normal mode, local phone system connected to network in Advanced / Isolate modes)	No ECM, or ECM Normal Mode – Master Phone is OFF HOOK. In ECM system Advanced and Isolate modes, ON when local phone audio buss must be connected to network WIP SPEECH buss, OFF for local WIP operation independent from network.
LD6	Red (SPIF 9709 only)	Relay 6 operated (Local PA buss disconnected from network)	No ECM, or ECM Normal Mode – Always OFF. In ECM system Advanced and Isolate modes, ON when local PA audio buss must be disconnected from network PA SPEECH buss due to local PA independent from network.
LD7	Green	+24V Supply	(Note this is LD6 on SPIF9506)
LD8	Green	+5V Supply	(Note this is LD7 on SPIF9506)

13.5 SE9004 SIGNALS INTERFACE MODULE

The SE9004 is a very simplistic Signals Interface module. It is now used only in basic systems where there is no SECP, no remote equipment, and no paging console. (It was used in these systems before 1995, but does not provide full monitoring and redundancy of the WIP and PA SPEECH cables.)

It does not allow the ECP phone to be transferred to another circuit, as can be done when the SPIF9709 module is fitted.

When Evac ECP software version 2.0 or higher is used on a system with a SE9004, the WIP Bus and Evac Bus terminals must be looped together. WIP BUS+ is connected to EVAC BUS+, and WIP BUS– is connected to EVAC BUS–.

14 WIP SLAVE MODULE

14.1 WIP SLAVE OVERVIEW

The WIPS2000 and WIPS9004 WIP Slave modules provide the following functions:

1) Provide the WIP phone signalling tones.
2) Control the switching of the appropriate WIP phone lines.
3) Monitor the WIP line for faults.
4) Supervise the input circuits for activation / fault on FIP / BGA / GP inputs.

Each module can control up to 30 WIPs. Two modules can be located in each rack to control up to 60 WIPS. A maximum number of six modules can be accommodated in a system for a total of 180 WIP lines.

If the ECP has one WIP per zone, a WIP circuit may or may not be allocated to any given zone. If the ECP has three WIPs per zone, any given zone may have zero, one, two, or three WIPs allocated to it. This allocation is performed by Tyco, and is printed on the Panel's configuration printout.

These modules do not have any field wiring themselves, but connect to the appropriate WIP termination module WTRM2000 or WTRM9007 via a flat ribbon cable and the backplane.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

14.2 LED INDICATORS - WIPS2000

Eleven LED indicators are located on the front of the module and their function is as follows:

<table>
<tr><th>LED</th><th colspan="2">CONDITION INDICATED</th></tr>
<tr><td>V1 (green)</td><td colspan="2">On = 24V SUPPLY OK</td></tr>
<tr><td>V2 (green)</td><td colspan="2">On = +5V SUPPLY OK</td></tr>
<tr><td>COMMS (yellow)</td><td colspan="2">Flashing = Transmitting on COMMS CHANNEL</td></tr>
<tr><td>LD1 (green)</td><td rowspan="5">Indicate the number of any circuit in fault. The circuit number is sum of the weightings shown. For example, if leds 1 and 3 are on, circuit 20 is in fault (16 + 4).
If more than one circuit is in fault, these LEDs will cycle around all such circuit numbers.</td><td>weighting = 16</td></tr>
<tr><td>LD2 (green)</td><td>weighting = 8</td></tr>
<tr><td>LD3 (green)</td><td>weighting = 4</td></tr>
<tr><td>LD4 (green)</td><td>weighting = 2</td></tr>
<tr><td>LD5 (green)</td><td>weighting = 1</td></tr>
<tr><td>LD6 (red)</td><td colspan="2">On steady when one or more phones are in talk mode</td></tr>
<tr><td>LD7 (yellow)</td><td colspan="2">Flashes when one or more circuits is ringing i.e. being called by the ECP.</td></tr>
<tr><td>LD8 (green)</td><td colspan="2">Flashes when one or more circuits is off-hook i.e. calling the ECP.</td></tr>
</table>

14.3 LED INDICATORS - WIPS9004

Five LED indicators are located on the front of the module and their function is as follows:

LED	NORMAL STATUS	CONDITION INDICATED
V1	ILLUMINATED	24V SUPPLY OK
V2	ILLUMINATED	+12V SWITCHING SUPPLY OK
V3	ILLUMINATED	+12V REFERENCE SUPPLY OK
Sys	ILLUMINATED	MICROPROCESSOR RUNNING OK
Cm	PULSING	COMMS CHANNEL OK

14.4 DIP SWITCH SETTINGS

MODULE	WIP CIRCUITS	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1	1-30	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
2	31-60	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
3	61-90	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
4	91-120	ON	ON	OFF	OFF	OFF	OFF	ON	ON
5	121-150	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
6	151-180	ON	OFF	ON	OFF	OFF	OFF	ON	ON
7	181-199	OFF	ON	ON	OFF	OFF	OFF	ON	ON

14.5 LINK SETTINGS

On the WIPS2000, there are 3 link settings to enable the Microprocessor (U1) to be programmed. These should normally be in the “RUN” position. They are set to the “PROG” position to program the Microprocessor Flash. Currently, this is performed only by Tyco.

There is a further link setting LK4 which enables the EEPROM (U3) to be written to. Currently this IC is not used, so the setting of LK4 is immaterial.

14.6 WIP SYSTEM EXPANSION.

When fitting a new WIP Slave module be sure to set the DIP switches correctly as described above, and refer to section 6.6 for details on fitting and wiring the termination module.

The WIPS2000 must connect to a WTRM2000 termination module. The WIPS9004 must connect to a WTRM9007 termination module. Do not swap them over.

15 MULTIPLEXER MODULES - EMUX9601 & EMUX9002

15.1 MULTIPLEXER OVERVIEW

The Multiplexer module provides the following functions:

1. Controls the audio source to the amplifiers in the same card cage.

2. Generates the emergency tones and digitised speech message(s) for those amplifiers it is controlling.

3. Performs the speaker line fault monitoring in conjunction with the amplifiers it is controlling.

4. Performs monitoring of the amplifiers it is controlling.

Each rack contains one EMUX module which can control up to 5 amplifier modules. This module does not have any direct field wiring, but receives inputs from the signals interface module via a flat ribbon cable and the backplane.

There are two types of Multiplexer Modules - EMUX9002 and EMUX9601.

The EMUX9002 is now obsolete for new production and is replaced by the EMUX9601, but the EMUX9002 information is presented here for use in the upgrading of existing systems that still use it.

The functionality of the EMUX9601 and EMUX9002 is essentially the same, except the EMUX9601 provides additional facilities:

1. Field programmable messages recordable from 3 sources: PA Speech, Paging Console (PABX), and external line-level source.

2. Two versions are available - one with 16 seconds (4 messages) and the other with 60 seconds (15 messages) of stored speech.

3. Each unique message can be up to 4 seconds long. However a longer message can be created by overlapping up to 4 consecutive message spaces, i.e. up to 16 seconds long.

4. A 3 LED recording level meter.

5. Message playback test facility, which can be listened to by connecting an 8Ω speaker directly to the EMUX.

6. Messages can be played with the evacuation tones, with the alert tones, or standalone messages can be played to zones for background music.

7. Standalone messages can be played on background music once only, or continuously.

8. Two different evacuate tones are available – the original AS2220 evacuate tone and a newer ISO8201 evacuate tone. The ISO tone is only available with EMUX software version 1.16 or later (which requires the “Widget Board”).

Refer to Chapter 25 for information on the “Widget Board” used to replace the microprocessor on the EMUX9601 from late 2004.

15.2 EMUX9601 LED INDICATORS

Ten LED indicators are located on the front of the EMUX9601. Their functions are as follows:

LED	OPERATING MODE	NORMAL STATUS	CONDITION INDICATED
V1	ALL	ON STEADY	24V SUPPLY OK
V2	ALL	ON STEADY	+8V SWITCHING SUPPLY OK
V3	ALL	ON STEADY	-VE SWITCHING SUPPLY OK
SYS	ALL	ON STEADY	MICROPROCESSOR RUNNING OK
CM	RUN	PULSING	COMMS CHANNEL OK
PROG MODE	PROGRAM	OFF	EMUX IN PROGRAM MODE
BUSY	PROGRAM	OFF	MESSAGE PLAYING OR RECORDING IN PROGRAM MODE*
HIGH	PROGRAM	OFF	RECORD SIGNAL TOO HIGH (CLIPPING)
OK	PROGRAM	OFF	RECORD SIGNAL LEVEL OK
LOW	PROGRAM	OFF	RECORD SIGNAL LEVEL TOO LOW

Note*: - The BUSY LED flashes 3 times during the last second of each 4 second period when recording or replaying a message.

15.3 EMUX9601 DIP SWITCH SETTINGS

There are two sets of DIP switches on the EMUX9601; SW1 a block of 4 just in from the edge of the board for selecting the module and amplifiers, and SW2 a block of 8 on the edge of the board for selecting mode, messages, recording sources, speech chip type, and evacuate tone (AS2220 or ISO).

MODULE	AMPLIFIERS	SW1 SWITCHES ON (REST OFF)
1	1 – 20	NONE
2	21 – 40	1
3	41 – 60	2
4	61 – 80	1, 2
5	81 – 100	3
6	101 – 120	1, 3
7	121 – 140	2, 3
8	141 – 160	1, 2, 3
9	161 – 180	4
10	181 – 200	1, 4

Note: - These amplifier numbers refer to those which appear on the configuration printout -
- Each 10W amplifier is allocated a number.
- Each 25W amplifier is allocated two successive amplifier numbers.
- A pair of 50W amplifiers uses the first two numbers in a group of four, with the second two numbers being unused.
- A 100W amplifier uses the first number in a group of four, with the next three numbers being unused.

EMUX9601 DIP SWITCH SETTINGS (CONTINUED)

In Program mode the following switches select which message will be recorded.

MESSAGE NUMBER	SW2 SWITCHES	
	OFF	ON
1	2, 3, 4	1
2	1, 3, 4	2
3	3, 4	1, 2
4	1, 2, 4	3
5	2, 4	1, 3
6	1, 4	2, 3
7	4	1, 2, 3
8	1, 2, 3	4
9	2, 3	1, 4
10	1, 3	2, 4
11	3	1, 2, 4
12	1, 2	3, 4
13	2	1, 3, 4
14	1	2, 3, 4
15		1, 2, 3, 4

Note:
- The switch settings above are only used for the message number function in program mode. However they have additional functions when not in Program mode. When exiting program mode, be sure to set switches 1 – 4 to the required position to select the required message options.
- Message numbers 5 – 15 are not used in the 16 second (4 message) version of the EMUX9601.
- Message number 0 (SW2 - 1:4 all off) is not a valid message.

The following table shows the function of DIP switches 1 – 4 when not in program mode, and the function of switches 5 – 8.

SW2 SWITCH	OFF FUNCTION	ON FUNCTION
1	Play AS2220 Evacuation Signal	Play ISO Evacuation signal with “Emergency” and “Evacuate Now” keywords.
2	Play the evacuation voice message from the speech chip. Special messages can be recorded on site or at the factory.	Play the evacuation voice message selected by SW2:3 from the widget board instead of speech chip message 1.
3	When SW2:2 is on, play the fixed “Evacuate as directed, evacuate as directed” voice message.	When SW2:2 is on, play the fixed “Evacuate the building using the nearest fire exit” voice message.
4	Alert tones (if any) include a voice message if so configured in Factory Programming.	If the default Alert message is configured in factory programming (i.e. speech chip message 3), it will **not** be played.
5	PA speech not selected as the recording source.	* PA Speech selected as the recording source.
6	PABX not selected as the recording source.	* PABX selected as the recording source.
7	EMUX9601 in RUN mode.	EMUX9601 In Program Mode
8	EMUX9601 is 16 second (4 message) version (ISD1416 is fitted).	EMUX9601 is 60 second (15 message) version (ISD2560 is fitted).

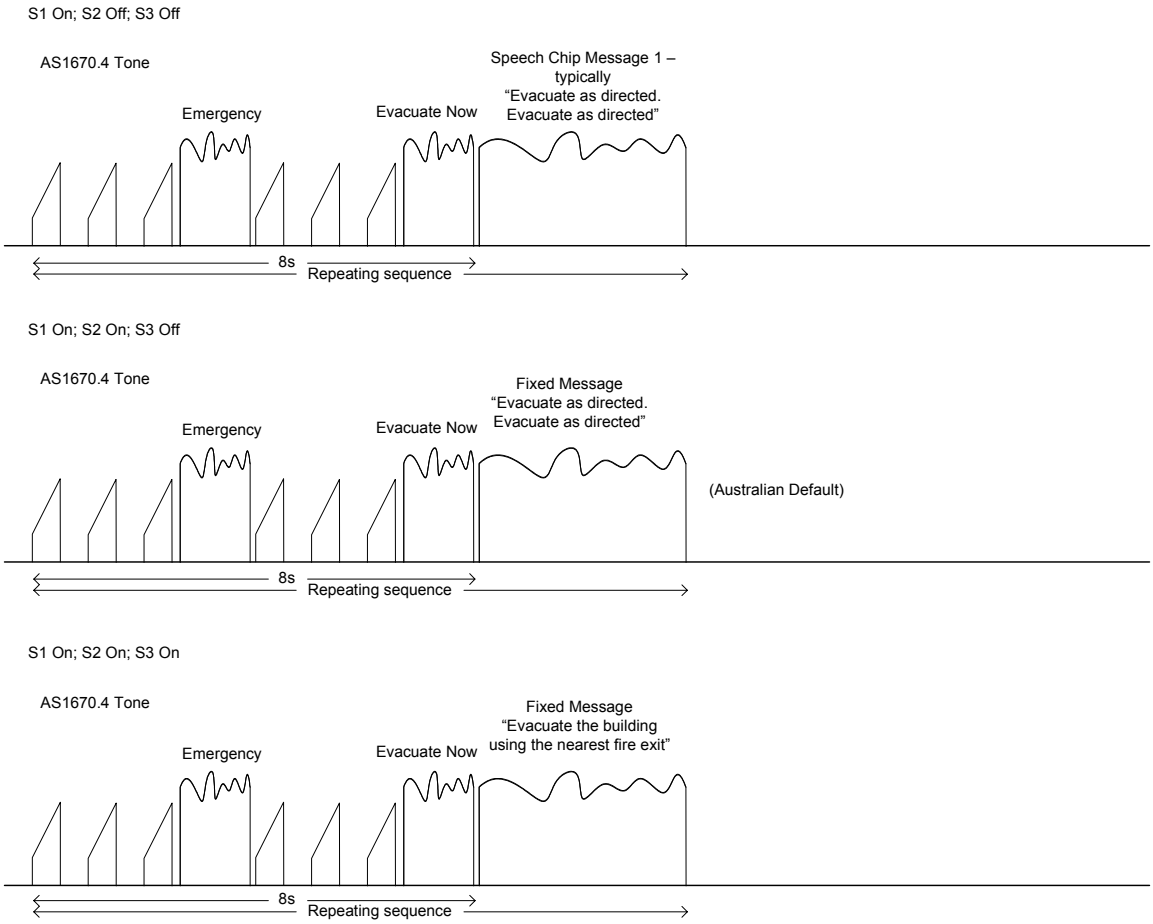
Note*: - Switches 5 and 6 must never both be on at the same time. If both are off the Ext source (J3) input can be used.
- Switch 7 should only be in the on position when message recording or play-back is required. For normal QE90 operation switch 7 must be left in the off position.
- The EMUX will be compatible with older revisions i.e. EMUX9601 up to Revision 5 and all revisions of EMUX9002, provided switches 1 – 4 are all switched off. It can thus be used for replacements in older systems.

15.4 EMUX9601 TONES AND MESSAGES

The following diagrams show the effect of various combinations of the DIP switches 2-1 to 2-4.

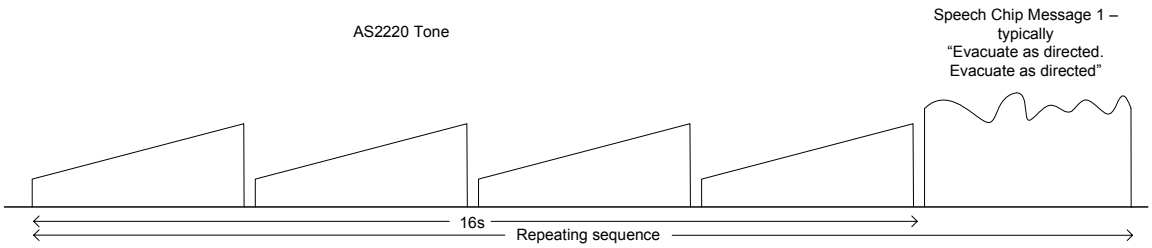
These are new features introduced in November 2004. Boards supporting these features have Rev 7 (or later) marked on the board, and have a label near U2 titled “SW2 Functions. (Note Rev 6 supported the ISO tones, but did not support interspersing the Emergency and Evacuate keywords in the 1.5 second gaps.)

15.4.1 ISO EVACUATION SIGNAL AND VOICE MESSAGE

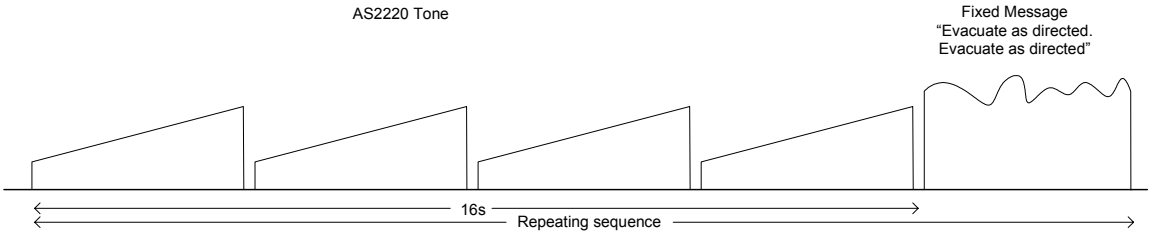


15.4.2 AS2220 EVACUATION SIGNAL

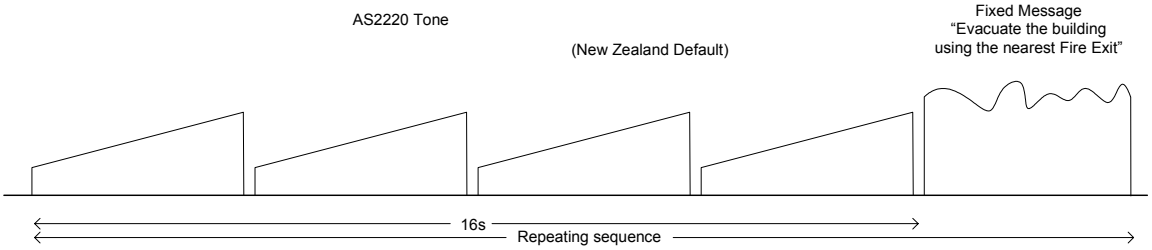
S1 Off; S2 Off; S3 Off



S1 Off; S2 On; S3 Off

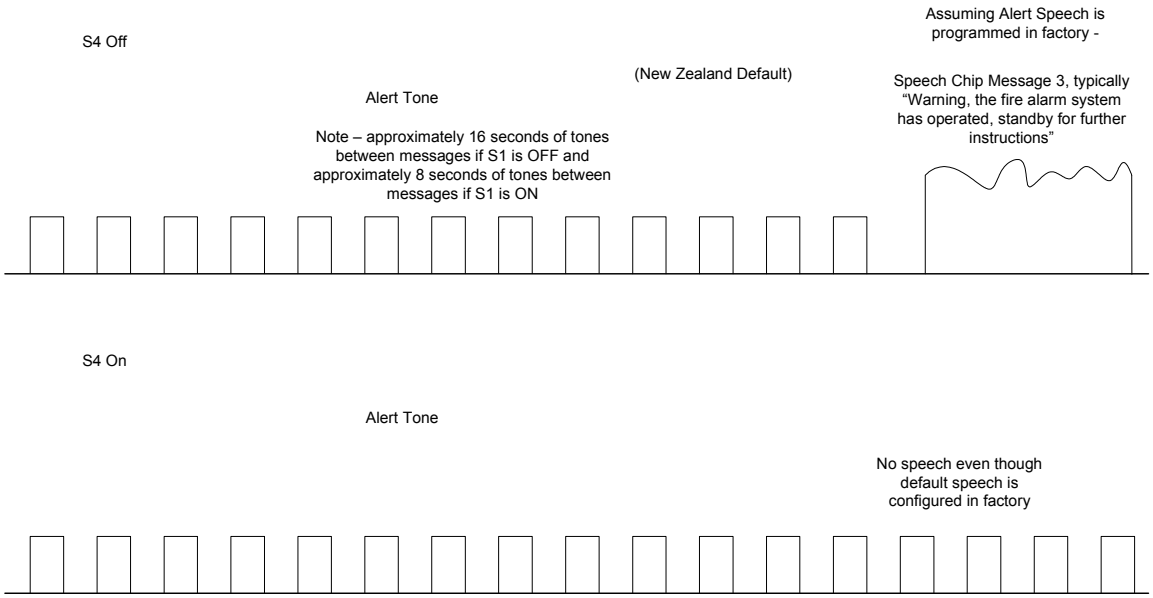


S1 Off; S2 On; S3 On



15.4.3 ALERT TONES

Note that Alert tone is now not used in Australia unless the building has a specific emergency plan requiring it (see “Cascade Sequences and Alert Tones” below), therefore the following diagram is usually not relevant. However by default Alert speech will be programmed to message 3 in the factory, so that if Alert tone is selected in the factory configuration, then the generation of the Alert message can be controlled by DIP switch 4. Note that the option to disable the alert message only applies when the default message (i.e. message 3) is programmed in the factory configuration.



15.4.4 BALANCING TONE AND SPEECH LEVELS

The “Emergency” and “Evacuate Now” Keywords, and the fixed messages in the Widget board selected when SW2-2 is ON, cannot have their volume adjusted. (The Digitised Speech control only affects the Site Recordable messages generated by the “Speech Chip” U2.) To ensure that the keywords and fixed messages are played at the highest level possible relative to the tones, the volume controls on all amplifier cards should be turned right up (and adjustments in various building areas made with the tappings on speakers). If the amplifier volume controls are turned down the speech level will decrease more than the tone level decreases and the resulting speech sound level may be significantly below the tone sound level. With amplifier volume settings below maximum, it will also be difficult to get consistent levels of the various other signals generated by the EMUX. See also Sections 15.8 and 17.4.

15.5 EMUX9601 CONNECTORS

There are two connectors on the EMUX9601 for connection of the External Source recording signal (J3) and for an Ext Speaker (J2) (8Ω speaker) for listening to the recorded messages.

For successful recording, the External Source signal level should be at least 300mV RMS.

The pinouts are as follows:

Pin Number	J2 Ext Speaker	J3 Ext Source
1	+ Speaker (8Ω)	NC
2	NC	Signal Input
3	NC	0V
4	- Speaker (8Ω)	NC

15.6 EMUX9601 CUSTOMISING MESSAGES

The standard EMUX9601 is supplied with pre-recorded messages for evacuation and alert. The message configuration is shown below.

Message	**Message Number**		**Message Description**
Type	16 Second	60 Second	
Evacuation	1	1	"Evacuate as directed, evacuate as directed"
Alert	3,4	3,4 9,10*	"Warning, the fire alarm system has operated, standby for further instructions".

Note*: - The 60 second version has an extra copy of the alert message stored at message number 9.
- The alert message is just over 5 seconds long and hence uses 2 message numbers.

Standard ECP software shipped with each QE90 system is configured for playing of the evacuate message with evacuation tones only. Therefore the standard configuration does not include a message with alert tones.

Thus with a standard configuration of ECP and EMUX9601 software (regardless of whether it is the 16 or 60 second version) the user is only able to customize the evacuation message. The message duration can be between 100 milliseconds and 16 seconds, but must start at message number 1.

Custom ECP / ECM software is required for any of the following features:

1. Messages with alert tones.
2. Standalone messages to be played continuously to zones on background music.
3. Standalone messages to be played once to zones on background music.
4. Additional messages (e.g longer than 16 seconds, or multiple messages) to be played with the evacuate tones.
5. Messages to be played only in Auto and not Manual. (It is now the default for messages to be played in both Manual and Auto).

Contact your equipment supplier or Tyco if you require changes to the ECP / ECM software.

15.7 EMUX9601 MESSAGE RECORDING & PLAYBACK

The EMUX9601 provides field recording of the digitised speech messages. These can be recorded / played back when the EMUX9601 is switched to PROGRAM mode (SW2-7).

There are two buttons provided at the front edge of the EMUX9601, labelled “PLAY” and “RECORD”.

To record a message:

1. Put the EMUX9601 in PROGRAM mode by setting switch SW2-7 in the PROG position (ON). The QE90 control panel will now indicate a module fault, which needs to be acknowledged to silence it.

2. Select the recording source by setting DIP switches SW2-5 and SW2-6.

   Setting SW2-5 to the on position selects the ECP microphone (PA speech) as the recording source. Setting SW2-6 to the on position selects the paging microphone, or paging console (PABX) as the recording source. If both SW2-5 and SW2-6 are set to the off position the Ext Source (J3) is selected as the recording source. The external source can be any line level input (CD, DAT, tape deck or microphone and pre-amp) and is connected via the 4-way header J3 at the edge of the board.

   NOTE: Only one recording source should ever be selected at a time i.e. only one of the DIP switches SW2-5 and SW2-6 should ever be in the on position and both must be in the off position if an external recording source is connected. Always switch both recording source DIP switches to the off position first if changing between recording sources.

3. Adjust the source signal with the RECORD LEVEL potentiometer (VR7) so that the record level meter has both green and yellow LEDs predominantly on, with the red LED flickering occasionally.

   If for example, the ECP microphone is to be used as the recording source, speak into the microphone with the press-to-talk button depressed and adjust the RECORD LEVEL clockwise to increase the record level meter display (up from green to yellow to red), or anti-clockwise to decrease the meter level (back from red to yellow to green).

4. Select the message number that the recording is to start from by setting the first 4 DIP switches on the SW2 to the appropriate message number. (Note message number 0 is invalid).

5. Press and hold the RECORD button.

6. To start recording press and hold the PLAY button.

EMUX9601 MESSAGE RECORDING & PLAYBACK (CONTINUED)

7. The message will continue recording for as long as the RECORD button is held down; or if the PLAY button is released before the end of a message number, recording will stop at the conclusion of the current message number. This is an ideal way of ensuring that the recording does not go over a message boundary and erase the next message. Message duration can be between 100 milliseconds and a maximum of 16 seconds (4 consecutive message numbers).

   If the message is to be greater than 4 seconds, the PLAY button must be held depressed at the end of each message (4 second period).

   The BUSY LED will illuminate for the duration of the recording and will flash three times during the final second of each message, to indicate the pending message number transition. The recording will automatically cease after the recording of 4 consecutive message numbers or if there is not enough message space left.

Note: - Recording a message will erase whatever previously occupied that message.
- A message recorded over the latter part of a multi-part message will delete the latter part of the original message and add the new message to the end of the remaining part of the original message.
- It may be easier to temporarily install EMUX9601 modules from remote equipment racks in the MECP for message recording.

To replay a message for test purposes:

1. Put the EMUX9601 in program mode by setting DIP switch SW2-7 to the Program mode position (ON).

2. Connect an 8Ω or higher speaker to the external speaker header J2.

3. Select the message number that the playback is to start from by setting the first 4 DIP switches (SW2-1:4) to the appropriate message number.

4. Press the PLAY button. The selected message will play to its conclusion, which could be up to 16 seconds (4 consecutive messages).

   If the PLAY button is held down at the end of a message then the next message will be played. By continually holding the PLAY button down the entire message content of the EMUX can be played. Once the last message has been played playback will continue from the first message. If the PLAY button is released, the playback will cease at the end of the current message. The Busy LED will illuminate for the duration of the playback and will flash three times during the final second of each message number (4 second period) to indicate a pending message number transition.

   Playback will automatically cease after 16 seconds, or 4 message numbers of the same message.

   After recording or playing messages ensure that the Program mode DIP switch (SW2-7) is returned to the RUN position and that the PA Speech and PABX recording DIP switches are switched off. Also, disconnect any external source and speaker. The module fault on the QE90 can now be cleared.

15.8 EMUX9601 VOLUME CONTROL ADJUSTMENTS

Seven volume control adjustments are provided at the front edge of the EMUX9601 as shown in Figure 15-1.

The record level control is used to adjust the level of the recording in Program mode. It is used in conjunction with the record level meter.

The other six controls give volume adjustments common to all amplifiers in the card cage, and may be used to adjust the balance between Alert, PA Speech, Digitised Speech and Evacuate; or to reduce the Paging Console (PABX), auxiliary input (AUX) or background Music (BGM) levels below the emergency tone levels. Note that there is no control for Evacuate tones. You should first set up the amplifiers and speaker transformer taps to get the correct sound levels with Evacuate tones and then adjust the balance between Evacuate and all the other signals with the controls on this module.

The PA SPEECH control on this module has a similar function to the microphone level control on the ECP module, however the control on the ECP affects all outputs, while the control on an EMUX9601 affects only the outputs of the amplifiers in the card cage controlled by that EMUX9601.

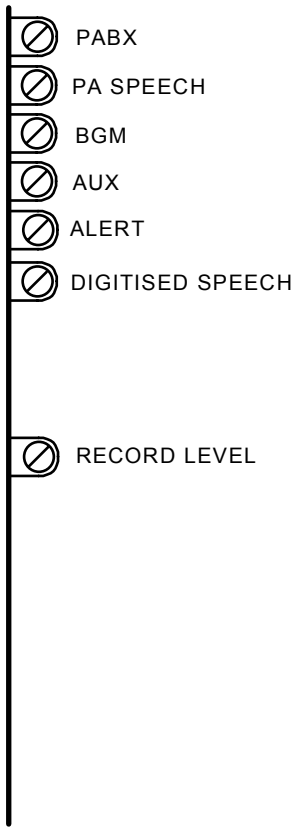


Figure 15-1 : EMUX9601 Module Volume Adjustments

15.9 EMUX9002 LED INDICATORS

Five LED indicators are located on the front of the EMUX9002. Their functions are as follows:

LED	NORMAL STATUS	CONDITION INDICATED
V1	ON STEADY	24V SUPPLY OK
V2	ON STEADY	+8V SWITCHING SUPPLY OK
V3	ON STEADY	-VE SWITCHING SUPPLY OK
SYS	ON STEADY	MICROPROCESSOR RUNNING OK
CM	PULSING	COMMS CHANNEL OK

15.10 EMUX9002 DIP SWITCH SETTINGS

MODULE	AMPLIFIERS	SWITCHES ON (REST OFF)
1	1 - 20	6
2	21 - 40	6, 1
3	41 - 60	6, 2
4	61 - 80	6, 2, 1
5	81 - 100	6, 3
6	101 - 120	6, 3, 1
7	121 - 140	6, 3, 2
8	141 - 160	6, 3, 2, 1
9	161 - 180	6, 4
10	181 - 200	6, 4, 1

Note - these amplifier numbers refer to those which appear on the configuration printout -

- Each 10W amplifier is allocated a number.
- Each 25W amplifier is allocated two successive amplifier numbers.
- A pair of 50W amplifiers uses the first two numbers in a group of four, with the second two numbers being unused.
- A 100W amplifier uses the first number in a group of four, with the next three numbers being unused.
- A 200W amplifier uses the first number in a group of eight, with the next seven numbers being unused. (In some cases the slave amplifier module may be mounted in a separate card cage with no EMUX module, in which case the 200W amplifier uses the first number in a group of four.)

15.11 EMUX9002 VOLUME CONTROL ADJUSTMENTS

Five volume control adjustments are provided at the front edge of the EMUX9002 as shown in Figure 15.2.

These controls give a volume adjustment for all amplifiers in the card cage, and may be used to adjust the balance between the Alert, PA Speech and Evacuate; or to reduce the Paging Console (PABX), auxiliary input (AUX) or background Music (BGM) levels below the emergency tone levels. Note that there is no control for Evacuate tones, you should first set up the amplifiers and speaker transformer taps to get the correct sound levels with Evacuate tones and then adjust the balance between Evacuate and all the other signals with the controls on this module.

The PA SPEECH control on this module has a similar function to the microphone level control on the ECP module, however the control on the ECP affects all outputs, while the control on an EMUX9002 affects only the outputs of the amplifiers controlled by that EMUX9002.

Figure 15-2 : EMUX9002 Module Volume Adjustments

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16 ECP MODULE

16.1 OVERVIEW

The ECP module contains site specific software which defines the system configuration, and controls all the other modules.

If there is more than one ECP in the system, then only one is in control at any given time - the MECP if it is switched to manual, otherwise the SECP if it is switched to manual (the first SECP to be switched to manual if there is more than one), otherwise if all ECPs are switched to automatic, the last ECP which was in manual.

For a networked system with ECM modules, the role of the ECP is reduced - it is basically a control module for only the LEDs and switches. The overall control of the system is vested in the ECM modules.

The original ECP was the ECP9002. The ECP9702 is a newer revision of it with some additional features –

- EEPROM instead of battery backed RAM for storage of the system's on site programmable information.
- Alarm when ECP circuit breaker is opened.
- Service jumper on the Beeper which reduces the volume.
- Software has full control of SYSTEM FAULT LED.
- Ring and confidence tone generation circuitry for Master Phone is on board, so the Master Phone does not need a RING9006 PCB. There is a two wire connector for the master phone instead of a 10 way ribbon cable connector.

Otherwise it is functionally compatible with and is interchangeable with the original ECP9002. (Refer to Section 16.3 for details when changing ECP modules.)

Refer to Chapter 25 for information on the "Widget Board" used to replace the WIP microprocessor on the ECP9702 from late 2004. Also refer to section 16.3 for details of the interchangeability of ECP boards which use the "Widget Board" and previous versions.

16.2 DIP SWITCH SETTINGS

There are two DIP switches on the ECP module, which must be set to define -

- Whether the module is an MECP or SECP. In a system more than one ECP, the ECP which is to have master control if both are switched to Manual is the MECP. This is not necessarily the one with the equipment (amplifiers etc).
- If the module is an SECP, its address.
- Whether a printer is fitted. (In addition, a MAX232 IC must be fitted in the socket U9 if a printer is to be fitted)
- If the system has SPIF9506/SPIF9709 modules, whether the SPARE SPEECH bus is wired or not.
- If the system has SPIF9506/SPIF9709 modules whether this ECP is connected to the SPIF at one end of the bus with its links in the M position.
- Whether the hardware is one WIP per zone or three WIPs per zone.

On the ECP9002 (if manufactured during or after 1996) there is one jumper to select the EPROM size. Select the positions shown for various software versions. Note that from August 1997 onwards, all systems will require the 27512 position.

On the ECP9702 there are links for the RAM Size and EPROM size. These should be set as follows -

LK1 : 27C256 position if U10 is a 27C256 (used for version 1.xx software and 3.0x software), otherwise 27C512/010 position (used for version 2.xx, and version 3.1x and higher software).

LK2 : 2k position if U14 is a MK48T02, MK48Z02, MK48T12, MK48Z12, or DS1220. Otherwise 8k/32k position.

LK3 : 2k/8k position with all ICs currently used.

LK4 : 2k/8k position with all ICs currently used.

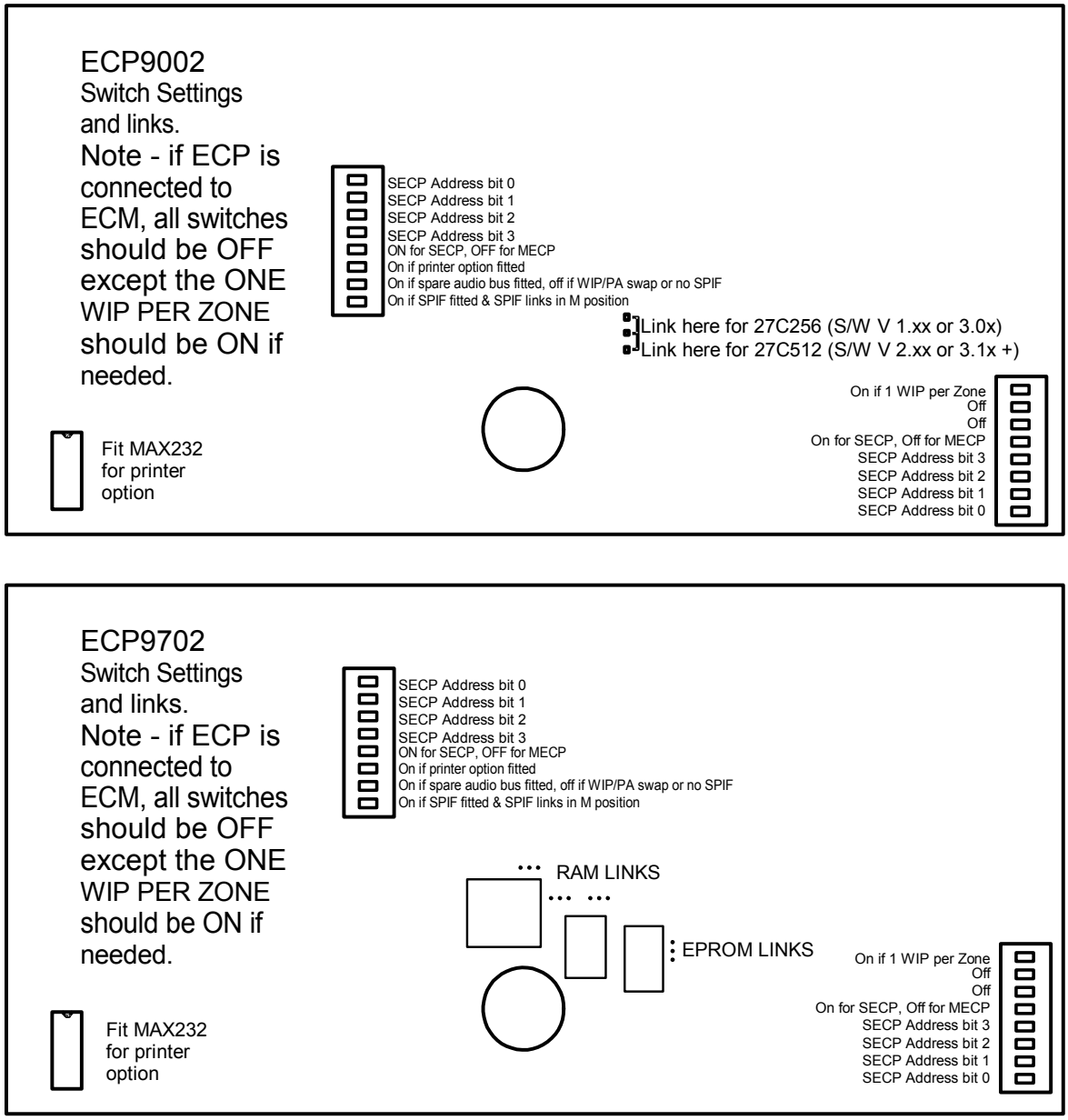


Figure 16-1 : ECP Module DIP Switches and Link

Refer to Section 20.2 for information on systems which have full networking with ECMs.

The SECP address switches are coded as follows. For an MECP or for any ECP in a system with ECM networking, all the SECP Address switches should be off.

SECP number	SECP Address	Address bit 3	Address bit 2	Address bit 1	Address bit 0
1	0	OFF	OFF	OFF	OFF
2	1	OFF	OFF	OFF	ON
3	2	OFF	OFF	ON	OFF
4	3	OFF	OFF	ON	ON
5	4	OFF	ON	OFF	OFF
6	5	OFF	ON	OFF	ON
7	6	OFF	ON	ON	OFF
8	7	OFF	ON	ON	ON

16.3 ECP REVISION INTERCHANGEABILITY

16.3.1 ECP9702 AND ECP9002

The new ECP9702 is interchangeable with the old ECP9002 with the following caveats -

- On new QE90 systems using the ECP9702 the Master Phone will no longer have a RING9006 board fitted inside, and it will be wired to the ECP module with two wires instead of a 10 way flat ribbon cable. If an ECP9002 board is fitted into such a new system, it will be necessary to obtain a RING9006 board (PA0656) and ribbon cable (LM0084) and fit these into the master phone.
- If an ECP9702 module is used to replace an ECP9002, then it will be necessary to remove the RING9006 PCB from the existing master phone and wire the master phone to the ECP board with a two wire cable.
- By default, the ECP9702 will not have a battery-backed clock IC fitted to U14, but will have a standard RAM IC instead. The battery-backed clock IC will only be fitted in new systems requiring a printer for event logging. Previously this IC was required for storage of programmed parameters in all ECP9002 modules even when there was no printer output. The battery backed RAM IC is required
    1. In ECP9002 modules regardless of software versions.
    2. In ECP9702 modules when the evac ECP software version is 2.99 or less, or when there is a printer connected to that ECP.

  When replacing an ECP board in a system which requires a battery-backed clock IC, if the replacement board is not fitted with an IC of type MK48T02, MK48Z02, MK48T12, MK48Z12, MK48T08, DS1643 or DS1220, it is necessary to remove this IC from the board being replaced and fit it into the replacement board. Of course it is always necessary to remove the Evac and WIP software ICs from the board being replaced and fit them to the replacement ECP. The location of these ICs is shown in the diagram on page 2. Also note that the on site programmed parameters should always be checked after an ECP board is replaced.
  Refer to Figure 16-2 for the locations of these components.
- If the ECP9702 has the Widget board fitted to U52 then refer to section 16.3.2.

Note that when you need to insert an IC into a socket which has more positions than there are pins on the IC, you should leave the blank positions at the pin 1 end of the IC (the end with the indentation).

Note If you are upgrading the Evac ECP software to version 2.0 or later from version 1.x when changing the ECP board (this is frequently done, but by no means essential) refer to section 13.5 for notes about the SE9004 module.

16.3.2 REPLACING AN OLDER ECP WITH A WIDGET BOARD ECP

Systems with Three WIP Per Zone Facias
The latest ECP9702 (part number PA0643) (i.e. Revision C/5/2 or higher, with the widget board in place of the TMS77C82 microprocessor) can be used to replace an older ECP9702 or ECP9002 provided the existing WIP ECP Software version is Version 2.0 or higher. This version is generic, i.e. not site-specific, and it has been used for all panels with SECPs or Amp Racks manufactured since late 1995 and all other panels manufactured since late 1997. If the existing system has an ECP9002 refer to section 16.3.1 above for further information.

For older systems (i.e. with Version 1.x site specific WIP ECP Software) a specially-made service ECP9702 is available, part number PA0623. This has a 40 pin socket into which you can plug the site-specific WIP ECP software from the board being replaced. If the existing system has an ECP9002 this ECP9702 can also be used to replace it - refer to section 16.3.1 above for further information.

Systems with One WIP Per Zone Facias
Older ECPs with a One WIP Per Zone facia, can be replaced with the PA0641. This has a 40 pin socket into which you can plug the site-specific or generic WIP ECP software from the board being replaced. If the existing system has an ECP9002 this ECP9702 can also be used to replace it - refer to section 16.3.1 above for further information.

16.3.3 REPLACING A WIDGET BOARD ECP WITH AN OLDER ECP

An ECP9702 fitted with a Widget Board can theoretically be replaced by any ECP9702 as long as it is already fitted with version 2.x WIP ECP Software. However note that an ECP9702 fitted with a Widget Board cannot directly be replaced by the PA0623 service part, as the PA0623 has **no** WIP ECP Software fitted since it is was designed as a replacement for PA0643s with plug in software, and to take the software from the board being replaced.

16.4 SOFTWARE LOCATIONS

If you are supplied with new software for a system, Figure 16-2 shows where it is to be fitted in the ECP module.

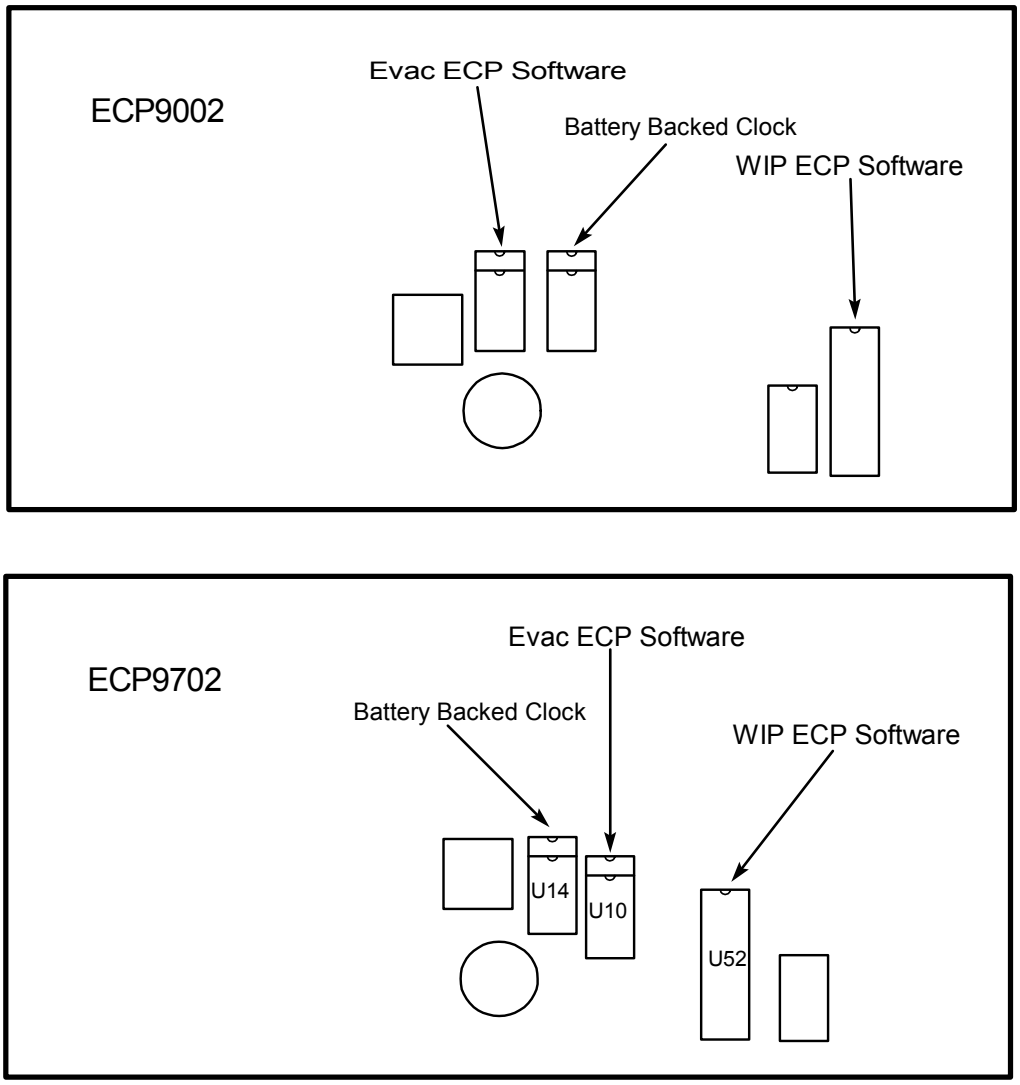


Figure 16-2 : ECP Key Components Location

16.5 MICROPHONE CONTROLS

There are also controls on this module for the ECP Microphone level and (on the ECP9002 only) its Voice Operated Switch sensitivity. Refer to section 17.4.2 for more information.

16.6 MASTER PHONE TERMINATION

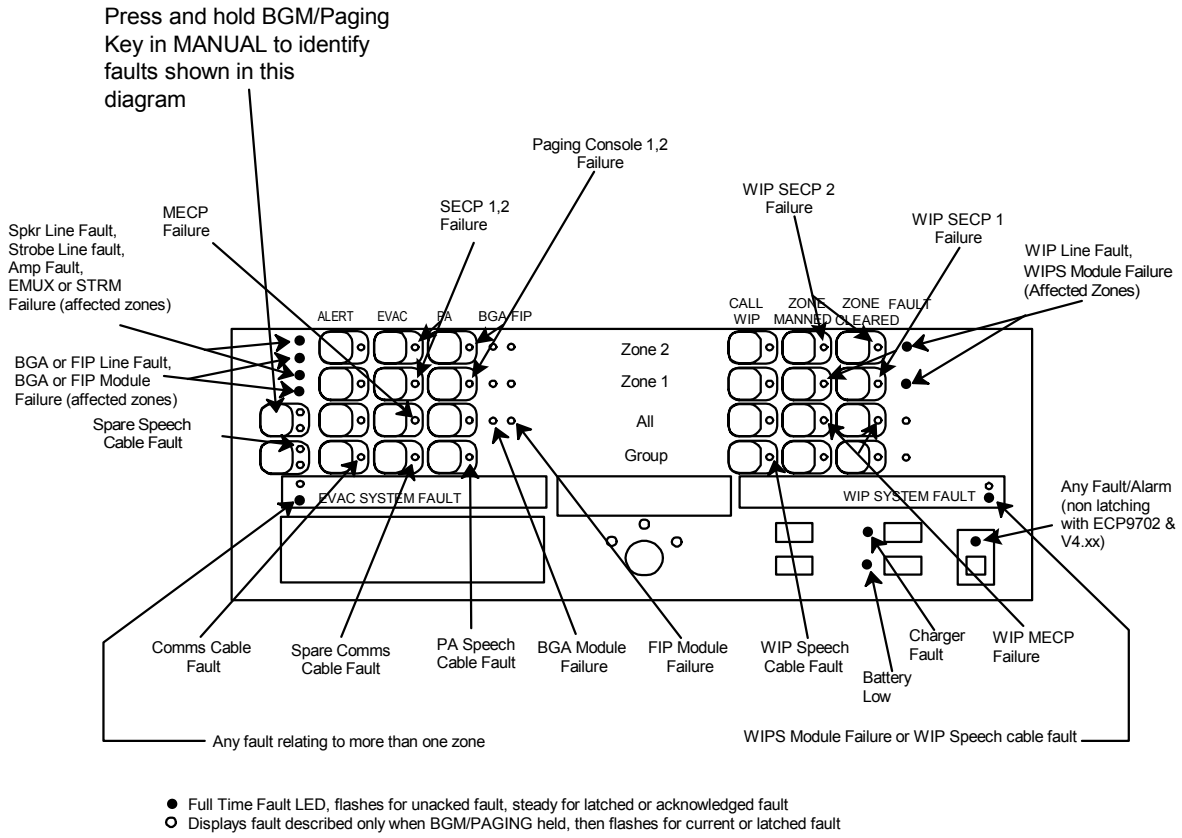
On the ECP9702 a Master Phone of the same type as a WIP phone (refer to section 6.2) needs to be connected across the two terminals on the demountable screw connector on the back of the right side of the module (viewed from the front). Polarity is not important and no end of line component is required.

16.7 LEDS

There are dedicated fault and alarm LEDs on the ECP module, and other LEDs are used to further identify faults when BGM is pressed and held in Manual.

Note – in non-ECM systems with older software (versions before 2.00) it is not necessary to hold BGM and there are some other differences – refer to the QE90 Operator's Manual LT0087.

The fault LEDs are identified in Figure 16-3 and Figure 16-4 –



QE90 Version 2.xx / 4.xx : System Fault Display

Figure 16-3 Versions 2.xx / 4.xx Fault Display

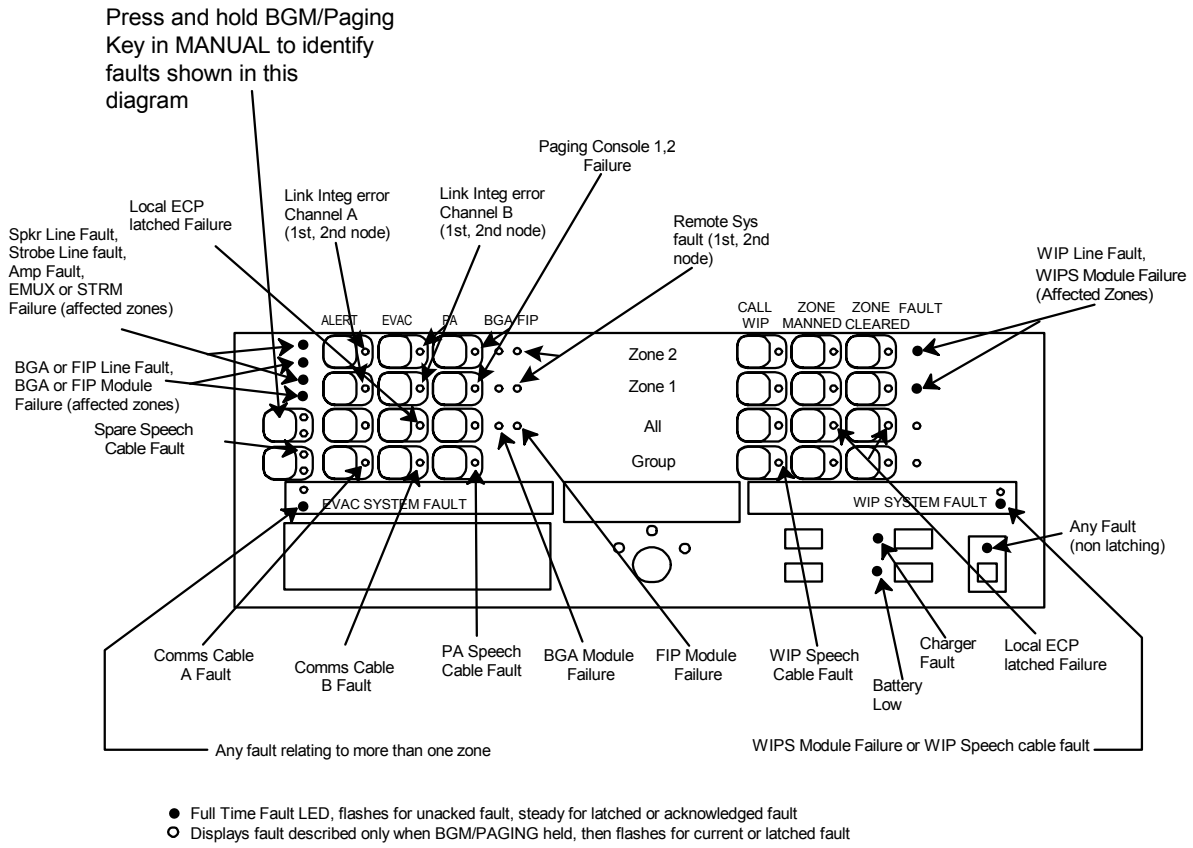


Figure 16-4 ECM Networked System – Fault Display

16.8 HIDDEN ECP FOR EXPANDING DISPLAY ZONES

In systems with ECMs, it is possible to expand the display zones at a node above the normal limit of 98 @ 1 WIPs / Zone or 82 @ 3 WIPs per zone, by the use of one or more hidden ECPs to control some of the display extender modules.

The address switches (Evac and WIP) on these hidden ECPs should be set as follows -

Expansion ECP	MECP/SECP	SECP A2	SECP A1	SECP A0
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF

16.9 FLUORESCENT LIGHT OUTPUT

If there is more than one cabinet with displays, and each cabinet has a fluorescent light, the light output of the ECP module must be connected to a relay, and the relay contacts used to drive the lights. Refer to drawing 699-180 at the end of Chapter 19.

If the panel does not have a fluorescent light, and does not have any relays available for a fault output (for example it does not have a FIB8910 module or any spare strobe relay outputs), then the fluorescent light output can be used to drive an external relay and programmed to operate when there is a fault condition. In fact it can be programmed with any other logic equation just like other relay outputs.

The output can be wired to a PA0730 relay board as shown Figure 16-5. Note that if the relay is programmed as a fault output, it will be programmed to be energised when there is no fault, so the C and N/O contacts will be connected when there is no fault.

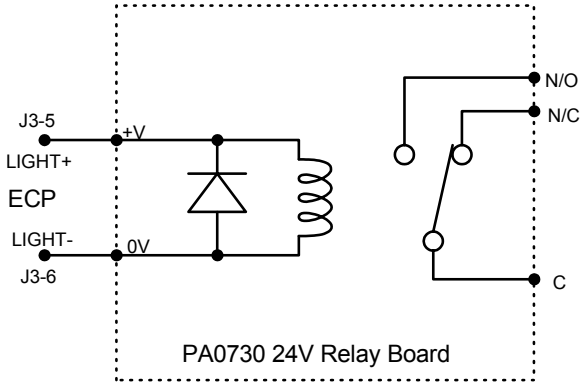


Figure 16-5 Relay Connected to light output

17 PLACING INTO OPERATION

17.1 PLACING INTO OPERATION OVERVIEW

Before undertaking any activities, inspect the interior visually, and check that all system equipment is securely mounted and that all cables are connected to the appropriate points. Modules have been known to work loose in transit.

Refer to AS2220 Part 2, section 5.8 and section 6.

You should now fit zone labels to the front of the ECP using the pockets in the mylar, and by typing labels to fit inside the pockets.

Before powering up, check the loading on the speaker lines as described in section 4.8 if this has not already been done.

17.2 POWER SWITCHES AND CIRCUIT BREAKERS

Several Power Supply Models are in use -

- The 3 Amp PSU2403 has a Mains switch on the left and two 24V DC switches on the right, one labelled ECP and one labelled AMP RACK.
- The 6 Amp PSU2406 has a Mains switch on the left and a 24V DC switch on the right, labelled ECP and a circuit breaker labelled AMP RACK. In 21U cabinets an internal “brick” model is used, while in other cabinets a 2U rack mounting version is used.
- The 12 Amp PSU2412 has a Mains switch on the left and a number of 24V DC breakers on the right, labelled ECP and AMP RACK 1, AMP RACK 2, AMP RACK 3 etc..
- The 12 Amp PSU308. The mains switch is on a GPO outlet mounted on the gear plate above the top card frame. The system DC circuit breakers / switches are located on the left hand side of the power supply/charger unit. Up to four circuit breakers may be fitted depending upon the system configuration. The left-most circuit breaker switches power to the ECP, while the remaining breakers switch power to the amplifier racks.

The ECP switch supplies the ECP module, FIP Input modules, and Strobe output modules, while AMP RACK switch(es) supply the amplifiers, EMUX module, and WIPS module.

The mains switch controls the 240V input to the battery charger, and this should be ON at all times except when testing that the system will run on its batteries alone, or when required for maintenance.

The normal position of the 24V DC switches is ON. Turning all switches to the OFF position will completely remove 24V DC power to the equipment.

In some cases it may be useful to switch the amplifiers off but leave the ECP on, e.g. to check the connections from a Fire Panel or Breakglass inputs and the resulting Evacuation cascade sequence without disturbing the building occupants. The ECP will indicate several faults if this is done, however the indications of alarms and the indications of cascading of Alert and Evacuate tones will still occur normally.

17.3 POWER UP

To place a correctly installed system into operation, perform the following steps:

STEP 1 Ensure that the Mains Isolate Switch is OFF
Ensure that all the DC circuit breakers or switches are switched OFF

STEP 2 Ensure that 240 VAC is available and connected to the system from the mains distribution switchboard.

STEP 3 Connect the batteries, ensuring correct polarity.
When connected the system fault LED may illuminate.

STEP 4 Turn the panel keyswitch to the ISOLATE position.
Turn Mains Isolate Switch to the ON position. The charger indicators/meters should register.

Switch ON the DC circuit breakers starting with right most breaker and then progressing to through to the left most breaker (i.e.. power the amp racks first before the ECP).

The sounder may operate and audio fault LEDs may be flashing. Press the SILENCE key to mute the sounder if it is on. Wait about 45 seconds for any audio line faults to be detected.

Then press and hold the SILENCE key for 2 seconds to clear the system fault indicator.

STEP 5 Check the panel to ensure that no fault indicators are illuminated. Check and remedy those that are (refer Operator Manual).

STEP 6 With the keyswitch in the ISOLATE position, confirm the operation of all panel switches and their associated indicators.

Press the LAMP TEST button on both the evacuation system panel and fire phone system panel to ensure that all non-switch indicators are operational.

STEP 7 Turn keyswitch to the MANUAL position.
Operate an ALERT switch and check that the alert tone is generated in the selected zone. While the alert tone is being generated, operate the EVAC switch and ensure that the EVAC tone is generated, overriding the alert tone.

STEP 8 While the EVAC tone is present, press the zone P/A SPEECH switch and then operate the push-to-talk switch on the microphone. Talk into the microphone and check that the EVAC tone is overridden with speech.

Release the push-to-talk switch on the microphone and check the output returns to the EVAC tone.

Repeat steps 7 and 8 for each zone fitted.

STEP 9 Enter system programming mode (refer to LT0087 QE90 Operator's Manual) and check that the delay before action timeout, initial timeout and subsequent timeout periods have been set correctly, and cascade has been enabled or disabled as required.

Turn the keyswitch to the AUTO position, wait 10 seconds, and generate an alarm signal on a FIP input. The relevant zone FIP LED should illuminate and the system should automatically generate the ALERT tone (after the delay before action, if any), for the pre-programmed period after which it should switch to the EVAC tone interspersed with a voice message.

If the system has been programmed for cascade operation check that the cascade sequence functions correctly. If Cascade is disabled check that all alert tones are generated in all zones, then after the programmed delay, evacuate tones are generated in all zones.

Note that when many zones are generating tones a Charger Low fault may be generated. This is to be expected as the batteries are supplying the full load to the system and the charger is only required to supply the quiescent current plus charging current.

Repeat the alarm activation for each connected FIP input.

STEP 10 Generate an alarm signal on each BGA input. The relevant zone BGA status LED should illuminate and the system should automatically generate the ALERT TONE for the pre-programmed period after which it should switch to a continuous EVAC tone interspersed with a voice message. Repeat for each BGA input.

STEP 11 Lift the intercom master handset and verify that a pulsed confidence tone is heard. (Continuous confidence tone with Software version 2.)

STEP 12 Press a zone WIP FIRE PHONE key on the front panel and check the zone WIP is now ringing. (On the ECP phone, a pulsed tone will be heard with software Version 2 and no tone with version 1.x software.) Pick up the ringing WIP handset.

When the selected WIP is answered the indicator should go steady. Verify that conversation can take place clearly. Hang up the zone handset.

Repeat step 12 with each fitted WIP.

STEP 13 Verify that a ring tone is generated at the master handset when a remote WIP calls the MECP by lifting the handset.

STEP 14 Press the WIP CALL ALL key on the front panel. Confirm that the WIP status indicators are flashing for all enabled WIPs and that a ring tone is being generated at each WIP.

Confirm that when each WIP is answered, the respective WIP status indicator goes steady and that speech from the master handset can be heard at the remote WIP. Verify that no speech generated at a remote WIP can be heard at the master WIP or at other remote WIPs.

STEP 15 Check that the float charge voltage at the battery terminals is 27.3V (less at higher temperatures, more at lower temperatures). If not adjust the float voltage to the correct value (refer LT9002 QE90 Technical Manual).

STEP 16 When the batteries are fully charged turn the "mains" switch OFF. Check that a charger fault is indicated after a few seconds. Check that the fluorescent light operates when the ECP is switched to MANUAL. Place all zones into ALERT using the ALL ALERT key and confirm that the system functions correctly under full load on the standby batteries.

Place all zones in EVAC using the ALL EVAC key and confirm that the system functions correctly under full load on the standby batteries.

STEP 17 Check the operation of any optional equipment (e.g. Paging Consoles) and any special functions.

17.4 OUTPUT LEVEL ADJUSTMENT

The general method of output level adjustment is as follows-

- Set all controls on the system to their maximum position.
- With Evacuate tones selected adjust the speaker tap settings to the minimum power rating required to achieve the required sound level. If required, adjust the controls on the amplifiers to achieve more precisely the level required (but note that in general it is best if all amplifier controls are left at their maximum positions in order to achieve consistent relative levels of the various signals that can be produced). Refer to sections 15.4.4, 17.4.1 and Figure 17-1.
- Adjust the controls on the ECP module to achieve clear and undistorted speech. Refer to section 17.4.2.
- Adjust the controls on the EMUX modules to achieve balance between the various emergency signals, and a lower level (if required) for non-emergency signals. Repeat this for each EMUX module (i.e. each card cage containing amplifiers). Refer to section 17.4.3.

More specific instructions follow.

17.4.1 LOCATION OF AMPLIFIER CONTROLS

The location of the controls is shown in Figure 17-1

4 x 10W AMPLIFIER

If the EAMP9001 module is configured as 4 x 10W amplifiers, all four controls are used.

2 x 25 WATT AMPLIFIER MODULE

If the EAMP9001 module is configured as two 25 Watt amplifiers then only volume controls 1 and 3 are used.

2 x 50 WATT AMPLIFIER MODULE

If the HAMP9308 module is configured as two 50 Watt amplifiers then both volume controls 1 and 2 are used.

1 x 100 WATT AMPLIFIER MODULE

If the HAMP9308 module is configured as one 100 Watt amplifier then only volume control 1 is used.

200 WATT AMPLIFIER MODULE

The volume control on the “Master” module is used. Refer to section 5.2.2.

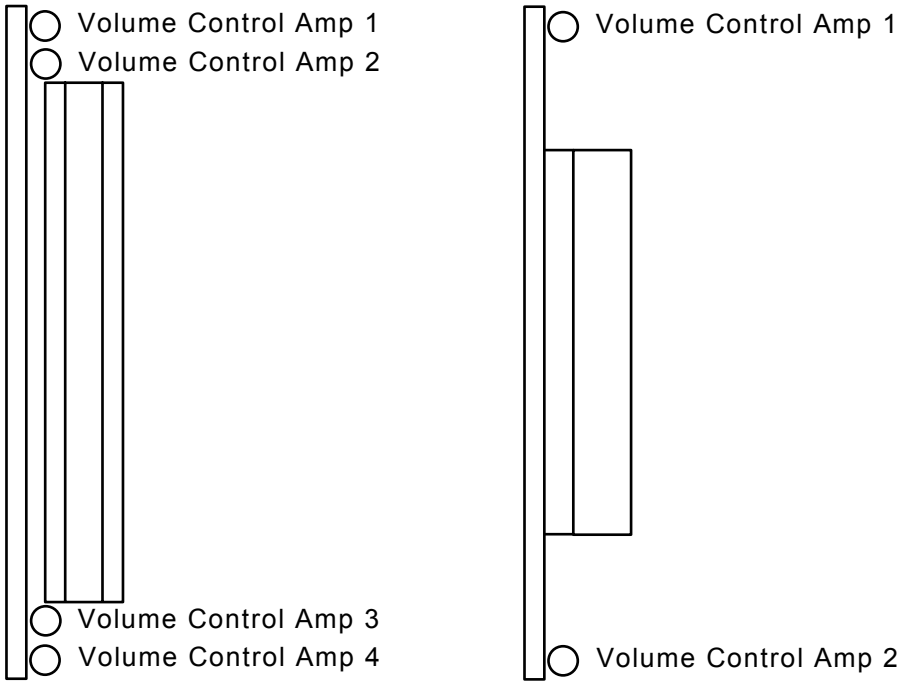


Figure 17-1 Volume Controls for EAMP9001 and HAMP9308 Amplifiers

17.4.2 SPEECH MICROPHONE LEVEL ADJUSTMENT

The adjustment potentiometers are located on the rear of the ECP module.

- The TOP pot (50K ohm) provides microphone level adjustment.
  (Rotate clockwise to increase level.)

- The BOTTOM pot (10k ohm) provides Voice Operated Switch (VOX) level adjustment. (This pot is present on the ECP9002, and not present on the ECP9702)
  (Rotate anticlockwise to increase sensitivity.)

(NOTE: On modules manufactured before 1993, rotation direction may be reversed from that stated above for each pot.)

ADJUSTMENT PROCEDURE

STEP 1 Adjust the SPEECH pots on the EMUX module(s) to about ¾ position.
STEP 2 Turn the VOX adjustment pot to mid position.
STEP 3 Adjust the MIC level pot so that the SPEECH is at the required level, and is clear and undistorted, in a typical area.
STEP 4 Adjust the VOX level pot such that the speech attack time is not too long i.e. speech is heard as soon as the person speaks into the microphone and not halfway through a word.

17.4.3 EMUX LEVEL ADJUSTMENTS

For each EMUX module, adjust the controls shown in Figure 15-1 to achieve balance between the various signals, for those amplifiers controlled by that EMUX i.e. those amplifiers in the same card cage. Remember, if there are two card cages in a cabinet, the upper card cage is terminated in the transformer modules down the left side of the cabinet, and the lower card cage is terminated in the transformer modules down the right hand side of the cabinet.

18 SPARE PARTS LIST AND INFORMATION

18.1 GENERAL SPARE PARTS LIST

The following is a list of the modules used in QE90. It provides a cross reference between the drawing number referred to in this manual and printed on the module (e.g. EAMP9001), and the part number to be used for ordering (e.g. PA0650).

Some modules are available in two forms, one to mount on a DIN rail, and the other to be screwed to standoffs. The former is identified by (DIN RAIL) in the description.

One WIP per zone modules and membrane keyboards are no longer manufactured or available. If required, a system can be upgraded to 3 WIPs per zone.

```
Membrane keyboards - 4 zone size – obsolete - use 8 zone keyboard cut in half if necessary.

Membrane keyboards - 8 zone size –
FA2027   FAB,699-237,QE90 ECP+2Z KEYBOARD,NO NAME,3WIP/ZONE
FA2029   FAB,699-238,QE90 8Z EXTENDER KEYBOARD,3WIP/ZONE

FP0539   QE90 PAGING CONSOLE
FP0546   FP,F4000 THERMAL PRINTER
FP0752   FP,QE90,PRINTER OPTION KIT,699-244
KT0169   KIT,QE90 ECP,ICs FOR RS232/PRINTER
LM0043   LOOM,699-090-1,FRC,20W,0.07m,QE90 FIP EXTENDER
LM0047   LOOM,699-089,FRC,26W,1.3m,TWISTED,QE90 TRAN
LM0048   LOOM,699-090-2,FRC,20W,0.25m,QE90 DISPLAY EXTDR
LM0060   LOOM,699-087,FRC,34W,1.2m,QE90
LM0063   LOOM,699-228,QE90 ECP POWER LOOM,UP TO 21U
LM0065   LOOM,1901-174,RS485 COMMS BD(also ECM),10 W FRC TO DB9 CABLE
LM0076   LOOM,1922-25,ECM PROG,DB9(FEM)-DB9(FEM),NULL MODEM
LM0077   LOOM,1922-26,RZDU RS232-ECP HIGH LEVEL LINK,2.9M
LM0078   LOOM,1922-27,RZDU RS232-ECM HIGH LEVEL LINK,3M
LM0098   LOOM,699-087,FRC,34W,0.8m,QE90
LM0100   LOOM,699-087,FRC,34W,1.5m,QE90
LM0101   LOOM,699-241,FRC,26W,0.45m + 0.9m,QE90
LM0131   LOOM,SERIAL PRINTER CABLE,DB9(M)to(x)DB9(M)+DB9(F)
ME0202   QE90 DISPLAY ASSEMBLY 1 WIP PER ZONE, 8 ZONE              obsolete
ME0204   QE90 ECP ASSEMBLY 1 WIP PER ZONE                          obsolete
ME0205   QE90 DISPLAY ASSEMBLY 3 WIP PER ZONE, 8 ZONE
ME0207   QE90 ECP ASSEMBLY 3 WIP PER ZONE
ME0208   QE90 FLUORESCENT LIGHT
ME0211   QE90 24V 12A PSU, PSU308                                  superseded by ME0333
ME0212   QE90 24V 3A PSU, PSU2403                                  superseded by ME0331
ME0213   QE90 NOISE CANCELLING MICROPHONE INCLUDING DIN PLUG
ME0330   MECH ASSY,1966-6,PSU2406,BRICK
ME0331   MECH ASSY,1966-21,PSU2406,2U RACK MTG
ME0333   MECH ASSY,1966-22,PSU2412,2U RACK MTG
ME0381   MECH ASSY,QE90 ECP + 2Z KEYBOARD REPLACE,3W
ME0382   MECH ASSY,QE90 ECP 8 ZONE KEYBOARD REPLACE,3W

PA0623   PCB ASSY,QE90 ECP9702-2  EVAC CNTL PANEL 3WIP/ZONE with socket for site-specific WIP s/w

PA0631   PCB ASSY,QE90 RFIB9511 FIP/BGA MASTER (REMOTE RACK) (DIN RAIL) obsolete, use PA0651 Issue
         E or later
PA0641   PCB ASSY,QE90 ECP9702-1  EVAC CNTL PANEL 1WIP/ZONE        obsolete
PA0642   PCB ASSY,QE90 WIPS2000 WIP SLAVE,0V REF
PA0643   PCB ASSY,QE90 ECP9702-2  EVAC CNTL PANEL 3WIP/ZONE        see also PA0623
PA0646   PCB ASSY,QE90 ALIM9706,AUDIO LINE ISOLATOR MODULE
PA0647   PCB ASSY,QE90 AMP200     200W AMPLIFIER MODULE
PA0648   PCB ASSY,QE90 TRAN200    200W TRANSFORMER MODULE
PA0649   PCB ASSY,QE90 SPIF9709   SECONDARY PANEL INTERFACE (DIN RAIL)
PA0650   PCB ASSY,QE90 EAMP9001   4 ZONE POWER AMP
PA0651   PCB ASSY,QE90 FIB8910    FIP/BGA MASTER (DIN RAIL)
PA0652   PCB ASSY,QE90 FIPE9004   FIP/BGA EXTENSION (DIN RAIL)
PA0653   PCB ASSY,QE90 EMSP8911-2 DISPLAY KBD 3WIP/ZN
PA0654   PCB ASSY,QE90 EMUX9002   MULTIPLEXER              superseded by PA0758
PA0655   PCB ASSY,699-033,QE90,TRAN8872-1,4 10W            superseded by PA0795 or PA0796
PA0656   PCB ASSY,QE90 RING9006   MASTER PHONE RING
PA0657   PCB ASSY,QE90 SE9004     SIGNAL INTERFACE (DIN RAIL)
PA0658   PCB ASSY,QE90 WTRM9007   WIP TERMINATION (DIN RAIL)
PA0659   PCB ASSY,QE90 EMSP8911-1 DISPLAY KBD 1WIP/ZN       obsolete
```

```
PA0660   PCB ASSY,QE90 BPLN9001   BACKPLANE
PA0661   PCB ASSY,QE90 ECP9002-1  EVAC CTRL PNL 1WIP/ZN     obsolete
PA0662   PCB ASSY,QE90 WIPS9004   WIP SLAVE                 use PA0642 with PA0916
PA0663   PCB ASSY,QE90 ECP9002-2  EVAC CTRL PNL 3WIP/ZN     superseded by PA0643
PA0664   PCB ASSY,699-075,QE90,TRAN8872-2,2x25W             superseded by PA0793
PA0667   PCB ASSY,QE90,STBM9008,STROBE DRIVER MASTER        superseded by PA0697
PA0668   PCB ASSY,QE90 STBT9008   STROBE TERMINATOR(not used in new systems)
PA0677   PCB ASSY,QE90 MEXP9103,MECP SIGNAL INTERFACE       update system to use PA0649
PA0681   PCB ASSY,1923-2,MICROVAC DISPLAY KEYBOARD          obsolete
PA0682   PCB ASSY,1923-1,MICROVAC MAIN BOARD                obsolete
PA0684   PCB ASSY,TRAN9304-1,4 X 10W MODULE WITHOUT RELAYS  superseded by PA0795 or PA0796
PA0685   PCB ASSY,TRAN9304-2,4 X 10W MODULE WITH RELAYS     superseded by PA0796
PA0686   PCB ASSY,TRAN9304-3,2 X 25W MODULE WITHOUT RELAYS  superseded by PA0794
PA0687   PCB ASSY,TRAN9304-4,2 X 25W MODULE WITH RELAYS     superseded by PA0794
PA0688   PCB ASSY,1923-19,MICROVAC MICROPHONE PRE-AMP       obsolete
PA0689   PCB ASSY,QE90,WLED9307,WIP FLASHING LED
PA0690   PCB ASSY,QE90 HAMP9308    2 X 50W AMPLIFIER MODULE
PA0691   PCB ASSY,QE90 HTRN9308-1 2X50W TRANSFORMER MODULE
PA0692   PCB ASSY,QE90 HTRN9308-2 1X100W TRANSFORMER MODULE
PA0695   PCB ASSY,QE90 HTMS9408-1,2*50W XFMR MOD MUSIC SWCH
PA0696   PCB ASSY,QE90 HTMS9408-2,100W XFRMR MOD MUSIC SWCH
PA0697   PCB ASSY,QE90 STRM9502   STROBE/RELAY MODULE (DIN RAIL)
PA0698   PCB ASSY,QE90 ECM9603    EVAC COMMUNICATION MODULE (DIN RAIL)
PA0699   PCB ASSY,QE90 SPIF9506   SECONDARY PANEL INTERFACE superseded by PA0649
PA0730   PCB ASSY,1922-11-2,24V GENERAL PURPOSE RELAY BD
PA0758   PCB ASSY,QE90,EMUX9601,MULTIPLEXER 16SEC SPEECH
PA0759   PCB ASSY,QE90,EMUX9601,MULTIPLEXER 60SEC SPEECH
PA0791   PCB ASSY,TRAN9705-1,4x25W MODULE WITHOUT RELAYS    use PA0792
PA0792   PCB ASSY,TRAN9705-2,4x25W MODULE C/W RELAYS
PA0793   PCB ASSY,TRAN9705-3,2x25W MODULE WITHOUT RELAYS    use PA0794
PA0794   PCB ASSY,TRAN9705-4,2x25W MODULE C/W RELAYS
PA0795   PCB ASSY,TRAN9706-1,4x10W MODULE WITHOUT RELAYS    (can also use PA0796)
PA0796   PCB ASSY,TRAN9706-2,4x10W MODULE C/W RELAYS
PA0822   PCB ASSY,QE90 MWIP9903   8 CIRCUIT WIP MODULE
PA0916   PCB ASSY,QE90 WTRM2000,WIP TERMINATION (DIN)

RR0038   RESISTOR,0.6W,1%,50PPM,D2.5mm,P10mm,2K70
RR0045   RESISTOR,0.6W,1%,50PPM,D2.5mm,P10mm,10K0
RR0054   RESISTOR,0.6W,1%,50PPM,D2.5mm,P10mm,56K0

SF0131   SOFTWARE,QE90,EMUX9601,ALERT/EVAC 16SEC SPEECH
SU0168   SUNDRY,MICROPHONE,GOOSENECK DM521B
SU0169   SUNDRY,MICROPHONE,DESK PM600D
```

18.2 BARE BOARD PARTS

The following parts in the PA08xx series are the same as the corresponding PA06xx modules but without the DIN Rail mounting hardware. The PCB has mounting holes so that the PCB may be screw mounted onto metal standoffs.

```
PA0849   PCB ASSY,QE90 SPIF9709   SECONDARY PANEL INTERFACE
PA0851   PCB ASSY,QE90 FIB8910    FIP/BGA MASTER
PA0852   PCB ASSY,QE90 FIPE9004   FIP/BGA EXTENSION
PA0857   PCB ASSY,QE90 SE9004     SIGNAL INTERFACE
PA0858   PCB ASSY,QE90 WTRM9007   WIP TERMINATION
PA0897   PCB ASSY,QE90 STRM9502   STROBE/RELAY MODULE
PA0898   PCB ASSY,QE90 ECM9603    EVAC COMMUNICATION MODULE
PA0922   PCB ASSY,QE90 WTRM2000   WIP TERMINATION
```

If you require a replacement “Bare Board” part, please order the corresponding “DIN RAIL” part. When you receive it, remove the plastic holders or metal plate from the new PCB and assemble the FAULTY PCB into the plastic holders or metal plate. This has effectively converted the new part from “DIN RAIL” to “Bare Board” and converted the faulty part from “Bare Board” to “DIN RAIL”. Return the faulty part for repair complete with the DIN RAIL components just fitted.

18.3 EMC COMPLIANCE

From early 1999, most DIN RAIL modules will be supplied with metal hardware instead of the plastic holders previously used. This is to ensure compliance with EMC emission requirements. These modules with metal hardware are interchangeable with the old modules with plastic hardware. When fitting a part with a metal frame ensure the tips of the screws underneath it make good electrical contact with the DIN rail, if necessary by bending out the tabs on which the screws are mounted.

When mounting a bare board directly to a 21U cabinet ensure that steel mounting hardware is used so that the earth connection points on the board connect to the chassis.

19 CABINET WIRING

19.1 DRAWINGS

The following drawings show the wiring inside a typical QE90 cabinet for reference. This information will be useful when you need to fit additional parts to expand the QE90 beyond the capacity it was delivered with.

699-177	QE90 Generalised Wiring Diagram
699-180	QE90 Optional Panel Wiring
699-198	QE90 Generalised Wiring Diagram - Remote Equipment Rack

20 EVACUATION COMMUNICATIONS MODULE (ECM9603)

20.1 OVERVIEW

The Evacuation Communications Module (ECM9603) is used:

- In networked systems, where there are multiple ECPs, some of which control only some zones;
- In systems where there is a high level link to a Fire Panel, or Colour Graphics;
- In large systems, i.e. systems which would otherwise have in total more than 16 slave modules.

The ECM provides a high speed RS485 communications bus between networked locations. The QE90 communications bus connecting the modules within each location becomes a local bus. The ECM also provides the RS232 ports used for communicating at a high level with Fire Panels or colour graphics PCs.

The ECM EPROM contains the site and panel specific information, and is programmed by Tyco specifically for each panel. In a panel with an ECM, the ECM provides most of the system processing, with the ECP reverting to a simpler control and display panel.

20.2 CONNECTION TO ECP

In a system with no ECM, the ECP connects directly to its SPIF with a 34 way cable. When an ECM is used the ECP connects to the ECM with a 34 way cable, and the ECM connects to the SPIF with a second 34 way cable.

The ECP needs generic software to be fitted, i.e. the ECP software is no longer site-specific. For the EVAC ECP the EPROM will be labelled GENERIC ECP Ver 3.xx, and for the WIP ECP it will be labelled WIP ECP V2.06 or greater. The EPROM for the Evac ECP is a 27C256 for versions 3.00 to 3.09, and a 27C512 for version 3.10 and higher – be sure the link on the ECP is set correctly. (Refer to Section 16.2)

The ECP address switches should be set as if the Evac ECP and Wip ECP are MECPs, regardless of their function in the network. I.e. All switches off for the evac DIP switch, all switches off for the WIP DIP switch except switch 1 on for a 1 wip per zone system. (In the special case where there are 3 wips per zone and more than 66 zones there will be an additional hidden ECP for WIP zones 67 and above. This ECP should have the evac DIP switch 5 on and WIP DIP switch 4 on with all other switches off.)

Refer Section 16.2 for further information on DIP switch settings, noting that the following switches have no effect if the ECP is connected to an ECM.

- The switch labelled “On if printer option fitted”.
- The switch labelled “On if spare audio bus fitted, off if WIP/PA swap or no SPIF”.
- The switch labelled “On if SPIF fitted and SPIF links in M position”

All these switches should be OFF.

Figure 20-1 shows the arrangement of the ECM in the QE90 panel.

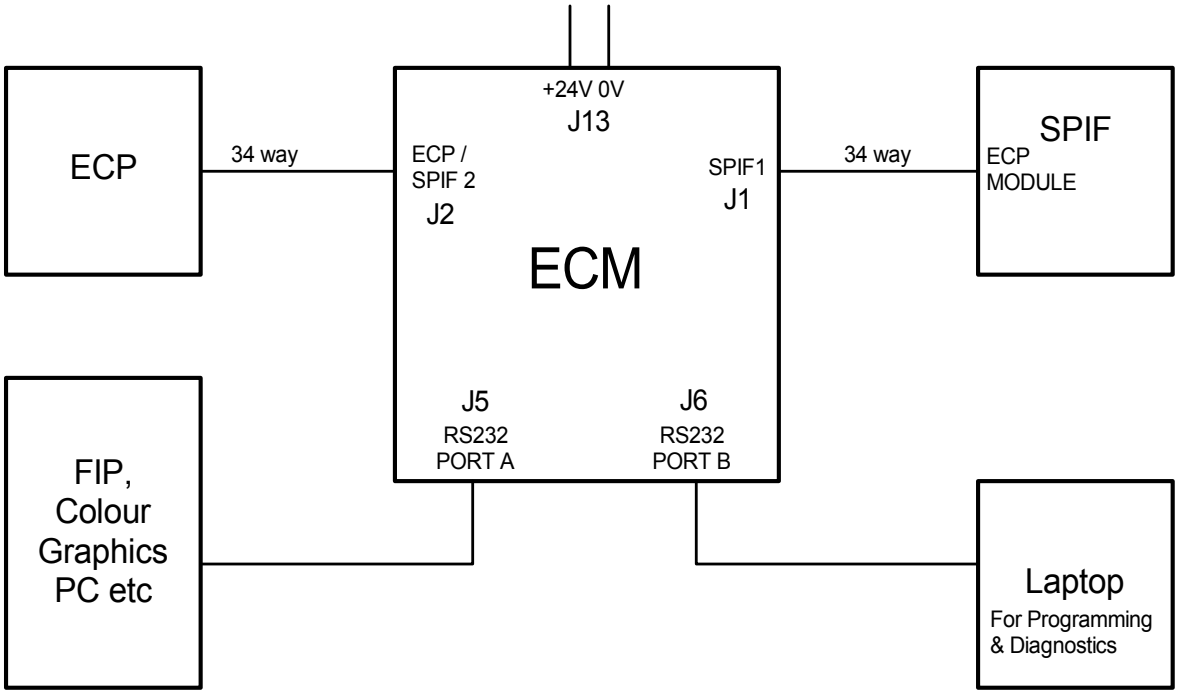


Figure 20-1 ECM Wiring to ECP and SPIF

20.3 WIRING BETWEEN LOCATIONS

The RS485 cables (A and B) and the WIP Speech and PA Speech must be connected between all locations. This can be done in a bussed mode, or a bus with spurs.
The RS485 ports on all the ECMs must be bussed together. There is no connection to the COMMS and COMMS BKUP on the SPIF modules. (Except that if there is a Paging Console it should be connected to COMMS). It is possible to program which SPIF/ECM(s) monitor the SPEECH cables and whether or not there is a dedicated SPEECH buss fitted, in the ECM programming mode (see later). Refer to Section 13.2 for more information on link settings on the SPIF.

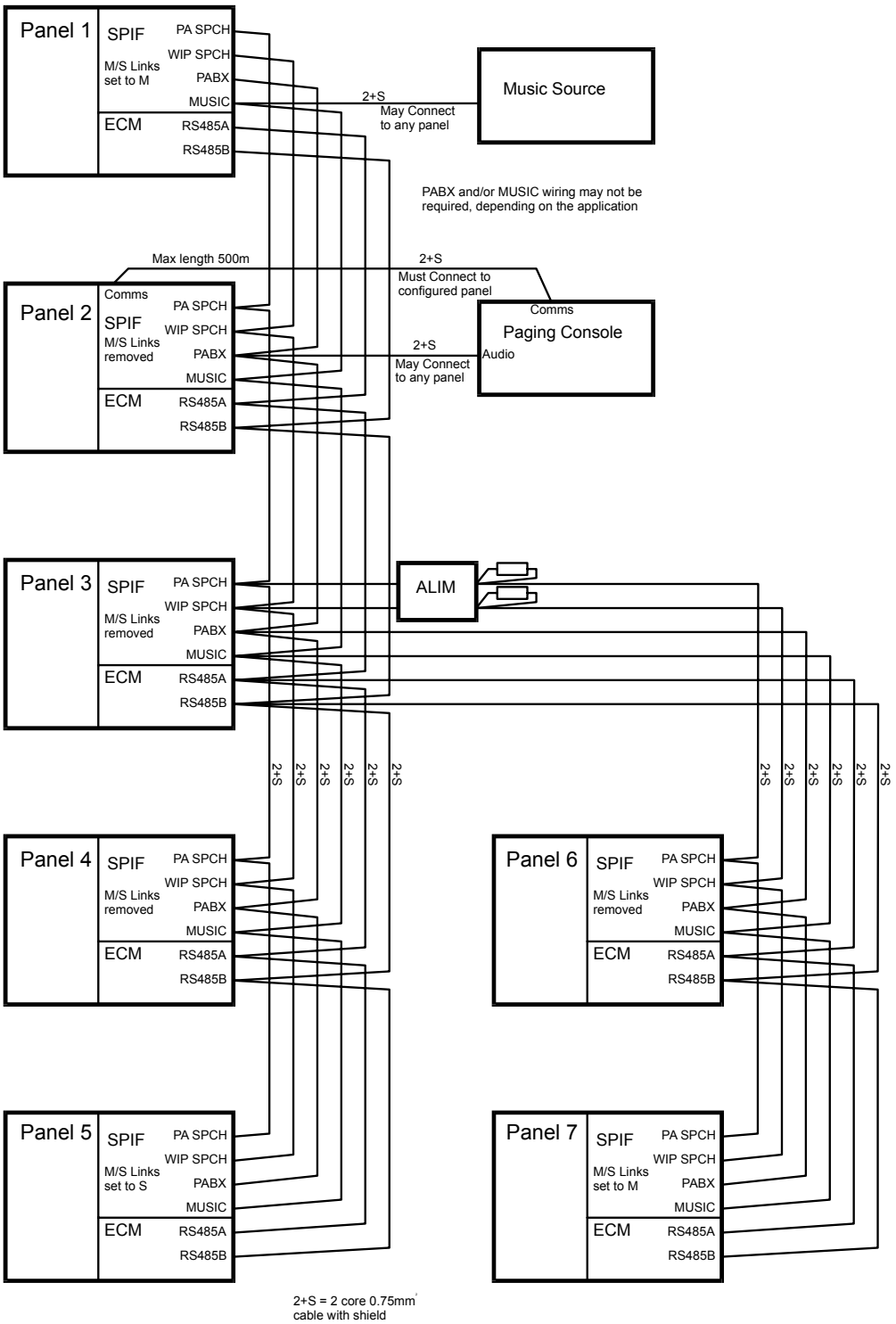
Refer to Figure 20-2 for a typical topology.

Figure 20-3 shows in more detail how each panel is wired, and shows the wiring via the ALIM9706 at the location where the spur joins the main bus (Location 2 in Figure 20-2). Other locations will not have a spur and will not require the ALIM9706.

It was previously recommended that termination resistors / capacitors were fitted to the ends of the bus. This has been found to provide no advantage (usually at least), and it is now recommended that they are not fitted.

In some cases where very long cables are used, Tyco Safety Products will may provide specific alternative details for particular systems. These system specific details override the information given in this manual.

In the case where the RX and TX pins must be separate (for example connection via a modem, fibre-optic interface, or 4 wire per port interface to another ECM), links 11 and 13 must be removed for port 1, and links 12 and 14 removed for port 2. The RX pins are then the INPUT to the ECM, and the TX pins are the OUTPUT of the ECM.



Audio Monitoring
The two panels with the M/S links in the M position (and no others) should have "Monitor Analog busses from this ECM" set to "Yes" (in ECM Programming mode).

Maximum cable length
The total bus length including spurs should be less than 1200m
i.e. Panel 1 to Panel 5 plus Panel 3 to Panel 7 must be less than 1200m.
The maximum length of a stub (Panel 3 to Panel 7) must be less than 200m.

Figure 20-2 General Wiring Topology of ECM networked QE90s

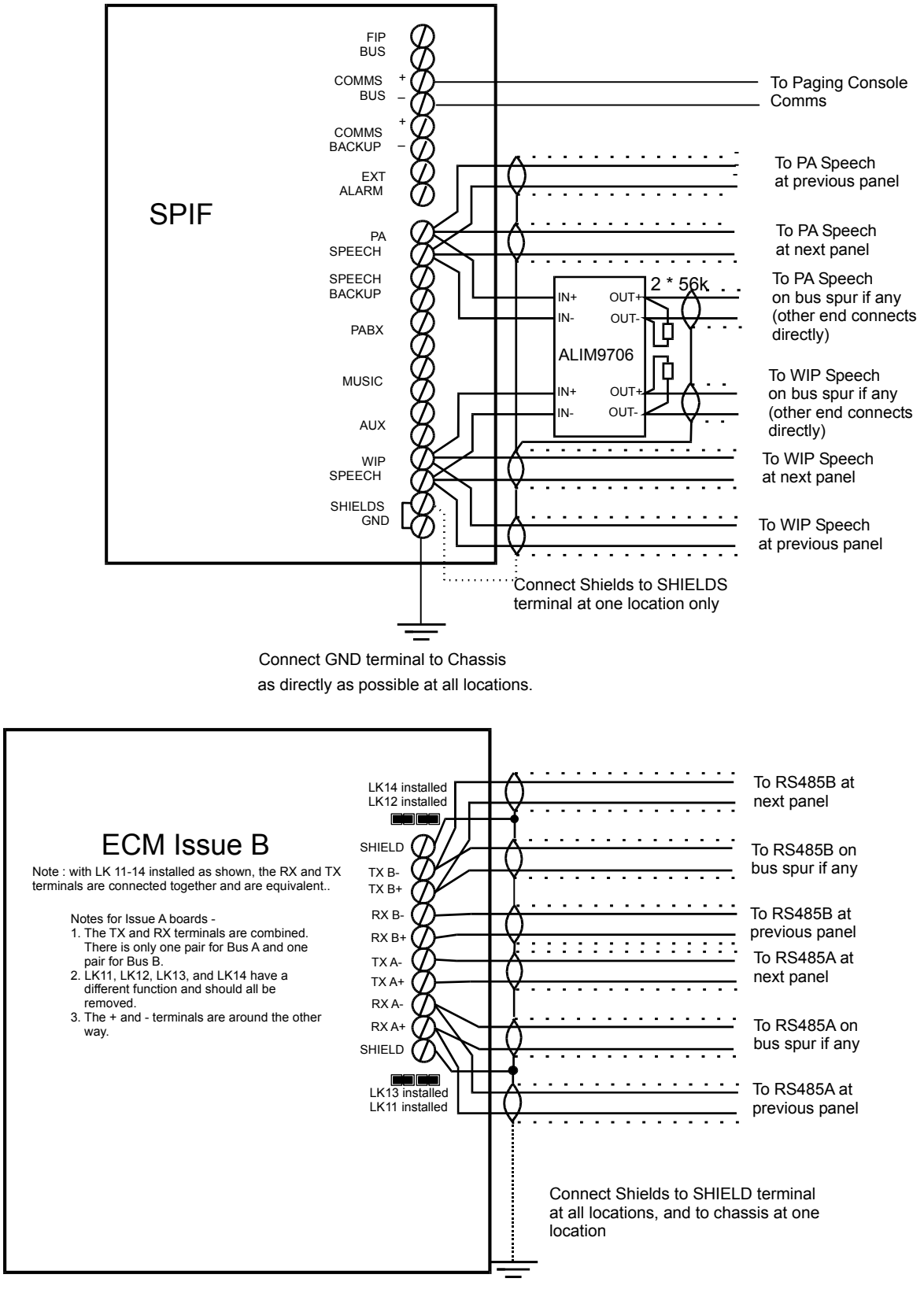


Figure 20-3 Network Wiring At SPIF9506/SPIF9709 and ECM

20.4 SYSTEMS WITH MULTIPLE PA / WIP BUS SEGMENTS

On some complex systems the PA and WIP busses may be broken into segments. For example in a system with a number of MECPs and corresponding SECPs there may be a bus segment between each MECP and its corresponding SECP, and another global segment which joins the MECPs. At the locations where two segments join, there will be two SPIF modules. One of these modules will connect to the local bus segment and the other module to the global bus segment. A system of this type is shown in Figure 20-5. In this example MECP1 and MECP2 will have two SPIF modules as shown in Figure 20-4. The configuration listing will list which segments connect to each location and each SPIF module.

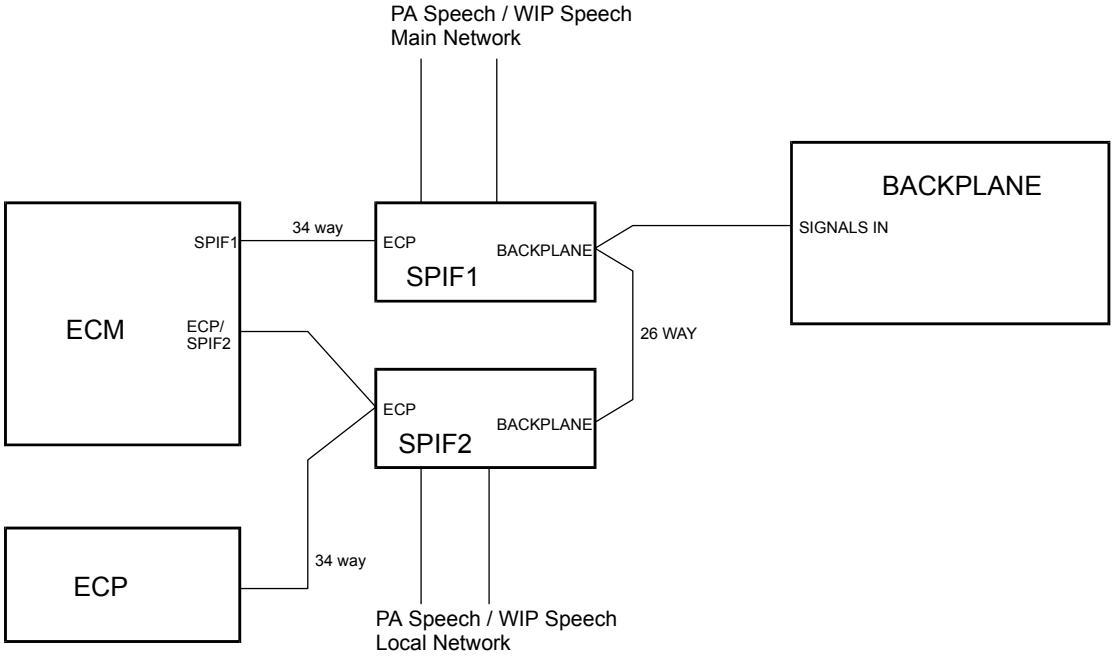


Figure 20-4 Wiring at Panel With Network Join

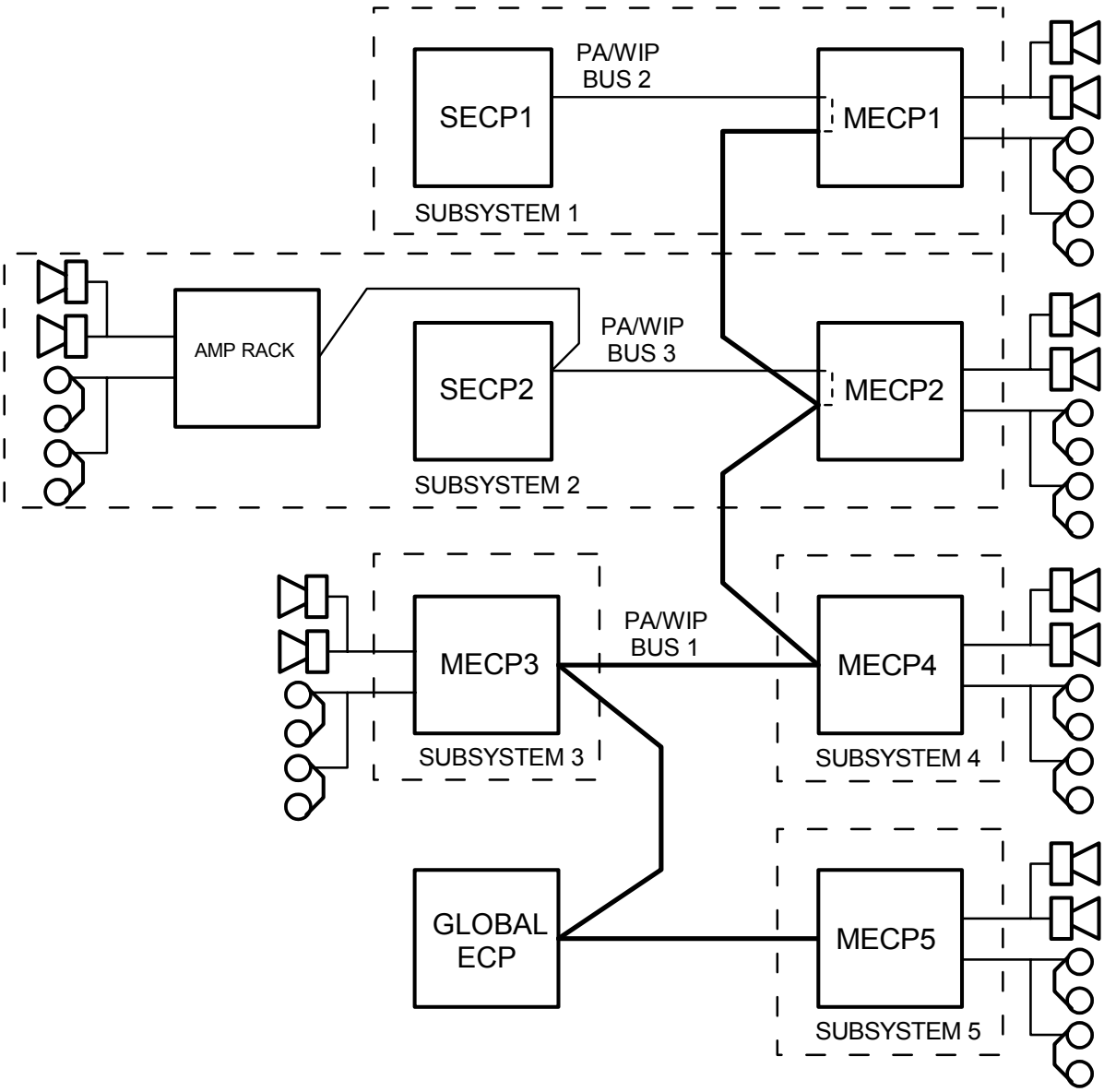


Figure 20-5 Segmented PA/WIP Speech Wiring.

20.5 CONNECTION TO IHUB

The digital data traffic between QE90 ECMs may pass through one or more IHUBs which are setup in PanelLink or RingNet mode.

One or more QE90s (with ECMs) may connect to each port of an IHUB. The QE90 RS485 bus is simply extended to the port of the IHUB. In all cases connect A+ to A+, A- to A-, B+ to B+, and B- to B-.

If the IHUBs are using RingNet, the QE90 ECM RS485 terminals must connect to the RS485 terminals on an RS485 board connected to the IHUB ECM port 3, 4, or 5.

If the IHUB is using PanelLink, the QE90 ECM RS485 terminals may connect to the RS485 terminals on an RS485 board connected to the IHUB ECM port 3, 4, or 5, or directly to the RS485 terminals on the IHUB ECM (ports 1 and 2).

The IHUB must be programmed to pass through Application 7 (Application 8 for I2000), and to pass through Link Integrity. You can tell what QE90s need to communicate with each other from the Networking / Related Nodes section of the configuration printout.

The IHUB must be programmed NOT to use concatenated messages if the ECM software version is before version 1.50 or between versions 5.19 to 5.35 inclusive.

The QE90s must be programmed to Disable Cyclic Addressing when QE90 data must pass through an IHUB. Then the IHUB should usually be programmed to acknowledge broadcasts on each port that QE90s connect to. The most distant (or only) QE90 on each IHUB port should be programmed to acknowledge broadcasts from the IHUB. Refer to section 20.7.

When the connection of a QE90 network to an IHUB, is only to provide high level FIP inputs to the QE90, it is not necessary to Disable Cyclic Addressing on the QE90 network. The IHUB port which connects to the QE90 must still be programmed to not use message concatenation with the ECM software versions mentioned above. The most distant QE90 from the IHUB should be programmed to Acknowledge broadcasts from the IHUB. In this case, the IHUB must pass through Link Integrity and the Status Transfer Application (not Application 7 or 8). Refer to PBQ0051A and Chapter 22 for further information on High Level FIP Inputs to QE90.

20.6 ECM LINKS

The links on the ECM should be set as follows

LK1 : (EEPROM SIZE) 1-3 & 4-5
LK2 : (Issue A only) (EPROM SIZE) 1/4M
LK3 : (RAM SIZE) 62256/628128
LK4 : (EEPROM Write Enable) Removed, write disabled. (However it must be temporarily installed when exiting program mode if something has been changed.)
LK5 : (DIGITAL I/O VOLTAGE) Don't care.
LK6 : (RS232 PORT B CTS/DCD SELECT) CTS
LK7 : Removed
LK8 : (SPIF 2 Power) Removed, unless SPIF rather than ECP connected in ECP/SPIF2 position
LK9 : (SPIF 2 Power) Removed, unless SPIF rather than ECP connected in ECP/SPIF2 position
LK10 : (ENABLE QE90 COMMS) : Fitted.
LK11 : Issue A - Do not Fit.
Issue B - Fit if RX and TX common for RS485 port 1.
LK12 : Issue A - Do not fit.
Issue B - Fit if .RX and TX common for RS485 port 1.
LK13 : Issue B - Fit if .RX and TX common for RS485 port 2.
LK14 : Issue B - Fit if .RX and TX common for RS485 port 2.

20.7 ECM PROGRAMMING

20.7.1 OVERVIEW

The ECM is programmed from a laptop running terminal emulation software (e.g. PROCOMM). It is not possible to change any programming from an ECP. The laptop/terminal needs to be connected to the ECM with (1) a ribbon cable adaptor LM0065 and (2) a null modem cable LM0076. Refer to Chapter 23 for more details of connecting a printer or terminal.

The terminal or terminal emulation software should be set for 9600 baud, 8 data bits, no parity, 1 stop bit.

The ECM requires programming to setup Cascade timeouts and Background Music Zones in EEPROM. It is also possible to program network parameters but as these default to the normal values, it is seldom necessary to change them. To program the Cascade or Background Music zones, or to change a network parameter, it is necessary to have a laptop connected and running a terminal emulator program.

The cascade timeouts and background music zones must be programmed at the ECM(s) where the amplifiers are located, and not at a node which contains an ECP only. The values programmed only affect the cascading at the node where they are programmed and they can be different at different nodes.

It is no longer possible to “disable” the cascade. In a large system in which ECMs are required, there would normally be a custom cascade and it is not desirable to allow it to be disabled on site.

20.7.2 PROCEDURE FOR PROGRAMMING

<Enter> represents the Enter key. For all entries, the current value will be displayed. To leave the value as is just type **<Enter>**.

- Connect the laptop as described above, and start up the terminal emulation program.
- Power Up the ECM, and within 5 seconds type a lower case **e** three times.
- The main menu will be displayed as follows -

```
Set Date & Time (D)
Configure Network (C)
Tune Network (T)
Print Config(P)
Select Groups and Event types for printing (G) (Currently not applicable)
Configure Printing and Link Integrity Monitoring of Individual panels
(I) (Currently not applicable)
QE90 Configure (Q)
Display QE90 Factory Configuration (F)
Exit Configuration (X)
```

Type D, C, T, P, Q, F, or X as required.

Q Menu

```
Delay after alarm before any tones (secs) Currently 0 :
```

Enter the required delay (See “Delay Before Action” in Section 24.3).

```
Initial cascade time delay (secs) Currently 30 :
```

Enter the delay between the first tones being generated and tones first spreading to other zones or changing from Alert to Evacuate. (See “Initial Delay” in Section 24.3)

```
Subsequent cascade time delay (secs) Currently 30 :
```
Enter the delay between each subsequent cascade stage. (See “Subsequent Delay” in Section 24.3)

```
Monitor analog busses from this ECM (Y / N) Currently N :
```
Enter Y if this ECM is at the end of a bus or spur and its links are in the M position.

```
Spare speech bus is fitted (Y / N) Currently N :
```
Enter Y if there are 3 audio busses fitted, and redundancy is provided by switching in the spare bus. Enter N if there are only two audio busses fitted, and redundancy is provided by swapping WIP and PA busses.

```
Zones for Background Music
```
Enter zones which are to receive background music if there is no run-time control of such zones. Use commands like **ADD 3 6-8 <Enter>** to add zones 3 and 6 to 8, or **DEL 5 22 <Enter>** to delete zones 5 and 22. When finished just type **<Enter>**

```
Zones for Alert/Evac/PA Group Keys
```
Enter zones which are controlled by the Alert, Evac, and PA Group keys. The format is the same as for adding or deleting Background music zones.

```
Default Zones for non-emergency paging default (PABX)
(relevant if the PABX input is used but there is no paging console)
```
Enter zones which are to receive the PABX audio input if there is no run-time control of such zones. Use commands like **ADD 3 6-8 <Enter>** to add zones 3 and 6 to 8, or **DEL 5 22 <Enter>** to delete zones 5 and 22. When finished just type **<Enter>**

```
Current modem dial string []
To change, type a new string <Enter> eg ATDT1,12345678
To disable dial out facility, type / <Enter>
```
Enter the dial string for the modem as described in 20.11. If there is no modem to dial out and print alarms remotely, and a string is already defined, type **/<Enter>** which will remove the string.

```
Current modem initialise string []
To leave as is type <Enter>
To change, type a new string <Enter>
This string should disable echo and result codes eg ATE0Q0
To disable modem initialisation, type / <Enter>
```
Enter the initialisation string for the modem as described in 20.11. If these is no modem to dial out and print alarms remotely, and a string is already defined, type **/<Enter>** which will remove the string.

```
Modbus Zone Address (0 to disable) Currently 0 :
```
Enter the lower of the two slave addresses to be used for Modbus (typically colour graphics) communications. This address is the Zone address. The Group address is one higher.

```
Maximum time between modbus polls (255 to disable fault) Currently 5 :
```
(Only presented if the modbus zone address is not 0). Enter the maximum time in seconds between modbus polls before a fault is raised.

```
Control via modbus disallowed Currently N :
```
(Only presented if the modbus zone address is not 0). Enter Y to disable control over modbus.

```
Baud rate for printer / terminal port Currently 9600 :
```

Enter the baud rate for the port you are using. Any change will take effect after you exit programming mode and restart the ECM.

`Use hardware handshaking on printer/terminal port (Y / N) Currently N :`
Enable or disable hardware handshake for the port you are using. Any change will take effect after you exit programming mode and restart the ECM.

`Baud rate for colour graphics / modbus port Currently 19200 :`
Enter the baud rate for the colour graphics / modbus / high level FIP port. Any change will take effect after you exit programming mode and restart the ECM.

C Menu

`Set everything to default (Y / N) :`
Enter Y to set **all** site configurable data to its default. **This includes setting all items in the Q and T menus to their default values.**

`Your address is 5`
This is for your information, you can't change it.

`Acknowledge Broadcasts from which SIDs`
`0 = None, 255 = All, Other = Single specific SID Currently 0 :`
Set to 0 unless you are connecting to other QE90s through IHUB(s) and therefore you have set "Disable Cyclic Addressing" to Y. Then you should enable one node on the network spur to Acknowledge messages from all panels on that spur (typically the IHUB), and one node to acknowledge messages from the IHUB. So in this case you would enter the IHUBs address here.

`Point to point mode (Y / N) Currently N :`
Enter Y only if there is only one other node on the network and you have separate cables for transmit and receive to that other node, or you are connecting through a modem or similar and you can transmit and receive at the same time. That other node must also be set to Y.

`Tx all link integrity on both channels (Y / N) Currently N :`
Entering Y will transmit link integrity messages for channels A **and** B on each channel (instead of transmitting channel A link integrity on channel A only and transmitting channel B link integrity on channel B only). This avoids getting fault indications when there is only a single channel (connecting to a non-essential part of the system).

`Disable Cyclic Addressing (Y / N) Currently N :`
Enter Y if data between QE90s must pass through one or more IHUBs. In this case see also "Acknowledge broadcasts from which SIDs" above.

`Additional Refresh Interval`
`(Additional to basic interval of 60 - 120secs ) Currently 0 :`
Enter a number usually in the range of 60 - 200 on large systems. This reduces network traffic at the expense of increasing the time between refreshing data which has not changed.

T menu

`Network tuning - set to default (D), modify/view (M), leave as is :`
Self explanatory. Setting to default applies only to this menu.

`Network baud Currently 9600 :`
Enter the baud rate for the network.

`Rx Timeout * 3.3msec Currently 2 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Tx delay * 3.3msec Currently 1 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Ack Time * 33msec Currently 40 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Dup Periods * 33msec Currently 45 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Leading FF Currently 1 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Trailing FF Currently 1 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Link Integrity Rx interval * 1sec (0 = disabled) Currently 25 :`
Leave at the default of 25, or set to 50 on larger systems.

`Link Integrity Tx interval * 1sec (0 = disabled) Currently 5 :`
Leave at the default of 5, or set to 10 on larger systems. If you set to 10 also set the RX interval above to 50.

`Multicast Tx times Currently 2 :`
Leave at this default unless instructed otherwise by Tyco Safety Products.

`Point to point mode (Y / N) Currently N :`
Another way of selecting point to point mode as described in the C menu.

`Network Tuning OK ? (Y / N) : y`
Enter Y if you are happy with your changes, or N to go through the menu again.

Exit
If any changes have been made install the EEPROM write enable link (LK4). Type **X<Enter>** to save your changes and exit. Remove the write enable link (LK4). On older systems it may be necessary to power down and up for the changes to take effect.

20.8 CHARGER FAULT CONNECTION AT AMP RACK

At a location with a power supply but no ECP e.g. a remote amplifier rack, the PTT input is used to monitor the power supply “charger fault” output and signal it to ECPs. If “PTT” is open it will be taken as a charger fault, if closed no fault. This will normally be wired in the factory. A suitable relay mounted on a PCB is the Tyco part number PA0730.

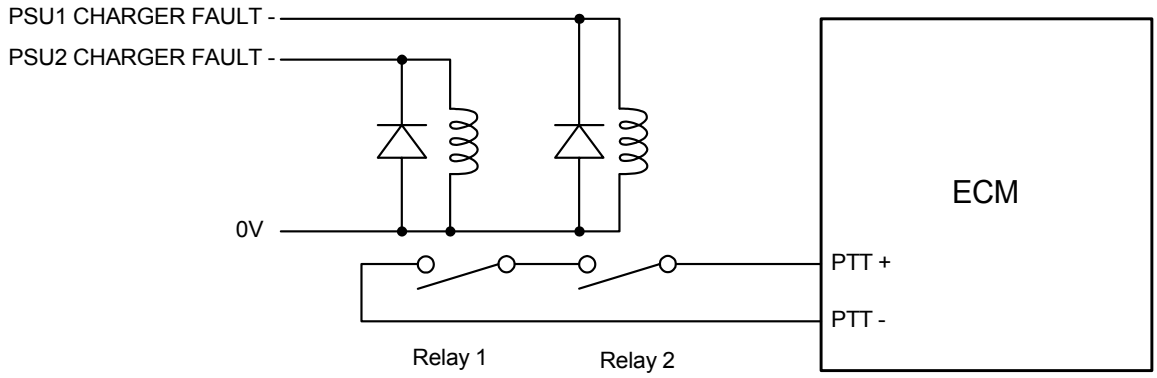


Figure 20-6 Charger Fault Wiring at Amplifier Rack

20.9 CONNECTION AT COLOUR GRAPHICS PC

If the ECM is acting as an interface to a colour graphics PC acting as an ECP, the RING9006 PCB is connected to the FRC connector J10 on the ECM. The PTT switch on the microphone is connected to the ECM screw terminals J9 through the PA0688 Preamp. See Figure 20-7 Colour Graphics Wiring.

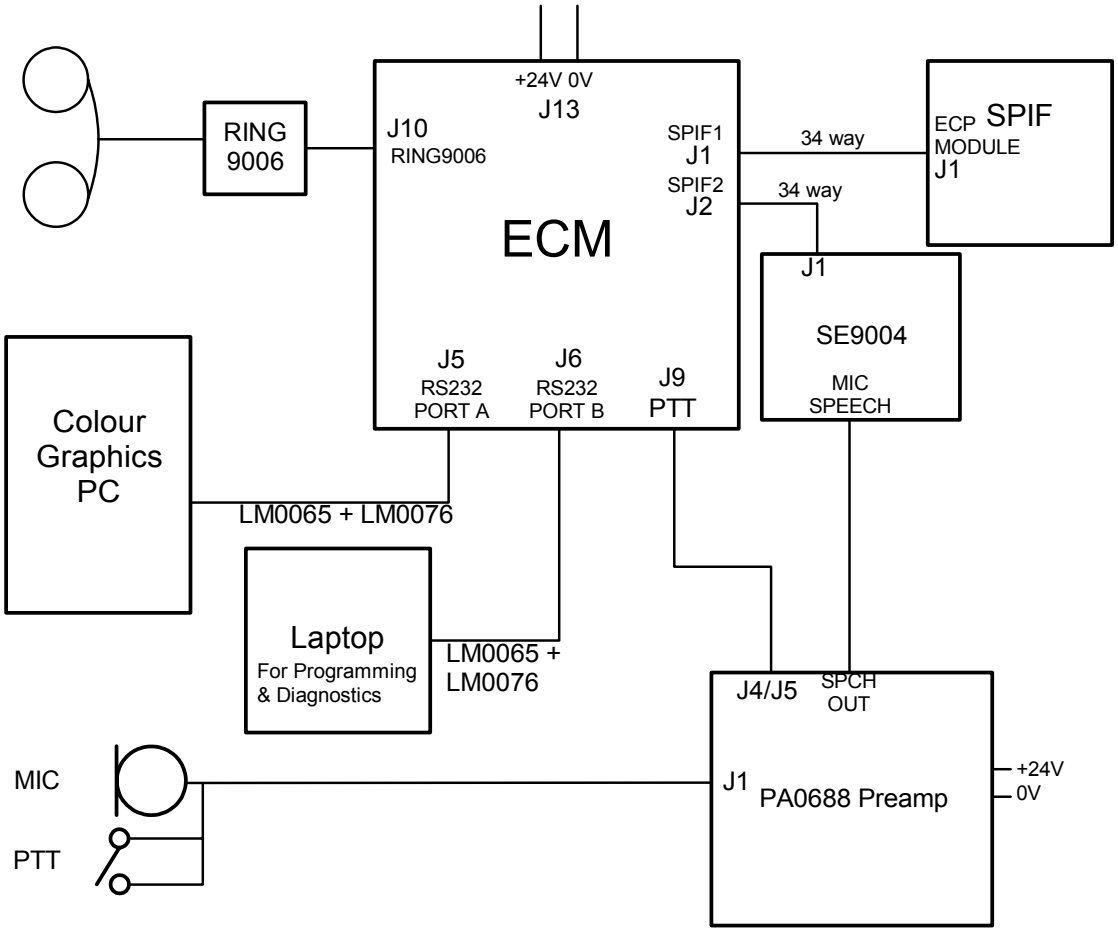


Figure 20-7 Colour Graphics Wiring

Wiring of the ECM and SPIF is otherwise the same as at a QE90 Panel.

20.10 ECM DIAGNOSTICS & EVENT LOG

20.10.1 OVERVIEW

The ECM has a diagnostic facility which can be used to print events on a printer, or using a terminal emulator, list all off normal conditions, control alert and evacuation tones for zones, and log various comms messages. The logs of the communications messages are intended for Tyco's use, normally Tyco will advise what to do to diagnose a problem.

Refer to Chapter 23 for more details of connecting to a printer or terminal.

The facility to display off normal conditions, and to control zones, means that most of the commissioning of an “amp rack” (i.e. a panel with no ECP containing amplifiers, possibly strobe outputs, possibly FIP/BGA inputs, and possibly WIP circuits), can be done at the amp rack, with or without the remote ECP powered up.

20.10.2 DIAGNOSTICS PROCEDURE

Connect the laptop/terminal emulator as described in Chapter 23.
Type <Enter> and you will get a list of commands like the following -

```
Terminal commands
f  Display factory configuration and some site programmed values
o (letter) Display status by displaying all off normal conditions
e  Toggle Event Log On/Off
q  Toggle Local (QE90) Comms Diagnostic Log On/Off
m  Toggle Modbus Comms Diagnostic Log On/Off
p  Toggle RS485 Panel Link Comms Diagnostic Log On/Off
l  Toggle RS485 Link Integrity Comms Diagnostic Log On/Off
s  Toggle Simplex FIP HLL Comms Diagnostic Log On/Off
r  Toggle RZDU FIP HLL Comms Diagnostic Log On/Off
x  Toggle External Speech Generator Log
SPACE Turn Off all Comms Diagnostic Logs
d  Display Panel Link Diagnostic Counters
0 (digit) Clear Panel Link Diagnostic Counters
<  Display Memory Usage
i  Enter line (exact case) as per the following (between <>)
   <date 25/12/2001>
   <time 23:15:00>
   <E20=1> or any script language statement
   <===RESET_ECM===>        Reset (Restart) ECM
   <===PROGRAM_ECM===>      Reset ECM and go into programming mode
?  Any expression in script language to evaluate eg E20|E21
Note log of most events is suspended while entering line for i or ? command
```

Much of the above is self explanatory, some commands are expanded below -

- **e** enables/disables the event log. This log is enabled by default and will display changes in the Alert and Evacuate status for each zone, and most kinds of faults. The display is generally similar to output of the "Off Normals" command, but each condition is listed as it happens along with the time and date.
- **i** allows you to input line of script to interpret as described in Section 20.10.4. Or input one of the two commands as shown (exactly) to reset the ECM, or reset and proceed to programming mode, without needing to power it down.
- **o** lists all off normal conditions as described in Section 20.10.3.

20.10.3 OFF NORMAL DISPLAY.

The **o** command will give a display `like the following` with explanations added in this font

```
Off Normal conditions Tyco Demo V1.13 Mar 06 1997. SID 120
```
(The name of the system is Tyco Demo, the software version is 1.13, the date it was programmed is March 06 1997, and the network SID (address) is 120.)

`Alert Zone(s) 1 2 3 4` (Zones 1, 2, 3,and 4 are generating Alert Tones.)

`Speaker Line Faults on circuits  *4` (Speaker circuit 4 has a line fault.)

`BGA Alarms on circuits *2 3 (`BGA circuit 2 has an alarm. BGA circuit 3 has a latched alarm, i.e. there has been an alarm but it has now cleared.)

`WIP Line Faults on circuits *7 *10` WIP circuits 7 and 10 have line faults

`Speaker Line Faults on zones *4` There is a speaker line fault on zone 4.

`WIP circuits active as BGA/FIP/GP inputs *15` WIP circuit 15 is active as a BGA, FIP, or switch input.

`BGA Alarms on zones *2 3 *5.` There are BGA alarms on zones 2 and 5. There has been a BGA alarm on zone 3.

`WIP1 Line Faults on zones *7 *10` There are WIP line faults on the WIP1 connection for zones 7 and 10.

`Card Failures (Hexadecimal addresses) *70 c0 (`QE90 Card address hex 70 is not responding. Card address hex c0 has been not responding but now is responding.)

`SIDs not responding *6` (SID 6 is not acknowledging messages addressed to it. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition.)

`Link Integ Ch A not received here from SIDs *6` (This means that **this node** is not receiving link integrity transmissions on channel A from SID 6. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition.)

`QE90 SIDs which have detected Link Integ Error, Channel A *7` (This means that **SID 7** is not receiving link integrity transmissions on channel A from at least one expected SID. Note that only SIDs listed under Related Nodes in the configuration listing can generate this condition)

Note that a * precedes circuit and zone numbers where the fault or alarm is current, except for Alert and Evacuate conditions for zones which never have a * and are not latched. If there is no * preceding the circuit or zone number, the condition is latched, i.e. the abnormal condition has occurred and subsequently returned to normal. These latched conditions are reset when faults are reset at an ECP, i.e. the SILENCE key is pressed and held for 2 seconds.

The local information is displayed for “circuits” and again for “zones”. A circuit refers to the circuit number on the I/O termination module, or to an amplifier number. A zone refers to the zone the circuit is mapped to.

The relationship between local circuits and zones can be obtained from the factory configuration printout. A zone may have zero, one, or more than one circuit of each type assigned to it.

Remote Information is given only for zones. Circuit data is not transmitted across the network.

OFF NORMAL DISPLAY NOTES

The QE90 card addresses are as follows

- 00 Evac ECP
- 2x EMUX module x
- 4x FIP module x
- 5x BGA module x
- 6x Strobe module x
- 7x Paging Console x

80 WIP ECP
cx WIP slave module x.

20.10.4 INTERPRET COMMAND

After typing **i** it is possible to enter the commands to turn Alert and Evacuate On and Off for each zone. It is necessary to type **i** before each command. Commands have the general form
A(range)=0 or A(range)=1 or E(range)=0 or E(range)=1.
A corresponds to Alert, E to Evacuate. Setting Alert or Evacuate to 1 turns it on, setting it to 0 turns it off. The (range) is best described by examples. Note that the case (upper/lower) of the letters is significant and must be as in the following examples.

`A5=1`	Set alert for zone 5
`E12=0`	Reset evacuate for zone 12
`An=1`	Set alert for all zones
`An5-12=0`	Reset alert for zones 5 to 12

Any powered up ECPs at other locations which could control the zones must be switched to AUTO or their controls may override the commands typed in.

20.11 DIAL OUT ALARM LOG

The ECM can be configured to dial out using a modem when an alarm occurs and display/print the alarm message remotely. The modem is connected to RS232 PORT B (J6), i.e. the same port as the laptop/terminal for diagnostics. In programming mode under QE90 programming you can enter a modem initialisation string and a modem dial command string. The baud rate used to converse with the modem is 9600 baud. Most modern modems will auto detect this. Most modern modems will also automatically determine a suitable baud rate with which to converse with the remote modem. The initialisation string should reset the modem to the factory defaults then NO ECHO, NO RESULT CODES and GENUINE CARRIER DETECT (if this is not the default). For example for the US Robotics Sportster VI, AT&F0E0Q1. If the modem is required to auto answer so that the ECM can be called from a remote terminal, then command it to do so eg AT&F0E0Q1S0=1. The ECM will add a carriage return character to the strings it sends to the modem. The dial string should be whatever is needed to dial the remote system eg ATDT1,,96460001. After entering the codes with the laptop and exiting programming mode, the ECM should be powered down and the modem connected to RS232 PORT B (J6) and the ECM powered up. The modem can be connected using the Tyco loom LM0065 which provides 9 way male and female DB9 connectors, and then a standard 9 pin to 9 pin or 9 pin to 25 pin cable as required to suit the modem. Most modems will come with a suitable cable.

The remote system should run a terminal emulator program and initialise its modem to auto answer. If required the terminal emulator program can be configured to automatically print data as it is received - if this is the case it is suggested that the remote computer should run DOS and not Windows as it is not possible for a Windows program to print line by line.

The remote system can do all of the diagnostics listed under ECM DIAGNOSTICS, either when automatically dialled as a result of an alarm, or by manually dialling in. When the ECM dials out it will terminate the call 1 minute after the last activity, however if the remote system dials the ECM, then the call must be terminated by the remote system.

20.12 DIAGNOSTIC LEDS

There are some diagnostic LEDs on the ECM which may be useful -

LD1 (red) will flash with every communications error with QE90 modules (i.e. Evac and WIP ECPs, FIP/BGA modules, EMUX modules, Strobe and WIP modules).
LD2 (yellow) will flash with every successful communications message with QE90 modules. It should be flashing very rapidly.
LD3 (green) should be always on if the ECM is powered up. If it flicks off briefly it indicates the ECM is being reset.
LD4 (yellow) (RS485 A Transmit) flicks on whenever the ECM transmits on the channel A RS485 bus. It should do this at least once every 5 seconds, transmitting its link integrity message. Whenever anything changes, and about once per minute, this LED and LD6 flash together indicating transmissions on both A and B busses.
LD5 (yellow) (RS485 A Receive) flicks on whenever the ECM receives on the channel A RS485 bus. This should include whenever it transmits, and whenever it receives from another ECM. This LED should be normally off, blinking on with data reception. If it is on steady or not blinking there is something wrong.
LD6 (yellow) (RS485 B Transmit) flicks on whenever the ECM transmits on the channel B RS485 bus. It should do this at least once every 5 seconds, transmitting its link integrity message. Whenever anything changes, and about once per minute, this LED and LD4 flash together indicating transmissions on both A and B busses.
LD7 (yellow) (RS485 B Receive) flicks on whenever the ECM receives on the channel B RS485 bus. This should include whenever it transmits, and whenever it receives from another ECM. This LED should be normally off, blinking on with data reception. If it is on steady or not blinking there is something wrong.

20.13 ECP STATUS LEDS

All the status LEDs on the bottom of the ECP module will flash when it is powered up, until communication is established with the ECM.

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 under 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.

Some but not all of the above also apply to non-networked systems and are described in LT0087, QE90 Operators Manual.

The EVACUATION SYSTEM OPERATING LED always 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.

20.14 ECP DIAGNOSTIC LEDS

The fault LEDs on the ECP function in a similar manner to those for non networked software, with some additions. Refer to Figure 16-4 for more details. In this diagram The “first” remote node is the one in the leftmost Sid_xx_Zone column in the NETWORK INTERFACE section of the configuration printout. The “second” remote node is the one in the second Sid_xx_Zone column in the NETWORK INTERFACE section of the configuration printout. Similarly for the other remote nodes.

All these faults are displayed as flashing indications for current or latched faults. The “off normal” command on the laptop gives much more detailed information.

20.15 QE90 MODULE ADDRESS SWITCHES

Each node on the network is self contained and the module addresses (FIP, BGA, EMUX, STRM, WIPS, and ECP) restart from their base address at each node. If upgrading from an older system without ECMs the addresses would have incremented across the whole system, and may need adjusting.

21 AUDIO LINE ISOLATOR MODULE (ALIM9706)

21.1 OVERVIEW

The Audio Line Isolator Module (ALIM9706) is used:

- As an isolation transformer (with optional volume control) for background music inputs connecting to the Local Inputs of Amplifiers (refer to section 5.2.5) (Note to connect a 100V line to a QE90 input, refer to PBQ0065A).
- To allow spurs on the WIP speech and PA speech busses in a networked system.

21.2 ALIM9706 ON AMPLIFIER LOCAL INPUTS

The ALIM9706 should be wired as shown in Figure 21-1 to provide isolation, balanced inputs, and optional volume controls for amplifier local inputs.

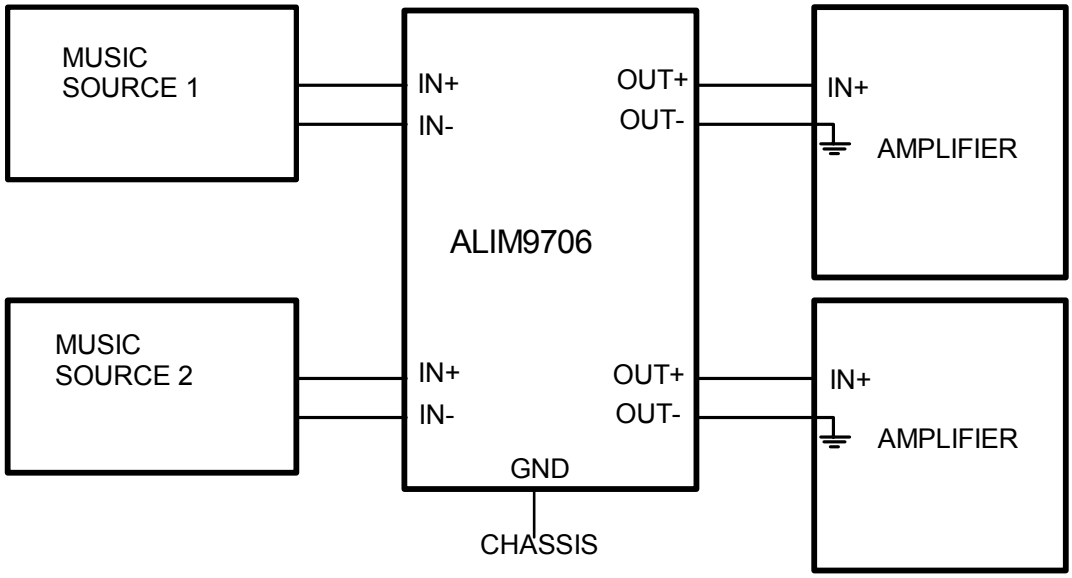


Figure 21-1 ALIM9706 Providing Isolation for Amplifier Local Inputs

There are two circuits per ALIM9706 - each module can provide isolation for two music sources.

If **no** individual zone volume controls are required, links LK1 and LK2 on the ALIM9706 should be installed, and LK3 not installed. In this mode the ALIM9706 has unity gain, and the input voltage required for maximum output is 300mV RMS.

When individual zone volume controls **are** required, links LK1 and LK2 should be removed, and link LK3 installed in the 2-3 position. In this mode the ALIM9706 has a maximum gain of about 0.3 , and the input voltage required for maximum output is 1V RMS.

21.3 PROVIDING SPURS IN NETWORK SYSTEM WIRING

The ALIM9706 can be used in a networked QE90 system (one with ECMs) to allow spurs in the wiring to the various panels. This is achieved as described in Section 20.3 and shown in Figure 20-3.

22 HIGH LEVEL FIP INTERFACES

22.1 OVERVIEW

High Level FIP interfaces are available from Tyco F3200 and MX4428, and F4000 panels using the Panel Link protocol and/or the RZDU protocol, and from some Simplex panels using the Simplex 4100 protocol.

The RZDU protocol is available on systems without ECM modules. All other protocols require ECM modules on the QE90 systems.

Refer to PBQ0051A for more information on High Level Inputs to QE90.

22.2 RZDU INTERFACE

An RZDU - RS232 interface (PA0481) is required at the QE90.

As there is only one cable carrying data for multiple zones the FIP and the QE90 must be located together.

The QE90 panel automatically determines whether non-LCD or LCD protocol is being used, and so does not require programming of which protocol to use. However if the protocol is changed at the FIP, the QE90 must be powered down and up so it will re-establish the correct protocol.

The jumpers on the PA0481 must be set to the RZDU position.

22.2.1 RZDU - ECP

When connecting to an ECP module a LM0077 loom will be required. The ECP must have a MAX232 IC installed in the U9 position. (Fitted by default after early 1999) If a printer output is required at the same time as the RZDU input, then the printer is connected to the female DB9 socket at the double header end of the cable (LM0077). The pinout of the DB9 socket on LM0077 is as follows –

Pin	Signal	Description
1		
2	TXDATA	Output of QE90 to printer or terminal
3		
4		
5	GROUND	
6		
7	CTS	Input to QE90, must be high for QE90 to transmit
8		
9		

This socket may be directly connected to a PC with a 9 pin cable wired straight through. The format is 1200 baud, 8 data bits, no parity. To connect a printer here, refer to section 13.3, noting the baud rate for the printer must be 1200.

The 24V for the RZDU interface may be obtained from the power terminals on a FIB8910 or STRM9502 module.

For wiring details, refer to Figure 22-1 RZDU – ECP Wiring.

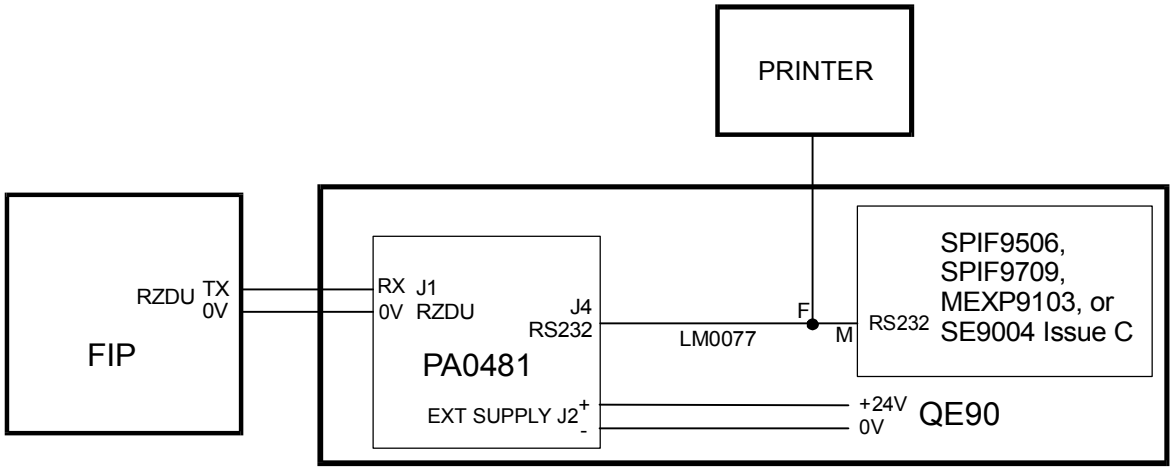


Figure 22-1 RZDU – ECP Wiring

22.2.2 RZDU - ECM

To connect the RZDU interface to an ECM a LM0065 and LM0078 will be required. This connection uses RS232 Port A on the ECM. Therefore it cannot be used with a Modbus interface at the same ECM, as this requires RS232 Port A as well.

The 24V for the RZDU interface may be obtained from the power terminals on a FIB8910 or STRM9502 module.

For wiring details, refer to Figure 22-2 RZDU – ECM Wiring.

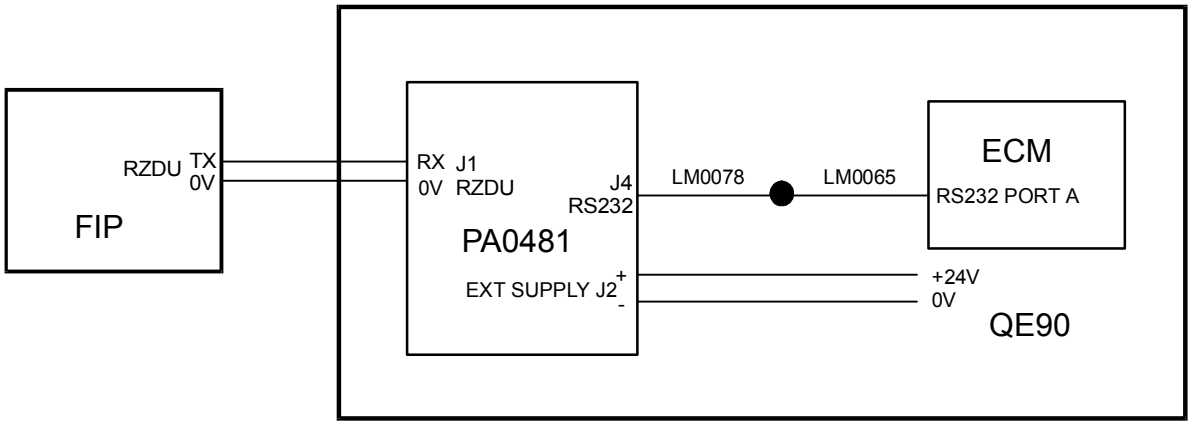


Figure 22-2 RZDU – ECM Wiring

22.3 PANEL LINK INTERFACE

One or more FIPs can be wired to one or more QE90 panels using a common RS485 Panel Link network. The RS485 channel A terminals are bussed together on all Fire Panels and QE90 Panels on the network. Similarly, the RS485 channel B terminals are bussed together on all Fire Panels and QE90 Panels on the network.

As there are two redundant cables carrying the data for multiple zones the FIPs and the QE90s need not be located together.

22.4 PANEL-LINK / RZDU FIRE PANEL PROGRAMMING

For the Panel Link interface, the F4000 / F3200 must be programmed to enable the Status Transfer Application and set its Refresh TX Period (or TX rate) to much less than 60 seconds. The QE90 will indicate a fault if it does not receive a message from the fire panel every 60 seconds. Typically the refresh rate should be set to 30 seconds or less and the Fast Update rate to 5 seconds or less. For further details, refer to the programming manuals for the F3200 and F4000.

Check that the fire panel SID (or SIDs if more than one panel) are set correctly. If you are using a range of ACZs on the fire panel to trigger the EWIS, check that the logic for these ACZs is correct.

F4000 software must be version 2.25N or later.

With an RZDU interface, the F4000 / F3200 must be programmed with a maximum remote display zone of at least the highest zone number sent to the QE90.

22.5 PANEL-LINK / RZDU QE90 PROGRAMMING

On QE90 systems using ECM modules, you can program whether zones isolated at the FIP should give a fault indication at the QE90. This is done in programming mode as described in Chapter 20, when prompted "Zones isolated on FIP display fault on EWIS Y/N".

22.6 SIMPLEX 4100 INTERFACE

An interface to a Simplex 4100 series fire panel is available for QE90 systems with ECM modules fitted. These modules are normally fitted only to networked QE90 systems, but can also be fitted in stand-alone panels to provide the interface to the 4100 FIP.

The 4100 and QE90 panels must be co-located as there is only a single connection between the two panels.

On QE90 the 4100 interface cannot be used in conjunction with FIP module inputs at the same ECM, but can be used in conjunction with WIP circuits used as FIP inputs. You must allocate a contiguous series of pseudo points on the 4100 to map to FIP inputs. You can then map these FIP inputs to Evac zones in the normal way for switch inputs (i.e., you can have more than 1 FIP zone mapping to a QE90 zone, but one FIP zone cannot map to more than 1 QE90 zone). Normally you would have the sequence of FIP pseudo points mapping 1 to 1 to QE90 zones. It is recommended that this range of pseudo points be P451 – P511 (covering 60 zones).

The 4100 must be programmed so that this range of pseudo points reflect the EVAC trigger points. The QE90 is programmable in the factory to set the starting point (e.g., 451) and to map the points to EVAC zones (however point to zone mapping other than 1:1 would normally be unnecessary as it can be done in the FIP).

The 4100 FIP needs a dual RS232 module fitted (4100-0113) with one of its RS232 ports programmed as a computer port, with the following terminal setup.

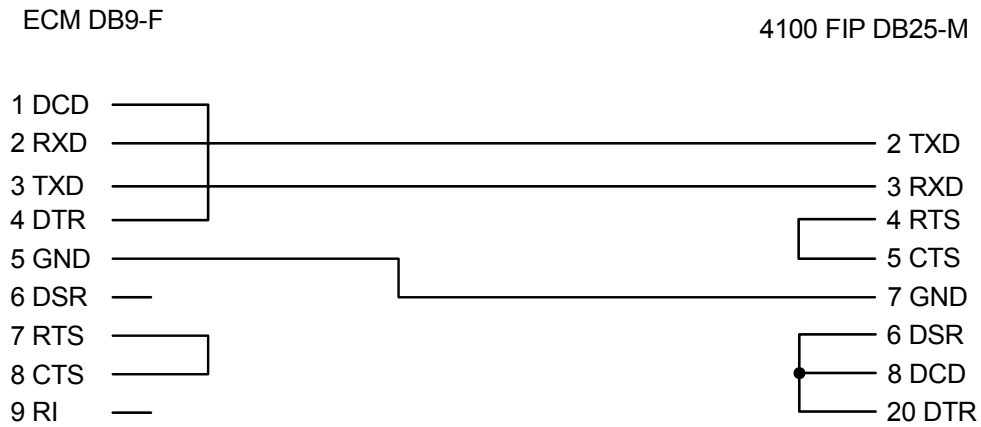
9600 baud, even parity, 8 data bits, 1 stop bit.

PROTOCOL
NOECHO
NOLOGGING
STATUS
NOADDRESS
BPREFIX
NOAPREFIX
SUPV
NOBELLS
NOHSHAKE
POLL
ATTRIB
LF

Disable all Event reporting except PSEUDO Events.

If the connection is broken, both the FIP and the QE90 will indicate faults after 30 - 60 seconds. The FIP will indicate “RS232 Interface Port B Abnormal”, while the QE90 will indicate a FIP/BGA fault for all the affected zones. Similarly the QE90 will indicate a fault if the FIP is powered down or not producing supervisory messages. The FIP will indicate a fault if the QE90 is powered down or not replying to the supervisory messages.

The connection to the QE90 is into RS232 port A on the ECM module. A LM0065 should be used from the ECM RS232 Port A to provide a 9 pin connector, and LM0277 used to provide a 3m connection to the DB25 port on the Dual RS232 module in the 4100 panel. The wiring for LM0277 is as follows:



If zones go into alarm while the connection is broken, the QE90 will be updated within a couple of minutes of the connection being restored. However if zones go out of alarm while the connection is broken, the QE90 will never be informed of the fact and the zones will continue to indicate Alarm on the QE90. This situation can be overcome by powering down (and up) either the FIP or the QE90.

23 PRINTER / TERMINAL CONNECTION

23.1 PRINTER / TERMINAL OVERVIEW

The QE90 EWIS system has an RS232 Port configured for a Terminal or Printer.

The port can be used to attach a printer, terminal, or laptop computer with terminal emulation software, so that events and fault conditions can be logged in more detail than is available through the ECP front panel LEDs. This is particularly useful during commissioning or fault finding as specific fault conditions will be identified.

The printer / terminal will log all events as they occur, be they front panel activations by the operator or automatic operations initiated by FIP or BGA inputs. If a terminal is used, it can also be used to set up the Cascade variables, to set the date and time, and to change the baud rate from the default of 9600, and also adjust many additional items on ECM networked systems.

An example of the log follows. The format will vary slightly depending on the software version and whether the system has ECM networking or not.

```
Tue 28-07-92  16:31:18 Powered up
Tue 28-07-92  16:31:19 keyswitch turned to Manual
Tue 28-07-92  16:31:37 All EVAC on
Tue 28-07-92  16:31:40 All EVAC off
Tue 28-07-92  16:31:42 Zone 1 ALERT on
Tue 28-07-92  16:31:46 Zone 1 ALERT off
Tue 28-07-92  16:31:50 keyswitch turned to Auto
Tue 28-07-92  16:31:59 Zone 13 Amplifier in fault
Tue 28-07-92  16:32:20 Zone 2 BGA active
Tue 28-07-92  16:32:30 Zone 2 ALERT on
Tue 28-07-92  16:33:30 Zone 2 EVAC on
Tue 28-07-92  16:33:30 Zone 1 ALERT on
Tue 28-07-92  16:33:30 Zone 3 ALERT on
Tue 28-07-92  16:33:30 Zone 4 ALERT on
Tue 28-07-92  16:33:48 keyswitch turned to Manual
Tue 28-07-92  16:33:53 All ALERT on
Tue 28-07-92  16:33:54 All ALERT off
Tue 28-07-92  16:33:55 All EVAC on
Tue 28-07-92  16:33:56 All EVAC off
Tue 28-07-92  16:34:01 FIB Card 0 off line
Tue 28-07-92  16:34:08 Zone 2 BGA cleared
Tue 28-07-92  16:34:16 Zone 5 BGA in fault
```

In a non networked system with an SECP the printer may be connected at the MECP or SECP, and it will log all events as they occur including manual operations carried out at any ECP.

In an ECM networked system, the printer may connected to any ECM. It will log events relating to all zones mapped to that ECM. Thus, for a system-wide event log the printer should be connected to an ECM at an ECP or SECP/VDU interface which controls all zones in the system.

The events logged include:

1. Manual operations of Alert, Evac and PA.
2. Alarm inputs from FIP and BGA inputs.
3. Automatic activations of Alert and Evac due to an alarm input.
4. FIP, BGA, Strobe, and Speaker Line Faults.
5. Amplifier supervision fault.
6. Fault Silence and Reset operations from the front panel.
7. Changes to cascade settings from the front panel.
8. Changes to the position of the AUTO/MANUAL/ISOLATE keyswitch, and any resulting changes to the ECP in control (for a system with an SECP).

WIP calls and faults are logged on non networked systems with Evac ECP software version 4.00 and higher, but are not logged on older versions. WIP faults, but not WIP calls, are logged on ECM networked systems.

23.2 SOFTWARE REQUIREMENTS

The Event Log is supported on non networked systems with ECP software version 1.65 or later, and on systems with ECM networking ECM version 1.50 and later. Earlier versions may provide a partial event log and should preferably have upgraded software fitted.

23.3 HARDWARE REQUIREMENTS - NEW PRODUCTION

From early 1999, all QE90s will have the required hardware to allow the printer / terminal to be used. However additional hardware may be required if date and time identification is required.

QE90 System	Terminal / Printer	Requirements
Non networked	Terminal	LM0138 (Std Cable DB9 Plug to DB9 socket) KT0169 if time/date required
Non Networked	Printer	FP0546 Printer FP0752 Printer cable / power supply KT0169 only if time/date required
ECM Networked	Terminal	LM0065 Ribbon Cable (supplied) LM0076 Null Modem Cable (supplied) IC0412 if non volatile time/date required
ECM Networked	Printer	FP0546 Printer FP0752 Printer cable / power supply IC0412 if non volatile time/date required

FP0546 is a small printer capable of operating from a DC supply. FP0752 contains a supply for the FP0546 so that it can be powered from the QE90, and an LM0131 cable for connecting the printer to the QE90.

Figure 23-1 and Figure 23-2 at the end of this chapter show how the various systems are wired.

The 28 pin IC in KT0169 is fitted into the ECP by removing U14 from its socket and fitting the new 28 pin IC. There is also a 14 pin MAX232 IC in KT0169 – this is fitted into the U9 socket on the ECP if there is no IC there already. Also ensure that Evac DIP switch 6 on the ECP board is ON with non ECM networked systems. Refer to Figure 23-3.

The IC0412 part is fitted into an ECM by removing IC U5 from its socket, inserting IC0412 into the U5 socket, and then reinserting U5 into the socket on IC0412.

23.4 HARDWARE REQUIREMENTS - OLDER PRODUCTION

Some older systems may require extra hardware to be fitted to provide a connection point. Refer to Product Bulletin PBQ0016A for details.

23.5 CONNECTOR PINOUTS

For users wishing to use their own printers or cables, the following tables show the pinout of the various ports.

SE9004 Issue C, MEXP, and SPIF (Used on system without ECM)
(Also connection on LM0077 on system with RZDU High Level Link)

1	No Connection	
2	TXDATA	Data from QE90 to printer or terminal
3	RXDATA	Data from terminal keyboard to QE90
4	No Connection	(DO NOT CONNECT on PRE1994 MEXP)
5	GND	Reference
6	No Connection	
7	CTS	High input required for QE90 to Transmit
8	RTS	High output transmitted by QE90.
9	No Connection	

DB9 Connector on LM0065 to ECM

1	DCD	Not used
2	RXDATA	Data from terminal keyboard to QE90
3	TXDATA	Data from QE90 to printer or terminal
4	DTR	
5	GND	Reference
6	DSR	
7	RTS	High output transmitted by QE90.
8	CTS	High input required for QE90 to Transmit
9	RI	Not used

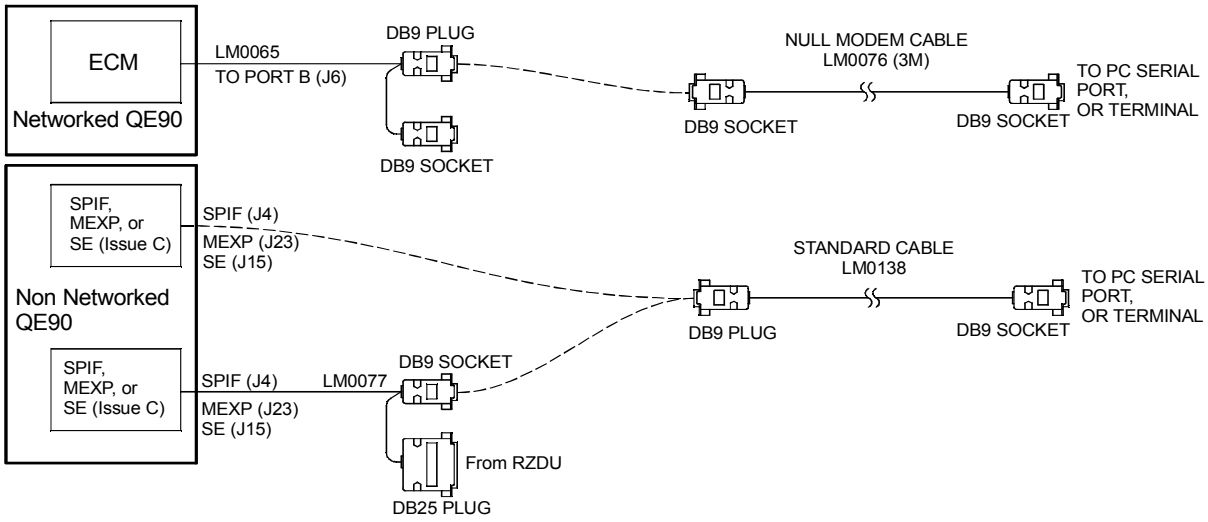


Figure 23-1 – Wiring to PC / Terminal

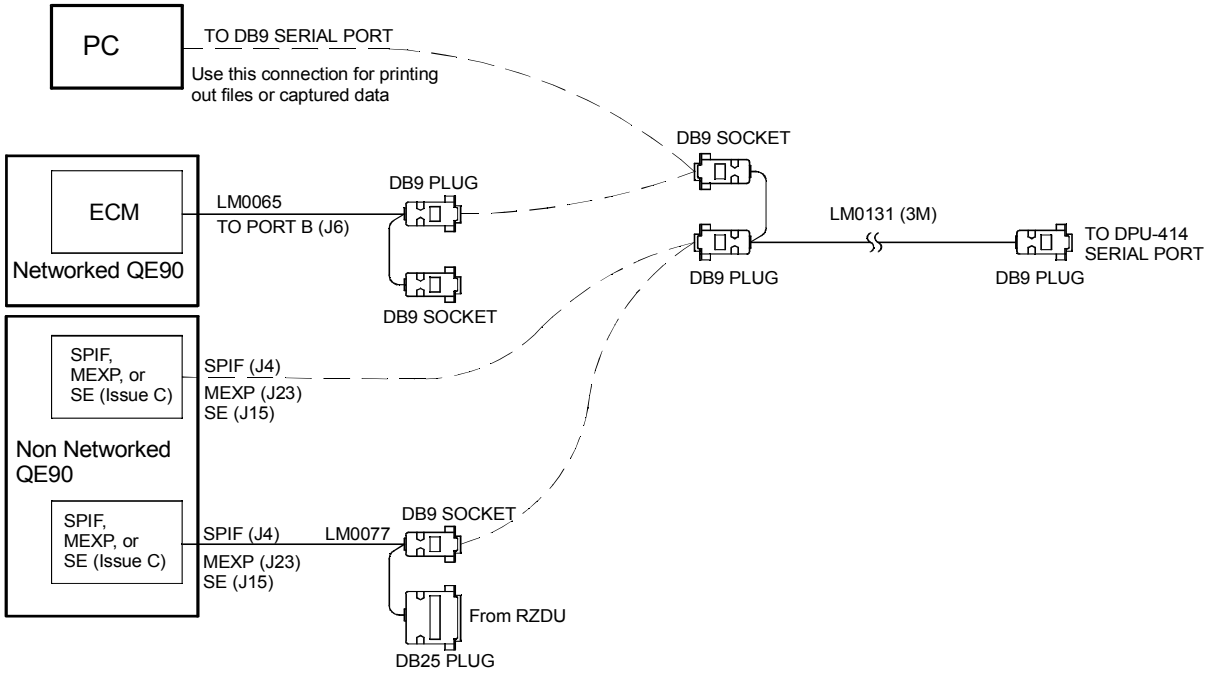


Figure 23-2 – Wiring to Printer

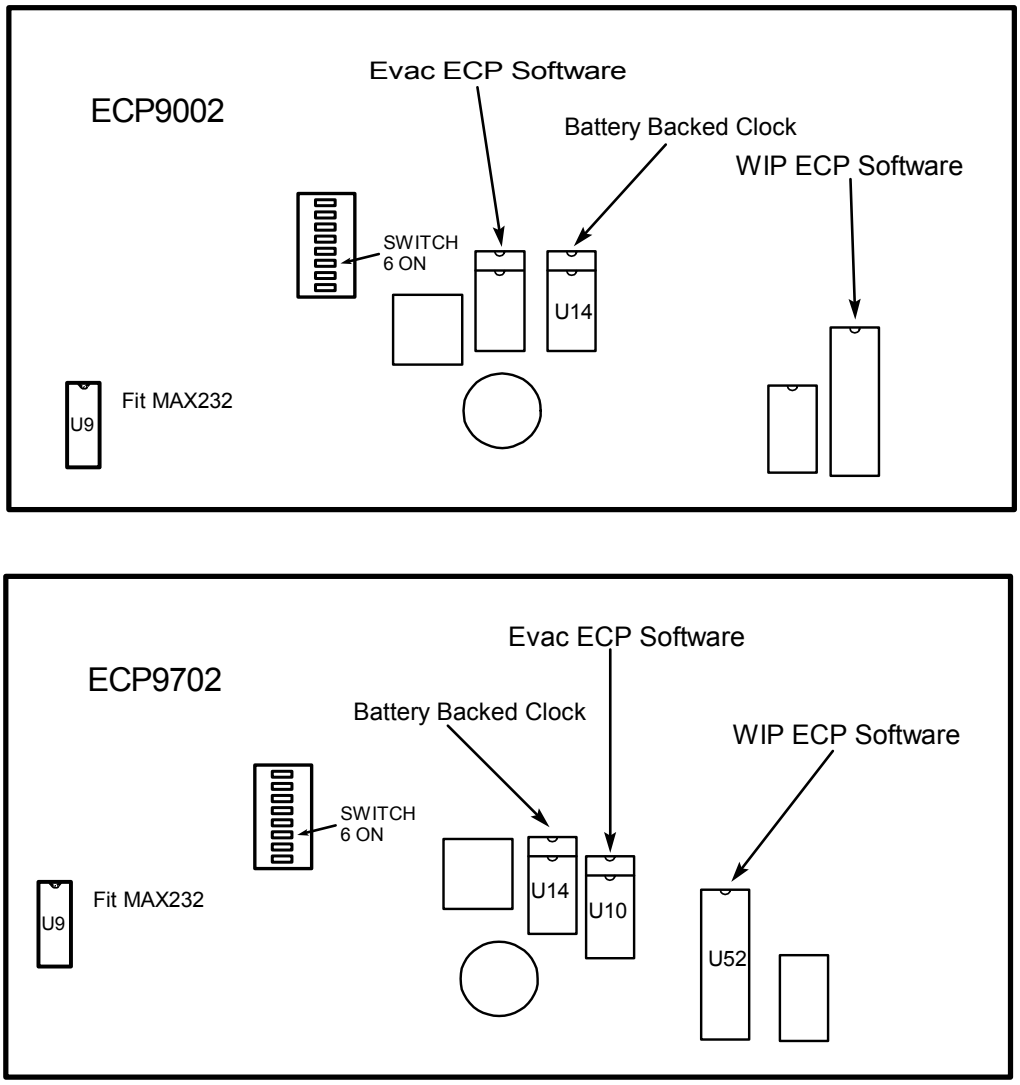


Figure 23-3 – Location of MAX232 and Battery Backed Clock

24 PROGRAMMING OF NON-ECM SYSTEM

24.1 GENERAL

The QE90 EWIS panel can be on-site programmed for the following features:

a) Cascade/No Cascade

b) Cascade Time Periods
- Delay before action
- Initial time out
- Subsequent time out

c) - Zones belonging to GROUP Alert, Evacuate and PA Speech Commands.

d) - Zones that background music is enabled for.

e) - Zones to be isolated. (Service function only)

f) - Time and date for the real time clock (if present)

g) - WIP Master Phone redirection.

For systems with an ECM, the programming is done using a laptop connected to the ECM. Refer to Section 20 for details.

For systems without an ECM there are two methods of programming the information into the QE90.

- Front panel via keyboard – refer section 24.2.
- PC via serial port – refer section 24.3.

Note the WIP Master phone redirection can only be programmed via the front panel – Refer section 24.4.

The default values for the programmable items are given in Section 24.5.

24.2 PROGRAMMING PROCEDURE VIA KEYBOARD

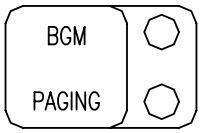
Programming can only be carried out at the MECP when the keyswitch is in Isolate and no zones have been selected for Alert, Evacuate or PA Speech.

Note the complete Evacuation System is disabled during programming and only the keys that are valid at each position in the programming sequence will work at that position.

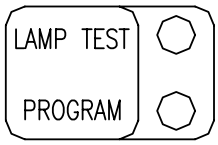
The following steps work through each of the programmable items. This process is also shown as a flowchart in Figure 24.1.

STEP 1: Programming Mode Entry.

At the MECP de-select any zones in Alert, Evacuate, or PA Speech.

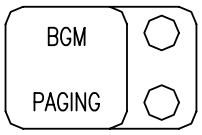


Turn the keyswitch to the ISOLATE position.
Press and hold the BGM/PAGING key on the EVAC keyboard (i.e. left hand keyboard) and then press the LAMP TEST/PROGRAM key for 2 seconds until the LED test finishes and the PROGRAM LED turns on by itself.



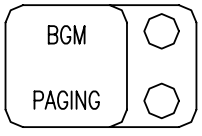
Release the BGM/Paging key first otherwise the programming may step onto the BGM function automatically.

STEP 2: Select Zones for Background Music (BGM).



Press the BGM/PAGING key so that the BGM LED is on to indicate that BGM zones can be programmed.
Select the zones to have BGM present by pressing the EVACUATE key for that zone so that the EVACUATE LED is on. Similarly, pressing the EVACUATE key so the LED is off will disable BGM for that zone.

STEP 3:



Press the BMG/PAGING key again to turn on the PAGING LED. This normally has no function, however in systems **without** a Paging Console it is possible to select at this point zones which will receive the PABX audio input if no emergency signal is present. This could be used to enable an alternative channel of music for some zones. Use the PA keys in a similar manner to the EVACUATE keys in step 2 to select zones for the PABX input. Zones selected for both PABX and MUSIC will receive only PABX. (Usually the PABX input is only used in systems **with** a Paging Console, and the Paging Console determines which zones are selected).

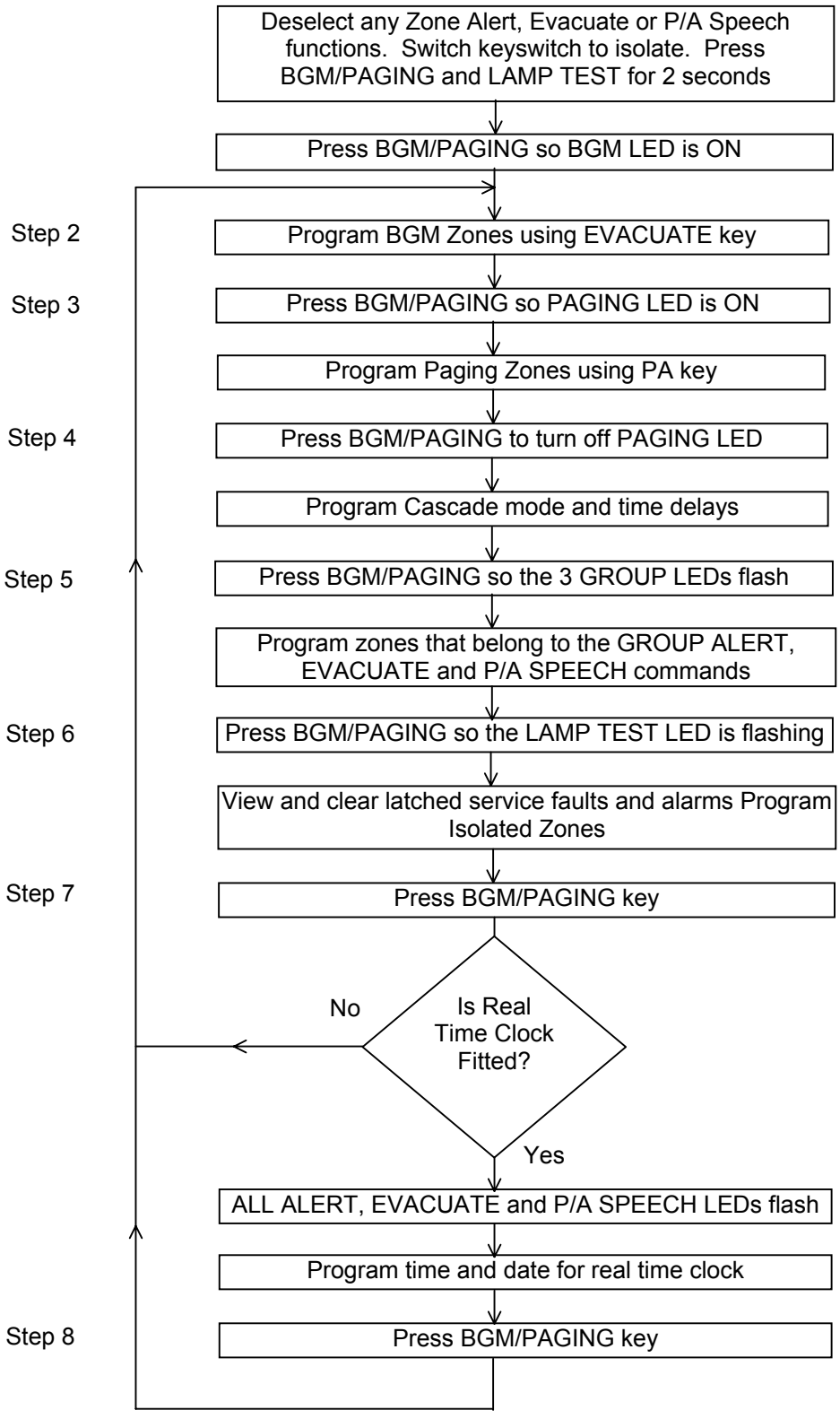
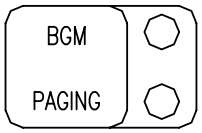


FIG 24.1
FRONT PANEL PROGRAMMING FLOWCHART

STEP 4: Select Cascade/No Cascade and Cascade Times.
(See Section 24.3 for the meanings of the 3 cascade delays.)

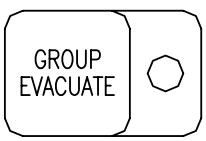


Press the BGM/PAGING key again to just turn off the PAGING LED. The ALL ALERT, ALL EVACUATE, all PA SPEECH and GROUP EVACUATE LEDs may or may not be on, depending on the current programming.

In the Select Cascade programming mode the following keys and actions are available.

KEY	ACTION
ALL ALERT	Increment the "initial delay" by 10 seconds (maximum delay is 42.5 minutes).
ALL EVAC	Increment the "subsequent delay" by 10 seconds (maximum delay is 42.5 minutes).
ALL PA SPEECH	Increments the "delay before action" by 10 seconds (maximum delay is 42.5 minutes).
GROUP EVAC	Turns cascade on or off. Turning the GROUP EVAC LED on enables cascade and turning it off disables cascade i.e. selects the “All Out” sequence in Section 24.3). NOTE that each time cascade is enabled or disabled the time delays are cleared and it is necessary to re-enter them.
GROUP ALERT	Displays the currently programmed "initial delay" time and the "subsequent delay" time by flashing the appropriate ALL ALERT and ALL EVACUATE LED and beeping the buzzer for every 10 seconds of delay programmed. Eg the number of times the ALL ALERT LED flashes (with accompanying beeps) multiplied by 10 seconds is the "initial delay" delay time. NOTE once started it is not possible to stop the display until the required number of beeps has been generated.

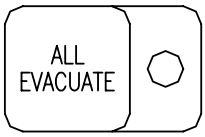
Unless the exact time delays are known (or are read back using the GROUP ALERT key) it is suggested that they always be cleared before being re-entered.



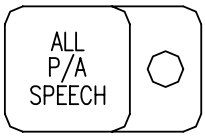
Press the GROUP EVACUATE key twice (whether the LED is on or off) and then once more, if necessary, to enable cascade - LED on, or disable cascade - LED off.

Press the ALL ALERT key once for each 10 second “initial delay” required. E.g. press 6 times to give a 1 minute "initial delay" delay.

Note that programming initial and/or subsequent delays greater than 10 minutes is contrary to AS2220.



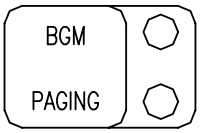
Press the ALL EVACUATE key once for each 10 second “subsequent delay” required. E.g. 9 times to give a 1 minute, thirty seconds "subsequent delay" time delay.



Press the ALL PA SPEECH key once for each 10 second “delay before action” required. E.g. 9 times to give a 1 minute, thirty seconds "delay before action". Note – this delay is usually set to zero.

Press the GROUP ALERT key to verify the delays programmed.

STEP 5: Select Zones belonging to Group Commands.

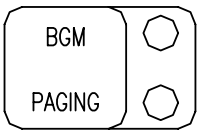


Press the BGM/PAGING key again so the 3 Group LEDs flash.

At this point the current programming of zones to the Group ALERT, EVACUATE and PA SPEECH commands is shown.

If a zone ALERT, EVACUATE or PA SPEECH LED is on then that zone belongs to the Group ALERT, EVACUATE or PA SPEECH command respectively. Pressing the appropriate zone ALERT, EVACUATE or PA SPEECH key will toggle the LED on or off and program whether that zone belongs to the particular group command or not.

STEP 6: Select Service Fault Table Display.



Press the BGM/PAGING key again so that the LAMP TEST LED flashes.

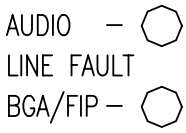
At this point zones that have been into fault or alarm and/or modules that have been in fault will be shown with the appropriate fault or alarm LED(s) illuminated. This gives the engineer/service person a separate latched fault/alarm memory in addition to the operator one. WIP faults are not stored in this memory.

Also displayed at this time is the count of detected communications errors. This count is displayed in the ALERT LEDs in binary, with zone 3 = 1, zone 4 = 2, zone 5 = 4, zone 6 = 8 and so on up to zone 18 = 32768. It would be unusual for no errors to occur, however if more than say 10 errors per hour are occurring the cause should be investigated.

Pressing the SILENCE button for 2 seconds at this point will clear

the Service Fault/Alarm Table so that new faults/alarms can be collected. (It is not cleared by powering down.)

It is possible at this point to isolate zones so that if the FIP/BGA inputs are activated, faults detected or operator commands are selected then these will not affect the zone.



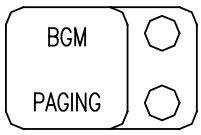
Press the keyboard area where the "AUDIO FIP/BGA LINE FAULT" text is to isolate or de-isolate individual zones. (Hidden key) Isolated zones will be shown by the ALERT, EVACUATE and PA SPEECH LEDs flashing together.

NOTE: Zone Isolation should be used with great care as a zone is completely isolated from the system while it is isolated and cannot be used for any emergency warning function.

While in the Service Fault Table Display, it is possible to fully reset the system by pressing the ALL-EVAC key. This will completely clear all the setup information and set all field-programmable parameters back to default. This operation will also operate the CPU watchdog, resulting in a continuous beep being emitted, which can be silenced by pressing the SILENCE button.

STEP 7: Set the time and date for the real time clock.

The ECP module can contain an optional battery-backed real time clock (RTC) that is used to generate the date and time for the event printout on the optional logging printer. Only if the RTC is fitted will this programming step be included. If the RTC is not fitted this step is automatically excluded from the programming steps.



Press the BGM/PAGING key again so that the ALL ALERT, ALL EVACUATE and ALL PA SPEECH LEDs flash in unison. If this cannot be obtained then the RTC is not fitted.

At this point the following keys and actions are valid.

KEY	ACTION
GROUP ALERT	Displays the current date or time, according to whichever is being set. The ALL ALERT LED will flash (buzzer also beeps) the number of the day or the hours. (24 hours) The ALL EVACUATE LED will flash (buzzer also beeps) the number of the month or the tens of minutes. The ALL PA SPEECH LED will flash (buzzer also beeps) the number of years since 1990 or the units of minutes.

GROUP EVAC	Clears or resets the date or time according to whichever is currently being set. The time is set to 00:00:00 and the date is set to 0/0/90. This allows the date to be set to 1 by a single key press.
GROUP PA	Toggles between setting the date and the time. When the GROUP PA LED is on the date is being set and if it is off the time is being set.
ALL ALERT	Increments either the day or the hour according to whichever is currently being set. The day counts up to 31 irrespective of the month so it is possible to enter illegal dates unless care is taken.
ALL EVAC	Increments the month or the tens of minutes according to whichever is currently being set.
ALL PA	Increments the year or the units of minutes according to whichever is currently being set.

When the time or date modification mode is entered the current time or date is read from the real time clock. This may be displayed by using the GROUP ALERT key and cleared or modified by using the appropriate keys.

The new date or time is written to the RTC when the date or time modification mode is exited, only if it was changed. This allows the time to be displayed without having to modify it and avoids writing back an old time when exiting. Note that the seconds are set to zero so the new time should be entered ahead of that time actually occurring and the time modification mode exited at the start of the minute for the new time.

STEP 8: The BGM/PAGING key can be pressed repeatedly to cycle through steps 2 to 7 and to verify all the programmed information.

STEP 9: Save Programmed Information & Exit.

At any point during the program sequence it is possible to exit the programming mode and save all changes by turning the keyswitch out of ISOLATE.

24.3 CASCADE SEQUENCES

The following tables show the meaning of the Cascade Time delays, and the default cascade and "all out" sequences for Australia and New Zealand. Note the sequences are only defaults and most sites have site specific sequences. The Australian sequences were changed as of November 2004 to remove the Alert phase by default for compliance with AS1670.4.

Australian Standard 2 up 1 down, with an alarm in Zone N					
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
Zone N + 6					Evacuate
Zone N + 5					Evacuate
Zone N + 4				Evacuate	Evacuate
Zone N + 3				Evacuate	Evacuate
Zone N + 2			Evacuate	Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate	Evacuate
Zone N – 2				Evacuate	Evacuate
Zone N – 3					Evacuate

Australian "All Out" with an alarm in Zone N				
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay
Zone N + 6			Evacuate	Evacuate
Zone N + 5			Evacuate	Evacuate
Zone N + 4			Evacuate	Evacuate
Zone N + 3			Evacuate	Evacuate
Zone N + 2			Evacuate	Evacuate
Zone N + 1			Evacuate	Evacuate
Zone N		Evacuate	Evacuate	Evacuate
Zone N – 1			Evacuate	Evacuate
Zone N – 2			Evacuate	Evacuate
Zone N – 3			Evacuate	Evacuate

New Zealand "Standard 2 up 1 down" for alarm in zone N							
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
Zone N + 5 (Top Zone)		Alert	Alert	Alert	Alert	Evacuate	Evacuate
Zone N + 4		Alert	Alert	Alert	Evacuate	Evacuate	Evacuate
Zone N + 3		Alert	Alert	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 2		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N + 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 1		Alert	Evacuate	Evacuate	Evacuate	Evacuate	Evacuate
Zone N – 2		Alert	Alert	Alert	Alert	Alert	Evacuate

New Zealand "All Out" for alarm in zone N is -					
	Delay Before Action	Initial Delay	Subsequent Delay	Subsequent Delay	Subsequent Delay
Zone N + 5 (Top Zone)		Alert	Alert	Evacuate	Evacuate
Zone N + 4		Alert	Alert	Evacuate	Evacuate
Zone N + 3		Alert	Alert	Evacuate	Evacuate
Zone N + 2		Alert	Evacuate	Evacuate	Evacuate
Zone N + 1		Alert	Evacuate	Evacuate	Evacuate
Zone N		Alert	Evacuate	Evacuate	Evacuate
Zone N – 1		Alert	Evacuate	Evacuate	Evacuate
Zone N – 2		Alert	Alert	Evacuate	Evacuate

24.4 PROGRAMMING VIA SERIAL PORT

24.4.1 SETUP OF COMPUTER

The computer needs to be running a Terminal Emulator program, such as HYPERTERMINAL, WINCOMMS, ACCUTERM, etc, and setup as follows:-

9600 baud rate (unless QE90 programmed otherwise)
8 data bits
1 stop bit
No Parity
Xon/Xoff Flow Control

Connect the serial port of the computer to J4 of the SPIF9709 (if present), or to J15 of the SE9004 (Issue C onwards) (if present), using a suitable lead.

Tyco loom LM0138 (DB9M – DB9F, 1.8 long) may be used, but a DB9 to DB25 converter will be required for computers with a 25 pin serial port.

24.4.2 ACCESSING PROGRAMMING MODE

Normally the QE90 serial port is operating in printer mode logging events as they occur. To enter programming mode press the Enter key to obtain the “Enter Password” prompt.

Enter the password (QUINTRIX by default) followed by the Enter key. Note the keys are not echoed, and if the password is correct a “QE90 programming mode:” message will be shown.

Type HE <Enter> to give a summary of the available commands. They are as follows:

CA	-	edit cascade variables	(Refer 24.3.3)
DA	-	read and set date	(Refer 24.3.4)
HE	-	command summary	(Refer 24.3.5)
PW	-	change user password	(Refer 24.3.6)
SP	-	change comms baud rate	(Refer 24.3.7)
TI	-	read and set time	(Refer 24.3.8)
VE	-	current software version	(Refer 24.3.9)
Q	-	quit and exit programming	(Refer 24.3.10)

24.4.3 EDIT CASCADE VARIABLES

The Cascade variables that can be edited are described in the QE90 Operator Manual (LT0087), and their default values are shown in Section 24.5.

Type CA <Enter> and the screen will show:

Delay before action 0 seconds
New time in seconds -->

Enter the new time followed by <Enter>, or just <Enter> to leave the current value unchanged.

If a new value is entered a message “eeprom-written” is displayed, ‘moving’ the cursor to the next line. However the QE90 is still waiting for the next value to be input. Next the Initial Timeout and Subsequent Timeout are shown and can be altered in the same manner.

Initial time out of 0 seconds
New time in seconds -->

Then the subsequent timeout is shown.

Subsequent time out of 180 seconds
New time in seconds -->

Finally, whether cascade is enabled (on) or disabled (off) is shown. Press Y to change the value or just <Enter> to leave it unchanged.

Cascade off
Change cascade on or off y/n -->

24.4.4 READ AND SET DATE

The date can be read and optionally changed by entering DA <Enter> at the main prompt.

The current date is displayed and a prompt given for the new date e.g.

Current date is Fri 15-09-00.
Enter new date (dd-mm-yy):

The new date can now be entered, e.g. 17-08-00, then press <Enter>, or just press <Enter> to skip changing the date. If a new date is entered then the new date entered is shown as the current date (including the day of the week) and so can be checked. Enter the correct date if it is still wrong, or just <Enter> to exit the command.

24.4.5 COMMAND SUMMARY

The HE <Enter> command will show the available commands – refer section 24.3.2.

24.4.6 CHANGE USER PASSWORD

The PW <Enter> command allows the serial port programming password to be changed. DO NOT enter this command unless you intend to change the password. If you do enter it un-intentionally, re-enter the existing password to get out. The PW command will display a prompt:

“Enter new user password (max 8 characters) -->

Type in the new password (USING UPPER CASE LETTERS), followed by <Enter>.

A message:
”New password now set”
--> eeprom_written
will be shown indicating the new password has been saved.

24.4.7 CHANGE COMMS BAUD RATE

This command allows the Baud rate of the programming/printer serial port to be changed (e.g. to suit a particular printer). The newly programmed value takes effect immediately, so the pc will need to have its settings changed to the new baud rate in order to re-establish communications.

Type SP <Enter> and the screen will show:

”Enter new baud rate -->”

Type in the required baud rate followed by <Enter>. The values allowed are 300, 600, 1200, 2400, 4800 & 9600. If no change is required just press <Enter>.

24.4.8 READ AND SET TIME

This command allows the current time to be displayed and changed if necessary.

Type TI <RETURN>

The screen will show the current time and a prompt to enter the new time in 24 hour format.

Current time is (e.g.) 12:47:30
Enter new time (24 hour format):

The new time can now be entered, e.g. 15:30:00, then press <Enter>, or just <Enter> to exit the command. The screen will display the new time if one is entered.

24.4.9 CURRENT SOFTWARE VERSION

Type VE <Enter> to display the software version on the screen eg:

QUINTRIX version V4.29

24.4.10 QUIT AND EXIT PROGRAMMING

Typing Q <Enter> will exit from the programming mode and return to printer event logging mode.

24.5 MASTER PHONE REDIRECTION

The QE90 can be programmed so that a field WIP will ring whenever the master WIP rings. Picking up either handset will stop both handsets ringing. Picking up the remote WIP will automatically answer the call and enable voice communication to occur between the calling WIP and the redirected WIP.

Picking up the master WIP still requires the calling WIP button to be pressed to enable voice communication.

This feature enables WIP calls to be answered at a remote location when the MECP is not manned.

WIP redirection is programmable on the QE90 front panel at any time. Simply press the WIP-side PROGRAM key (the LED turns on) and then the WIP key that calls should be redirected to (the PROGRAM LED turns off). If redirection is to be cancelled simply press the WIP-side PROGRAM key twice (LED turns on then off).

On an ECM networked system, the master phone can only be redirected to a WIP terminated at the ECP where the redirection is done.

24.6 DEFAULT VALUES

On the very initial factory power up of the system the following default values are programmed. These default parameters can also be restored in programming mode while in the Service Fault Table Display.

Cascade Disabled.
Zero delay before action.
3 Minute subsequent time out.
Zero initial time out.
Group Commands include all zones.
No zones are selected for BGM.
No zones isolated.

However, factory or pre-commission testing may result in some values being changed. Therefore it is necessary to ensure all values are programmed correctly during commissioning of each EWIS system.

25 WIDGET BOARD

25.1 WIDGET BOARD OVERVIEW

The WIDG2004 adaptor board is a small PCB for use on the ECP9702, EMUX9601, FIB8910, and STRM9502 modules. These four modules were all originally designed to use the TMS77C82 microcontroller. As of mid 2004, this microcontroller became obsolete, so the WIDG2004 assembly was created as a substitute.

The WIDG2004 module ("Widget") has pins on the underside designed to fit into the IC socket or PCB footprint of the TMS77C82 controller. The Widget mimics the operation of this controller, but instead runs using a Renesas M16C62A controller.

In new production, the Widget boards are soldered in place. Their firmware can be upgraded in situ as described later.

For field upgrades of older TMS77C82 software in the FIB8910 and STRM9502, the Widget board can be plugged into the existing socket. However this cannot be done on the ECP9702 as there is not enough space and cannot be done with the EMUX9601 as other modifications are also required.

25.2 FITTING WIDGET BOARD

Upgrading the software in the STRM9502 or FIB8910 to the following versions or later will require a Widget board to be fitted:

STRM9502	V1.60	SF0313
FIB8910	V2.10	SF0314

No change is required to the ECP/ECM or other software when upgrading these modules to use WIDG2004 boards.

Two kits are available to provide upgrade parts for each of the STRM9502 and FIB8910:

KT0466 KIT, QE90, STRM, UPGRADE WIDGET BOARD
KT0467 KIT, QE90, FIB, UPGRADE WIDGET BOARD

Each kit contains a WIDG2004 adaptor board programmed with the latest version of **SF0313** or **SF0314** respectively. In addition, each kit contains connector strips to fit narrower pins onto the existing pins on the underside of the Widget board. These allow the Widget board to fit into an IC socket more easily.

NOTE: Use anti-static (ESD) precautions when handling the circuit boards.

1. Power down the QE90. If necessary, remove the parent module (STRM or FIB) from the QE90 to allow access to the TMS77C82 IC. It may be possible to upgrade these modules without removing them.
2. Remove the TMS77C82 microcontroller from its socket. The relevant IC for each board is:

STRM9502	U1
FIB8910	U11

3. If not already fitted, fit the connector strips (CN0474) to the pins on the underside of the Widget board (PA1023). Carefully insert the Widget board into the vacated socket. The Widget should be oriented with its black FRC box header located over the pin 1 end of the IC socket.

4. Check the fitting of the Widget to see that it is oriented correctly and that no pins are bent underneath or outside the socket. Also check that the link LK1 on the Widget is not fitted. Check that all DIP switches on the parent board are set as desired.
5. Refit the parent board to the QE90 if required, and power up and test the QE90 system.
6. Field upgrading of an EMUX9601 or an ECP9702 to use the Widget is not practical.

25.3 PROGRAMMING WIDGET BOARD SOFTWARE

On occasion Tyco Safety Products may supply updated software for an ECP, EMUX, STRM, or FIP module which already has a Widget board fitted. The new microprocessor has its firmware in internal FLASH memory, and this can be updated in the field as described below.

Equipment required :

- A computer (e.g. laptop) with an on-board RS232 serial port or USB to RS232 adapter
- LM0065 cable
- LM0076 cable
- The program FlashStart.exe (this will be supplied with the software upgrade)
- The new File to be programmed into the Widget board e.g. SF0312_V1.18.MOT.
- An ID file e.g. SF0312_V1.18.ID.

Steps

1. Power down the QE90 and insert the FWE jumper (LK1) on the Widget board.
2. Connect the LM0076 to the appropriate COM port on the PC, and the other end to the Widget using the LM0065 cable.
3. Power up the QE90. Run the FlashStart application by double clicking the file FlashStart.exe. When the application window (Figure 25-1) appears, select the “Internal flash memory” radio button at the top, and select the COM port you are using from the list box at the bottom. Click OK.

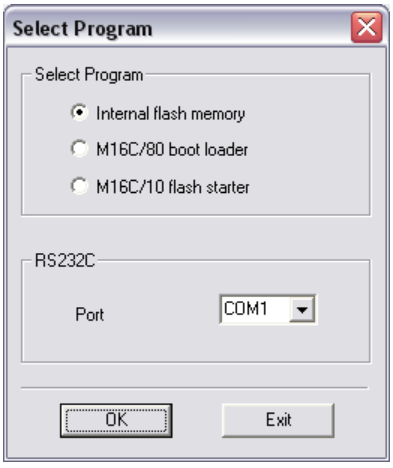


Figure 25-1 – FlashStart start screen

4. The “ID Check” screen shown in Figure 25-2 should appear. Click the “Refer…” button, and locate and select the supplied file XXXXXX**.mot**. The ID fields should be filled in automatically with zeroes if the .id file is present. Otherwise, they can be manually filled in with fourteen zeroes in total. Select the “M16C/20 62” radio button at the bottom, and click OK.

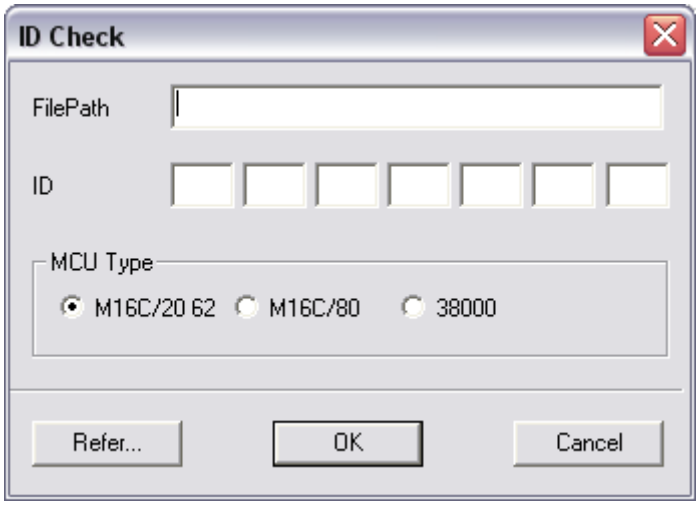


Figure 25-2 - Software selection screen

5. If the “ID Check” window (Figure 25-2) does not appear and the error message shown in Figure 25-3 is given instead, this means that there has been a communication failure to the Widget board. Click “Cancel” to close FlashStart. Check that the LK1 jumper is fitted on the Widget, the power is on, the cable connections from the PC to the Widget have been made correctly, and the correct COM port has been selected. Restart from Step 3.

Figure 25-3 - Error screen

6. The window shown in Figure 25-4 will appear. Click the “Setting…” button. Select a baud rate of 38400 with a program interval of 40ms and click “OK”. Click “Erase” to remove any previous software from the Widget’s memory, click “OK” to confirm, and click “OK” when the message “Erase OK” is given.

Figure 25-4 - Programming menu

7. Click “Program…” to program in the software. Click “OK” accepting the default addresses given, and click “OK” again on the next window.

8. When programming has completed, the message “Program OK” should appear. Click “OK” to close the popup and click “Exit” to quit FlashStart. Wait for the window to close before continuing. Switch off power to the QE90 and remove the FWE jumper (LK1) on the Widget board. Unplug the LM0065 ribbon cable.

9. Update the software version label on the Widget board.

10. Power up the QE90 and test the system.