

SYSTEM 3400 Orator II

Voice **ALARM**
SYSTEM

**Installation
Manual**
13499-30 Issue 1
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Safety

Notes to installer

Cable types

System overview

Audio control unit

Distributed amplifier unit

Speaker circuits

Speaker installations

4-Channel microphone

Entertainment equipment

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Preface

This first issue covers voice alarm products compatible with version 3.4X software. The manual is a guide to be read in conjunction with *BS7443:1991 Specification for sound system for emergency purpose* and the recommendations in *BS5839:Part 1:1988*, which is the *code of practice for Fire detection and alarm system for buildings*. Where appropriate the site specific project specification should also be read.

Associated Documents

13499-32 Operating Manual for System 3400 Orator II
13499-23 Installation Manual for System 3400 (with 34000 devices)
13499-26 Operating Manual for System 3400 (with 34000 devices)
13563-011 GENT Supervisor Operator's Manual

Conventions

NOTE: A note highlights important text that is normally hidden in the main text.

CAUTION: A caution is given to prevent damage to equipment.

WARNING: A warning is given to advise of dangerous conditions that may result in injury or death.

Issue Record

Section	Issue	Date	Comments
Prelims	1	11/97	This first issue covers Installation of system 3400 Orator II
1 to 10	1	11/97	
Parts	1	11/97	
Phone	1	11/97	

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Customer feedback

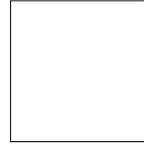
If you have any comments on this manual, then please provide them below. Post completed sheet to the address overleaf or pass on to your area sales representative.

Thanks

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Safety

Live equipment

WARNING: Ensure satisfactory safety measures are taken to guard against hazards and dangers of live equipment.

Where appropriate observe safety information giving warnings against hazards.

Lifting heavy equipment

WARNING: Ensure satisfactory safety measures are taken to prevent injury when lifting heavy equipment.

NOTE: A fully assembled distributed amplifier unit can exceed 100Kg weight.

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Notes to Installer

System power-up and commissioning must be carried out by Servicing organisation.

The manual contains fixing and wiring information to cover the installation of the GENT System 3400 Orator II in buildings.

- Checks**
- The power-up and commissioning of the system must be done by the servicing organisation.
 - The wires between the termination point and terminals should be short and straight as possible.
 - The cables of the fire detection and alarm system and other systems should be separated by at least 160mm unless dedicated conduit or ducting is used.
 - Do not use any part of a building structure for earthing.
 - Cable glands provided on the equipment should be used for cable termination.
 - Use only the **dedicated cable entry points** on the *audio control unit* and the *distributed amplifier units*.
 - Unused knockouts on the equipment enclosure that have been removed should not be left open.

Installation requirements

It is recommended that the installer follow the general requirements of:

- BS5839:Part 1:1988, which is the code of practice relating to the fire detection and alarm systems for buildings and BS7443:1991 Specification for sound system for emergency purpose.*
- The relevant parts of *BS7671:1992 Requirements for Electrical Installation* (previously called *Institute of Electrical Engineers Wiring Regulations 16th edition*) must also be followed. Also where appropriate the site specific project specification should also be read.

Second fix installation

To prevent the possibility of damage or dirt degrading the performance or appearance of the System 3400 Orator products, the installation of second fix items should be delayed until all major building work in the area is complete.

Fixture and fittings

It is the installers responsibility to provide adequate fixtures and fittings for the type of construction surface onto which a product is to be installed, whilst utilising the fixing points on the respective product.

As an aid to this decision, the weight and overall size of each full assembly together with implications on cable entries and routing should be taken into consideration.

NOTE: *All these procedures assume that the cable, gland, steel box (BESA box) and other related accessories are provided by the installer.*

Location

The installer should acquire site specific information from the interested parties, for details on the location of products for installation. The acquired information together with this guide and the relevant standards should be used to assist the work.

Each product assembly can be identified from its package label. The contents of all packages should be checked for any discrepancies.

Parts for later installation

All unused parts should be retained in their respective container for safe keeping until required.

NOTE: *The installation of all outstanding parts are usually carried out during Commissioning of the System.*

Earth continuity

To maintain earth continuity on a *audio loop, speaker and 3400 loop circuits*, each **cable screen** must be continued through each system circuit. Where appropriate the cable earth must be connected to respective earth terminal.

Mains supply

The Mains supply to fire alarm control and indicating equipment must be via an **unswitched fused spur** unit.

- 5A - Audio control units (Master and Slave)
- 13A - Distributed amplifier unit

The fused spur isolator cover should be red and marked:

FIRE ALARM - DO NOT SWITCH OFF

Each of the fire alarm equipment's' fused spur units must be fed from a dedicated switch or protective device at the local mains supply distribution board.

Mains and battery supply connections

The mains and battery supply cables must be installed to the stage to **facilitate the power up** for commissioning, which will be done by the Servicing organisation.

WARNING: *Where mains cable are to remain disconnected, their tail ends must be insulated to prevent dangerous conditions arising in the event of accidental switching On of the mains supply*

Cable termination and connection

Terminate each cable at the entry point to the enclosure, using the cable manufacturer recommended techniques. Where the cable is required to be connected, ensure it is secure to the respective terminal.

Where the cable is not required to be connected then leave **400mm** tail wire length, unless it is a Distributed Amplifier Unit in which case leave **700mm** tails.

Cable marking

Where cables left unconnected it is important to **mark each core** to help identify the the final point of connection.

Wiring test

CAUTION: *DO NOT undertake high voltage insulation tests WITH THE CABLES CONNECTED to their terminals. Such a test may damage the electronics circuitry in loop devices and panels.*

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Cable Types

The cable is an important part of the 3400 Orator fire alarm system, which carries both communication data and power supplies. Its integrity is therefore essential for fire detection and alarm signals to be processed to keep the system operational.

Circuits cables

The cable for use on the following circuits:

- **3400 loop**
- **Audio loop**
- **Between ACUs (master and slave) - Audio control and data makes use of 3 off 2-core cables**
- **Loudspeaker**
- **Mains supply**

Cable length

- Typically **1Km per circuit**.
The Audio loop may exceed a little over 1Km.

Cable type & Specification

- Mineral insulated copper cable** (EMC Compliant)
- The cable is to *BS6207: Part 1*
 - fire resistance tested to *BS6387 categories CWZ*
 - having continuous metal sheath encapsulation
 - no more than 2- cores
 - each core having **1.5mm²** minimum cross section area (speaker core may be up to **2.5mm²**)
 - a **red** cover sheath (preferred for alarm applications)
 - core to core capacitance **190pF/m**
 - core to screen capacitance **220pF/m**
- Delta Crompton FTZ2E1.5 FireTuf OHLS fire resistant cable** (EMC Compliant)
- two core plus earth wire
 - fire resistance tested to *BS6387 categories CWZ*
 - each wire having **1.5mm²** minimum cross section area (speaker core may be up to **2.5mm²**)
 - core to core capacitance **115pF/m**
 - core to screen capacitance **205pF/m**

NOTE: Multicore cables having more than 2-cores **are not allowed** for loop wiring, due to inadequate separation and possible electrical interference problems.

Alternative cable

CAUTION: In countries where the **European EMC directive** is in force, **only** those cables detailed in the **EMC Compliance** part of this manual may be used.

Alternative cable types which may be acceptable providing:

- The cable is to *BS6387* having
- typically no more than **1Km** cable usage per loop circuit
- no more than **2 - cores**
- a maximum of **0.5uF** intercore capacitance
- a maximum of **13** ohms per core
- each core having no less than **1.5mm²** minimum cross section area (speaker core may be up to **2.5mm²**)
- with an inherent or through metal conduit screen for earth continuity in order to produce electrical protection and screening
- having protection from heat and mechanical damage
- the cable screen must be capable of being earthed at each system device (outstation)

4-Channel Microphone cable

The 4-channel microphone that connects to a DAU can be used as a fire or PA applications.

- Cable length** A maximum of **500m** cable length between DAU and microphone may be used.
- Cable type** **Firemans microphone** cable should be as per loop cable (3-off 2-core cables used for the 4-channel microphone unit)
- PA Microphone** cable can be a 6-core (0.5mm² per core) with outer screen.

Background music cable

- tba

System 3400 - Orator II overview

Integrated system

The System 3400-Orator II is a fully integrated with:

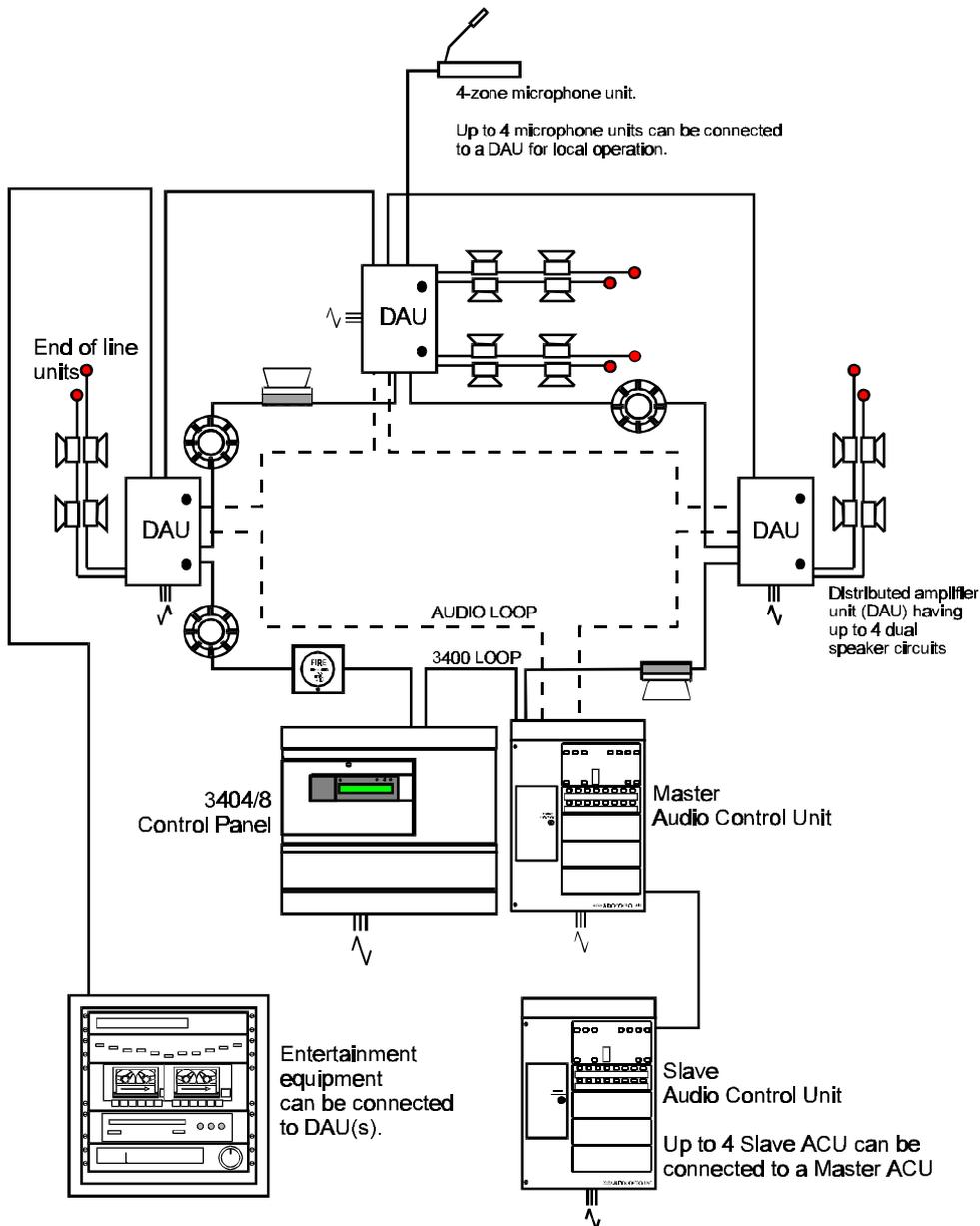
- analogue and addressable fire detection alarm system and
- distributed voice alarm system.

Distributed voice alarm

The distributed voice alarm system makes use of distributed amplifier units (DAUs) that connect to the system 3400 loop circuits.

Automatic fire announcement

In the event of a fire the specific DAU-zones announce fire messages via speaker circuits. The messages warn occupants in the protected building of fire.



cdm78

Figure 4-1 System 3400-Orator II

- ACU controls** The voice alarm can be manually activated using controls at a master or slave Audio control unit (ACU) to announce live or pre-recorded messages to selected zones.
- ACU microphone** Each ACU has an *integral microphone* to allow live high priority announcement of fire messages to be made throughout the Orator II system.
- DAU microphones** There can be up to optional four *4-zone microphone units* connected to a DAU(s) to allow live fire and public address announcements.
- Music broadcast** Optionally background music from CD, tape or radio can be broadcast to individual or multiple DAU-zones.

Audio Control Unit (ACU)

Master or Slave ACU

Where appropriate refer to as-fitted wiring drawings, notes to installer and cable types.

Fuses and locations

Fuse	Rating	Location
Mains	3A 20mm x 5mm QB	Top left side of ACU
FS1	2A 20mm x 5mm QB	Mother board bottom right
FS2	2A 20mm x 5mm QB	Mother board bottom right

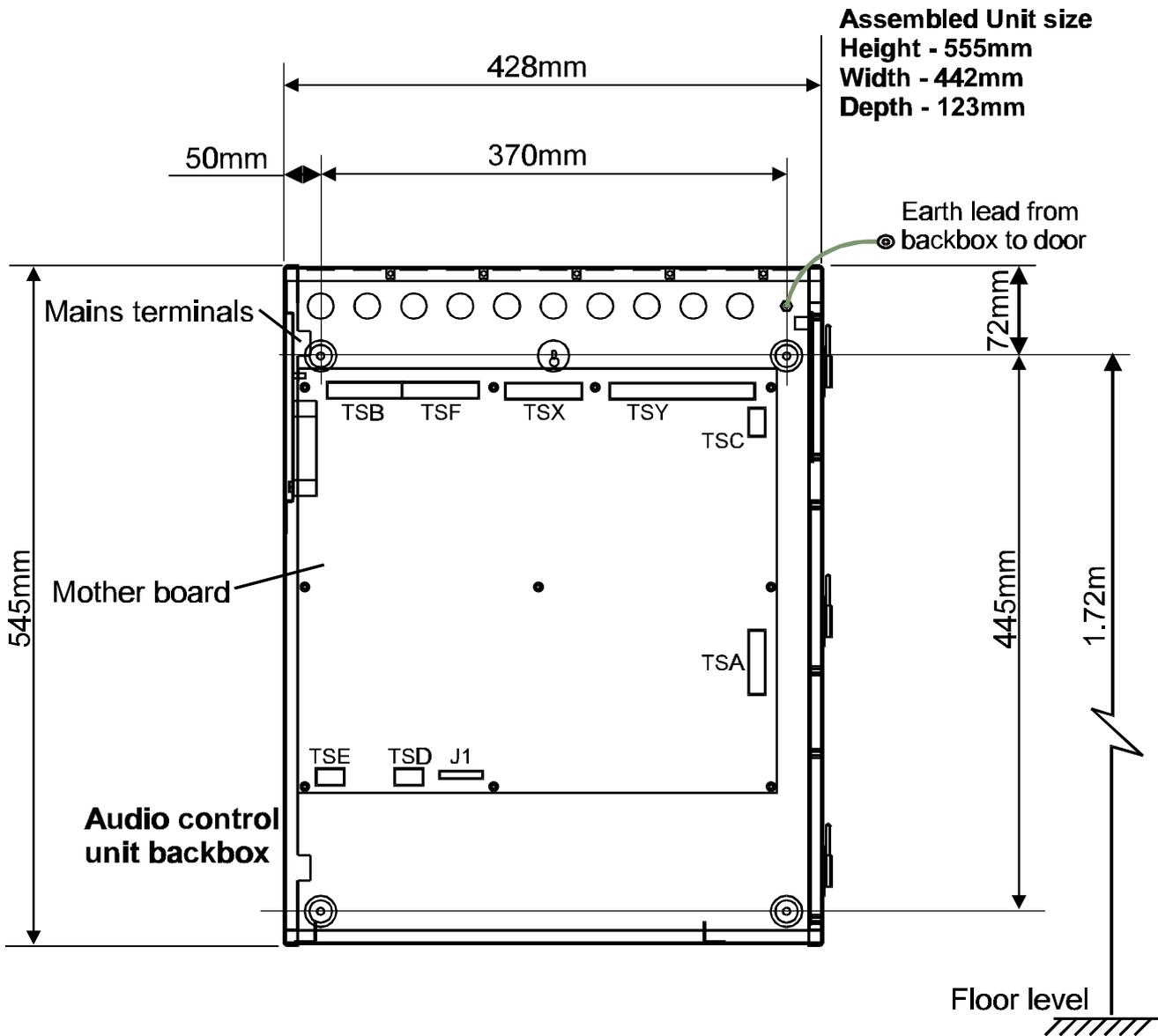


Figure 5-1 ACU Fixing details

cdm133

These procedures assume the Audio Control Unit is to be wall mounted using the **fixing points on the backbox**.

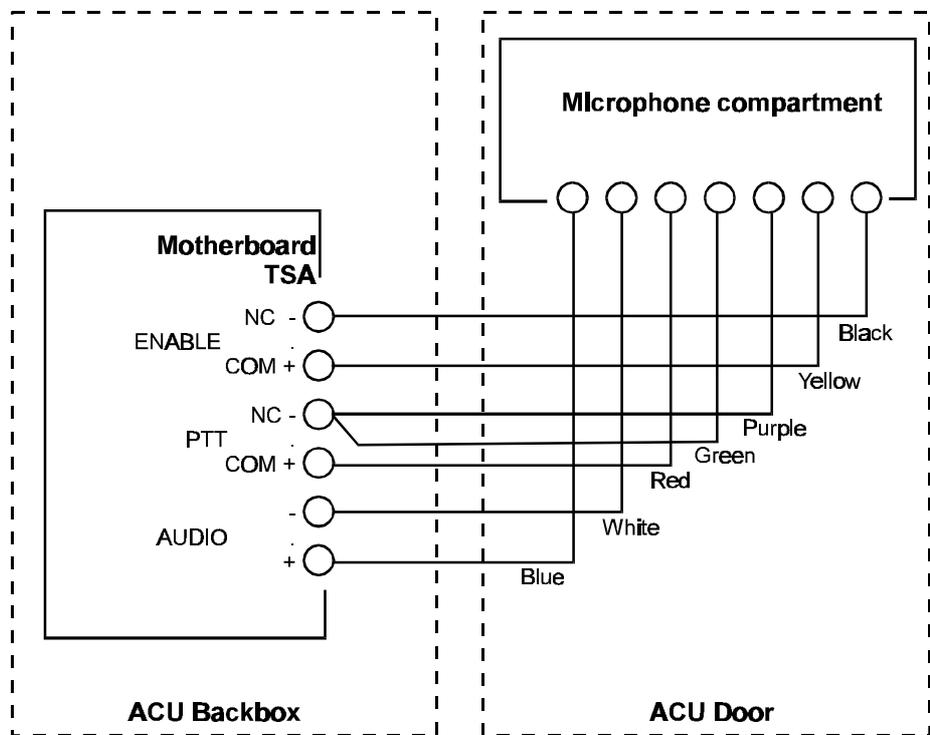
- a) Identify the Audio Control Unit ACU (Master or Slave) package numbers 13425-01 or 13425-02 respectively and check the contents:

Components	Quantity
16 Zone Audio Control Unit	1
Allen key	1
Microphone access (Enable control) key	1 pair
Zone designation label	1
Fuse 3A (mains)	1
Fuse 2A 20mm x 5mm AS	1
Fuse 1A 20mm x 5mm AS	1

Door removal

- b) Using the allen key hinge open the **ACU door**.

Figure 5-2 Microphone cable connection



cdm195

To ease installation it may be necessary to remove the **door** from the **backbox**. To do this:

- disconnect the ribbon cable at connector J1 on the *mother board*
- disconnect the **door** end of the earth lead that provides earth continuity between backbox and door
- disconnect the microphone cable connected to terminal TSA on the motherboard

and then remove the **door** from the **backbox**, by lifting it up and out.

- c) Mark the required **fixing points** on the wall to which the backbox is to be mounted.

- d) Secure the unit to the wall using suitable fixing to provide adequate support to the full assembly weighing **15kg**.

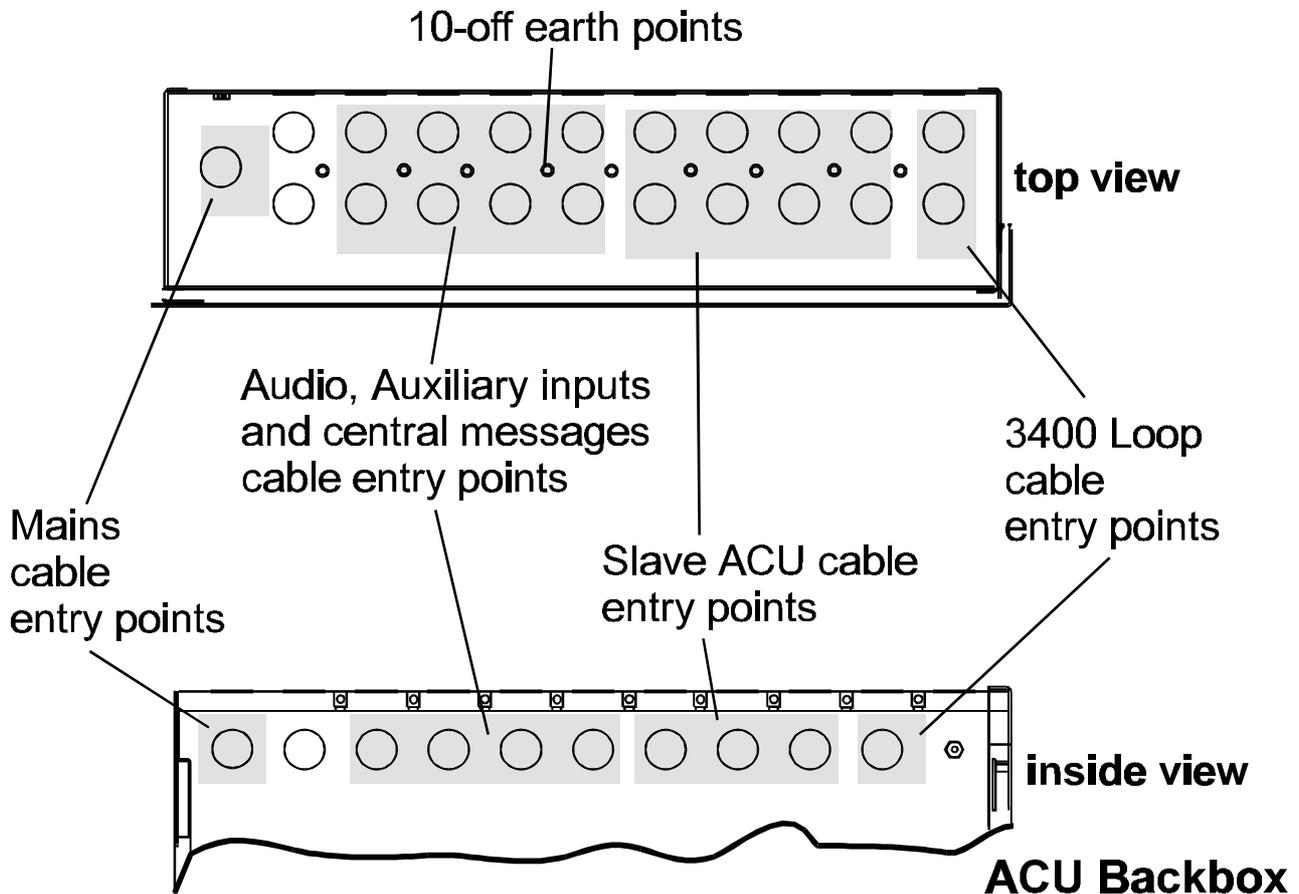


Figure 5-3 ACU dedicated cable entry points

cdm134

Cable termination

- h) Terminate each cable at the designated entry point leaving a tail wire length and mark each core to identify its indented connection point.

If previously removed refit the front cover and reconnect the cables to J1, TSA and backbox earth point.

- i) Close the **front cover** and leave all outstanding installation for the commissioning stage.

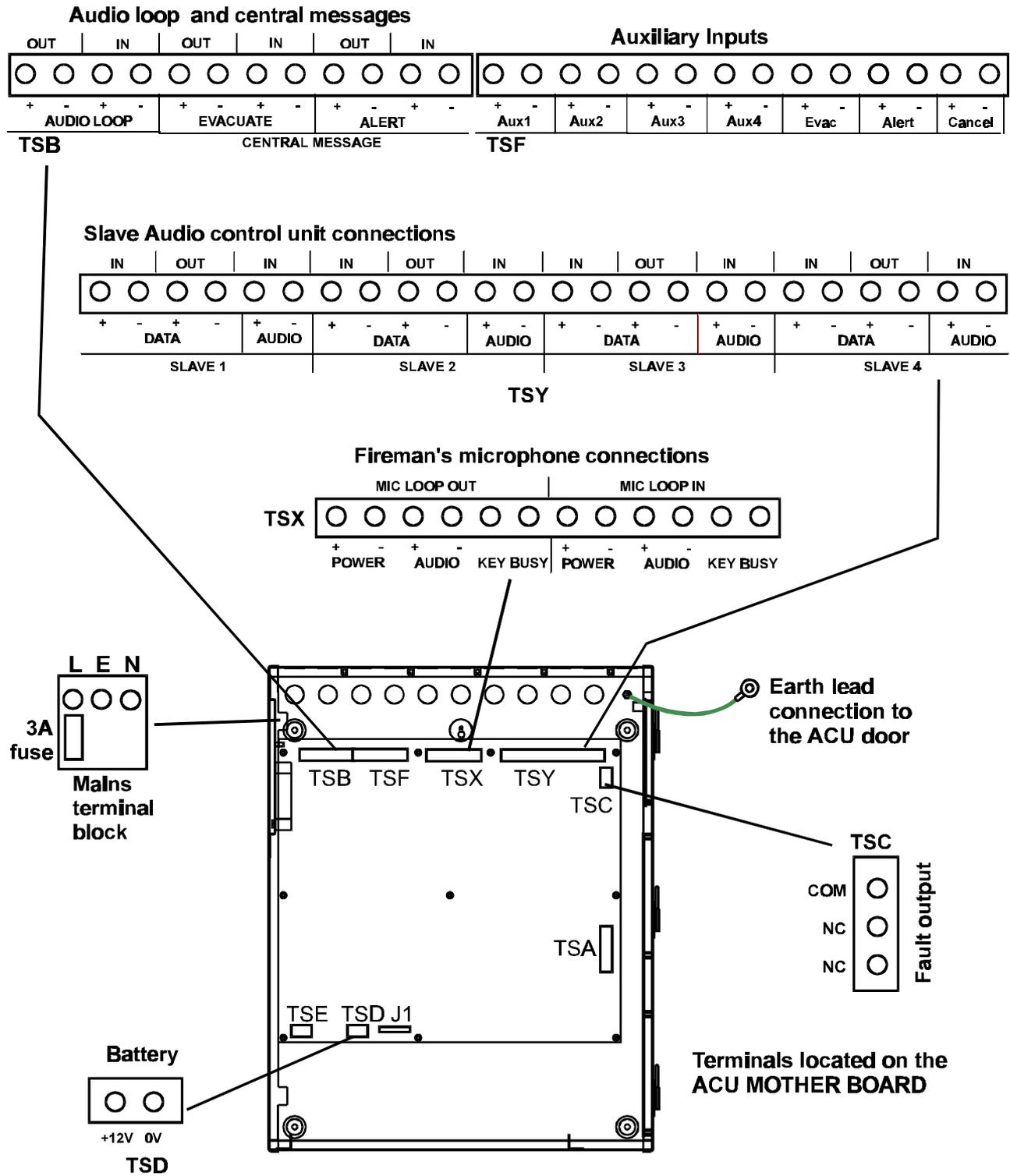


Figure 5-4 ACU connections

cdm129

Distributed Amplifier Unit

13426-01 Distributed Amplifier Unit (DAU)

Where appropriate refer to as-fitted wiring drawings, notes to installer and cable types.

Fuses and locations

Fuse	Rating	Location
Mains	10A	Top left of DAU
Battery	32A	Top left of DAU
F2	2.5A	Mother board
F1 to F4	500mA	MIC Card
F4 & F5	2.5A	PSU Board
F2 & F3	20A	PSU Board

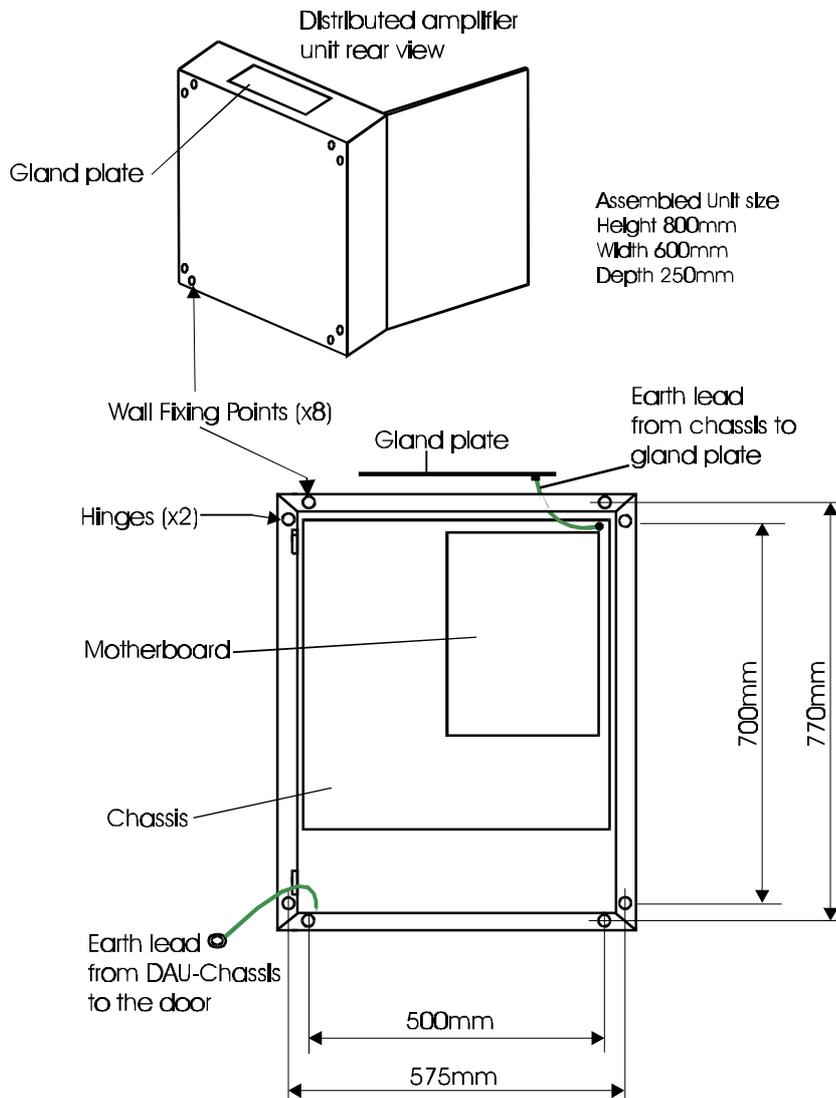


Figure 6-1 DAU fixing details

cds2

Unit installation

The DAU must be installed upright with the **gland plate** on the top side of the unit.

Gland plate

NOTE: All cables must only be terminated to the gland plate.

- a) Identify the Distributed Amplifier Unit (DAU) package 13426-01 and check the contents:

Components	Quantity
Un-populated DAU	1
Lock barrel and key	1 pair
Battery link	1
Screw and nut for battery link	2 sets
Fuse 10A (mains)	1
Fuse 20A 500V	1
Fuse 2.5A 20mm x 5mm AS	1

- b) Open the enclosure **door** using the lock barrel.
- c) Remove the required wall fixing hole **bungs** from the DAU backbox, there are eight fixing holes available.
- d) Mark the required **fixing points** on the wall to which the DAU is to be mounted.

WARNING: Ensure satisfactory safety measures are taken to prevent injury when lifting heavy equipment.

NOTE: A fully assembled distributed amplifier unit can exceed 100Kg weight.

- e) Secure the DAU to the wall using suitable fixing to provide adequate support to the full assembly weighing **102Kg**.

Gland plate

- f) Remove the required **knock outs** out of the **gland plate** for cable termination.

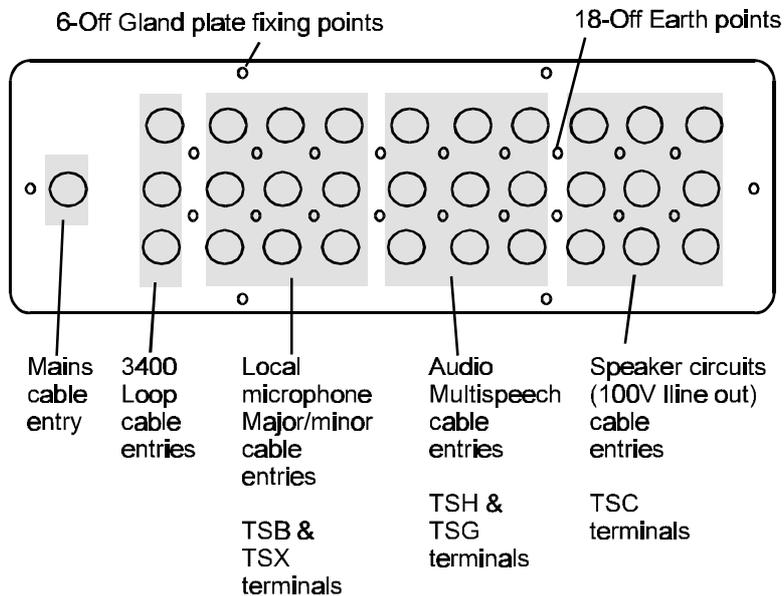


Figure 6-2
Gland plate

Cable termination

g) Terminate each cable at the entry point leaving **700mm** tail wire length and mark each core identifying its indented connection point.

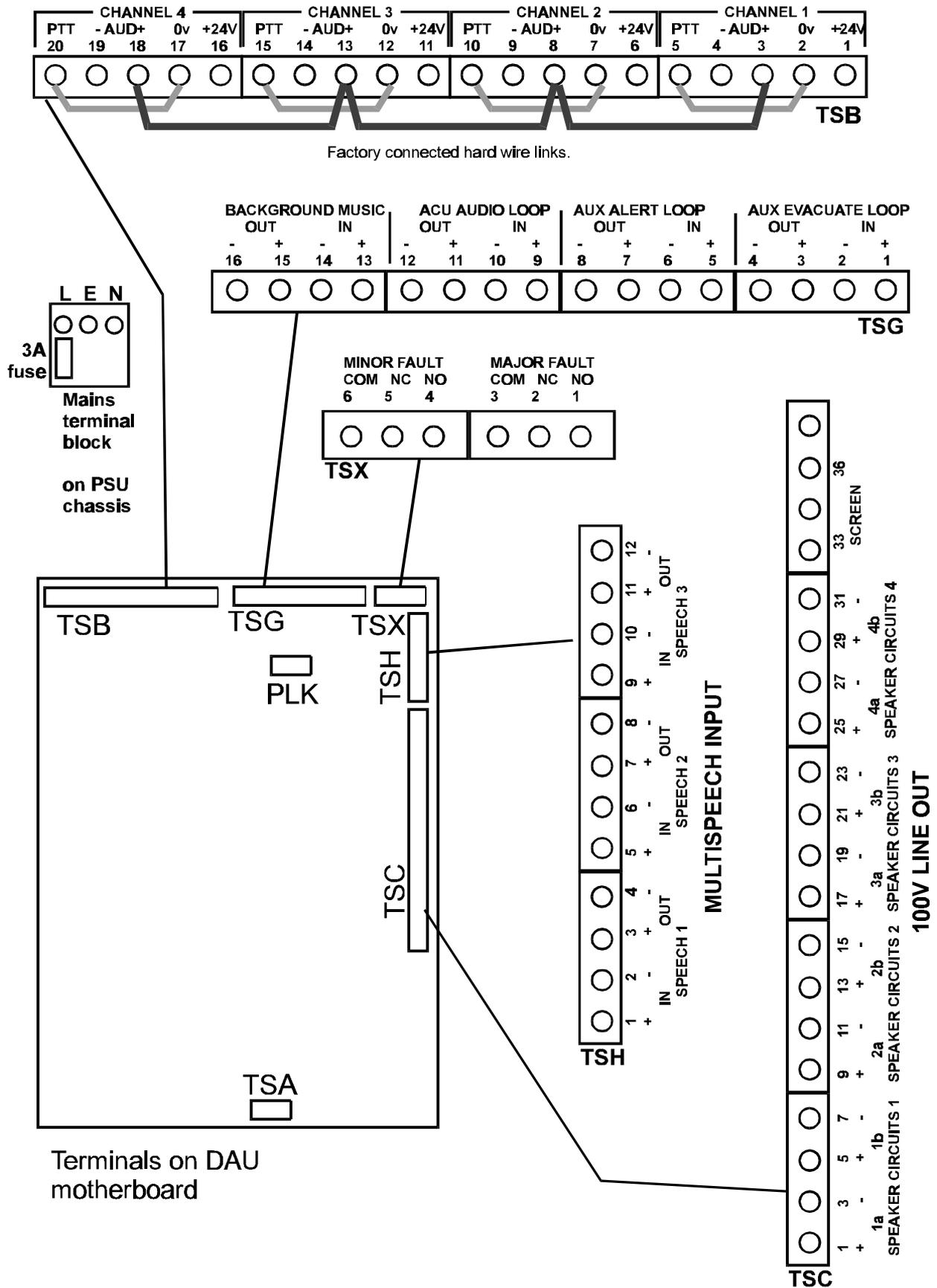


Figure 6-3 DAU connections

Earth connections

- i) Ensure all earth leads in the enclosure are securely fitted.
- j) Fit the lock barrel to the door, see instructions supplied with the lock barrel.
- k) Finally close and lock the door, leaving all outstanding installation for the servicing organisation.

Speaker circuit connections

Where appropriate refer to as-fitted wiring drawings, notes to installer and cable types.

Ideal wiring of 100V speaker circuits

Ideally an **orator-zone** should have two 100V-speaker circuits with interleaved wiring to loudspeakers installed in specific areas of a protected building. Each speaker circuit is independently powered such that in the event of one speaker circuit failure there is still adequate coverage to most areas in the zone.

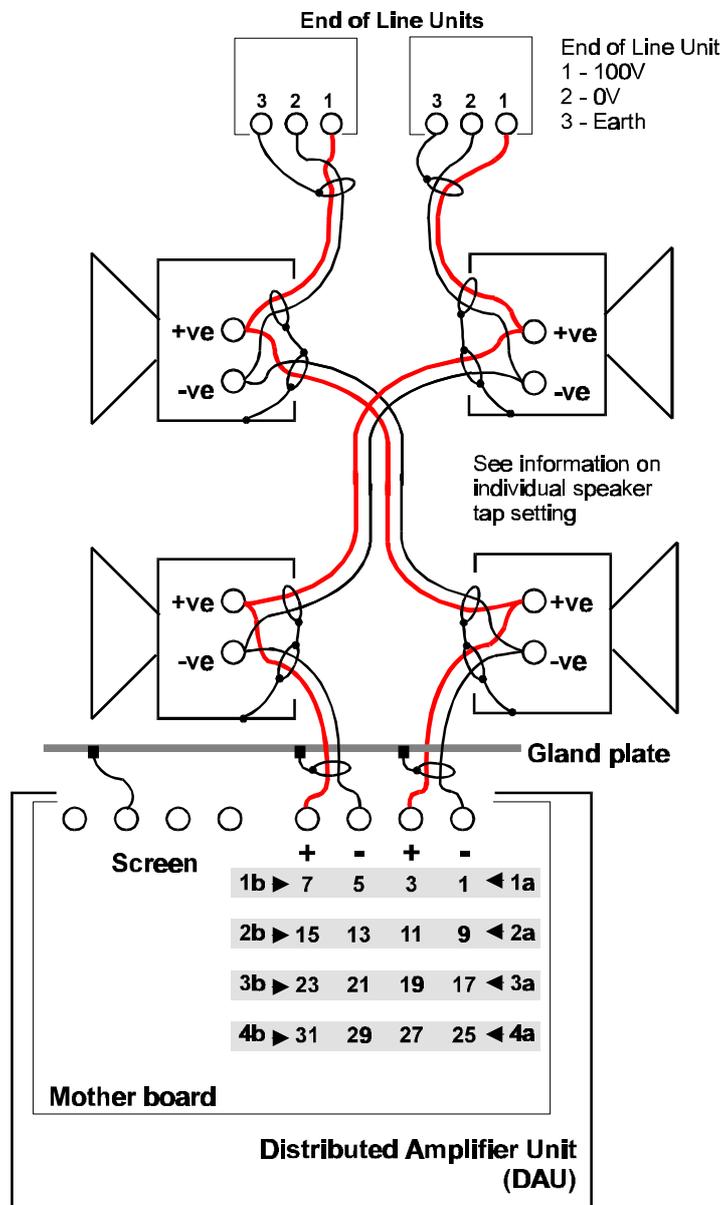


Figure 7-1 Speaker circuit connections

100V line outputs

There can be up to four zones of outputs from a distributed amplifier unit to power loudspeakers in a system, with each zone having twin 100V output lines. All loudspeakers in the orator II range are 100V rated, with some having an optional 50V tap terminal.

NOTE: It is important to connect the speaker circuit wires to the **100V tap** on each loudspeaker.

Speaker polarity

There are some loudspeakers which are polarity sensitive, that is they have terminals marked 100V and 0V (or COM).

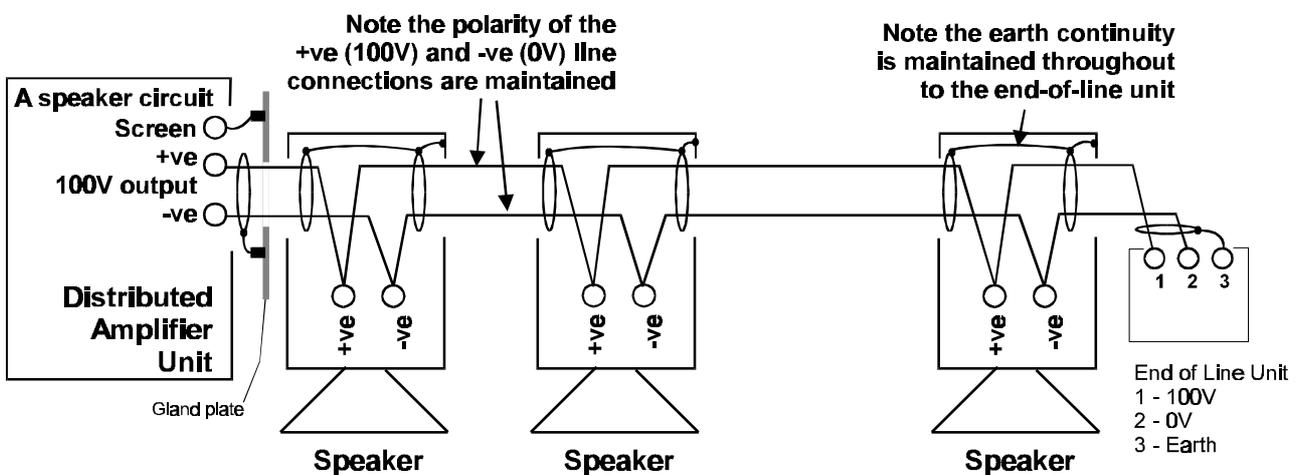


Figure 7-2 Speaker polarity and earth connections

cdm184

The +ve terminal of a speaker circuit at a DAU must be connected to the 100V terminal of each speaker on that circuit.

Similarly the -ve terminal of a speaker circuit at a DAU must be connected to the 0V (or COM) terminal of each speaker on that circuit.

Speaker circuit earth continuity

The **screen** of each speaker circuit **cab**le is used for fault monitoring. It is important that the electrical continuity of the screen is maintained from the DAU to the end-of-line unit.

Speaker tap adjustment

It is important to set each loudspeaker in the system to the correct tapping as specified in the site specific information.

CAUTION: Failure to correctly tap speakers will overload the respective distributed amplifier unit.

Speaker installation

Where appropriate refer to as-fitted wiring drawings, notes to installer and cable types.

Orator Ceiling speaker

These instructions cover:

- 13421-12 Orator 6W Ceiling speaker

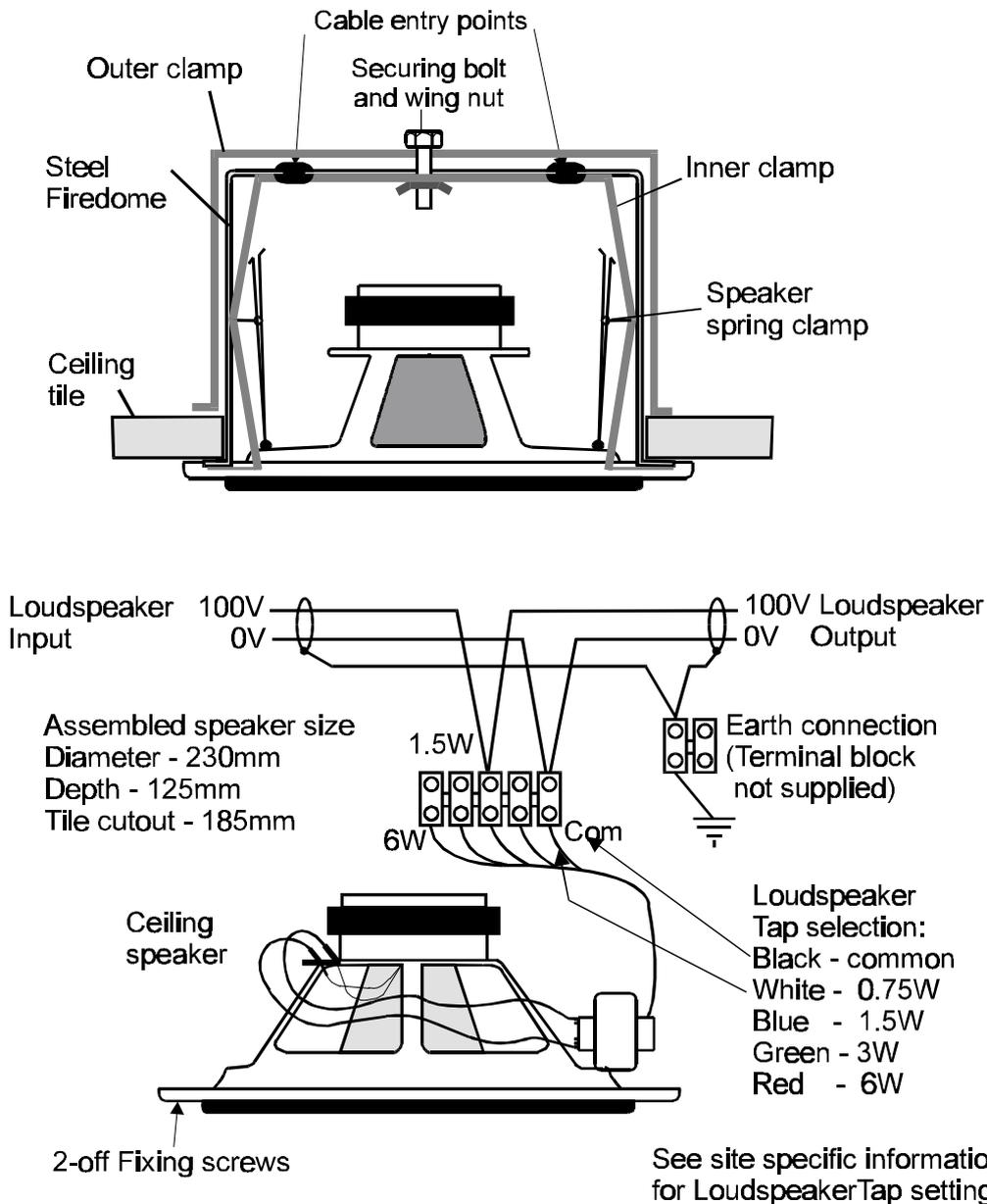


Figure 8-1 Ceiling speaker fixing details

cds16

These procedures assume that the ceiling speaker is to be mounted to an acoustic ceiling tile.

- a) Remove the **ceiling speaker** assembly from its carton and check it before installation.
- b) Separate the **dome assembly** from the **speaker assembly**.
- c) Disassemble the dome assembly by removing the **wing nut** from the **securing bolt** to separate the **outer clamp** and **inner clamp**.
- d) Open out the two cable entries in the dome.
- e) Remove the respective ceiling tile to which the speaker is to be fitted. Also remove adjacent tiles to ease installation.
- f) Cut a hole **185mm** diameter centrally in the tile to which the loudspeaker needs to be fitted.
- g) Feed the cables through the tile and terminate the two cables to the dome, fit an earth link (not supplied) if required to maintain earth continuity between the two glands.
- h) Select the required speaker power tapping and connect the two incoming and outgoing 100V speaker wires to the respective terminals.
- i) Re-fit the tile.
- j) Secure the **dome assembly** with the bolt and wing nut.
- k) Secure the ceiling speaker assembly to the tile.

Orator Cabinet loudspeaker - surface mounting

These instructions covers the:

- 13421-20 Orator 4W Cabinet loudspeaker
- 13421-21 Orator 6W Cabinet loudspeaker

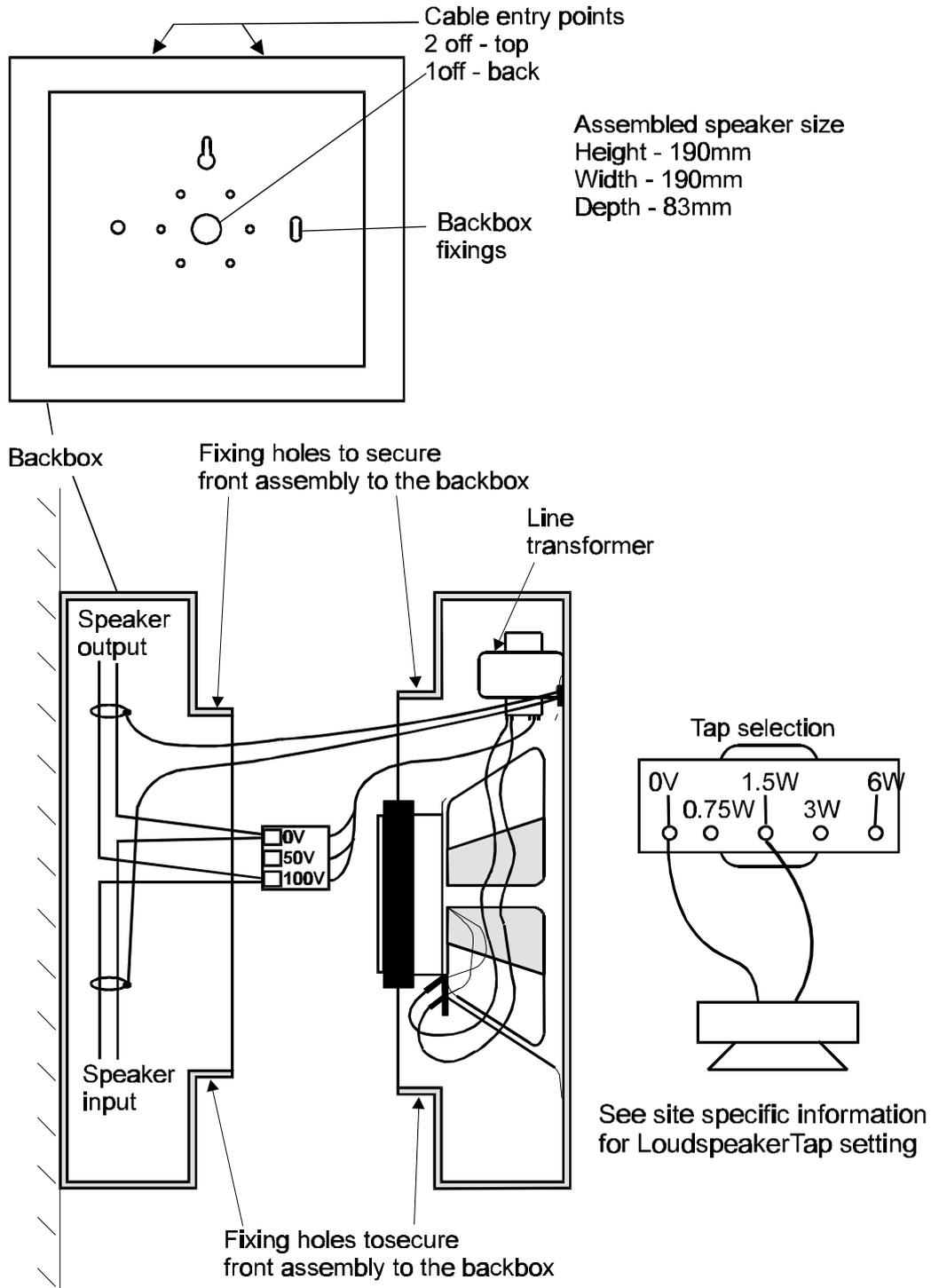


Figure 8-2 Cabinet speaker fixing and wiring details

cds17

These procedures assume that a Cabinet Speaker is to be mounted on a wall or ceiling depending on the application.

- a) Remove the **cabinet speaker** assembly from its package and check it before installation.
- b) Remove the fixing screws to separate the **backbox** from the **speaker/cover** assembly.
- c) Knockout two cable entries from the backbox.
- d) Fix the **backbox** to the wall or ceiling using the range of holes provided.

NOTE: Where the speaker is to be mounted on to ceiling, ensure adequate fixtures and fittings are used to support the fully assembly weight of 1.98Kg.

- e) Terminate the two cables to the backbox.

NOTE: Check to ensure that the two cable screens are connected to a common point on the speaker metal assembly.

- f) Connect the two incoming and outgoing 100V speaker circuit cables.
- g) Select the required speaker power tapping.
- h) Fit the **speaker/cover assembly** to the **backbox** using screws previously removed.

Orator Cabinet speaker - flush mounting

These instructions covers:

- 13421-24 Orator 4W Cabinet speaker flush
- 13421-25 Orator 6W Cabinet speaker flush

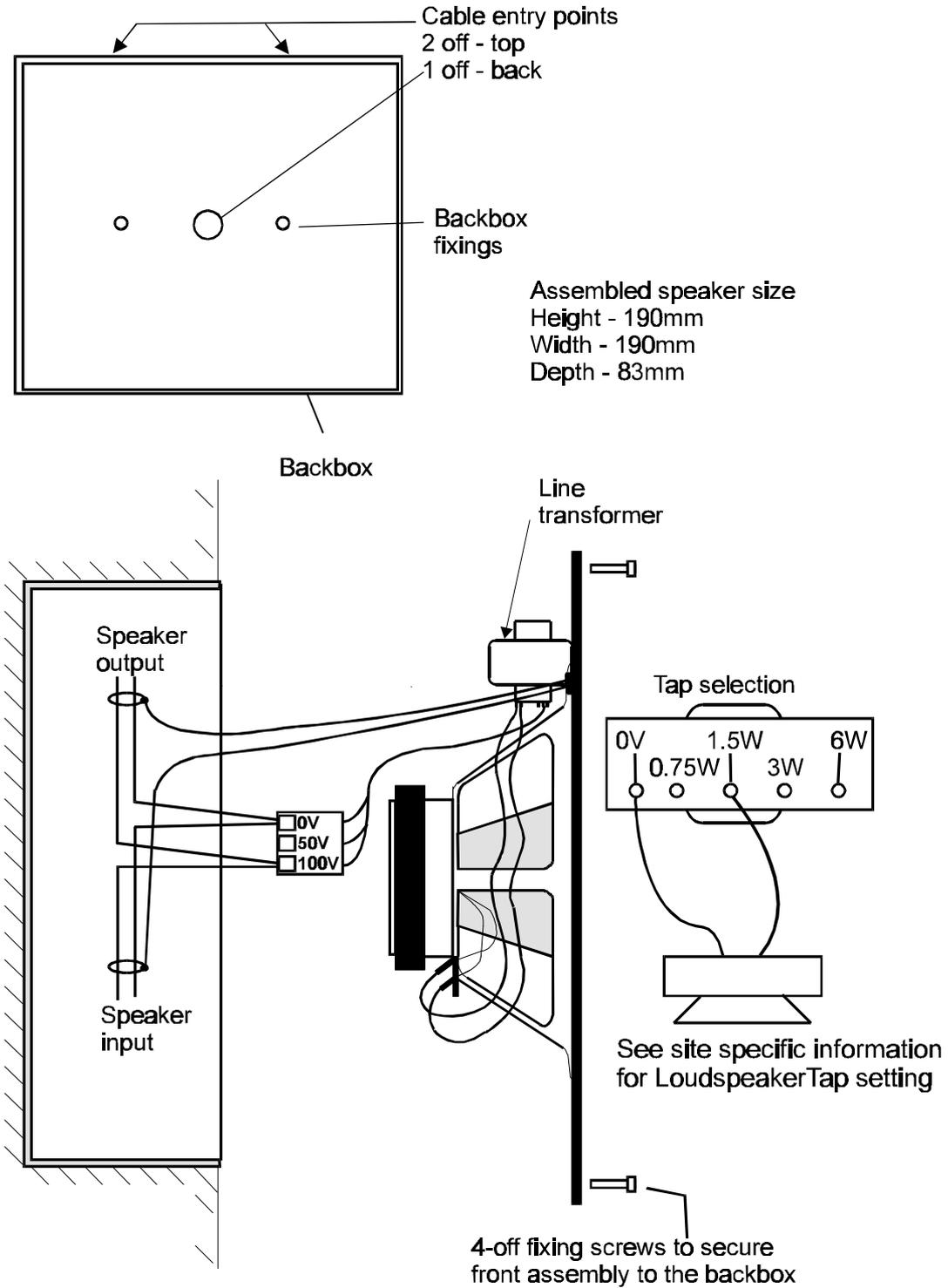


Figure 8-3 Cabinet speaker flush fixing and wiring

cds18

These procedures assume that the **cabinet speaker** is to be mounted on a wall or ceiling depending on the applications.

- a) Remove the **cabinet speaker** assembly from its package and check it before installation.
- b) Remove the fixing screws to separate the **backbox** from the **speaker/cover** assembly.
- c) Knockout the two cable entries from the backbox.
- d) Fix the Backbox flush into the wall or ceiling, using the range of holes provided.

NOTE: Where the speaker is to be mounted onto a ceiling ensure adequate fixtures and fittings are used to support the fully assembly weight of **1.98Kg**.

NOTE: Check to ensure that the two cable screens are connected to a common point on the speaker metal assembly.

- f) Connect the two incoming and outgoing 100V speaker circuit cables.
- g) Select the required speaker tapping.
- h) Fit the Speaker/Cover assembly to the Backbox using screws previously removed.

Orator Bi-directional speaker

These instructions covers:

- 13421-30 Orator 6W Bi-directional speaker

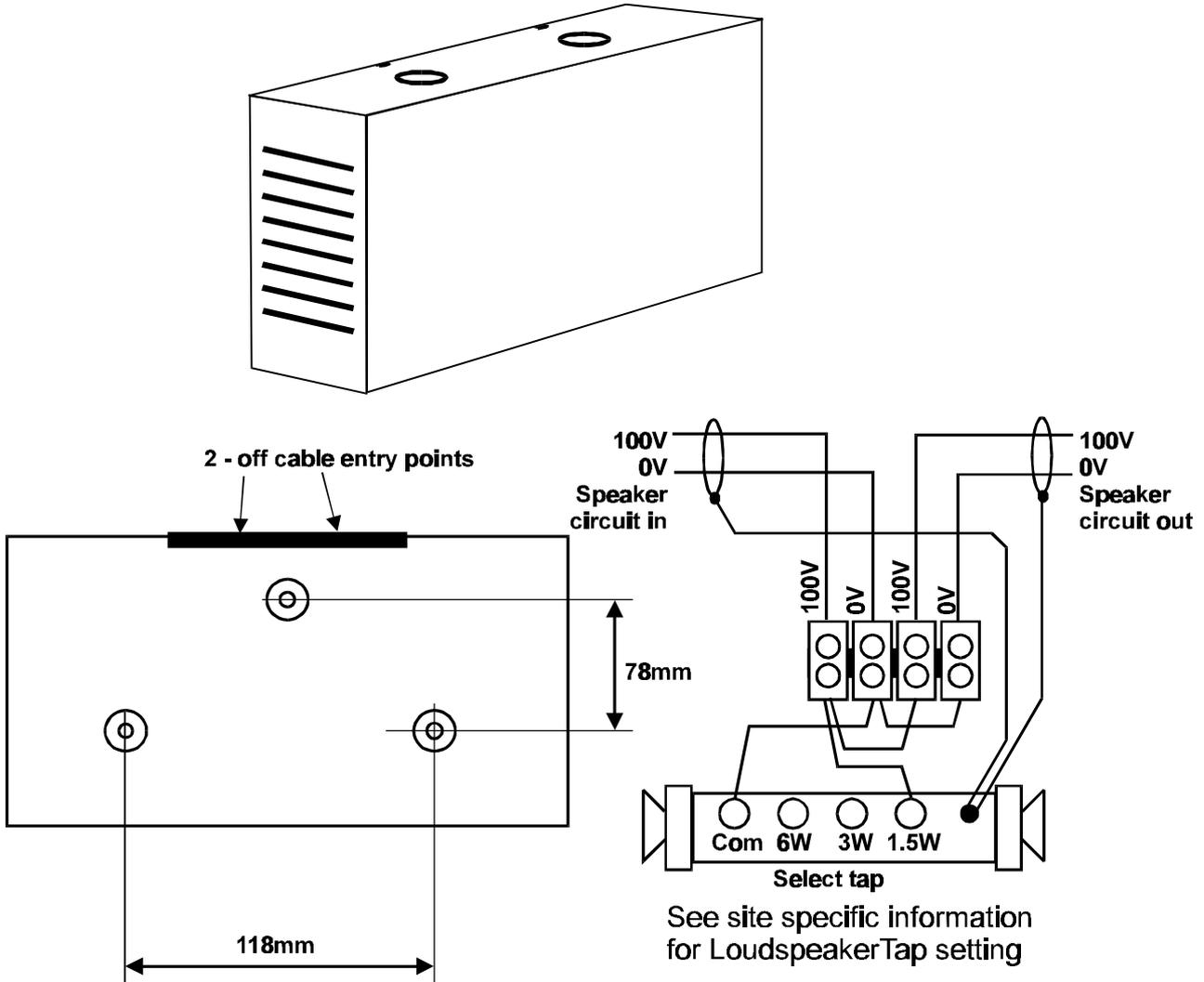


Figure 8-4 Bi directional speaker fixing details

cdm167

These procedures assume that the **bi-directional speaker** is to be mounted on a wall or ceiling depending on the application.

- a) Remove the speaker assembly from its package and check it before installation.
- b) Remove the four securing screws to disassemble the **main assembly** from the **wall plate**.
- c) Fix the **wall plate** in the required location, using suitable fixing to support the Bi directional speaker weighing **2Kg**.

- d) Knockout the two cable entries from the wall plate.
- e) Terminate the two incoming the outgoing 100V loudspeaker circuit cables and connect to the terminal block.

NOTE: Check to ensure that the two cable screens are connected to a common point on the speaker metal assembly.

- f) Select the required speaker tapping.
- g) Fit the speaker assembly to the wall plate and secure it using **fixing screws**.

Orator Horn speaker IP67

These instructions covers:

- 13421-40 Orator 15W Horn speaker IP67
- 13421-41 Orator 30W Horn speaker IP67

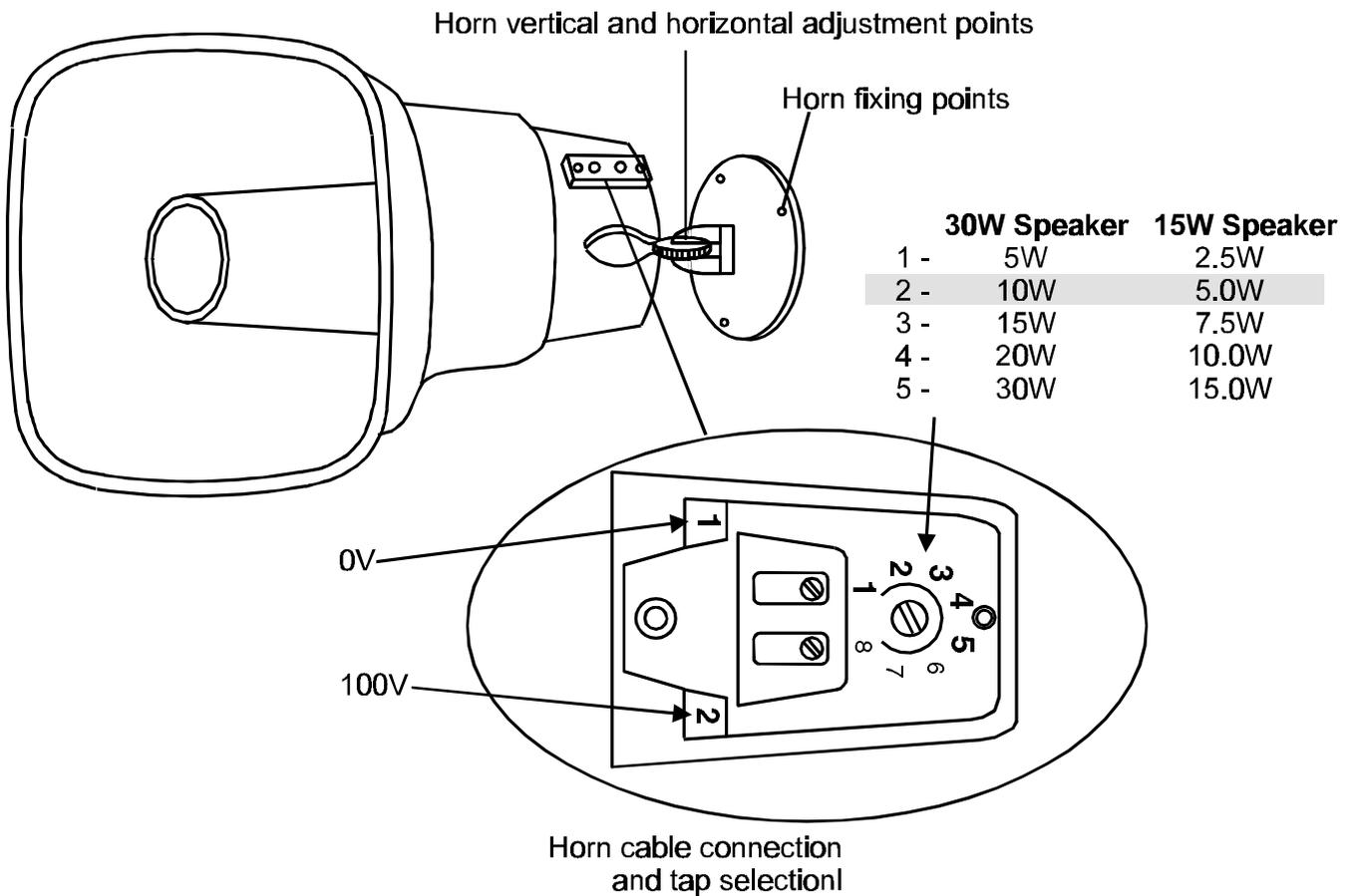


Figure 8-5 Horn speaker connection and fixing

cdm137

These procedures assume that the **horn speaker** is to be mounted on a wall or ceiling depending on the application.

- a) Remove the **horn speaker** assembly form its package and check it before installation.
- b) Remove the wing nut and bolt form the **swivel base** and detach the horn assembly.

- c) Fix the swivel base in the required location, using suitable fixing to support the complete assembly **1.7Kg** for 15W Horn and **3Kg** for the 30W Horn.
- d) Remove the **terminal cover** from the horn assembly.
- e) Terminate the two cables to the terminal cover. The two cables are the incoming and outgoing connections for a 100V speaker circuit.
- f) Connect the incoming and outgoing 100V cables to the designated terminals

NOTE: Check to ensure that the two cable screens are connected together electrically.

- g) Adjust to the required **speaker tapping**.
- h) Fit the **horn assembly** to the **swivel base** and secure it using the bolt and wing nut previously removed. Do not tighten the wing nut at this stage.
- i) Position the horn such that it projects the sound in the required location.
- j) Tighten the wing nut to secure the horn to the swivel base.

Orator IP55 Column Speaker

These instructions covers:

- 13427-50 Orator 50W IP55 Column speaker

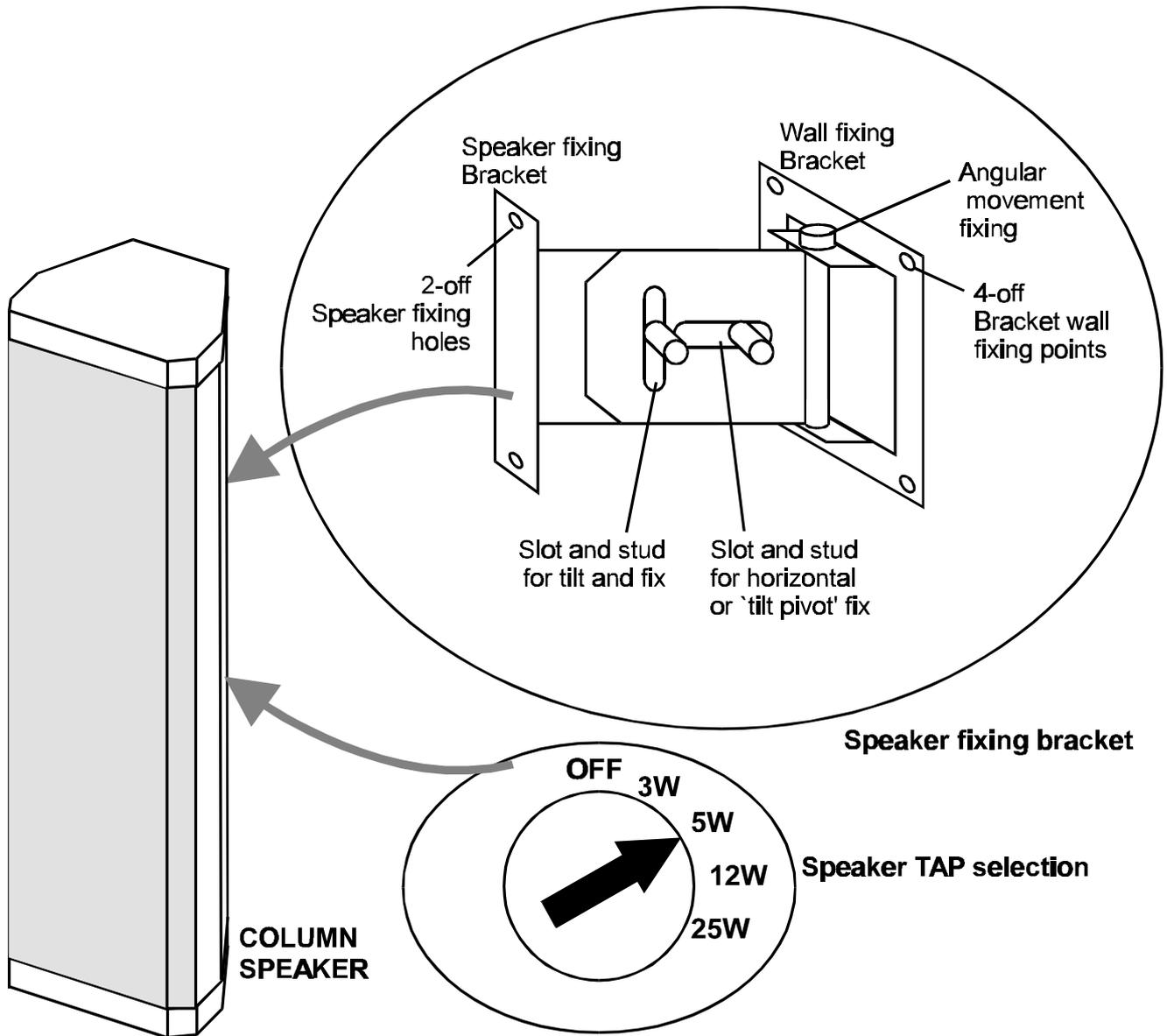


Figure 8-6 Column Speaker installation

cdm185

These procedures assume that the **column speaker** is to be mounted on a wall or ceiling depending on the application.

- a) Remove the **column speaker** assembly from its package and check it before installation.
- b) Disassemble the **speaker - wall bracket** assemblies.
- c) Fix the **wall bracket** in the required position on the wall using the four fixing holes.

NOTE: Ensure adequate fixtures and fittings are used to support the fully assembly weight of 4.38Kg.

- d) Adjust to the required column loudspeaker power tapping.
- e) Fit the **column speaker-bracket** to the **wall bracket**.
To do this:
 - engage the two *threaded studs* on the **wall bracket** into the required *horizontal and tilt adjust slots* of the **speaker bracket**
 - and adjust the speaker to project the sound in the required direction
 - and secure all fixing nuts to prevent speaker movement.
- f) Connect the two incoming and outgoing 100V speaker circuit cables to the speaker lead. A separate junction box may be required.

Obsolete column speaker

This is an older version of the Orator IP55 Column Speaker which is no longer supplied. This information here is for reference only.

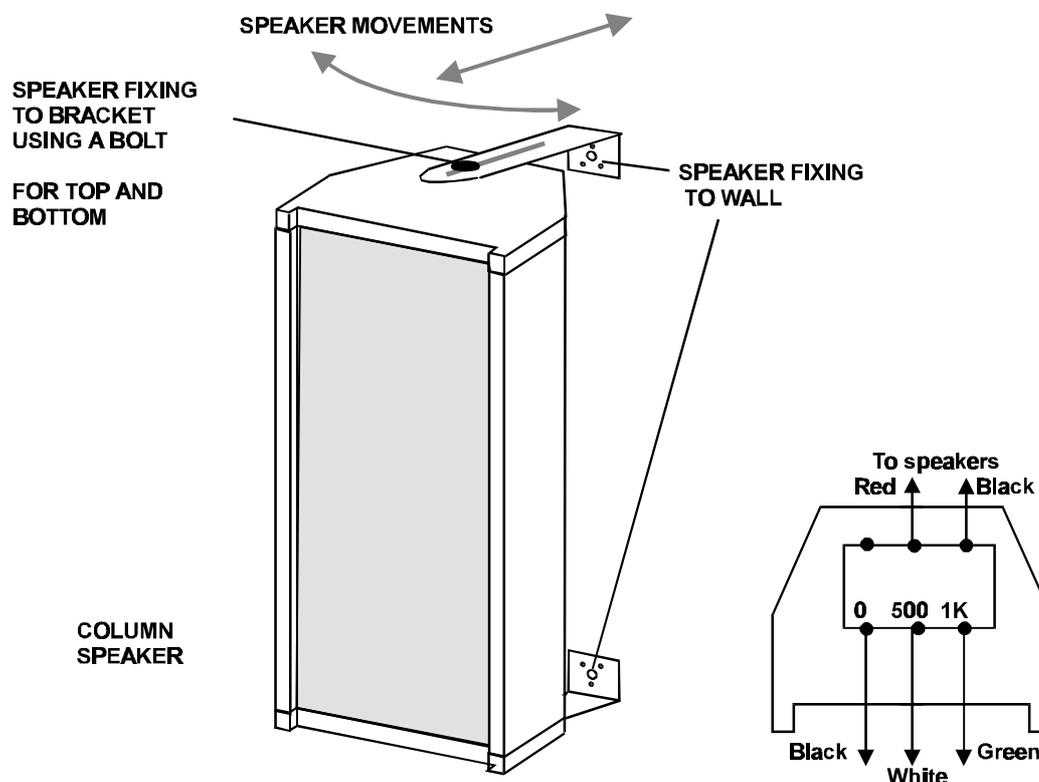


Figure 8-7 Obsolete column speaker fixing and wiring

cdm141

Orator End-of-line unit

These instructions covers:

13427-01 Orator End-of-line (EOL) unit

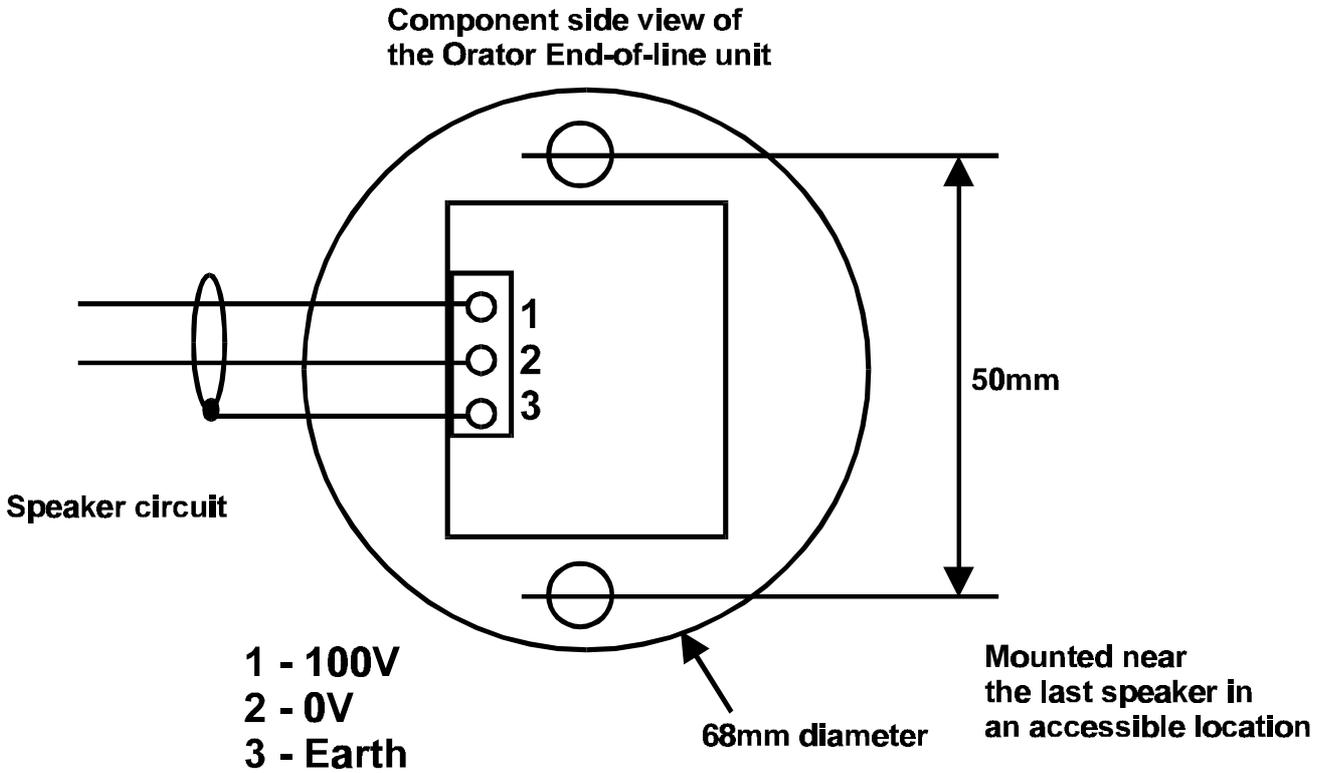


Figure 8-8 Orator EOL fixing details

cdm168

The **end-of-line** unit should be mounted on a junction box.

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4-Zone Microphone Unit

13427-04 A 4-Zone Microphone Unit

Where appropriate refer to as-fitted wiring drawings, notes to installer and cable types.

These procedures assume that the **4-zone microphone unit** is to be fitted on a flat surface such as, a receptionist counter or security room desk.

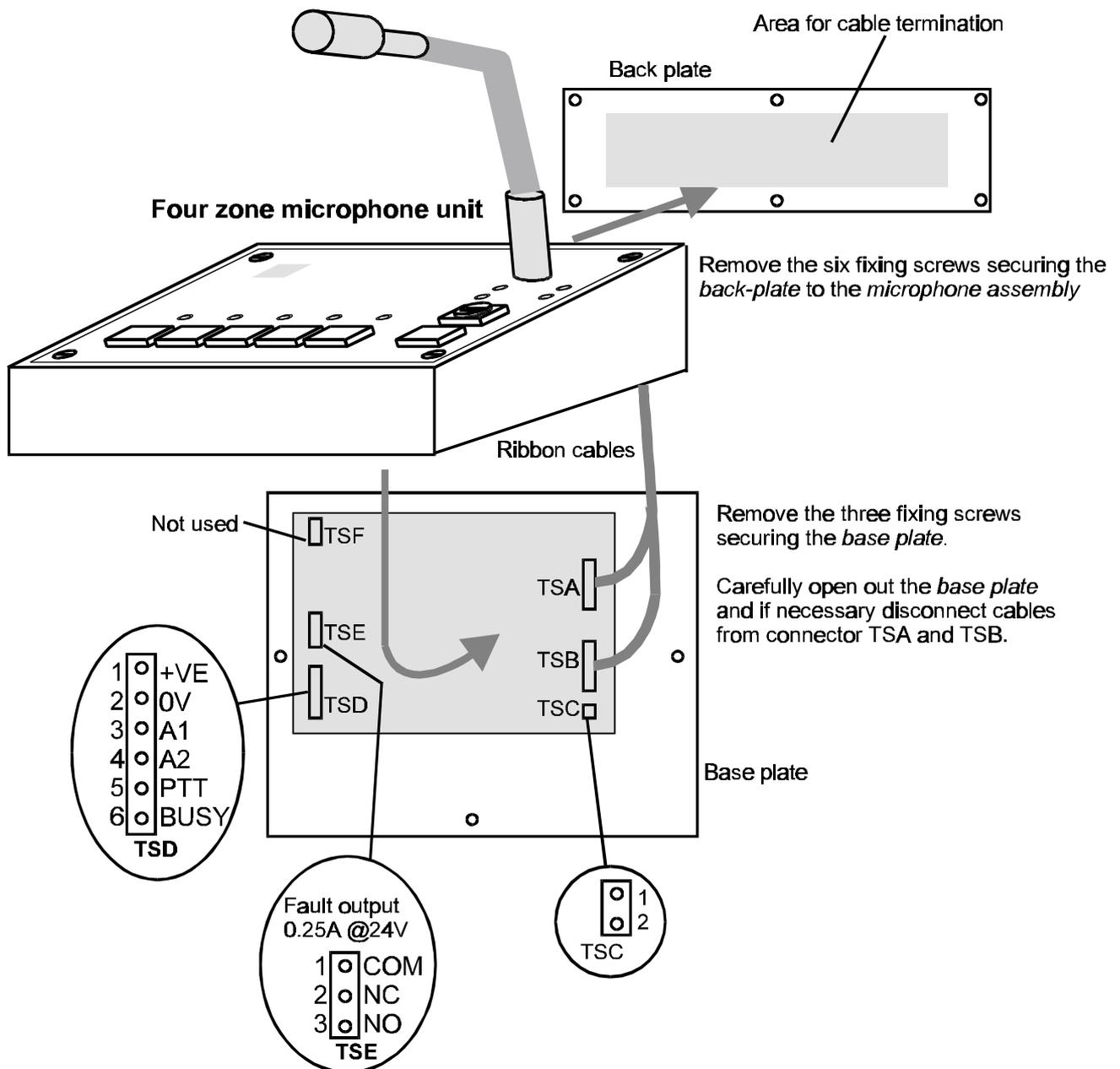


Figure 9-1 4-Zone Microphone unit details

cdm194

- a) Open the **back plate** on the **unit** by removing the 6-off fixing screws.
- b) Open the **base plate** out from underside of the **unit**, taking care not to pull on the connected cables.
- c) Terminate the required number of cables on to the **back plate leaving marked tail wire length** for connection during the commissioning of the system.
- d) Refit the **back plate** and **base plate** to the **unit**, using the screws previously removed.

Entertainment system installation

Entertainment system equipment

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System 3400 Orator II

This section lists the commercially available parts for use in the System 3400 Orator II.

Audio Control Units

Options	13425-01	ACU Master 16 zone
	13425-02	ACU Slave 16 zone
ancillaries	13425-20	ACU 16 Zone extender set (includes control membrane and ribbons for use with Master or Slave ACU)
	13425-25	ACU Slave interface
	13425-30	ACU Auxiliary message store (for up to 4 message)
	13425-31	ACU 3400 Loop I/O module
	13425-32	ACU I/O Buffer board
	4015-514	Battery 12V 12Ah (but 2 required for DAU)

Distributed Amplifier Unit

DAU (un- populated)	13426-01	DAU base unit (includes case, power supply and mother board)
Boards	13426-02	DAU 3400 loop I/O card/module
	13426-03	DAU Audio (highway) loop card/module
	13426-04	DAU Message store, no message
	13426-05	DAU Local (4-channel) microphone card/module
	13426-06	DAU Background music card/module
	13426-10	DAU Message store (Evacuate/commission)
	13426-11	DAU Message store (Alert/commission)
Messages	13426-30	Message EEPROM (standard) Evacuate/Commission
	13426-31	Message EEPROM (standard) Alert/Commission

	13426-50	Message EEPROM Custom
Amplifier modules	13426-81	Amplifier module 2 x 50W c/w line transformers and end-of-line units
	13426-82	Amplifier 4 x 50W module c/w line transformers and end-of-line units
	13426-83	Amplifier 2 x 100W module c/w line transformers and end-of-line units
	13426-84	Amplifier 2 x 250W module c/w line transformers and end-of-line units
Spare and ancillaries	13427-01	Orator End-of-line unit
	13427-04	DAU Local 4-Zone microphone unit
	05795-38	Battery 12V 38Ah 1-off (but 2 required for DAU)

Public address ancillaries

Options	13428-01	Mixer preamplifier 6 Inputs (2U)
	13428-02	Graphic equaliser (2U)
	13428-03	AM / FM Tuner (1U)
	13428-04	Cassette player - twin desk auto reverse (3U)
	13428-05	CD Player - 10 disc capacity (3U)
	13428-06	Monitor panel to facilitate source set up (2U)
Racks	13428-12	Rack, 12U to accept PA equipment, pre-wired
	13428-16	Rack, 16U to accept PA equipment, pre-wired
	13428-20	Rack, 20U to accept PA equipment, pre-wired
	13428-34	Rack, 34U to accept PA equipment, pre-wired
	13428-43	Rack, 43U to accept PA equipment, pre-wired

Loudspeakers

	13421-12	Orator 6W Ceiling speaker (with fire dome)
	13421-20	Orator 4W Cabinet loudspeaker
	13421-21	Orator 6W Cabinet loudspeaker

13421-24	Orator 4W Cabinet loudspeaker flush
13421-25	Orator 6W Cabinet loudspeaker flush
13421-30	Orator 6W Bi-directional loudspeaker
13421-40	Orator 15W Horn loudspeaker IP67
13421-41	Orator 30W Horn loudspeaker IP67
13421-50	Orator 20W IP55 Column loudspeaker
13427-01	Orator End-of-line (EOL) Unit

3400 panel cards

13430-11V3+	Local controller card V3+ (LCC)
13431-01V3	Loop processor card (LPC)
13433-01V3	1 - 4 Loop panel RAM card
13433-03V3	1 - 8 Loop panel RAM card
13501-01	Secure network card
13532-50	Universal I / O card V3
13532-53	Slave I/O card

Manuals

13499-30	System 3400-Orator II Installation manual
13499-32	System 3400-Orator II Operator's manual

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