MUSTANG COMMUNICATIONS

MAESTRO 125 & MAESTRO 60
INSTALLATION & OPERATION HANDBOOK

Issue No.4

Mustang Communications Ltd
Eastfield Industrial Estate
Scarborough
England
YO11 3UT

Telephone	01723 582555
Telephone International	+44 1723 582555
Fax	01723 581673
Fax International	+44 1723 581673
email	service@mustang.co.uk

Author: M. R. Tetley M. Inst. S. C. E.

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CE

Electromagnetic compatibility (EMC directive 89/336/EEC and amendment directive 92/31/EEC
This equipment has been designed and manufactured to the highest standards. If connected and operated as set out in this manual, there should be no Electromagnetic Compatibility problems. If any aspect of operation gives rise to concern, then please contact the manufacturer for advice.

INTRODUCTION

Thank you for purchasing this amplifier. You have made a wise choice. It is a purpose designed, British made, public address amplifier which, if installed and operated correctly, will give many years of trouble-free and accurate amplification. Used in conjunction with good quality loudspeakers and microphones etc., the MAESTRO series amplifier is capable of equalling or exceeding the performance of more expensive units from our competitors' ranges.

The Maestro 125 and Maestro 60 amplifiers are manufactured entirely by Mustang Communications Ltd., in Scarborough, England, and meet the relevant British Standards for safety and Quality Assurance.

The MAESTRO range is just one of many amplification ranges amongst the hundreds of items manufactured by Mustang Communications to meet the needs of the public address market. Your dealer will be pleased to advise you on the selection of the most suitable equipment from the comprehensive Mustang catalogue should you have further amplification requirements.

Applications

By design, the Maestro amplifier range is a particularly versatile concept and may be applied to a wide variety of amplification projects in locations such as schools, restaurants, theatres, churches, factories, recreation areas, etc., where high performance standards should be expected.
Maestro amplifiers are designed to meet internationally agreed standards of signal level, impedance, sensitivity etc., and therefore may be used successfully with all good quality public address loudspeakers, microphones, tape units and phono decks, of any origin.

Carton contents

On receipt from the manufacturer, this carton will contain:

1 amplifier
1 installation & operation handbook
7 DIN input connectors: 5 pin, 180 degree pin format
1 AC mains connection lead
9 front panel blanking plugs
1 guarantee registration sheet

Options

Rack mount brackets type BRK-20 may be purchased as a separate catalogue item to enable the Maestro 125 or Maestro 60 to be fixed in a standard 19" equipment rack, occupying 2U of panel space.

A low cost interconnection lead - part No. CC-1- may be purchased to enable simple interchange of signals between a Maestro 125 or 60 and a Mustang DL.500 inductive loop driver.

The Maestro range is carefully designed and budget priced. The amplifiers exhibit all the features required by the majority of simple public address amplification installations. Various internal adjustments and options may be selected by the commissioning engineer to suit the particular installation. The manufacturers are unable to undertake the consideration of any special options or modifications to the standard Maestro format amplifier, as it is probable that an alternative Mustang amplification range may be more appropriate. Your dealer will advise.

WARRANTY

This unit should operate successfully for many years if installed correctly. However, should any fault occur within 24 months of installation, the manufacturer undertakes to replace parts, or the whole unit, at their discretion, free of all labour or parts charges. However, should investigation of such a fault indicate operation of the unit outside its specification, accidental damage, or unauthorised modifications, then the manufacturer reserves the right to levy an appropriate repair charge.
Should a fault be suspected, your dealer should be notified in the first instance. All returns should be made via your dealer, forward carriage paid, and be accompanied by details of:

The reported symptoms
Brief details of the installation.
Details of the circumstances of failure

Following the routine warranty period, the unit may be returned via your dealer, to the manufacturer for any necessary repairs or refurbishing. Details of the work required/reported fault must accompany the unit, and nominal charges will be levied.

SPECIFICATIONS

	Maestro 60	Maestro 125
INPUTS		
Microphone input sensitivity: Inputs 1 - 5 . (These inputs may be operated in either balanced or unbalanced mode).	500uV @ 200 ohms	
Microphone overload level: Inputs 1 - 5	26dB	
Inputs 1 - 5 selectable attenuator	12dB	
Common mode rejection ratio @ 1KHz: Inputs 1 - 5	≥ 85dB	
Signal to noise ratio: Inputs 1 - 5 loaded	≥ 60dB	
unloaded	≥ 65dB	
Optional bass roll-off: Inputs 1 - 2. Internal cut link.	-3dB /octave below 200Hz	
Priority input channels sequence ladder	1 over 2 over 3/4/5/6	
Inputs 1 - 2 normal status	unmuted	
Inputs (2)-3-4-5-6 muting during priority	50dB	
Inputs 3 - 4 balanced/unbalanced line sensitivity	775mV @ 220k	
Input 5 balanced/unbalanced line sensitivity	100mV @ 47k	
Input 6: either auxiliary line input unbalanced	100mV @ 47k	
or RIAA magnetic phono pick up: (Internal switch)	5mV @ 47k	
Tape playback level via input No.6 gain control. (Stereo signals are mixed internally)	85mV @ 10k	
Phantom microphone supply voltage: Channel 1 - 5	+12V stabilised	
Connectors: Inputs 1 - 6, and tape interface.	5 pin 180 degree std DIN	
Priority chime level (internal adjustment)	zero to full amplitude	
OUTPUT		
Power output	60W RMS	125W RMS
Output matchings: standard connections -	4 ohms, 100V (ct) & 70V, 50V	
Frequency response. -3db points @ full rated power	30Hz to 17kHz	
100V line regulation load/no load @ 1KHz	0.6dB	0.4dB
Power output connector	Connection block for ≤ 2.5mm flexible cable	
Treble & bass equalisation (cut & lift)	± 12dB @ 100Hz and 10kHz	
Signal to noise ratio: zero equalisation, gains set zero	≥ 90dB	
Recording signal output/slave output pre or post tone	775mV @ 600 ohms (0dB)	
post tone & post master	775mV @ 10k ohms	
Output bargraph calibration (power section is monitored)	five 3dB steps	
SUPPLY		
Priority current sink capability (absolute maximum)	250mA from 40V maximum	
Auxiliary +24V DC output (absolute maximum)	150mA	
Supply voltage limits	180V to 250V AC 40/60Hz	
Maximum supply consumption - at full rated power output	120VA	250VA
MECHANICAL		
Overall width	432mm	(482.5mm with rack brackets)
Depth - fascia to rear of heatsink	354mm	excluding allowance for connectors
Depth - overall including control knobs	374mm	excluding allowance for connectors
Height Fascia	88.5mm	(main body 85mm)
Height Total including removable feet	95mm	

In the interests of our policy of continuous improvement - any of the above specifications may be changed without notice.

FRONT PANEL CONTROLS

Various front controls and facilities are provided to enable the user to obtain maximum clarity from the amplification system. The user may adjust these at will.

Input level controls

Up to six input signals may be accepted by this unit and the corresponding input circuits of the amplifier are normally referred to as input “channels”. Input level controls are used to set the relative sensitivities of the six input channels of the amplifier. Whilst these controls are calibrated, the associated numbers are only arbitrary and should not be taken to indicate *absolute* output powers. For instance: an unusually low level input signal will not necessarily cause the amplifier to be operating at maximum power even with the corresponding input control fully rotated. The numbers are primarily to enable accurate re-setting, and the controls should be set to provide the required sound volume from the loudspeakers.

Treble and bass controls

Treble and bass controls are provided to enable correct tonal adjustment to suit the characteristics of the input signals. Each operates on a cut and lift principle, and when set to position “0” has no effect.

Master level control

Use this control to change the sensitivity of all six inputs simultaneously. It would normally be used to fade down the total output to zero so set the control at about No. 8 or 9 before adjusting the individual input level controls. In this way the overall sensitivity may also be increased slightly.
Operating the master at too low a setting (less than 4 or 5) will render the amplifier liable to distortion on sound peaks.

Output level bargraph

To the right hand side of the front panel are 5 LEDs in the formation of a small bargraph to indicate the amplifier power output. Under normal operation, it is acceptable for the top LED to illuminate intermittently. If this LED is illuminated more frequently, distortion may be occurring in the amplifier and the corresponding input control should be adjusted.
Under certain installation fault conditions it is possible for some or all LEDs to illuminate even without an input signal and the amplifier will overheat. Refer to the “Fault Checklist” section of this manual.

Mains power switch & indicator

A front panel rocker switch isolates the unit from the AC power input, and the adjacent LED illuminates to confirm that the internal DC power supply circuit is operational.

INPUT FACILITIES

The six input circuits of the Maestro 125 and Maestro 60 have been designed to enable the amplifiers to be used in a wide variety of applications. Most of the inputs will accommodate two different types of input signal as follows:

Input 1	balanced microphone, phantom powered, with optional priority over inputs 2-3-4-5-6
Input 2	balanced microphone, phantom powered, with optional priority over inputs 3-4-5-6
Input 3	balanced microphone, phantom powered, or balanced high level line
Input 4	balanced microphone, phantom powered, or balanced high level line
Input 5	balanced microphone, phantom powered, or balanced low level line
Input 6	low level line or RIAA phono

Alternatively, the balanced inputs may be used with unbalanced signals if required.

Input connections and selection of cables

It is essential that input connections are made carefully, using appropriate screened cable, soldered to the DIN connector plugs supplied, and using the appropriate terminal numbers indicated in the “Signal Connection” drawing at the end of this manual. Unscreened “telephone” type cables are NOT suitable. Either twin conductor, or single conductor types may be used depending upon the application. For long fixed cable runs, a cable with a conventionally braided outer shield is preferable to a lap-screened type. A conductive plastic shield type is ideal for cables which will be subject to constant flexing such as those connected directly to microphones. For guidance as to the installation and routing of input cables - especially microphone cables - please refer to section - INSTALLATION. Failure to meet these requirements will result in inferior performance, and at worst, damage to the amplifier.
It is not possible in this manual to be specific about the exact types of input cable for use in any particular amplification system, as many practical factors will need to be taken into account. However, as a guide, we would recommend the following:

Balanced microphone lines should be wired in twin, twisted core, screened cable with a conductor size of at least 0.22sq.mm., and preferably 0.5sq.mm. This is equally valid for dynamic or phantom-powered microphones.
Paging microphone lines will need an extra two conductors to operate the priority circuit of the amplifier. These need not be screened. For short runs, (up to 2 mtrs), paging microphones may be connected using 4-core overall screened cable, and for longer runs, (up to 10 mtrs), 4-core individually screened cable. If it is necessary to run a cable over say 10 mtrs, then there may be some performance advantage in using a separate twin-twisted screened cable for the audio, and a separate twin unscreened cable for the priority operate cores.
Line level cables, such as those between a tape recorder and the amplifier, which may be up to a few metres in length are less critical and may be run using lap-screened, single or twin cable with conductors of 7/0.1mm or 7./0.2mm.

Input control removal

Each of the six input level controls and the treble and bass controls and master level control and associated spindles may be removed, by pulling, to prevent unauthorised tampering. Blanking plugs are provided. At any time in the future, the situation may be reversed, but care should be exercised in correctly locating the spindle splines.

Input priorities

A facility is provided whereby input No.1 and input No.2 take priority over the other inputs. When the priority circuit of input No.2 is operated for example, inputs 3-4-5-6 are muted. This is particularly important for a paging system where background music may, for example, be playing via channel 5. Operation of the microphone button will automatically mute the music whilst the paging announcement is made. Input No.1 operates in a similar manner though note that input No.1 priority will mute input No.2 as well as 3-4-5-6. This is known as a ladder priority sequence. In both cases, the priority circuit is operated by making a contact between pins 4 and 5 of the corresponding DIN input plug. This would normally be done by the microphone “press-to-talk” button via the microphone lead. Inputs 1 and 2 are normally active (live), so the microphone “press-to-talk” button will need to be wired such that the audio output from the microphone is muted until the button is operated. The Mustang DM/1 microphone has been designed with this facility in mind. Operating the priority circuit will normally trigger the chime generator circuit.

Chimes

A chime generator circuit is fitted to the amplifier which is triggered by the operation of either of the priority input channels (see above). This would be used as a pre-announcement chime in conjunction with a microphone used with input 1 or 2. The chime volume level is independent of any of the input level controls, and is set by a small pre-settable adjustment accessible from within the amplifier. It is located at the centre of the bottom of the front PCB.
The chime facility may be switched off by an internal ‘jumper’ link switch if required: Remove the AC power and case top panel to gain access to the front PCB. Locate and identify the switch at the top of the PCB and between the No.1 and No. 2 input level controls. The top two pins of the three pin assembly will be bridged by the plastic jumper link. To cancel the chime, pull off the jumper and re-position it on the lower two pins. This change does not effect the operation of the priority muting circuits or the DC current sink.

Phantom powering of microphones

Certain professional microphones require a small DC current to power a pre-amplifier within the microphone housing. The technique normally adopted is known as phantom powering, whereby both of the two conductors of the standard two core microphone cable carry a DC voltage generated in the amplifier, as well as the normal audio signal. The DC circuit is completed by the screening shield of the cable. Either conventional dynamic microphones or phantom powered microphones may be used with the Maestro amplifiers without any preparation. No damage will be caused to dynamic microphones but if this facility is not required, it may be disabled by repositioning the plastic jumper link located on a 3-pin assembly on the rear PCB. This assembly may be identified as the one nearest to the power output PCB. Relocate the jumper to the top two pins to disable the phantom powering. The phantom powering voltage is +12 Volts and is extremely well stabilised.

Channel 1 & 2 bass-cut option

For paging microphone applications, it is usually advantageous to introduce a small amount of attenuation of the bass frequencies - bass cut - for increased clarity. The Maestro amplifiers leave the factory with all microphone input channels amplifying the full frequency range. Bass cut is introduced by moving the plastic jumper links on the 3 pin assemblies at the top of the rear circuit board containing the input sockets. These links are fitted to both input No.1 and input No.2. To introduce bass cut, reposition the corresponding jumper on the pins positioned towards the centre of the PCB

Setting the input channel sensitivities

The Maestro range is designed to be applicable to a wide variety of amplification situations. The level of the sound to be amplified may vary enormously with consequent need for very different control settings. In a typical sound re-inforcement church installation, for example, where the speakers may stand well back from the microphone, the input level controls will be set perhaps mid-position, (with the master at its normal setting of 8-9). But in a stage sound installation where the microphones may be held close to the mouth, the input level control settings could be as low as positions 1 to 2. It is not appropriate to reduce the Master Level control setting too far as this may give rise to distortion on signal peaks. The Maestro 125 and Maestro 60 are fitted with input channel attenuator pads to resolve this problem, by de-sensitising the channel, effectively spreading out the input control settings and easing their adjustment. A pad is fitted to each of inputs 1 to 5 and may be set individually by internal ‘jumper link’ switches. The amplifier will be set for maximum sensitivity on leaving the factory. To change the setting, remove the top cover of the case after first disconnecting the AC supply. The five switches are located on the front PCB directly above the input level controls, and take the form of an assembly of three pins with a plastic jumper link fitted across the left-hand two pins (furthest from the AC power switch). To change the setting to lower the sensitivity, pull off the jumper, and re-position it across the right-hand two pins.

Connection of record deck - magnetic phono

Input channel 6 has been designed with a selectable dual function. Either to accommodate a magnetic phono pick-up, providing the necessary sensitivity and RIAA tone equalisation, or to accommodate a low level line input. The latter is the factory setting. To enable the RIAA equalisation, it is necessary to relocate a plastic jumper link on a 3-pin assembly on the rear PCB. This assembly can be identified towards the centre of the PCB. Relocate the jumper on the two pins nearest the centre of the PCB.

LOUDSPEAKER OUTPUT

The output circuitry of the Maestro amplifiers is designed to be used with all internationally recognised loudspeakers, operating at low impedance or 100 Volt or 70V or 50 Volt line level. The use of 100/70/50 Volt line enables a greater number of loudspeakers to be connected accurately and at differing powers if required, than would be possible with low impedance units. There is no limit to the number of 100/70/50 Volt line loudspeakers that may be connected but the total collective consumption should not exceed the amplifier power output rating.

Typical loudspeaker arrangements

The following are acceptable examples of loudspeaker loading arrangements for a Maestro 125:

A 250 x 1/2 Watt 100 Volt line speakers = 125 Watts total load to the amplifier

B 125 x 1 Watt 100 Volt line speakers = 125 Watts total load to the amplifier

C 5 x 25 Watt 100 Volt line speakers = 125 Watts total load to the amplifier

D 50 x 2 Watt 100 Volt line speakers = 100 Watts total load to the amplifier, and therefore 25 Watts spare capacity for future expansion

E 3 x 25 Watt, and 50 x 1 Watt 100 Volt line speakers = 125 Watts total load to the amplifier

F 2 x 30 Watt, and 10 x 4 Watt 100 Volt line speakers = 100 Watts total load and therefore 25 Watts spare capacity for future expansion

G 4 x 16 ohm speakers (rated at at least 35 Watts each) connected in parallel across the 4 ohm output terminals

H 2 x 8 ohm speakers (rated at at least 65 Watts each) connected in parallel across the 4 ohm output terminals

J 1 x 4 ohm speaker (rated at at least 125 Watts)

100 Volt line loudspeakers use a transformer which can usually be 'tapped' at various Wattages so that each loudspeaker may be adjusted individually to provide the sound level required. All the loudspeakers should be wired across the corresponding output terminals at the rear of the amplifier. Do not attempt to combine a mixture of 100V, 70V, and 50V loudspeakers as serious damage may result to the amplifier.
The '0V' terminal is permanently internally connected to the amplifier casing via the circuitry, and is the centre-tap for the 100V line connections only. 70V and 50V connections are not centre-tapped.
See the drawing "Typical loudspeaker connections" at the rear of this manual for examples of connection arrangements.

Loudspeaker cables

Use of an appropriate cable for the connection of loudspeakers to the amplifier will ensure that a minimum amount of audio power is lost during transmission to the loudspeaker network. The loss will depend upon several factors - loudspeaker loadings, size of cable conductor, length of cable, etc.
As a general rule, for any particular loudspeaker system, the longer and the thinner the cable, the greater will be the loss. We therefore recommend, that the system is planned such that the amplifier is as near as possible to the loudspeakers, especially with low impedance loudspeakers, and that the cable used is as large as practicable.
Whilst it is not possible to be specific about the precise cable to be used in any particular system, we would suggest as follows:

A for 100V or 70V line systems, with loudspeakers located up to 50 mtrs, twin conductors of 0.75sq.mm cross-sectional area.

B for 50V line systems with loudspeakers located up to 50 mtrs, twin conductors of 1.0 sq.mm cross-sectional area.

C for 20V line or 4 ohm systems, twin conductors of 1.0 sq.mm cross sectional area and the loudspeakers should be no more than 25 mtrs from the amplifier.

Either solid or flexible conductor cables may be used, or a combination of both. It would be appropriate for a heavy duty cable to be used between the amplifier location and the general loudspeaker location, and for the subsequent loudspeakers of the network to be interconnected with thinner cable.

TAPE RECORDING FACILITIES

A tape recording/playback socket is a standard feature of the Maestro 125 and Maestro 60. Users may conveniently connect, by means of one standard 5 pin DIN connection lead, most standard domestic or professional tape decks. Operate the tape recorder at any time to record the amplified program. As supplied, the amplifier treble & bass controls will be in circuit for recording purposes, though this may be changed - see section below. The recorder may be played back through the amplifier at any time using input No.6 level control to adjust the volume. Stereo signals are electronically mixed to mono within the amplifier.
Alternatively, this playback connection may be used to amplify any suitable input signal - from a tuner for example - and similarly the record output signal may be used to drive other amplification systems. The signal levels and impedances will match most professional equipment.

Record/playback connections

A standard 5 pin 180 degree line plug should be connected as follows:

Pin 1 Record signal from amplifier to tape deck
Pin 4 Record signal from amplifier to tape deck
Pin 2 Cable braid/screening
Pin 3 Playback signal from tape deck to amplifier
Pin 5 Playback signal from tape deck to amplifier

Your dealer will be able to make up or supply a lead fitted with suitable connectors.
Please note that certain models of domestic recorder present a short circuit to the recording terminals during playback. This will cause a reduction in sensitivity of the Maestro 125 & Maestro 60.

Selection of recording take-off point

The recording signal is normally sampled within the amplifier signal path at a point *following* the treble and bass tone control circuits. There are two alternative sampling points, selectable by an internal 'jumper' switch. It may be set for recording from a point *before* those circuits, or from a point *following* the treble and bass circuits and *following* the master level control. Remove AC power from the amplifier by disconnecting. Remove the top cover and identify on the front PCB a small assembly of six pins with a plastic 'jumper' link just above the master level control. As supplied the central two pins will be linked by the jumper. Reset this switch by pulling the jumper off and re-positioning it on the two pins furthest from the power switch to change the sampling point to *before* the treble and bass controls. Conversely, the two pins nearest the power switch are for sampling after treble-bass-master controls.

DC SINK OUTPUT

This feature is rarely found on general purpose amplifiers but is useful in microphone paging systems where a number of operations may be required co-incident with the use of the microphone "press-to-talk" button. e.g.

A The introduction of 'page only' 100 Volt loudspeaker circuits by using relays to switch them on only during paging.
B The restoration to full volume of a remote 100 Volt loudspeaker group volume control, such as the Mustang MVC series.
C The powering of lamps at a microphone position, to indicate that the amplifier system is already in use (by another microphone for example)
D The interruption by means of a solenoid/relay of the sound output of another amplification system e.g. Juke box
E The sending of a low-level paging signal to another remote amplification system

The principle of operation is that when the priority circuit of either input channel 1 or 2 is activated, the output terminal marked 'DC SINK' becomes a 0 Volt point. This is used to complete a simple external circuit comprising relays or lamps etc., connected to the adjacent '+24V DC' terminal. Care should be exercised when considering the use of this circuit not to exceed the ratings of either the DC sink or the +24 Volt auxiliary supply. Refer to the amplifier specification for details.
The priority circuitry described above normally operates simultaneously with the chime generator. If the chime circuit is switched off by the internal jumper link switch (see section - CHIMES), the priority facility and DC current sink are not effected.

DC AUXILIARY OUTPUT

A DC supply of +24 Volts is available at the '+24V DC' output terminal for use either with the DC sink facility (see above) or for powering external low-level signal circuitry. In the latter case, a 0 Volt connection is also available at the adjacent terminal. The output is stabilised and smoothed, but of limited current capacity. Refer to the amplifier specification for details.

SLAVE AMPLIFIER FACILITIES

The Maestro 125 or 60 amplifiers may be used as slave amplifiers themselves by utilising a suitable input channel (or the tape playback connection), or they may be used to derive a suitable low level drive signal for use with another slave amplifier. In the latter case, refer to the above section "TAPE RECORDING FACILITIES" for details and connections. The output level or the 'recording output' is nominally 775mV with a source impedance of 600 ohms and this is usually known as 0dB (10k ohms source impedance if the recording selector jumper is set to 'post-master' source). All professional amplification equipment is designed to accommodate signals to this specification.

INSTALLATION

No two installations are identical. We recommend that all aspects of installation should be carried out by a competent engineer or dealer who will have the experience to enable him to recognise potential trouble spots, and the symptoms of existing ones. He will be able to advise on the selection of loudspeakers and their locations for best results. The use of a dealer will also provide the user of the system with a contact should a problem occur in the future.

Location

The installation environment for a Maestro amplifier is not critical but in general we would recommend a location that will:-

avoid dampness or heavy vibration
prevent unauthorised adjustment
prevent heat build-up around the amplifier casing or heatsink
separate microphone cables form loudspeaker cables
separate microphone cables from mains cables
prevent microphone cables passing strong magnetic fields
avoid long microphone leads - over 50 Metres
avoid long, low impedance loudspeaker leads - over 50 Metres

When one or more Maestro amplifiers are fitted into a 19" cubicle, we recommend that the cubicle is ventilated to assist heat dissipation.

Installation checklist

During the commissioning of the amplifier, various options are available to the engineer to enable him to meet various technical requirements and the operating requirements of the user:

Bass cut on paging microphone
Input channel sensitivity settings via internal switches
Pre-announcement chime level - or on-off via internal switch
Recording source (or slave amplifier output):- pre tone, or post tone
or post tone/post master via internal switch
Disconnection of phantom power for microphones
Input channel 6 for RIAA phono deck, or for level response
Use of priorities for input channels 1 or 2
Removal of front control knobs

AC MAINS POWER INPUT

The standard UK power requirement for the Maestro range is 230V 50Hz though correct operation is possible between 180-250V and 40-60Hz.
No special consideration of the power supply is necessary though it is good safety practice to fit a small AC fuse in the supply to the unit. The amplifier may be switched on/off remotely, by interruption of the supply, without any adverse effects.
Mains power transformers for supply voltages other than the UK standard are available.

FUSES

Fuses are fitted to electronic equipment to isolate damaged circuitry thus preventing further consequent damage, and to avoid excess consumption from the AC supply. The failure of a fuse is far more likely to indicate a problem with the amplifier circuitry or the loudspeaker network rather than a 'weak' fuse.
In the unlikely event of an AC fuse failure (rear panel), it is acceptable to replace the fuse using the correct type, and try to run the amplifier again. If the fuse fails again, refer to your dealer.
In the unlikely event of an internal fuse failing, it is pointless and possibly dangerous to attempt replacement. Consult your dealer.
UNDER NO CIRCUMSTANCES use fuses of a higher value than those specified.

EARTHING & HUM LOOPS

If the amplifier is interconnected with other earthed equipment using unbalanced screened connections, it may be possible to form an earth hum loop. The symptoms would be that of a soft low-level humming audible on the loop programme, which is uneffected by the front control settings.

Such problems may be resolved easily by the use of the balanced line input signal connections. If the interconnection is via the 'Slave' or 'Tape' sockets - which do not feature a balanced input connection - then it should be possible to resolve the hum loop by lifting the internal signal earth of either the Maestro amplifier or the other unit. The signal circuitry within the case is earthed to the chassis via an internal green wire signal earth link which is located between the rear PCB and an adjacent chassis earth lug.

As supplied, the amplifier chassis and casing is electrically earthed via the AC supply lead and connector.

INTERNAL WIRING USING YELLOW/GREEN STRIPED CABLE IS FOR SAFETY EARTHING AND SHOULD NEVER BE DISTURBED.

Where the unit is to be powered from a two-wire AC supply, the rear screw earth terminal must be permanently connected to a suitable earth point.
This terminal is indicated by the symbol -

CASE REMOVAL

To gain access to the inside of the amplifier for any adjustments which may be required, firstly remove the AC mains supply to the unit, then remove the 9 securing screws holding the top cover. The cover is earthed by a push-on tab connector which must always be in place when the AC supply is connected.

19" RACK BRACKET FIXING

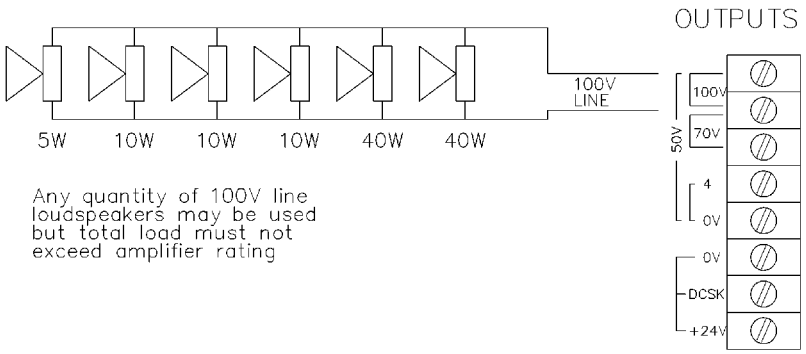
The optional rack bracket kit - BRK.20 - is fitted by first removing the four small plastic covers from the sides of the amplifier. These are a push fit. Then using the screws provided, fasten one angle bracket and one handle to each side of the amplifier. These brackets are not intended to support the full weight of the amplifier, but to fasten it securely into the front of the rack. A pair of chassis runners would normally be required to support the rear of ther unit, enabling the amplifier to be slid out using the front handles.
For rack mounting, it may also be necessary to remove the self-adhesive feet.

FAULT CHECKLIST

We would always recommend calling your dealer if any problem is experienced though an initial check through the following list may enable you to provide him with valuable time saving information.

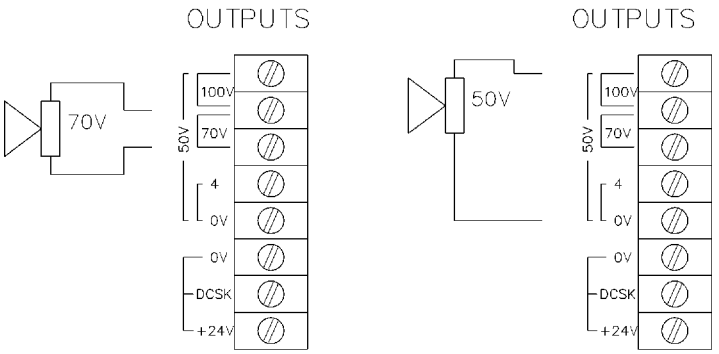
FAULT SYMPTOM	CHECK POINTS
1 Sound off, power lamp off	Mains supply Mains fuse mains switch
2 Sound off, power lamp on	Input level controls rotated Input connections secure Loudspeaker circuitry connected Priority input channel is in use Internal DC fuse fail: consult dealer
3 Sound faint	Input level controls rotated Inappropriate input signal Incorrect input connection Tape record socket partial short Loudspeaker line fault
4 Sound loud & distorted I	Inappropriate input signal nput level control rotated Incorrect loudspeaker connection Loudspeaker line fault Distorted input signal
5 Sound loud & distorted even with input control set low	Inappropriately high input signal for the input in use Distorted input signal Master level control set too low
6 Sound distorted on bass peaks only	Poor quality loudspeakers Bass control set too high
7 Distortion and insufficient volume	System requires more powerful amplifier system 100 Volt loudspeakers set too low Excess loudspeaker load: consult dealer
8 Extreme case temperature	Excess loudspeaker load: consult dealer System working very hard
9 Extreme case heat, LED bargraph indicating without corresponding input signal, possible soft hum/distortion	System oscillation due to proximity of microphone leads to loudspeaker leads: consult dealer Internal circuit fault: Consult dealer Input lead security
10 Persistent hum, input controls set normal	Incorrect input cables used Incorrect input connections Nearby electrical appliance Earthing hum loop: consult dealer
11 Persistent hum, input controls set to off	Earthing hum loop. Consult dealer Nearby electrical appliance
12 Persistent faint buzz	Nearby faulty electrical appliance Interference from lighting dimmer Interference to sensitive input cables
13 Intermittent loud crack	Faulty AC supply connection Input connector security Faulty input signal
14 Howling/ringing	Acoustic feedback due to proximity or angling of microphones relative to loudspeakers
15 Chimes low or off	Priority not being triggered Chime level adjustment incorrect Internal switch set to ‘off’

TYPICAL SINGLE CIRCUIT 100V LINE SYSTEM SUITABLE FOR A MAESTRO 125

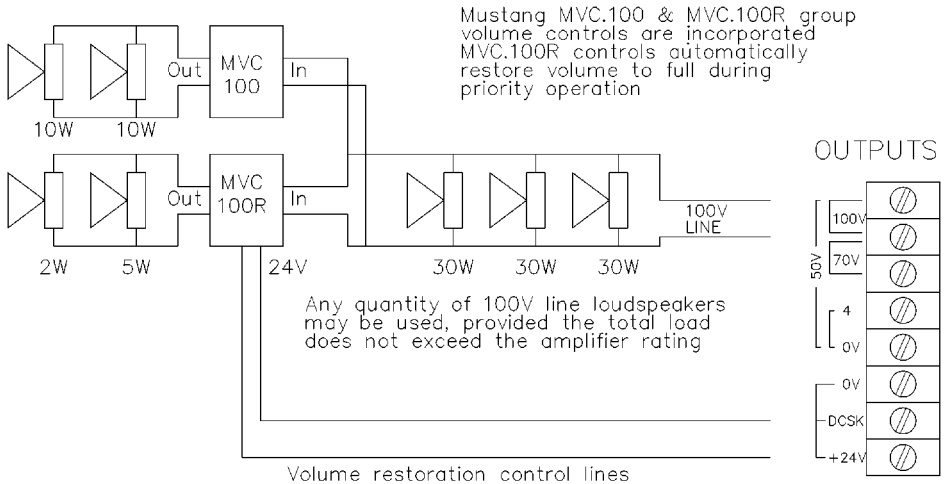


Any quantity of 100V line loudspeakers may be used but total load must not exceed amplifier rating

CONNECTIONS FOR 70V AND 50V LOUDSPEAKER CIRCUITS

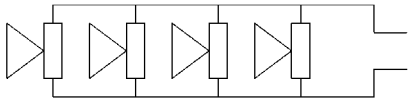


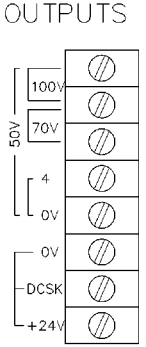
TYPICAL 100V LINE SYSTEM FEATURING ONE MAIN CIRCUIT AND TWO SUB-CIRCUITS SUITABLE FOR A MAESTRO 125



LOW IMPEDANCE LOUDSPEAKER CIRCUITS

Four 16 ohm loudspeakers or two 8 ohm loudspeakers wired in parallel, or one 4 ohm loudspeaker





REV	DESCRIPTION	APPD	DATE

MUSTANG COMMUNICATIONS LTD
SCARBOROUGH ENGLAND YO11 3UT
Phone 01723-582555 Fax 01723-581673
data@mustang.co.uk www.mustang.co.uk

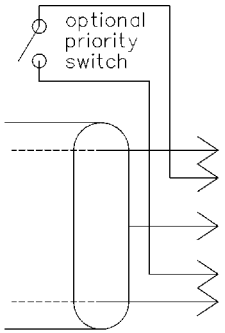
CUSTOMER REF

DRAWING TITLE
MAESTRO 125 & 60
TYPICAL LOUDSPEAKER
CONNECTIONS

DRAWN	TRACED	CHECKED	APPRVD	DATE
MRT				01-08-99

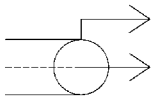
DRAWING No. MAE-M101

BALANCED MICROPHONE CHANNEL 1 & 2

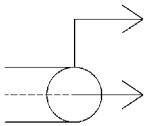


UNBALANCED LINE

(not channels 1 or 2)

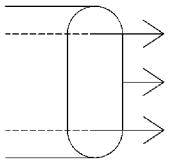


UNBALANCED MICROPHONE

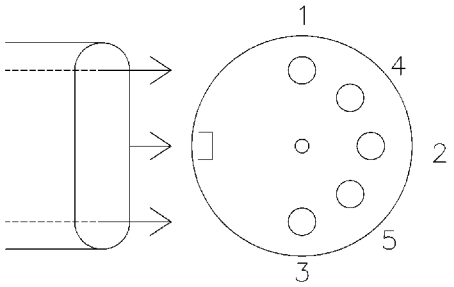


BALANCED LINE

(not channels 1 or 2)



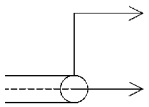
BALANCED MICROPHONE



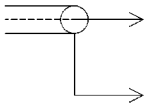
INPUTS 1–5

FOR RIAA MAGNETIC PHONO, OPERATE THE JUMPER SWITC ON THE REAR PCB. CONNECTIONS REMAIN THE SAME.

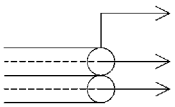
MONO LINE IN



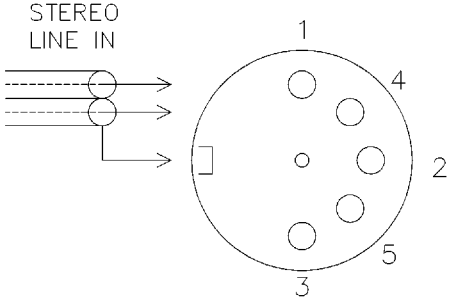
MONO LINE IN



STEREO LINE IN



STEREO LINE IN



INPUT 6

REV	DESCRIPTION	APPD	DATE

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SCARBOROUGH ENGLAND YO11 3UT
Phone 01723-582555 Fax 01723-581673
data@mustang.co.uk www.mustang.co.uk

CUSTOMER REF .

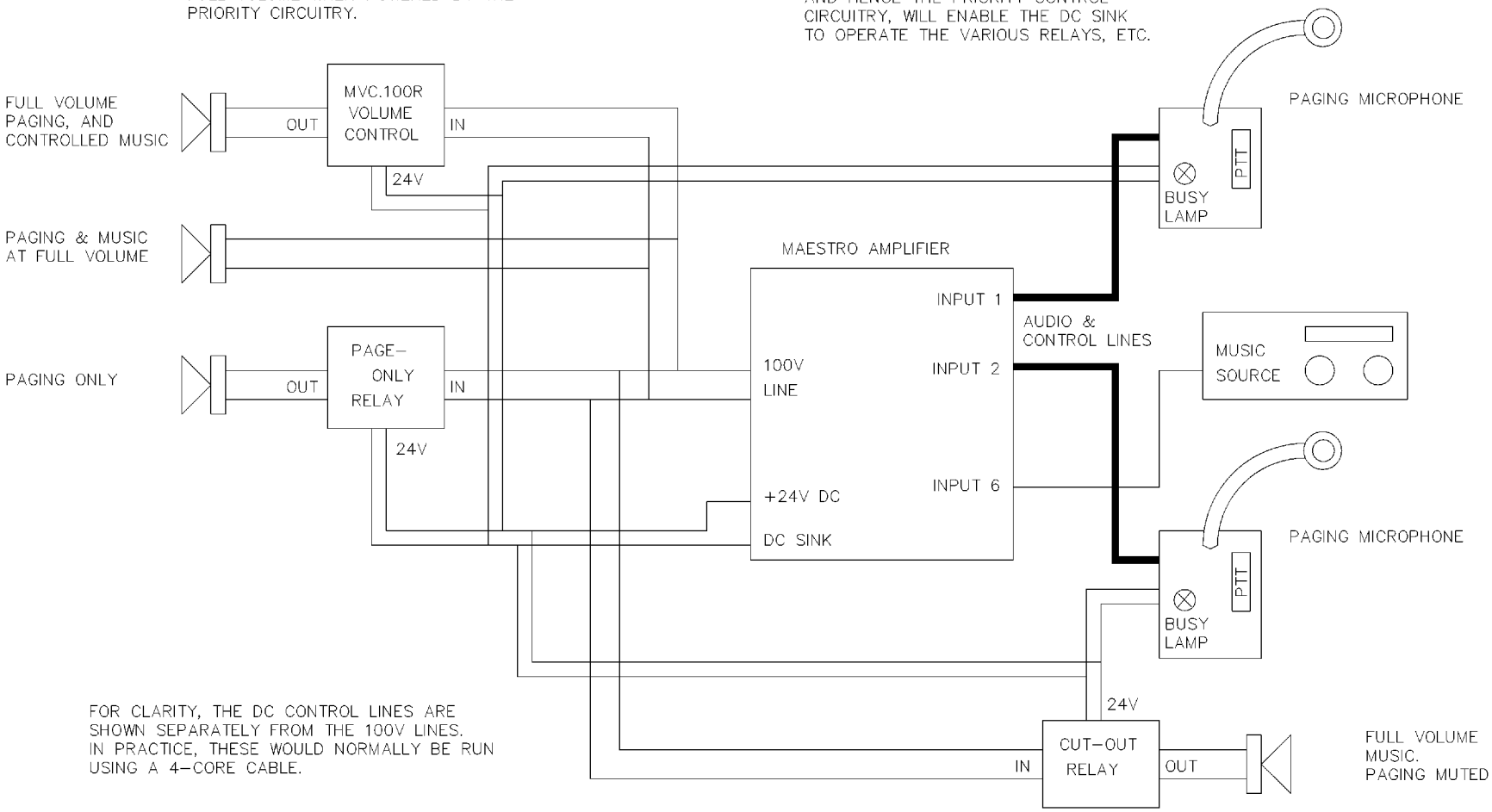
DRAWING TITLE
MAESTRO 125 & 60
TYPICAL INPUT CONNECTIONS

DRAWN	TRACED	CHECKED	APPRVD	DATE
MRT				01-08-99

DRAWING No. MAE-M111

THE MUSTANG MVC.100R WILL CONTROL THE VOLUME OF UP TO 100W LOAD, RESTORING TO FULL VOLUME WHEN POWERED BY THE PRIORITY CIRCUITRY.

OPERATING THE MICROPHONE BUTTON – AND HENCE THE PRIORITY CONTROL CIRCUITRY, WILL ENABLE THE DC SINK TO OPERATE THE VARIOUS RELAYS, ETC.



FOR CLARITY, THE DC CONTROL LINES ARE SHOWN SEPARATELY FROM THE 100V LINES. IN PRACTICE, THESE WOULD NORMALLY BE RUN USING A 4–CORE CABLE.

REV	DESCRIPTION	APPD	DATE

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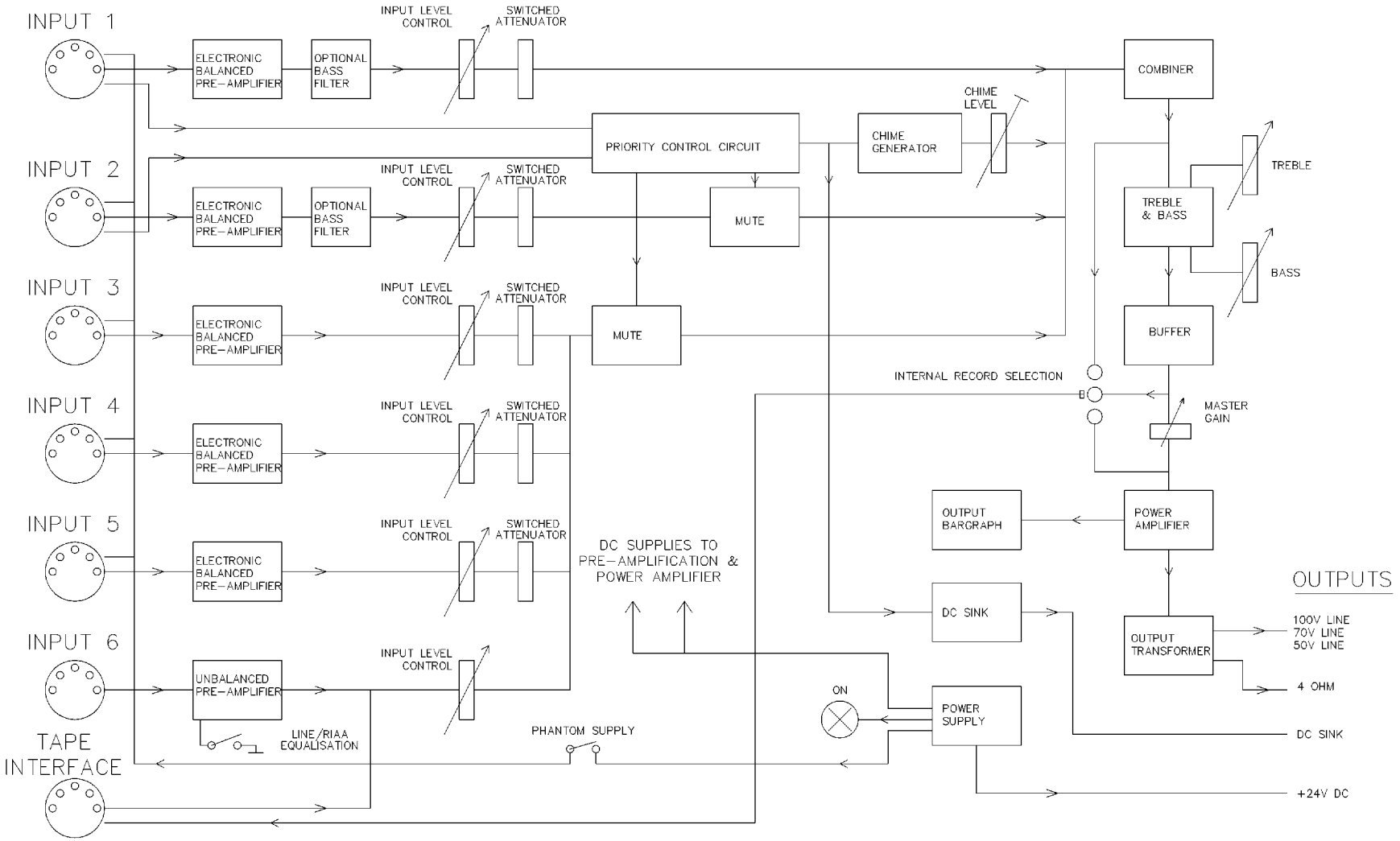
Phone 01723–582555 Fax 01723–581673
data@mustang.co.uk www.mustang.co.uk

CUSTOMER REF

DRAWING TITLE
MAESTRO 125 & 60
TYPICAL DC SINK & AUXILIARY CONNECTIONS

DRAWN	TRACED	CHECKED	APPRVD	DATE
MRT				01–08–99

DRAWING No. MAE–M121



REV	DESCRIPTION	APPD	DATE

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Phone 01723-582555 Fax 01723-581673
data@mustang.co.uk www.mustang.co.uk

CUSTOMER REF

DRAWING TITLE
MAESTRO 125 & 60
BLOCK SCHEMATIC

DRAWN	TRACED	CHECKED	APPRVD	DATE
MRT				01-08-99

DRAWING No. MAE-M131