INSTRUCTION BOOK CONTENTS

M16

The M16 is 16 independent channels of microphone/line preamplifier.
In addition, it is a complete 16 into 2 mixer with individual gain controls and pan controls.

THE MICROPHONE INPUT.

The microphone inputs are via XLR connectors.
The input is designed to suit conventional 200 ohm microphones, but because of its novel circuitry, it is particularly good at dealing with signals from dynamic microphones.

The 'current mode' microphone inputs operate by a current loop principle where cable length problems are eliminated, and cable interference is significantly reduced compared to conventional inputs.

A major factor with this system is that accidental unplugging of a microphone causes the mic amp to go 'silent', so there is no crackle or interference.

The input gain control is calibrated to give an idea of dB gain. When the phantom power push-button is pressed, 48V phantom power is applied to the XLR input.

When using capacitor microphones, plug the microphone into the M16 before switching on phantom power.

THE LINE INPUT.

A front panel switch selects mic or line input.

On the rear of the unit there are TRS ¼ inch jack sockets for balanced line input.
The line input stage, like the microphone amplifier, is transformer balanced and isolated, and is capable of handling a very wide range of input levels. The input is balanced and floating, but may be used for unbalanced inputs with no change in performance.

THE LED LEVEL METER

The horizontal LED level meter shows the peak audio level at the direct output of the channel.
The channel is designed to operate at high level and the top (red) LED shows a level of +12dBu. Note, this is a peak level and so it is normal to operate the channel so that this top LED lights occasionally; it represents a level where there is still 10dB at least in hand.
BUT bear in mind that if several channels are peaking at this level, then the mixer output could be very high.

PHASE REVERSE

Each channel has a phase reverse switch and indicator (yellow) LED. The phase reverse switch operates on both microphone and line input, and operates click free (the phase reverse is achieved electronically, not by hard switching).

HIGH PASS FILTER

The low frequency response of the M16 is extremely wide, going down to 8Hz. In certain circumstances this may cause problems, so a 2nd order filter (12dB per octave) at 75Hz is provided on each channel. A warning LED shows when this filter is in circuit.

INSERT FACILITY

When the channels are being used as a mixer, the individual channel output can be used as a 'SEND' output for an insert.
A separate balanced 'RETURN' socket is on the rear panel of each channel, labeled 'INSERT'. This arrangement gives the ideal facility of fully balanced channel inserts.
The 'INSERT' socket sensitivity is approx. -8dBu for zero level at the main mixer outputs, with the channel faders at 'zero'.

SOLO FACILITY

When the 'SOLO' button is pressed, it activates a relay changeover and routes the selected channel direct to the mixer monitor output, at a level that is similar to the normal line output. This output IS controlled by the channel fader (it is post fader), and it mutes all other channels on the monitor.
The monitored solo output is mono.
A highly visible red LED indicator shows that a solo button is pressed; this is in addition to the individual channel indicator LED.
Activation of 'SOLO' does not affect individual channel output or mixer main output in any way.

MUTE SWITCH.

On each channel there is a 'MUTE' switch which disconnects the channel from the mixer. NOTE: This 'MUTE' control ONLY affects the channel output to the mixer; it does NOT mute the individual channel output.
An LED shows that the channel is muted to the mixer.

PAN CONTROL

The rotary pan control apportions the audio signal between the left and right mixer channels. When the pan control is in the centre, the audio signal is 4dB lower than at either extreme.

CHANNEL FADER

The rotary channel fader affects only the audio level of the channel to the mixer (it does NOT affect the individual channel output).
At about ¾ the way around, the control is marked 'zero'. This corresponds to the normal operating point where zero level in the channel corresponds to zero level at the mixer output.

THE MIXER

Audio signals from the channels are mixed on balanced mixing buses.
The mixer amplifier outputs are accessible on the rear panel as balanced outputs.
Balanced input 'INSERT' jacks are provided so that balanced insert equipment can be used.

MAIN OUTPUTS

The main mixer outputs are at zero level balanced, on XLR connectors.
A separate pair of connectors gives balanced output on ¼ inch TRS jacks.
The main output is not affected by 'solo'.

MONITOR OUTPUTS

The monitor outputs are on ¼ inch TRS jack sockets. The outputs are fully balanced and at the same level (0dB) as the main outputs.
The monitor outputs are interrupted by the 'SOLO' facility.

POWER SUPPLY

The mains power supply can operate from either 120VAC or 230VAC. The changeover switch is INSIDE the box.
CAUTION! Do not operate the power supply from the wrong input mains voltage or the supply and possibly the M16 will be seriously damaged.
The supply provides stabilized power of +15volts, -15volts and +48volts.
The length of the power supply cable to the M16 is 1.8 metres and should not be lengthened.

Do not operate the power supply disconnected from the M16.

TECHNICAL SPECIFICATIONS

Number of simultaneous inputs 16
Number of simultaneous outputs 20
MICROPHONE INPUTS transformer balanced, designed FOR 200Ohm source impedance.
Maximum system gain 70dB
LINE INPUTS 20Kohm transformer balanced floating. Maximum system gain 50dB.
Direct channel outputs and mix amp outputs nominal 0dBu 300 ohms balanced. Maximum output +21dBu
Channel insert returns and mix amp insert returns, nominal -8dBu. 20Kohm balanced.
Monitor outputs and main outputs, nominal 0dBu 300 ohms balanced. Maximum output +26dBu.

Amplitude frequency response; microphone, +0 -1dB 8Hz to 15KHz. HF response reduces at approx 3dB per octave to 80KHz.
Line; +0 -1dB 8Hz to 22KHz; HF response reduces at approx 3dB per octave to 100KHz.
Harmonic distortion; less than 0.001% 3rd harmonic, less than 0.003% 2nd harmonic. At all gains and levels up to +18dBu output.
Noise. Equivalent to 127dB below input for mic gains above 50dB. (Current mode microphone input, noise reduces with increased input impedance).
Power consumption 30 watts.
Size, 4U rack mounting plus power supply.
Weight, 5Kg.

OPERATIONS

To operate the M16…..

Place the M16 in a position where it is not close to other equipment that radiates magnetic fields; this includes television monitors and mains transformers.
The M16 input transformers are susceptible to magnetic interference and care should be taken in this respect.
Place the power supply well away from the M16 unit making sure that there is plenty of ventilation around it. The power supply runs warm.

Connect the interconnecting cable to the M16 before turning the power on.

Make sure that input gain controls are turned down before turning on power. Connect inputs and outputs and plug in mains cable NOTE: THERE IS NO POWER ON/OFF SWITCH.

Switch on the M16 a minute or so before using it so that the amplifiers are running optimally. Crackles when moving controls are possible immediately after switch-on.

When using capacitor microphones, plug the microphone into the M16 before switching on phantom power.

A separate chassis ground connection is provided on the rear of the chassis.
It is sometimes necessary to connect this to a suitable ground point.

PROBLEMS.

1) Got no signal. Mic/Line switch?

2) It's noisy (1).
The circuitry is extremely quiet, but the normal output level is high. Make sure that the monitor equipment is suitable for true line level equipment!
3)It's noisy (2).
If the noise is a buzz, and it varies with input gain control, it could be associated with other mains operated gear too close to the M16. Make sure the M16 is well clear of transformers.

REGULATIONS AND SAFETY.

The M16 has been designed and built to conform to all known safety requirements in the world.
Within the European Union the M16 easily meets the requirements for electrostatic and electromagnetic emissions, and conforms to all safety requirements of the European Common Market. the 'CE' symbol on the rear of the unit indicates compliance.
In the United States of America the M16 complies with UL requirements
In that UL approved components are used in the power supply section.

POWER SELECTION

The M16 is fitted with a mains voltage selector for change of input voltage. To gain access to the changeover switch, disconnect from the mains and remove the top of the power supply unit by undoing the 4 screws.
In the '110' position, the unit will operate between 95 and 125V AC.
In the '230' position, the unit will operate between 210 and 240V AC.
The fuse should remain at 500mA for both ranges.

POWER EARTH (GROUND) CONNECTION (AND SIGNAL GROUNDS)

The power supply is NOT connected to mains earth (the mains transformer is double wound and complies with EEC standards of safety).
The Audio ground is not connected to chassis.
The 'screen' of all output terminations is bonded to the chassis.
The 'screen' of line input, individual line output and channel mix input connect together, but are NOT connected to chassis. (They are left floating to avoid possibility of ground loops.)
The screen of the microphone inputs is connected to audio ground in the normal way.
It may be an advantage to connect the ground terminal on the rear of the M16 chassis to a good mains ground point.

WARRANTY.

In the unlikely case of a breakdown, please return the unit in its original packing through the supplier.
The unit will be attended to immediately and returned to your supplier.
If any breakdown occurs (excluding physical mistreatment) within 12 months of purchase no charge will be made.

DECLARATION OF CONFORMITY.

This analogue audio processing equipment conforms to the standards and requirements of the European Economic Community.
The EC Harmonised standards that have been applied are;
a) Electrical equipment (safety) Regulations 1994 (S.I. 1994/3260)
b) Electromagnetic Compatibility Directive (89/336/EEC) incorporating (S.I. 1992/2372)

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