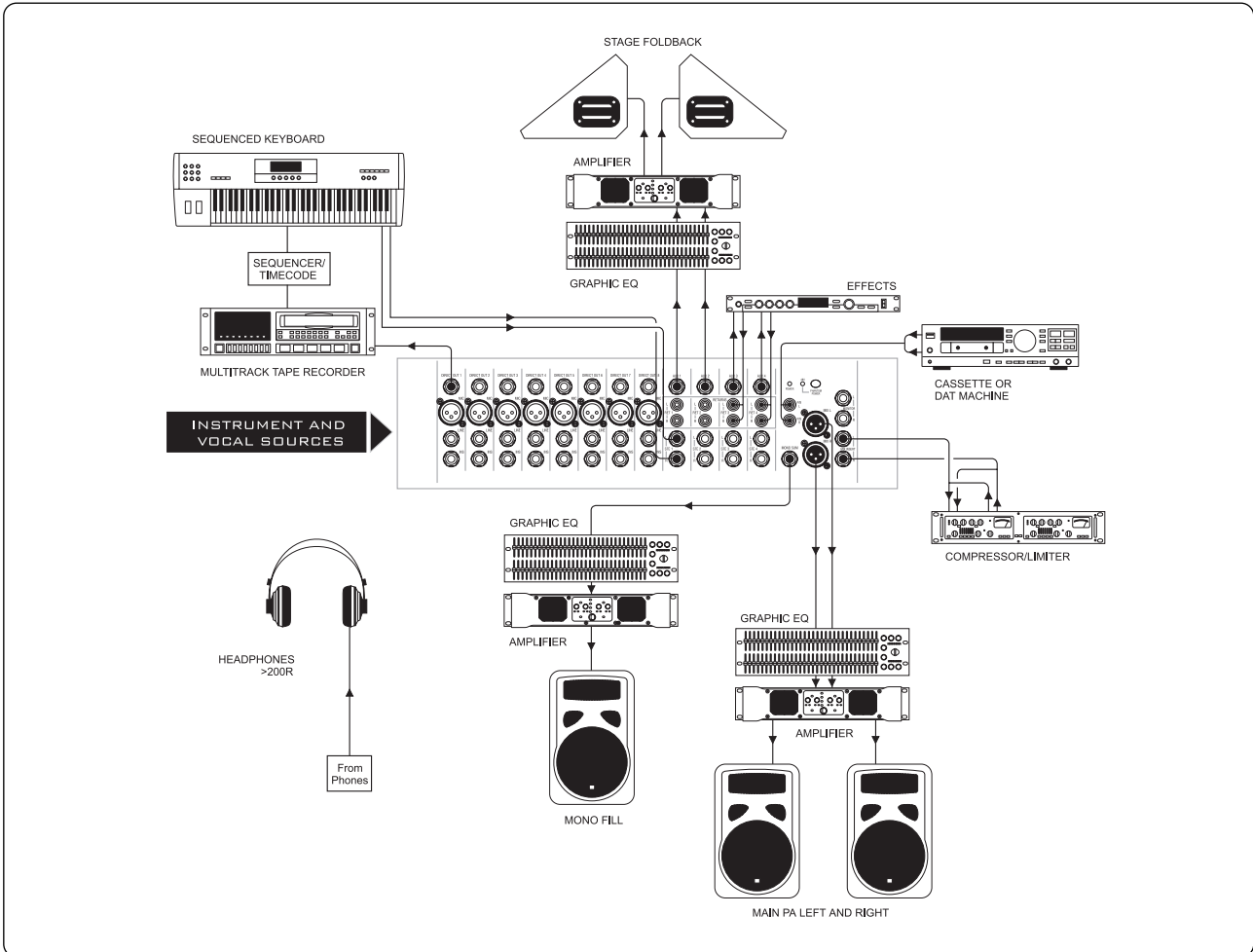
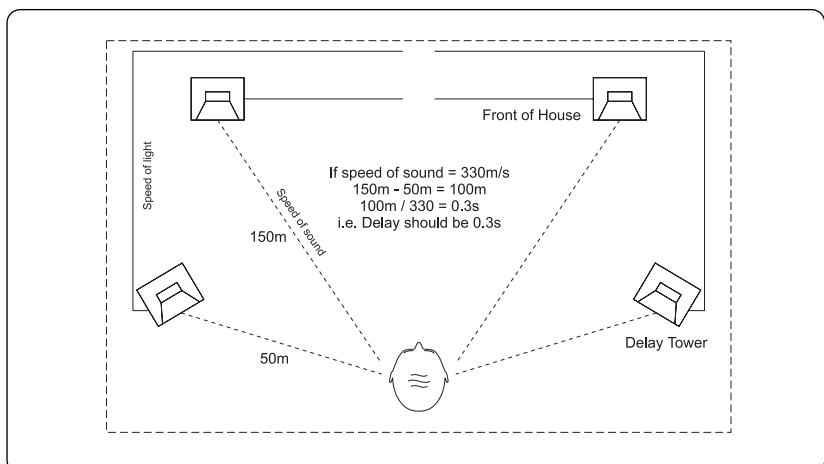


APPLICATION 1 - LIVE SOUND REINFORCEMENT



USING DELAY IN REINFORCEMENT SYSTEMS

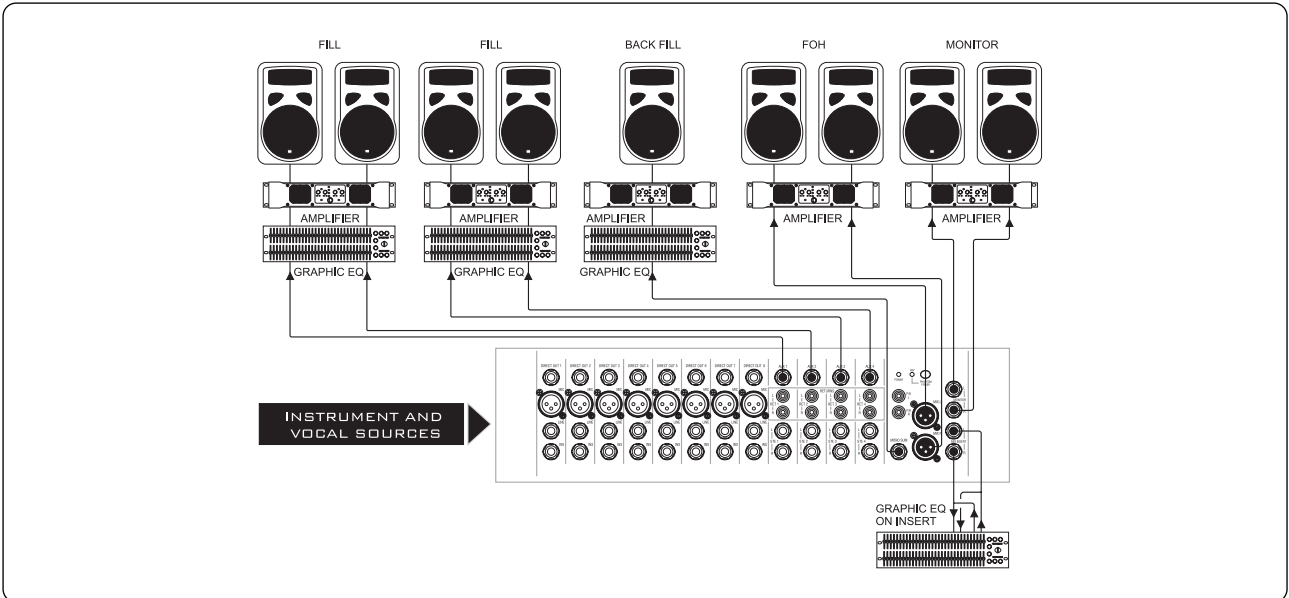
The drawing below illustrates how to calculate delay settings for fill speakers in multiple speaker installations.



USER GUIDE

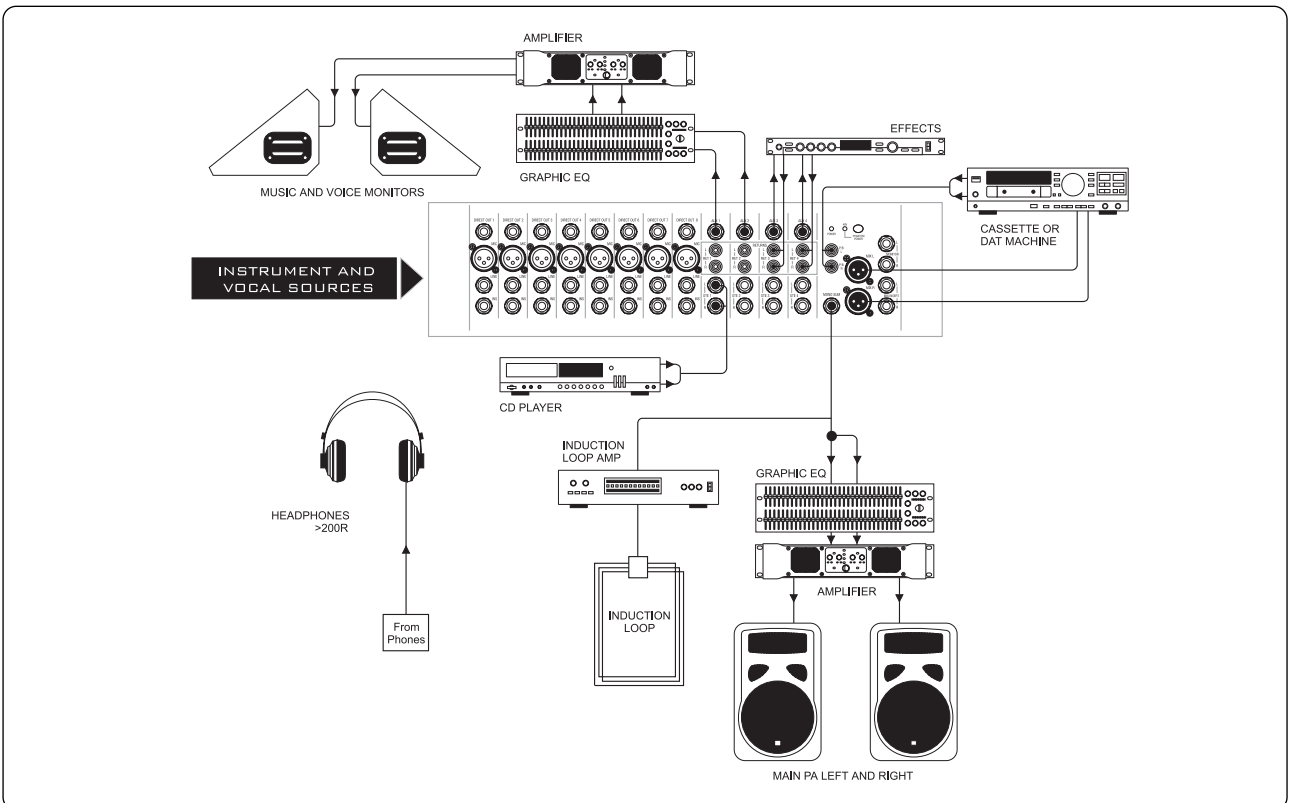
APPLICATION 2 - MULTISPEAKER APPLICATIONS

This configuration demonstrates how multiple speaker configurations can be driven by the Spirit M Range.



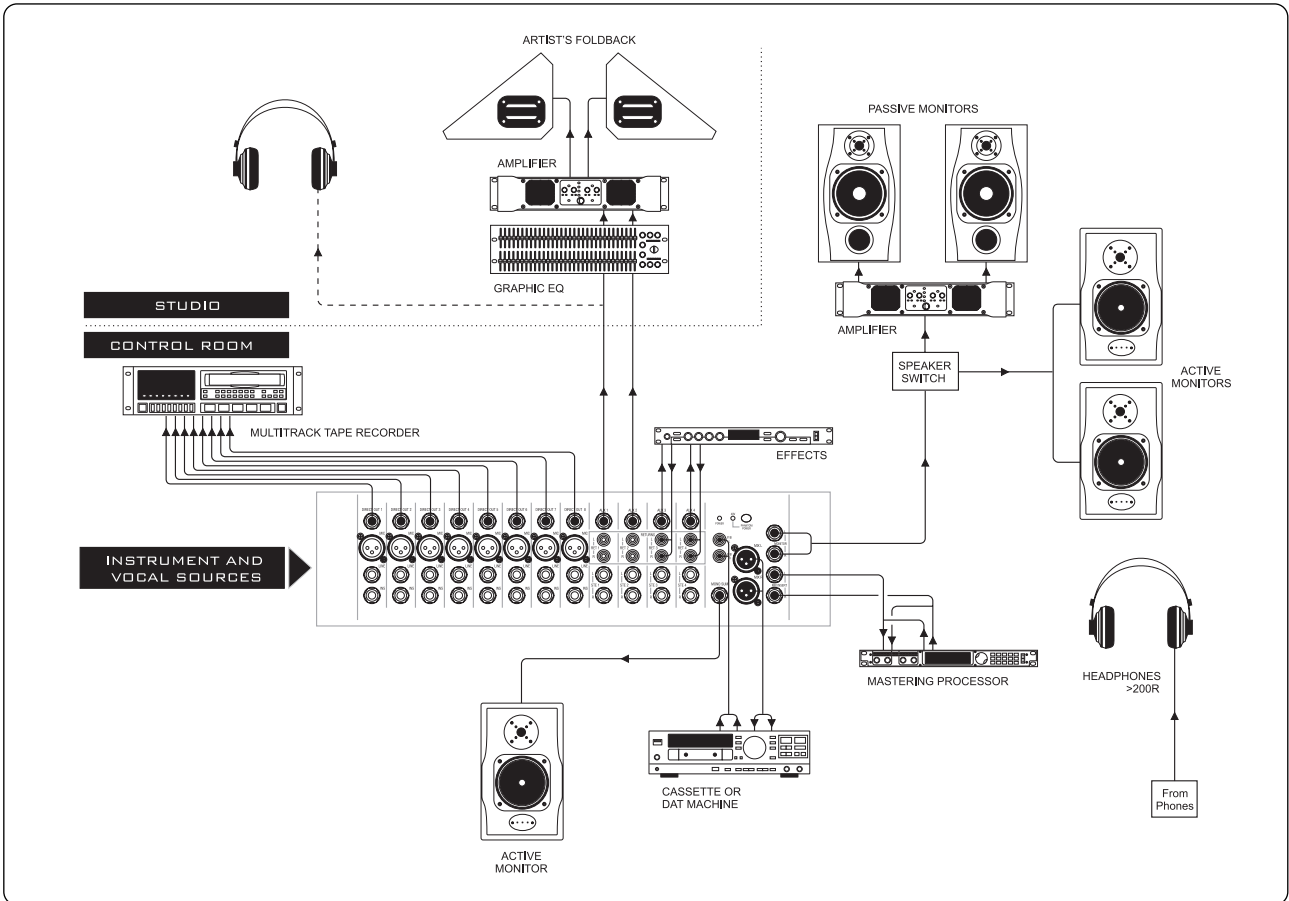
APPLICATION 3 - PLACES OF WORSHIP

This mono configuration uses the Mono output to drive the main speaker system and an induction loop for the hard of hearing. Aux sends are used for monitors and effects and Mix L & R feed a cassette or DAT machine to record the occasion if required.

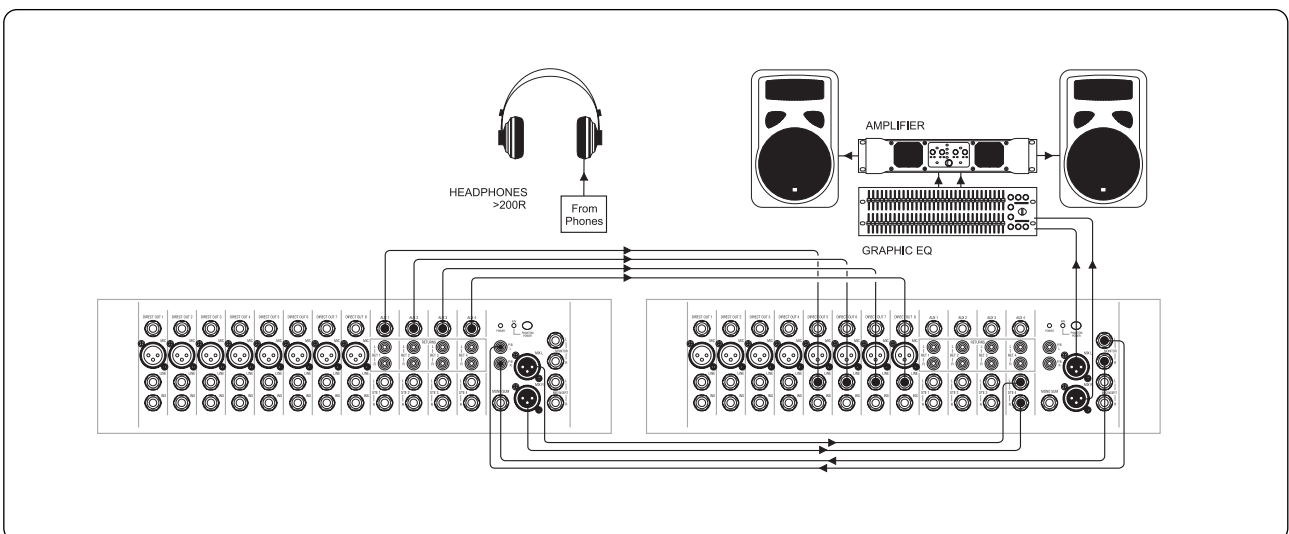


APPLICATION 4 - RECORDING

The direct outputs on channels 1-8 may be used to feed a multitrack recorder as shown. The direct outputs should be set to PRE, so that they are unaffected by fader position. The Mix outputs are used for a preliminary stereo mix on a DAT recorder.



APPLICATION 5 - LINKING TWO SPIRIT M SERIES CONSOLES



USER GUIDE

CARE OF YOUR MIXER



GENERAL PRECAUTIONS

Do Not obstruct any of the ventilation openings.

Avoid storing or using the mixer in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture.

Keep the mixer clean using a soft dry brush, and an occasional wipe with a damp cloth or ethyl alcohol. Do not use any other solvents which may cause damage to paint or plastic parts.

Avoid placing drinks or smoking materials on or near the mixer. Sticky drinks and cigarette ash are frequent causes of damage to faders and switches.

Regular care and inspection will be rewarded by a long life and maximum reliability.

GLOSSARY

AFL (After Fade Listen)	a function that allows the operator to monitor the post-fade signal in a channel independently of the main mix.
auxiliary send	an output from the console comprising a mix of signals from channels and groups derived independently of the main stereo/group mixes. Typically the feeds to the mix are implemented on rotary level controls.
balance	the relative levels of the left and right channels of a stereo signal.
balanced	a method of audio connection which 'balances' the wanted signal between two wires and a screen which carries no signal. Any interference is picked up equally by the two wires, which results in cancellation of the unwanted signal. In this guide, the term can refer to various circuit architectures. Connection details are given in relevant sections.
clipping	the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.
DAT	Digital Audio Tape, a cassette-based digital recording format.
dB (decibel)	a ratio of two voltages or signal levels, expressed by the equation $dB=20\log_{10}(V1/V2)$. Adding the suffix 'u' denotes the ratio is relative to 0.775V RMS.
DI(direct injection)/DI Box	the practice of connecting an electric musical instrument directly to the input of the mixing console, rather than to an amplifier and loudspeaker which is covered by a microphone feeding the console.
direct output	a post fade line level output from the input channel, bypassing the summing amplifiers, typically for sending to individual tape tracks during recording.
equaliser	a device that allows the boosting or cutting of selected bands of frequencies in the signal path.
fader	a linear control providing level adjustment.
feedback	the 'howling' sound caused by bringing a microphone too close to a loudspeaker driven from its amplified signal.
foldback	a feed sent back to the artistes via loudspeakers or headphones to enable them to monitor the sounds they are producing.
frequency response	the variation in gain of a device with frequency.
gain	the amount of amplification in level of the signal.
headroom	the available signal range above the nominal level before clipping occurs.
highpass filter	a filter that rejects low frequencies.
impedance balancing	a technique used on unbalanced outputs to minimise the effect of hum and interference when connecting to external balanced inputs.

insert	a break point in the signal path to allow the connection of external devices, for instance signal processors or other mixers at line level signals. Nominal levels can be anywhere between -10dBu to +6dBu, usually coming from a low impedance source.
pan (pot)	abbreviation of 'panorama': controls levels sent to left and right outputs.
peaking	the point at which a signal rises to its maximum instantaneous level, before falling back down again. It can also describe an equaliser response curve affecting only a band of frequencies, (like on a graphic equaliser), "peaking" at the centre of that band.
peak LED	a visual indication of the signal peaking just before the onset of clipping.
PFL (pre-fade listen)	a function that allows the operator to monitor the pre-fade signal in a channel independently of the main mix.
phase	a term used to describe the relationship of two audio signals. In-phase signals reinforce each other, out-of-phase signals result in cancellation.
polarity	a term used to describe the orientation of the positive and negative poles of an audio connection. Normally connections are made with positive to positive, negative to negative. If this is reversed, the result will be out-of-phase signals (see 'phase' above).
post-fade	the point in the signal path after the monitor or master fader and therefore affected by fader position.
pre-fade	the point in the signal path before the monitor or master fader position and therefore unaffected by the fader position.
rolloff	a fall in gain at the extremes of the frequency response.
shelving	an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.
spill	acoustic interference from other sources.
transient	a momentary rise in the signal level.
unbalanced	a method of audio connection which uses a single wire and the cable screen as the signal return. This method does not provide the noise immunity of a balanced input (see above).
+48V	the phantom power supply, available at the channel mic inputs, for condenser microphones and active DI boxes.

USER GUIDE

TYPICAL SPECIFICATIONS

FOR DIGITAL S/PDIF SPECIFICATIONS SEE P.25

NOISE
Measured 22Hz to 22kHz, unweighted
AUX & MIX O/Ps (8 Channels routed, faders down) <-84 dBu

E.I.N.
Microphone Input
(Maximum Gain, measured 22Hz - 22KHz, unweighted) -128 dBu

CROSSTALK 20Hz - 10kHz 10kHz - 20kHz
Channel mute <90 dB <80 dB
Fader cutoff (rel to 0 mark) <90dB <80dB
Routing isolation <90dB <80dB

FREQUENCY RESPONSE
Mic/Line Input to any output 20Hz to 20kHz ±1dB

T.H.D.
Mic Gain. +30dBu, +20dBu at all outputs @ 1kHz < 0.008%

INPUT & OUTPUT IMPEDANCES
Microphone Input ~2 kΩ
Mono Channel Line Input >40 kΩ
Stereo Input (Stereo Mode) >30 kΩ
Stereo Returns >10 kΩ
Headphones Output ~40 Ω
All other audio outputs 75 Ω

INPUT & OUTPUT LEVELS
Mic Input Maximum Level +12 dBu
Mono Channel Line Input Maximum Level +38 dBu
Insert Point Send / Return Levels +21dBu
Stereo Input Maximum Level +21dBu
Headphones (@200Ω) 150mW
All other audio outputs +21dBu into 10kΩ

FILTER
High Pass 100Hz, 18dB/octave

EQ
HF 12KHz, ±15dB
MF 240Hz - 6KHz, ±15dB
LF 60Hz, ±15dB

DIMENSIONS
M4 (With Sides) **W:** 397 (15.6") x **H:** 119 (4.7") x **D:** 523 (20.6")
M4 (No Sides) **W:** 373 (14.7") x **H:** 119 (4.7") x **D:** 490 (19.3")
M8/12 (With Sides) **W:** 506 (19.9") x **H:** 119 (4.7") x **D:** 523 (20.6")
M8/12 (No Sides, rackmount) **W:** 483 (19.0") x **H:** 119 (4.7") x **D:** 490 (19.3")

WEIGHT
M4 6.75Kg (14.8lbs)
M8 8.25Kg (18.1lbs)
M12 8.55Kg (18.8lbs)

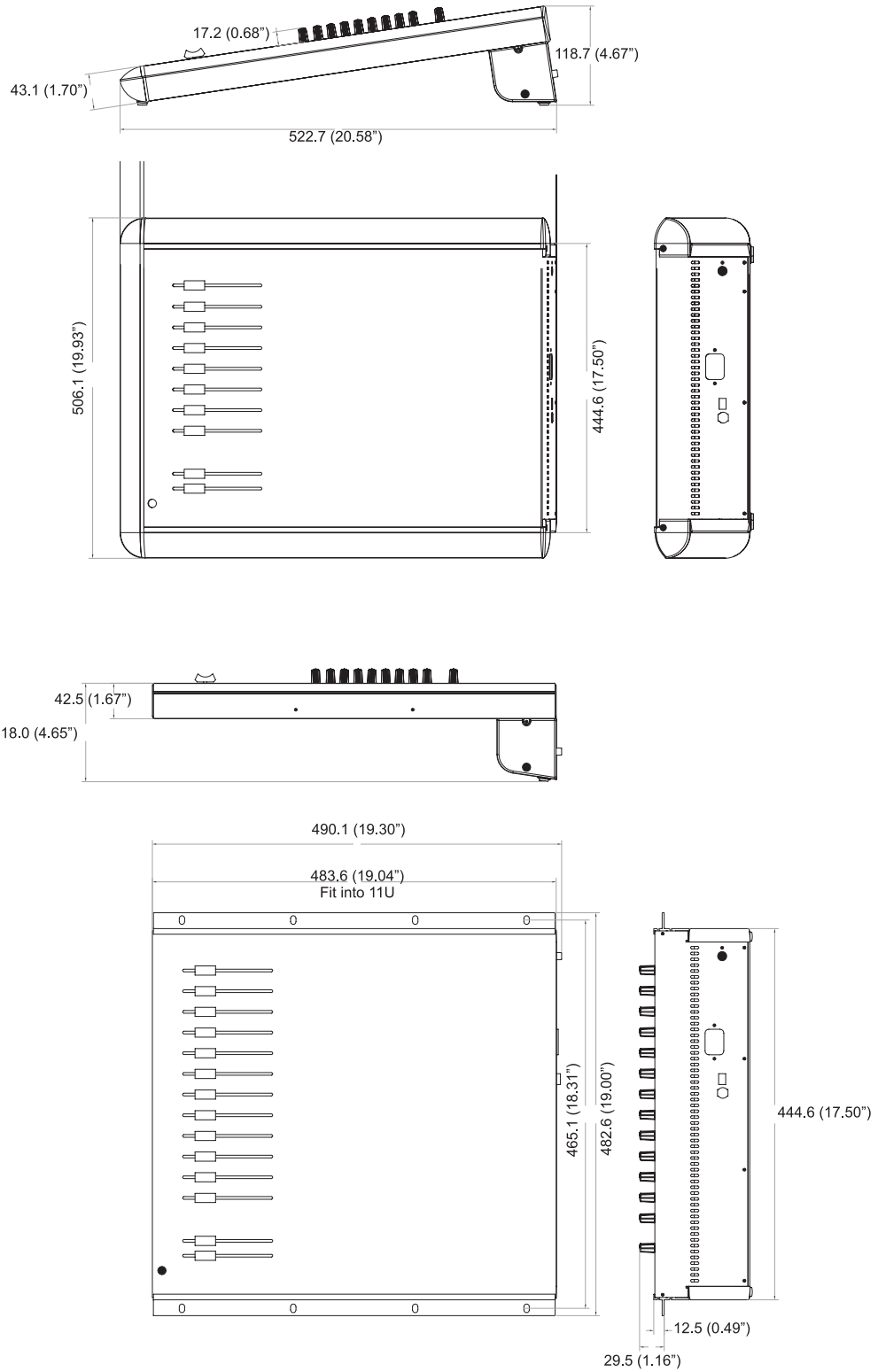
INRUSH CURRENT (M SERIES FAMILY)
Worst Case: M12 @ 115V AC 4 Amps Peak

AVERAGE POWER CONSUMPTION (QUIESCENT)
M4 19.51 Watts
M8 24.48 Watts
M12 30.00 Watts

MIN / MAX OPERATING TEMPERATURE (M SERIES FAMILY)
Centigrade / Fahrenheit 0°C - 50°C / 32°F - 122°F

M8 & M12 DIMENSIONS

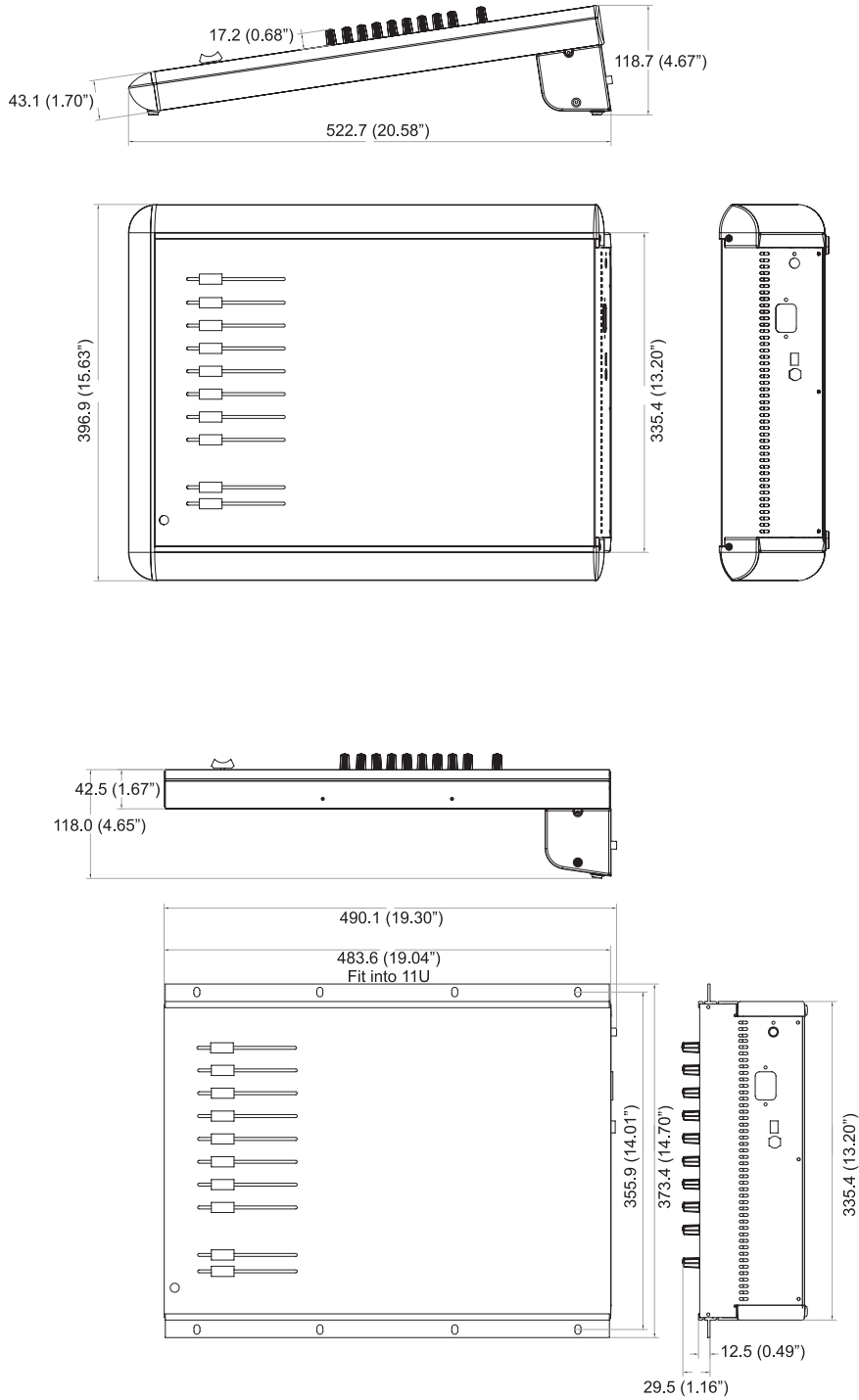
All dimensions are in millimetres (Inches shown in brackets).



USER GUIDE

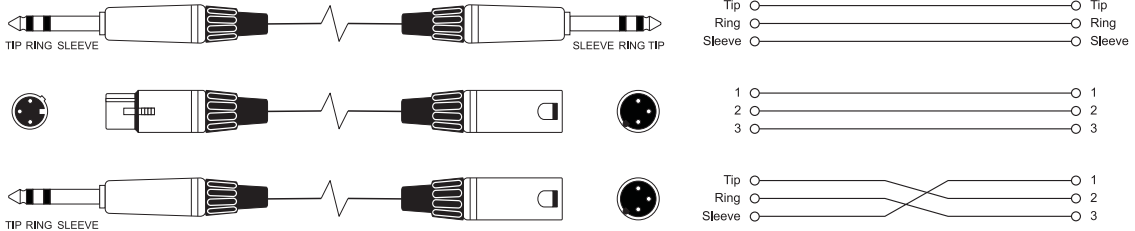
M4 DIMENSIONS

All dimensions are in millimetres (Inches shown in brackets).

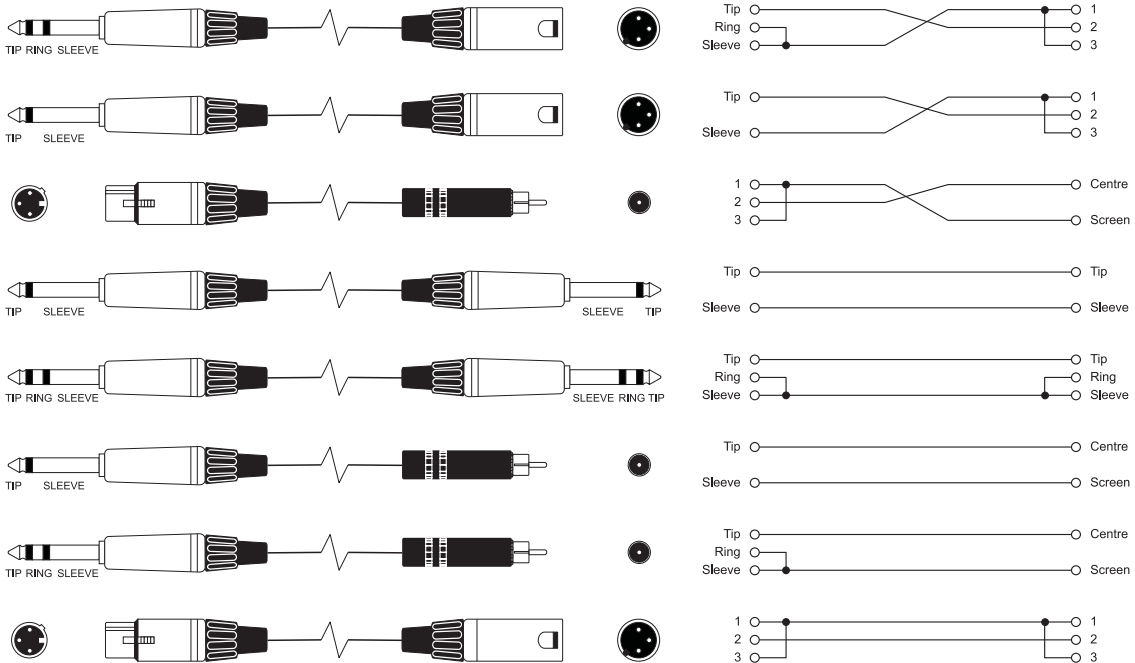


APPENDIX 1 - TYPICAL CONNECTING LEADS

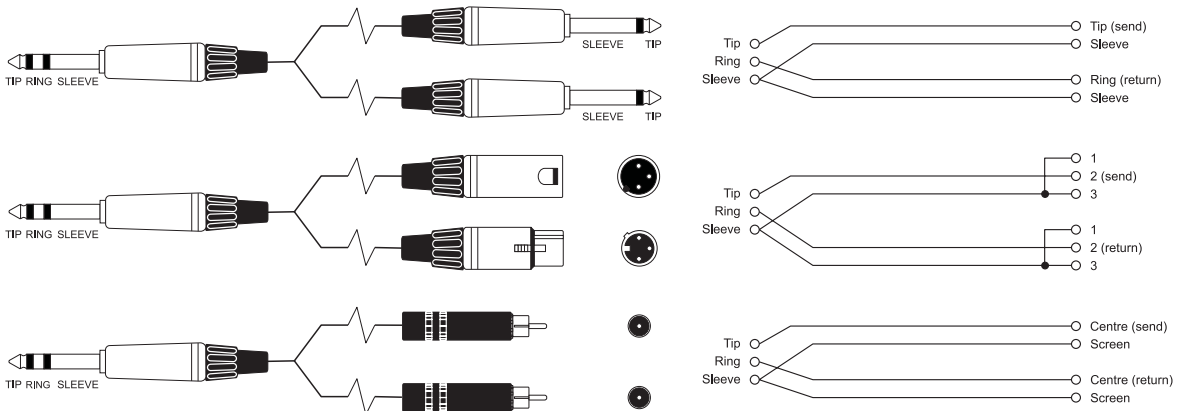
Balanced - Line Inputs, Mix L & R Outputs, Stereo Inputs, Auxiliary Outputs



Unbalanced - Direct Output, Monitor Output, Stereo Return Inputs

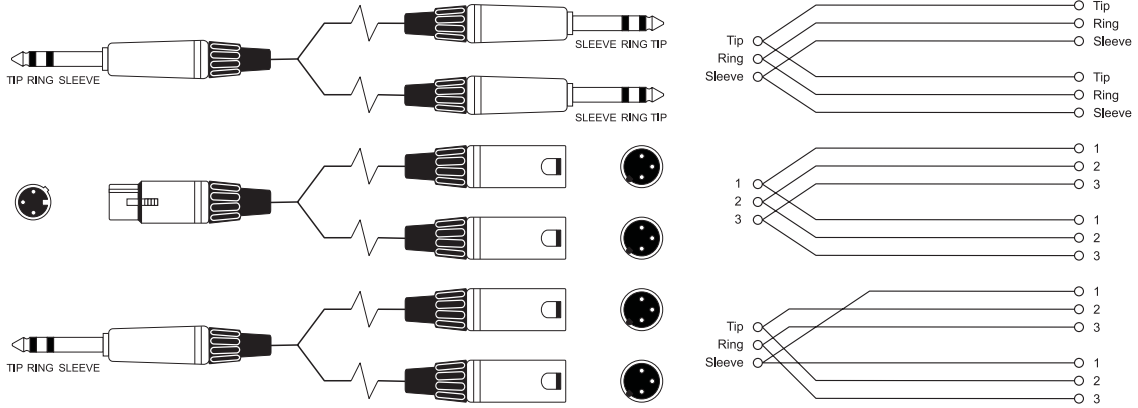


Insert Cables - Mono Inserts

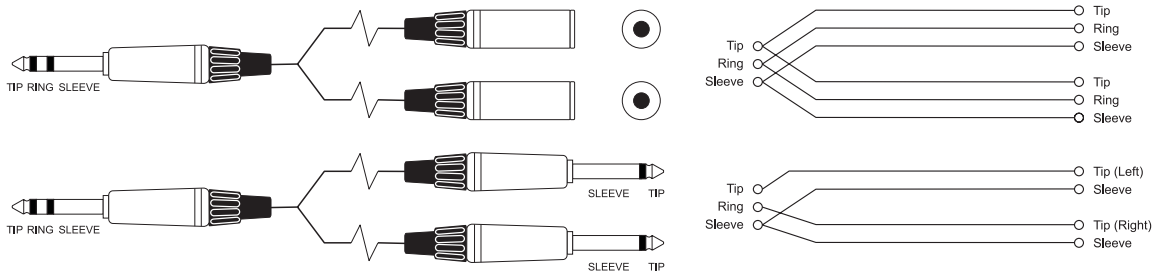


USER GUIDE

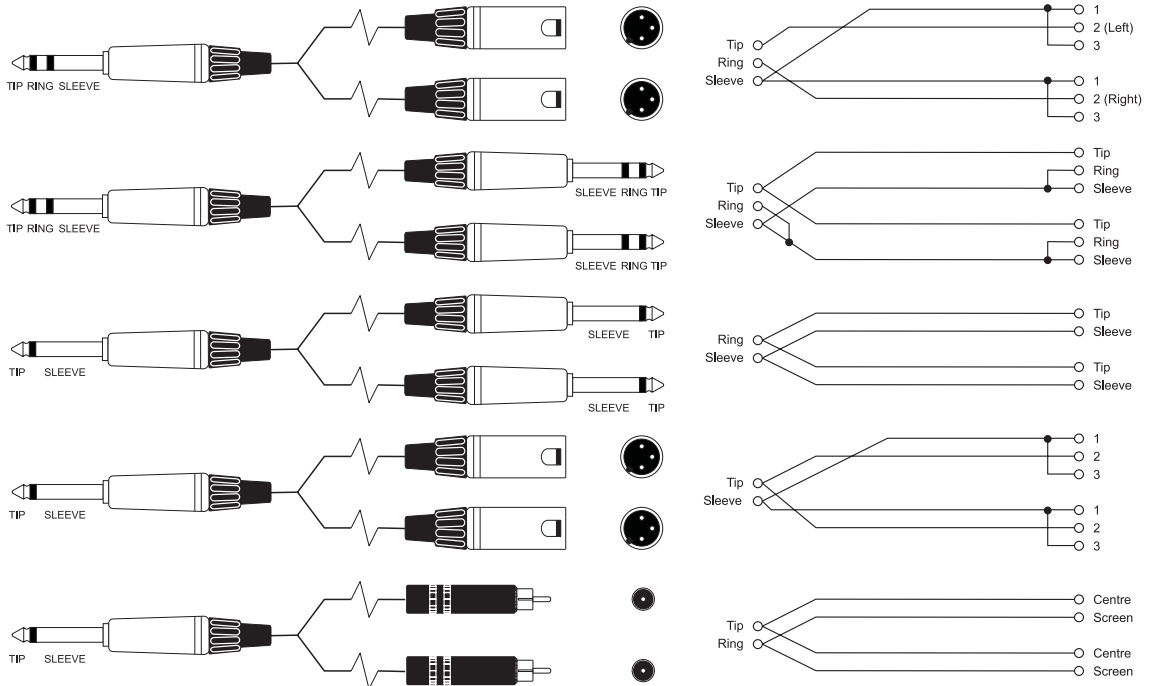
'Y' Cables (Balanced) Where used ... Aux, Mix outputs



Headphone Separator Note: for every doubling of headphones the load impedance is halved. Do not go below 200R.



'Y' Cables (Unbalanced)



USER GUIDE