Mach

Installation Series

user manual

revision b

M72i
M82i
M125i
M127i
M129i
M154i
M156i
M1502 mk 2

DESIGN CONCEPT

The Mach Installation Series is designed especially for fixed installations in discos, theatres, bars etc. The Installation Series consists of two different speaker types.

Medium throw top-boxes

The M127i, M129i, M154i & M156i are designed for placement up to 20 meters (65 feet) from the listener. Horn dispersion of 90° by 40° ensures good coverage in the horizontal plane while reducing distorting reflections from floor and ceiling in the vertical plane.

Near field top-boxes

The M72i, M82i & M125i are designed for placement up to 10 meters (32 feet) from the listener. Their wide 120° by 120° dispersion allows them to be flown on either axis and makes them ideal near field monitors in venues with low ceiling height.

Top-box frequency range

All top-boxes are tuned to work from the upper sub-bass and up. For ideal performance they must be supported by a subwoofer.

The idea behind this design is that in fixed installations, the speakers are typically flown. Flying provides less support for the audio energy below 100 Hz, reducing the sub-bass output. Instead of forcing the speaker to perform where the acoustic environment is working against it, our top-boxes are designed with a roll off in the sub-bass. The advantage compared to full-range boxes is smaller size, higher sensitivity and power handling.

CONNECTIONS

The top-boxes in the Installation Series come standard with a passive crossover. In passive mode they are connected with the 1+, 1- pins on the Speakon® terminal.

For correct phase, verify that + (red) on the amplifier is connected to 1+ on the Speakon® terminal. Likewise, - (black) on the amplifier must be connected to 1-.

When driven active, the woofers are connected to the 1+, 1- pins and the horns are connected to the 2+, 2- pins. Upgrading to active mode is done by removing the Speakon® terminal and re-connecting the wires. Please refer to page 5.

CABINET FEATURES

Removing the grill

The cabinets in the Installation Series are built around a solid aluminum frame. Apart from making the cabinet very strong, the frame is the mounting point for the grill. The grill is made of heavy 2 mm steel with 8 mm holes for maximum air-to-metal-ratio. The grill is removed by inserting a cable tie or like through the holes in the grill and pulling it outwards. This gives access to the drive units.

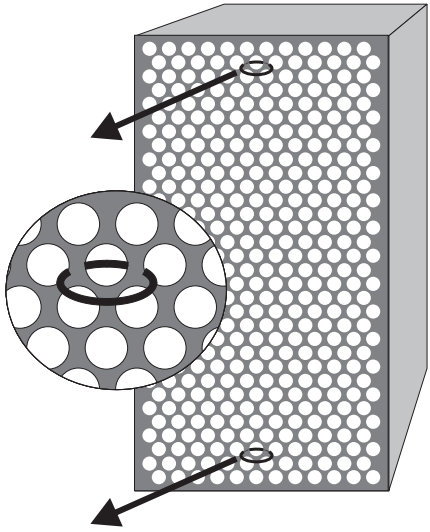


Figure 1: Removing the grill

Flying system

The M72i, M82i, and M125i are flown with customized brackets. All other boxes - and the M125i - are flown using M10 flying bolts mounted into the flying points on the top and bottom plate of the cabinets. To fly the box, simply remove the bolts and mount the flying bolts. The certified load for each flying bolt is 4000 kilograms (8800 pounds).

The flying points are placed so that the speaker will fly without tilt. If tilt is needed, wires can be connected to the rear or bottom flying points.

The M125i 127i, & 154i have been prepared for a top hat adapter that allows the speaker to be placed on a tripod. The top hat adapter must be ordered separately. Multi- and U-brackets are available for all models except the M154i, M129i & M156i.

HORN PROTECTION

The horns features a thermal protection circuit that increases impedance when the current exceeds a safe level. The increased impedance reduces current to the horn, thus protecting it from damage. The audible result is lower output from the horn. When this happens, *do not increase the high frequency level on the EQ or tone control*, as this may cause damage to the protection circuit and eventually damage the diaphragm.

When the current returns to a safe level, the protection circuit restores full signal current to the horn, and the audio output returns to normal.

The thermal protection is very effective as it combines good protection with excellent sound quality. The components in the protection circuit are all linear and thus have no influence on the sound when not engaged.

CABLES

High quality cable must always be used. Cables with high capacitance, high inductance and high impedance have a strong negative influence on sound quality as well as amplifier reliability.

We recommend the 2 x 4 mm (11 AWG) or 4 x 4 mm (11 AWG) Mach speaker cable. This is a professional rubber cable that is water tight, has low impedance, low inductance and low capacitance; and has as a low sulphur content that ensures minimum cable oxidation. The cable is very soft and easy to wind. For recommended cable lengths, please see table 1.

Cable size/load	8 ohms	4 ohms	2 ohms
1.5# (15 AWG)	15 m (50 ft.)	7.5 m (25 ft.)	4 m (13 ft.)
2.5# (13 AWG)	30 m (100 ft.)	15 m (50 ft.)	7.5 m (25 ft.)
4.0# (11 AWG)	60 m (200 ft.)	30 m (100 ft.)	15 m (50 ft.)

Table 1: Recommended cable lengths (dampening factor = 50)

ACTIVE MODE SETTINGS

Power handling

The active-mode power handling capacity of the individual drivers is shown in table 2. Power handling is measured in RMS power. When specifying amplifiers for active mode, we recommend that amplifier output be similar to the power handling figures.

Model	Driver	Power	Load
M127i	1” compression	50 W	16 ohm
	12” low/mid	350 W	8 ohm
M129i	2” compression	80 W	16 ohm
	12” low/mid (2)	700 W	4 ohm
M154i	1” compression	50 W	16 ohm
	15” low/mid	500 W	8 ohm
M156i	2” compression	80 W	16 ohm
	15” low/mid (2)	1000 W	4 ohm
M1502 mk 2	2” compression	75 W	16 ohm
	15” woofer	400 W	8 ohm

Table 2: Power handling

Crossover points

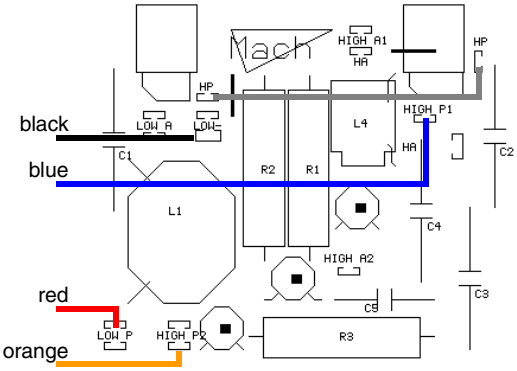
We recommend that all 2-way top-boxes from M127i and up be crossed at 1.3 kHz. The 12” and 15” units are all optimized as mid/high units, enabling linear operation beyond the 1.3 kHz point. Crossover slopes between the low/mid units and the horn should be 24 dB Linkvitz Riley.

CROSSOVER WIRING

Proper wiring of the crossover depends on the circuit board revision. There are 2 circuit boards in use: revision A and revision B. All new speakers have circuit board revision B. **To distinguish the circuit board revision on earlier units, look for 2 terminals marked “J” on the top-left part of the board: the J terminals are found only on revision B crossovers.**

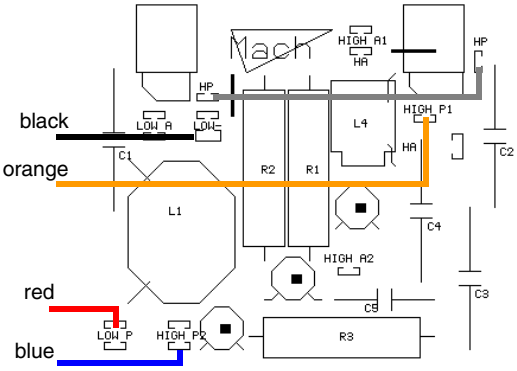
Revision A

Wire the crossovers as shown to change between active and passive mode.



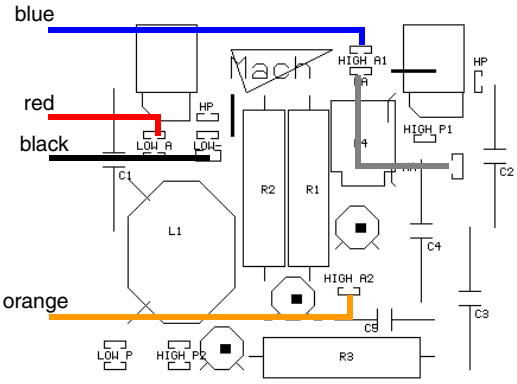
Passive mode: M127i, M129i, M154i, M156i

- Red (Woofer +) to LOW P
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH P2
- Blue (Tweeter -) to HIGH P1
- Jumper between HP and HP



Passive mode: M1502 mk 2

- Red (Woofer +) to LOW P
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH P1
- Blue (Tweeter -) to HIGH P2
- Jumper between HP and HP

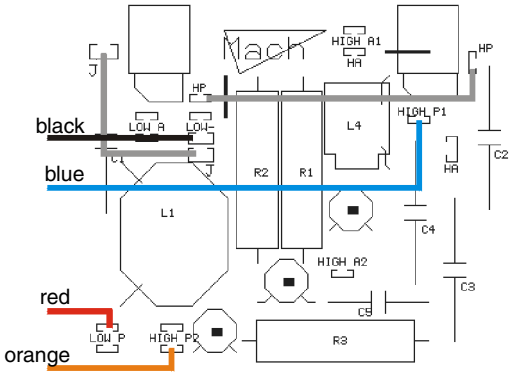


Active mode: All models

- Red (Woofer +) to LOW A
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH A2
- Blue (Tweeter -) to HIGH A1
- Jumper between HA and HA

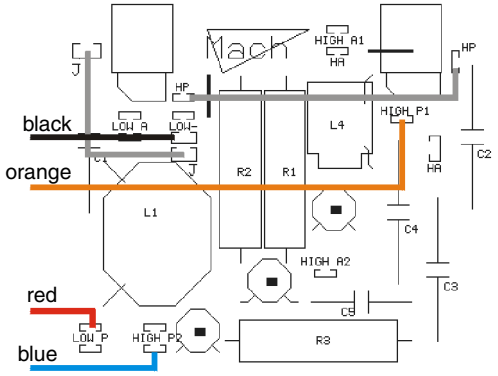
Revision B

Wire the crossovers as shown to change between active and passive mode.



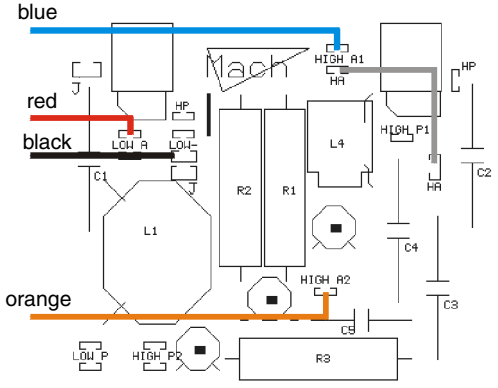
Passive mode: M127i, M156i

- Red (Woofer +) to LOW P
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH P2
- Blue (Tweeter -) to HIGH P1
- Jumper between HP and HP
- Jumper between J and J



Passive mode: M129i, M154i, M1502 mk 2

- Red (Woofer +) to LOW P
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH P1
- Blue (Tweeter -) to HIGH P2
- Jumper between HP and HP
- Jumper between J and J



Active mode: All models

- Red (Woofer +) to LOW A
- Black (Woofer -) to LOW -
- Orange (Tweeter +) to HIGH A2
- Blue (Tweeter -) to HIGH A1
- Jumper between HA and HA
- Remove jumper between J and J.