

# **TUBE-TECH MEC 1A**

## **Recording channel**

### **Description:**

The **TUBE-TECH recording channel MEC 1A** is a combined microphone and DI preamplifier, equalizer and optical compressor intended for recording directly to any recording media.

### **Microphone preamp:**

The microphone preamplifier consists of a microphone input transformer (with a static screen) with a step-up of +10 dB, two dual tube preamplifiers with two stepped gain switches, one with 10dB/step (coarse) and one 1dB/step (fine) giving a total gain range of +20dB to +70dB.

The microphone input is provided with a switchable -20dB attenuation (PAD), switchable +48 V phantom-power and phase reverse.

A highpass filter for the microphone and the DI input is switchable between off, 20 Hz and 40 Hz.

The microphone input is capable of accepting levels of up to +6 dBU (1.55V) at 40 Hz without the PAD. With the PAD switched into the circuit, the MEC 1A can be used as a unity gain line amplifier accepting levels up to +26 dBU (15.5V) at 40 Hz.

The high impedance DI input is unbalanced and placed in the circuit directly after the input transformer. The gain range for this input is +10dB to +60dB. When in use, the microphone input is disabled.

### **Equalizer:**

The equalizer has low and high shelving filter with a gain range of +/- 15dB, each with 6 switchable frequencies and a band filter with a gain range of +/- 20dB, 12 switchable frequencies and a bandwidth control.

The shelving and the bell filters are designed around a dual tube operational amplifier. The equalizer has a separate in /out switch.

### **Compressor:**

The compressor is of the optical device type. It has controls for ratio, threshold, attack and release. A switch selects between manual attack and release and fixed attack and release. With the link switch it is possible to link several units together on two independent bi-directional buses. The compressor has a separate in /out switch.

In normal operation the equalizer is in front of the compressor, but a switch enables the compressor to be in front of the equalizer.

### **COMPRESSOR INTERCONNECTION:**

The side chain sockets for interconnection of several compressors are located on the rear panel.

A switch (link1/link2) on the front selects which compressors are interconnected, and on which bus they are connected.

The interconnection implies, that the unit that performs the most compression is controlling the others. To choose which one you want to control, select the attack/release time, the threshold and the ratio on that unit, and turn the threshold fully counter clockwise on the reminding compressors.

It is of course possible to have all the interconnected compressors control each other simultaneously.

**NB:** Remember to set the ratio control and the gain control in the same position on the "slaves". Otherwise the stereo image could be shifted during compression.

The attack/release-control on the slaves will have no effect.

The input/output capability of the side chain-circuit allows up to **ten** compressors to be linked together. They are connected in parallel with a standard 1/4" stereo jack/-jack cord (tip: bus 1, ring: bus 2).

The two-jack socket on the rear panel is connected in parallel and both are input/output.

### **VU-Meter:**

The vu-meter can be switched between output level and compression.

### **Output gain:**

A level control with a gain from off to +10dB is placed at the output of the unit.

## **MIC PRE-AMP CONTROLS:**

**GAIN:** **Coarse:** The gain switch has a range from **+20dB** to **+60dB** in steps of 10dB.

**Fine:** The gain switch has a range from **0dB** to **+10dB** in steps of 1dB.

**LOW CUT:** The highpass filter is selectable between **off**, **20 Hz** (12dB/octave) and **40 Hz** (6dB/octave).

**PHANTOM:** The **phantom** switch turns the +48V DC power on and off.  
The +48V DC is supplied to the microphone input via two 6,81 K $\Omega$  resistors.

**PAD:** This switch selects between either 0dB or -20dB attenuation in front of the microphone transformer.

**DI:** The **D**irect **I**nput is an unbalanced, high impedance input intended for various instruments.

It goes directly into the preamplifier and has a gain range of +10dB to +60dB

## **EQUALIZER CONTROLS:**

### **LOW SHELF:**

**GAIN:** The gain control is continuously variable from 0 dB to 15 dB.

**FREQ. Hz:** There are a choice of six frequencies: 20, 30, 50, 70, 100, 160 Hz.  
(The frequency is 3dB from max./min.)



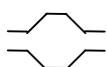
(Boost/cut) Determines whether the gain control shall be boosting or cutting.

### **MIDBAND:**

**GAIN:** The gain control is continuously variable from 0 dB to 20 dB.

**FREQ. Hz:** There is a choice of twelve frequencies:  
40, 60, 80, 130, 250, 500, 1k, 1,6k, 2,5k, 4k, 7k, 10k.

**BW:** The bandwidth control is continuously variable from sharp to broad.



(Boost/cut) Determines whether the gain control shall be boosting or cutting.

### **HIGH SHELF:**

**GAIN:** The gain control is continuously variable from 0 dB to 15 dB.

**FREQ. kHz:** There is a choice of six frequencies: 4, 6, 8, 12, 18, and 26  
(The frequency is 3dB from max. /min.)



(Boost/cut) Determines whether the gain control shall be boosting or cutting.

**EQ in/out:** Switches the frequency network in and out.

### **COMPRESSOR CONTROLS:**

**RATIO:** The ratio control varies the ratio by which the input signal is compressed.  
If the ratio selected is to 2:1, and the input signal increases 10 dB, the output signal is only increased by 5 dB.  
The ratio control is continuously variable from 1,5:1 to 10:1.

**THRESHOLD:** The threshold is the point where the compressor begins its action. It is defined as the point where the gain is reduced by 1 dB.  
The threshold is continuously variable from off to -20 dBm.

**COMP in/out:** This switch defeats the compressor side chain circuit

**ATTACK:** The attack control chooses how fast/slow the compressor responds to an increase in the input signal.  
The attack control is continuously variable from 1 to 100 milliseconds.

**RELEASE:** The release control chooses how fast/slow the compressor responds to a decrease in the input signal.  
The release control is continuously variable from 0,07 to 2,5 seconds.

**ATT/REL:** There are two settings of the switch:

There are two settings of the switch:

1. Fixed.      Attack time: 1 msec  
                    Release time: 50 msec
2. Manual.    Attack time: from 1 msec to 100 msec  
                    Release time: from 0.07 sec to 2,5 sec

**link1-off-link2:** Interconnects several compressors on bus 1 or bus 2. There is no difference between the two busses.  
If the switch is left in the mid position, the compressor works entirely independently.

**OUTPUT GAIN:** The gain control is used to "make up" for the gain loss that takes place when the unit is compressing.  
The gain control is continuously variable from off to +10 dB.

**METER:** The VU-meter switch has two positions:

1. **Compression** The VU-meter is reading gain reduction.  
It's rest position is "0 VU", and the amount of compression is shown as a decreasing deflection in dB.
2. **Output** The VU-meter is reading the level at the output socket.  
"0 VU" is equivalent to +4 dBm.

**NB:** Leave the meter switch in position **compression** as it might introduce distortion if left in the **output** position.

**EQ-COMP/COMP.-EQ:**

In the position EQ-COMP, the signal from the mike-preamp. goes to the equalizer and thereafter to the compressor.  
In the position COMP. -EQ the signal from the mike-preamp. goes to the compressor and then to the equalizer.

## ADJUSTMENT PROCEDURE:

(980810)

### CAUTION:

Before making any adjustment let the unit heat-up at least 30 min.

Always check the DC voltages at the power supply.

### ADJUSTMENT OF PSU:

- 1) The DC voltage in TP202 shall be +240V.  
Adjust with P201.
- 2) The DC voltage in TP203 shall be +150,0V.  
Adjust with P202.
- 3) The DC voltage in TP204 shall be -150,0V.  
Adjust with P203.

### ADJUSTMENT OFFSET IN TUBE-OP-AMPS:

- 1) The DC voltage in TP1 shall be < +/-50mV.  
Adjust with P1.

## THE GRE SHALL BE MARKED BETWEEN 1.005-1.175

### ADJUSTMENT OF BASIC GAIN:

- 1) Set the "PAD" on "off".
- 2) Set the "Low cut" on "off".
- 3) Set the gain control "Coarse" on "20".
- 4) Set the gain control "Fine" on "0".
- 5) Turn all "Gain" controls on the EQ fully CCW and the in/out switch on "Out".
- 6) Turn the "Threshold" fully CCW and the "Comp" in/out switch on "Out".
- 7) Turn the "Output gain" fully CW.
- 8) Apply a signal of 1 kHz, -20,0 dBU to the mike input.
- 9) Adjust the preset "Gain" P2 (on amp/psu PCB) to an output reading of +10,0 dBU.

## **ADJUSTMENT GAIN CONTROLS IN LOW/HIGH SHELIVING AND MIDBAND:**

(980112)

### **LOW SHELIVING:**

- 1) Apply a signal of 20 Hz, -20,0 dBU to the mike input.
- 2) Turn the **GAIN**-control at "0". Turn the freq. switch to "160Hz".
- 3) When switching between boost and cut, observe that the level is exactly the same (<+/- 0,1dB).  
Adjust with P5 located on the front PCB.

### **HIGH SHELIVING:**

- 1) Apply a signal of 20 kHz, -20,0 dBU to the mike input.
- 2) Turn the GAIN-control a "0". Turn the freq. switch to "4 kHz".
- 3) When switching between boost and cut, observe that the level is exactly the same (<+/- 0,1dB).  
Adjust with P7 located on the front PCB.

### **MIDBAND:**

- 1) Apply a signal of 1kHz -20,0 dBU to the mike input..
- 2) Turn the **GAIN**-control a "0". Turn the **Freq.** switch to 1kHz
- 3) When switching between boost and cut, observe that the level is exactly the same (<+/- 0,1dB).  
Adjust with P2 located on the front PCB.

## **ADJUSTMENT OF COMPRESSION TRACKING:**

- 1) Turn the **THRESHOLD**-control fully counter-clockwise.
- 2) Set the **RATIO**-control at 2:1.
- 3) Set the bus select switch at **link 1**.
- 4) Apply a signal of 1 kHz, -20,0 dBU into the input.
- 5) Adjust the **OUTPUTGAIN**-control to an output-reading of 0,0 dBU.
- 6) Apply a DC-voltage of +250,0 mV into the side chain jack socket (tip) and observe that the output level has dropped to -10,0 dBU.
- 7) If this is not the case, adjust the level with P 12, to obtain a drop of exactly -10,0 dB.

## **ADJUSTMENT OF THE VU METER READING "COMPRESSION":**

(980112)

- 1) Turn the **THRESHOLD**-control fully counter-clockwise.
- 2) Switch the **METER**-selector to Compression.
- 3) Set the **RATIO**-control at 2:1
- 4) Apply a signal of 1 kHz, -20,0 dBU into the input.
- 5) Adjust the **OUTPUTGAIN**-control to an output-reading of 0,0 dBU.
- 6) Adjust P 14 until the meter is reading 0 VU.
- 7) Apply a DC-voltage of +250,0 mV into the side chain jack socket and observe that the output level has dropped to -10,0 dBU. If this is not the case, adjust the compression tracking (see above)
- 8) Adjust P 13 until the meter is reading -10,0 VU.
- 9) Remove the DC-voltage from the side chain jack socket (by setting the bus select switch in the neutral position).
- 10) Repeat step 6 - 9.

NB: The VU-meter accuracy should be within +/- 0,5 dB when reading compression.