

ELECTROCOMPANET

EC 1 Preampliwire

USERS MANUAL

WARNING: To reduce the risk of fire or electric shock,
do not expose this appliance to rain or moisture .
Do not remove cover.No user serviceable parts inside.
Refer to qualified service personnel.

THE ELECTROCOMPANIET STORY

Electrocompaniet was founded in 1974 in Oslo, Norway. The company was primarily formed to produce the 25 watts amplifier based on a design by Dr. Matti Otala and Jan Lohstro.

This amplifier was the first commercial transistor amplifier using, at that time, new and different design approach, such as low overall feedback, high slewrate, high class A/B, high open-loop frequency response and high current capability. These factors are keys to achieve a good sounding amplifier. Due to this design approach the amplifier sounded less "transistor" and much more musical than other amplifiers. Therefore the 25W amplifier was an immediate success.

To follow up our reputation we started a more thorough investigation into the field of sound reproduction to learn what improvements could be accomplished. The result of this work has been marketed for many years under the famous name "Electrocompaniet".

Electrocompaniet has a special production method. Every amplifier is handmade. All soldering and assembly is done by Electrocompaniets highly-skilled technicians. After assembly and measurements, all amplifiers go through a long term test. Following this test the amplifiers are adjusted for maximum performance. The average production time for an amplifier is 7 days.

The Electrocompaniet amplifiers are sold in more than 23 countries to provide lasting audible pleasure.

ELECTROCOMPANIET - if music really matters

THE PHILOSOPHY BEHIND EC PREAMPLIFIERS

The EC amplifiers represent a totally new design concept. We believe we are satisfying a real need for a approach to increasing the sound quality of commercial amplifiers. The design work started soon after the legendary 25 watts amplifier.

Several research projects revealed the importance of reducing distortion. Listening tests always confirmed that conventional distortion correlated closely with audible imperfections in preamplifier performance. It seemed that whatever was the actual mechanism producing the distortion, its effects would show up on measurements and could be reduced by careful design. There are several ways to reduce distortion. Traditionally, you can increase the feedback to make a larger portion of the output signal control the amplifier's response. Our listening tests showed us that this was not the way to go. It turned out that feedback may reduce one type of distortion, but at the same time seriously effect other important parameters, thus leading to a lesser degree of fidelity. We knew that test-designs devoid of feedback would sound "wooly", usually because of the high distortion-level.

This prevented us from designing a "no feedback" preamplifier as the final solution. Most commercial preamplifiers use either of the two design approaches to achieve fidelity. But, both methods involved unavoidable compromises that seldom benefit, the serious audiophile in search of the highest fidelity.

The answer to this dilemma was found in a novel approach to feedback theory. We evolved a feedback concept that allowed local feedback to be applied around individual stages. As a consequence of this we managed to avoid the dangers of overall feedback from output to input. This concept was further developed to take care of phase and interface distortion between stages inside the EC 1 preamplifier. Because of our design philosophy, we could now concentrate the loop feedback on the stages where it gave audible improvements. Our stability margins were also expanded due to the fact that feedback no longer affected the frequency response. Distortion was thus reduced to minute values, resulting in a concept of gain blocks that were simple in functioning, but complex in structure.

The RIAA network is a 2 stage all passive network using 1% metalfilm resistors and 1% polypropylene film capacitors. The high frequency roll off is placed as close as possible to the cartridge to achieve better overload margin at high frequency and less strain in the following circuitry. The low frequency boost is placed in the second stage of the phono section to achieve better signal to noise ratio and better overload at low frequency. The input transistors are carefully selected for lowest possible noise especially the $1/f$ noise, so-called flicker noise. All stages incorporates cascade circuitry to linearise the preamplifier at high frequencies. The power supply has separate voltage regulators with high open loop frequency response for each stage and each channel. All capacitors are individually selected by extensive listening tests. This was the only way to make it possible to achieve our goal of the highest listening fidelity.

TABLE OF CONTENTS

1 Unpacking	6
2 Configuring EC 1	7
3 Connecting EC 1	9
4 Faceplate	10
5 Operating instructions	12
6 Repair policy	13
7 Technical specifications	14
8 Appendix A	16

1 UNPACKING

Immediately upon receiving the EC 1 preamplifier, inspect the carton for possible damage during shipment. If the carton is visibly damaged a claim must be filed with the carrier as soon as possible. Unpack the unit carefully, please save all packing materials for future shipment. They have been designed to offer the safest possible method for transporting your EC 1 preamplifier to prevent damage.

The content of the carton is as follows:

EC 1 preamplifier

AC power cord

Phono interconnect cable

Manual (this contains resistors and one Allan key)

One spare fuse 0.5A slow-blow 5x20mm. (Located inside the 3 pin male receptacle.)

2 Configuring EC 1

2.1 Moving coil or moving magnet

You can use either a moving magnet or a moving coil pickup on Your EC 1. If You are using a moving magnet pickup, then the switch on the rear should be set to MM. If You are using a moving coil pickup the switch should be in the MC position.

2.1.1 Matching EC 1 to different MC pickups

The moving coil input stage contains a current sensing input circuitry, and the moving coil cartridge delivers current not voltage. It is therefore important that the MC-input of the EC 1 "match" your cartridge DC resistance.

Your EC 1 is set from the factory to match most of the cartridges, having a DC resistance of 10 ohms or less. If your cartridge has higher impedance, follow these steps to match your cartridge, or contact your dealer for assistance.

NOTE

The MC input inverts phase. We therefore recommend that you change the input polarity on the cartridge to obtain absolute phase.

- * Turn off the preamplifier and unplug it from the mains.
- * Remove the top cover.
- * The moving coil amplifier is connected to the rear PCB that holds the input/output jack's.
- * Locate the resistor marked R1 mounted on the green sockets near the phono sockets (one in each channel). Ref. fig 2.1. Page 8.
- * Replace R1 with a resistor having the closest value to your cartridge.

ex.	DC impedance	R1
	2-10 ohm	leave it as it is.
	10-30 ohm	33 ohm
	30-40 ohm	43 ohm
	40-100 ohm	100 ohm

You will find the resistors inside the manual. They fit the green sockets on the moving-coil amplifier.

- * If R1 is changed to a higher value than 40 ohm or more, R2 , (one in each channel) should be changed to increase the gain.

If R1 = 43 ohm R2 = 470 ohm
If R1 = 100 ohm R2 = 620 ohm

- * NB.
Special cartridges like Ortofon MC 2000 with very low output (less than 0.15mV) and low DC resistance (less than 10 ohm) R1 should remain 10 ohm and only R2 should be changed to 620 ohm.

Fig. 2.1. MC-amplifier, location of R1 and R2

2.2 Bypassing blocking capacitor

The AC/DC switch is located at the left hand side of the preamplifier close to the relay. The EC 1 is AC connected from the factory. When the preamplifier is used with power amplifiers that are DC coupled on the input, the switch MUST REMAIN in this position or else you may damage your speakers and power amplifier. If your power amplifier is AC coupled, this switch can be used in DC mode to improve the sonic performance of your system.

WARNING! IF IN ANY DOUBT; DO NOT USE THE SWITCH.

3 Connecting EC 1

3.1 Connecting to mains

Check that the mains voltage printed on the rear panel matches the line voltage where you intend to connect your EC 1.

3.2 How to avoid noise problems

The EC 1 preamplifier contains circuitry that might be sensitive to magnetic fields. It should be placed well away from transformers etc. Care should also be taken in routing the leads. They should not run parallel to speaker cables or mains wiring. Keep cables as short as possible. For minimum hum, the preamplifier should be placed on the right hand side of the poweramplifier. Do not place the preamplifier closer than 10" (25cm) above the poweramplifier

3.3 How to avoid damages

A good operating practice is to turn off all equipment before connections/disconnections are made.

Do not under any circumstances connect or disconnect equipment when power is turned on. If you insist on connecting / disconnecting when power is on you should beware that;

The design of the RCA plug is such that a large is generated on inserting the plug. This could damage both the speakers and the amplifier.

3.4 The rear panel

The rear of the EC 1 contains all in / output connectors. The printed rear panel will give you all information at this point. To avoid wrong connections concerning tape input / output, please note that these words also mean the direction of the signal. Tape input means from tape to EC 1. This means that you must connect Your tape recorders tape output terminals to EC 1 tape input terminals and vice versa.

4 Faceplate

4.1 Drawing of the faceplate fig. 4.1.

4.2 The switches

4.2.1 Power switch

This switch turn the EC 1 on / off. Your transformer will still be connected to mains.

4.2.2 Dubbing

This switch directs the signals to and from tape recorders when You make copies. When in position "up" tape 1 will be the source and tape 2 the destination. In position "down" tape 2 is source and tape 1 the destination.

4.2.3 Tape

This switch selects which tape recorder is to be connected to the monitor.

4.2.4 Source / Monitor

This switch selects between monitor or source. In "monitor" position tape 1 and tape 2 are available. In "source" position phono, CD and tuner are available.

4.2.5 Phono / CD / Tuner

This switch has three positions. In source mode you can select one of the three mentioned devices. In "up" position phono is connected, in the "middle" position the compact disc player is connected and in "down" position the tuner is connected.

4.2.6 Muting

The muting switch allows you to use the volume control in its most linear region at low levels.

4.2.7 Volume / standby - balance

These controls are located to the right on the EC 1. The volume knob also contains a standby function. Your EC 1 will give the best result after 30 minutes of preheating. Therefore you should use the standby function instead of the on/off switch.

4.2.8 LED indicators

Located on the right side of the power switch is a green LED. This LED will light when the preamplifier is ready. A delay circuitry will turn on the EC 1 in about 20 seconds after you activate the power switch. On the left side of the volume / balance controls you will find a red LED. This will light whenever power is on and in standby mode.

5 Operating instructions

5.1 How to turn on Your system

You should always turn on your equipment in this order. Signal source devices, preamplifier, allow this 30 sec. of preheating before you turn on the power amplifier. When turning your system off you should start by switching off your power amplifier, preamplifier and at last your signal source devices.

5.2 Selecting signal source

Refer to front panel section 4.2

5.3 Tape recording

To record from source (phono,cd,tuner) select the wanted input on the input-selector and use the switch marked DUBBING to select tape recorder. 1-2 are tape 1 and 2-1 are tape 2. To play from tape 1 or tape 2, switch from source to monitor.

WARNING

Due to the high class A operating point used in the design it is normal that the preamplifier feels warm and it therefore should be given proper ventilation.

6 REPAIR POLICY

Your dealer will have all relevant information about the service facilities in your area, and will ensure that your unit is repaired without delay. It is our policy to return your EC 1 preamplifier in working order to you within 5 working days. This is an average time, and might vary depending on the work load at the service center. If, for some reason, there are no servicing facilities available in your country, please ship the EC 1 preamplifier to the following address:

ELECTROCOMPANIET A.S
SOLHEIMSVEIEN 72,
N-1473 SKAARER

NORWAY

You are responsible for all shipping, re-importation and duty arrangements. Please include the following for faster service:

1. A sales slip or other proof of purchase if repair is claimed under warranty.
2. The unit should be shipped in its original packing material to prevent damage during shipment. Electrocompaniet will not cover damages incurred in transit.
3. Please inform us, in an accompanying letter, symptoms or faults that occurs on your preamplifier.

If you require further information concerning the EC 1 preamplifier operation, or if you have any inquiries concerning servicing, please do not hesitate to contact your dealer.

7 TECHNICAL SPECIFICATIONS:

The following technical data was measured on randomized test objects and were typical data.

The measurements are made with the following equipment:

Distortion analyzer : Tektronix AA501
 Oscilloscope : Tektronix 468
 Oscillator : Tektronix SG505
 Frequency counter : Rascal 9838
 Phase meter : Hewlett Packard 3575A

PHONO STAGE:

Phono input to tape output:

Gain 1KHz Moving Coil (source impedance=10ohm)...52dB (398x)
 Gain 1KHz Moving Magnet.....32dB (40x)

THD 1KHz (3V output).....less than 0.0025%

Overload 1KHz Moving Coil (THD=0.2%)..... more than 25mV
 Overload 1KHz Moving Magnet (THD=0.2%)..... more than 200mV

Channel separation (1V output 1KHz)..... more than 80 dB

Noise A weight (ref. 0.5mV)..... 80 dB

Equivalent input noise (400Hz-30KHz)..... 0.2 uV

RIAA accuracy (20Hz-20KHz).....+- 0.1 dB

Overall loop feedback (10x)..... 20 dB

COMPACT DISC:

Gain 1KHz (10x)..... 20 dB

THD 1KHz (5V output)..... less than 0.003%

Overload 1KHz (THD=0.2%).....more than 10V (130 dB)

Channel separation (1V output 1KHz)..... more than 80 dB

Equivalent input noise..... 3uV

LIN STAGE

(all measures done from tuner to main output)

Gain (10x)..... 20 dB

THD (1KHz 1V input 1V output):

Max. Output: (THD=0.2%)..... more than 16V RMS

Channel separation: (1V output 1KHz)..... more than 90 dB

Equivalent input noise..... 0.4uV

Overall loop feedback (10x)..... 20 dB

APPENDIX A

Below is a list of frequently used MC-cartridges. The different load impedances, R1 and R2, are our suggested values.

MC-cartridge :	R1:	R2:
Accuphase AC-3	33 ohm	*
Denon DL-103D	43 ohm	470 ohm
Highphonic MC-A2e	43 ohm	470 ohm
Koetsu Black	*	*
Ortofon MC-10 Super	*	*
Ortofon MC-20 Super	*	*
Ortofon MC-30 Super	*	*
Ortofon MC 2000	*	620 ohm
Sumiko Talisman A	43 ohm	470 ohm
Sumiko Talisman B	43 ohm	470 ohm
Sumiko Talisman S	43 ohm	470 ohm
Van den Hul MC-10	33 ohm	470 ohm

* factory setting.