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| <u>Consisting of:</u> | Electronic Section | 2804.1 |
| | Position of Components | 2804.2 |
| | Parts List | 2804.3 |
| | Circuit Diagram | 2804.4 |

How to Open the Metal Case

Turn the thumb screw on the front plate anti-clockwise. The bottom plate can then be slid backwards and removed.

Unscrew the two 3 mm screws on the back plate. The two side plates can then be slid backwards and removed.

Battery Change

Unscrew the upper 3 mm screw on the back plate and slid the top plate backwards. The batteries can then easily be changed.

Trouble Shooting

If any problems should occur with this instrument, then first check the DC working voltages from the Power Supply. Then use the Block Diagram in order to localize the trouble to be located in one specific circuit.

When a fault has been found and corrected, the voltages and adjustment which are influenced by the correction must be rechecked, and the instrument controlled to see if all basic functions are fulfilled.

The tolerances stated in the instructions can only be used as a guide for adjustment and control.

Any deviations must not be corrected without being sure, that the tolerances, of the instruments used for making the adjustment, are so small as to have no influence on the measurements.

The instructions in this Manual are given purely as a guide to the service of the equipment. Some faults, as for example, small deviations in tolerances require for their corrections special control equipment and extensive experience, and in these cases it is necessary to send the instrument to the factory.

Voltages at various points throughout the apparatus are indicated on the circuit diagram and the simplified diagram in the service instructions. These voltages are typical nominals only and with the exception of stabilized power supply voltages, may vary considerably from apparatus to apparatus.

Spare Parts

Please state serial number of apparatus when spare parts are ordered.



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Spare Parts

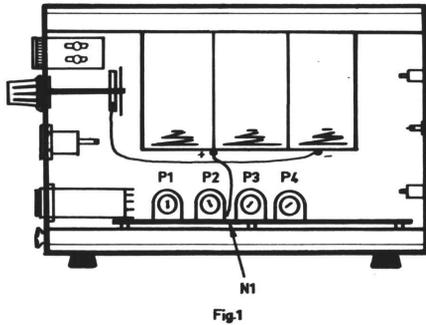
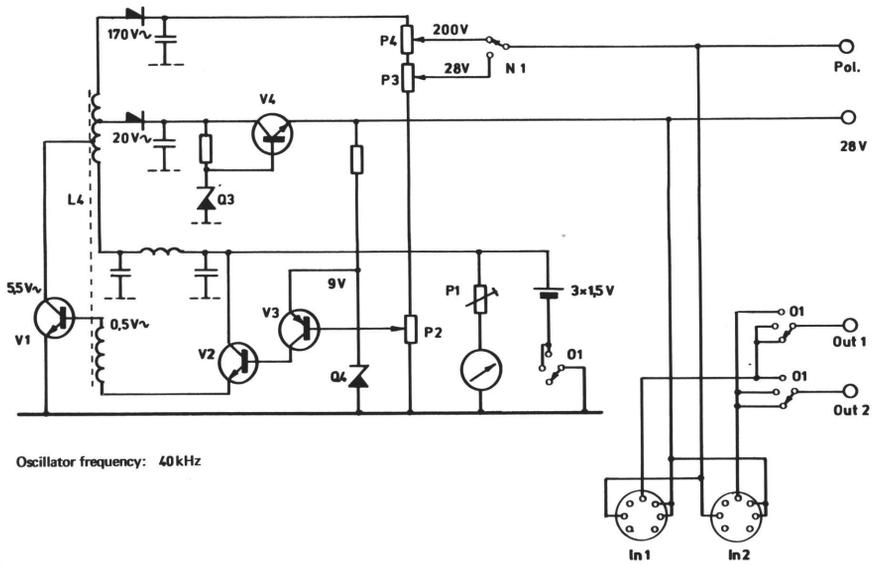
Please state serial number of apparatus when spare parts are ordered.

Instruments and accessories necessary for repair

Multimeter (50 μ A)
DC Power Supply
Electronic DC Voltmeter ($R_i > 10 M\Omega$)
Microphone Amplifier 2606
Filter Set 1614
Microphone Preamplifier 2619
Input Adaptor JJ 2615
Screened Plug JP 0101



Simplified Diagram



1.1 Battery Indicator

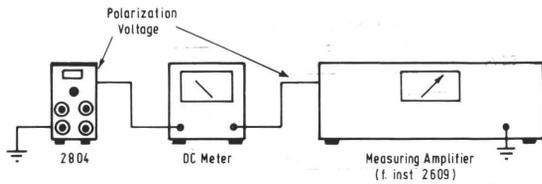
Supply a voltage of $3.5 \text{ V} \pm 0.1 \text{ V}$ to the terminals of the battery compartment.
The meter now deflect to a point between red and green part of the scale.
If necessary adjust P1.

1.2 Power Consumption

Supply a voltage of $4\text{ V} \pm 0.1\text{ V}$ to the terminals of the battery compartment, and adjust the consumption to 60 mA by means of P2.

1.3 Stability of Output Voltage

- Supply a voltage of 5 V to the terminals of the battery compartment.
Check the voltage on "28 V DC Outlets": 28 V tolerance $\pm 10\%$.
- Change the supply voltage to 3.5 V and load the "28 V DC Outlets" with a 7 k Ω resistor.
Check the output voltage: 28 V tolerance: $\pm 10\%$.



1.4 Polarization Voltage

N1 in position 28 V

- Measure the polarization voltage with a high impedance DC voltmeter.

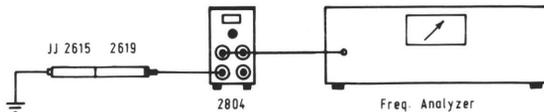
Polarization voltage: $28\text{ V} \pm 0.1\%$
If necessary adjust P3. (Check that the supply voltage is 4 V)

N1 in position 200 V.

- Check the POL. VOLT. on Measuring Amplifier (f. inst. 2609) and if necessary adjust for 200 V exactly.

Connect a DC meter between POL. VOLT. sockets on type 2804 and 2609, and adjust P4 for 0V deflection on the DC meter (1-3V range).

Remember ground connection between the two instruments.



1.5 Noise and Hum

Measure the voltage on "Out 1" : max $30\mu\text{V}$ (in 20 Hz - 20 kHz)
max $70\mu\text{V}$ (selective 1/3 octave band from 20 Hz - 80 kHz)

Simplified Diagram

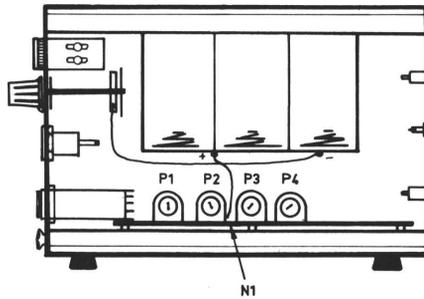
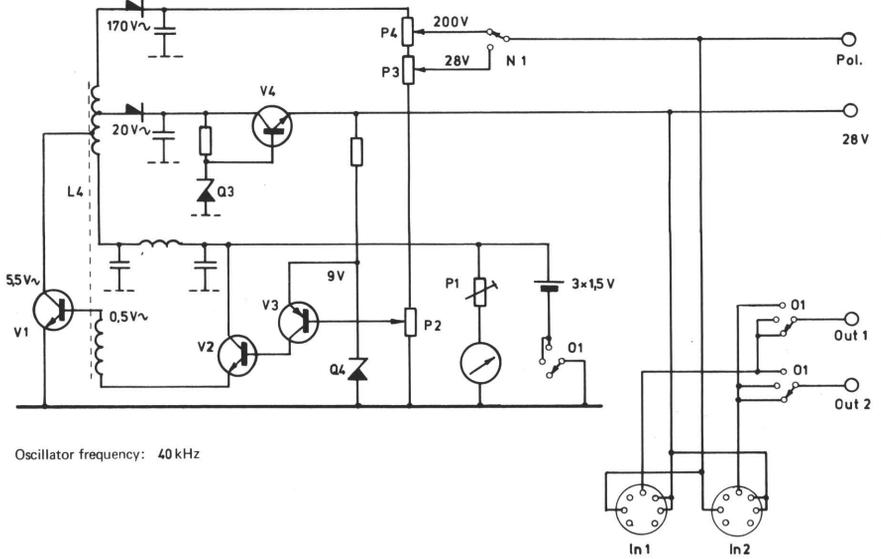


Fig.1

1.1 Battery Indicator

Supply a voltage of $3.5 \text{ V} \pm 0.1 \text{ V}$ to the terminals of the battery compartment.

The meter should now deflect to a point between red and green part of the scale.

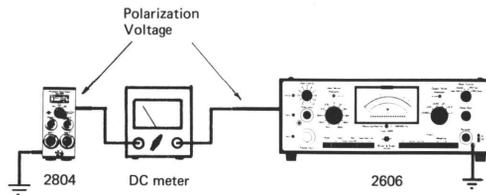
If necessary adjust P1.

1.2 Power Consumption

Supply a voltage of $4\text{ V} \pm 0.1\text{ V}$ to the terminals of the battery compartment, and adjust the consumption to 60 mA by means of P2.

1.3 Stability of Output Voltage

- Supply a voltage of 5 V to the terminals of the battery compartment.
Check the voltage on "28 V DC Outlets": 28 V tolerance $\pm 10\%$.
- Change the supply voltage to 3.5 V and load the "28 V DC Outlets" with a $7\text{ k}\Omega$ resistor.
Check the output voltage: 28 V tolerance: $\pm 10\%$.



1.4 Polarization Voltage

N1 in position 28 V

- Measure the polarization voltage with a high impedance DC voltmeter.

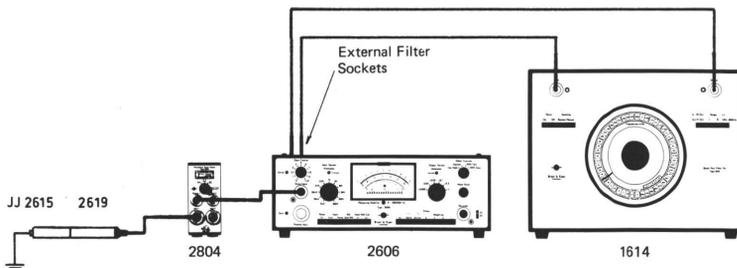
Polarization voltage: $28\text{ V} \pm 0.1\%$
If necessary adjust P3. (Check that the supply voltage is 4 V)

N1 in position 200 V.

- Check the POL. VOLT. on Microphone Amplifier type 2606 and if necessary adjust for 200 V exactly.

Connect a multimeter between POL. VOLT. sockets on type 2804 and 2606, and adjust P4 for OV deflection on the multimeter ($1\text{--}3\text{ V}$ range)

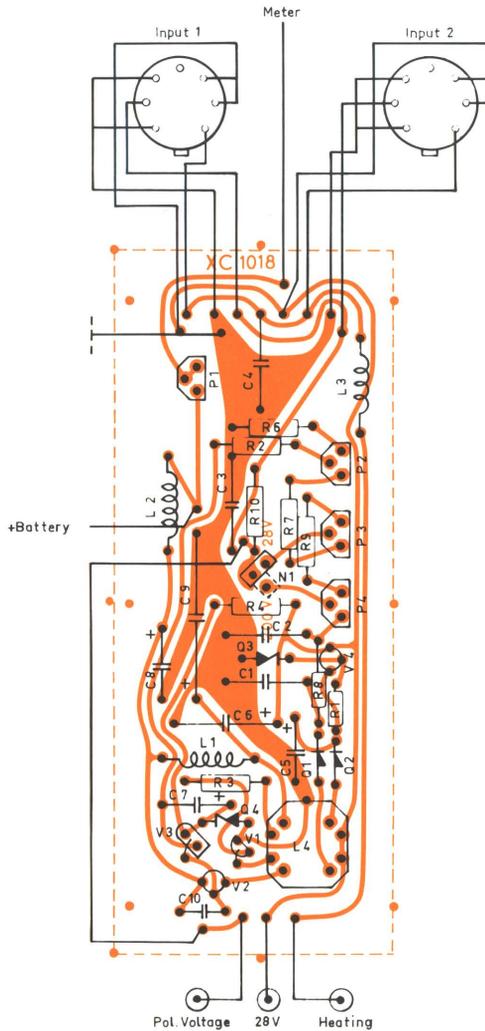
Remember ground connection between the two instruments.



1.5 Noise and Hum

- Switch 1614 to "Lin 22.4 – 22 400 Hz"
Noise: max $30\text{ }\mu\text{V}$
- Switch 1614 to "1/3 Octave" and measure the noise selectively in the frequency range from 20 Hz to 80 kHz .
Noise: max $10\text{ }\mu\text{V}$.

valid from serial no. 408601



ZG 0031
Printed Circuit XC 1018



valid from serial no. 408601

| CIRCUIT DIAGRAM REF. | COMPONENT TYPE | | STOCK REF. | CIRCUIT DIAGRAM REF. | COMPONENT TYPE | | STOCK REF. |
|----------------------------|-------------------|--|---------------|----------------------------|-------------------|--|---------------|
|----------------------------|-------------------|--|---------------|----------------------------|-------------------|--|---------------|

CAPACITORS:

| | | | |
|----------|--------------|--------------|---------|
| C 1 | Polyester | 47nF/400 V | CS 0109 |
| C 2 | - | 0.1µF/250 V | CS 0013 |
| C 3 | - | 0.22µF/250 V | CS 0017 |
| C 4 | - | 0.47µF/100 V | CS 0335 |
| C 5 | Electrolytic | 2µF/ 64 V | CE 0401 |
| C 6 | - | 22 µF/100 V | CE 0616 |
| C 7,8 | Tantalum | 56µF/ 6.4 V | CF 0001 |
| C 9 | Electrolytic | 640µF/ 6.4 V | CE 0206 |
| C 10 | Polyester | 10µF/250 V | CS 0403 |
| C 11, 12 | Tantalum | 1.5 µF/35 V | CF 0008 |

COILS AND TRANSFORMERS:

| | | | |
|-------|-------------|-------|---------|
| L 1,2 | Coil | 14 µH | LJ 0009 |
| L 3 | - | 30 µH | LJ 0008 |
| L 4 | Transformer | | LB 0679 |

DIODES:

| | | | | |
|-----|---------|--------|-----------------|---------|
| Q 1 | Silicon | BYX10 | 1200V/ 0.15 A | QV 0025 |
| Q 2 | - | 1N4004 | 400 V/ 1 A | QV 0237 |
| Q 3 | Zener | MZ28 | 28.5V/ 10 mA | QV 1120 |
| Q 4 | - | ZF9.1 | 8.5-9.6V/ 30 mA | QV 1109 |

POTENTIOMETERS:

| | | | | |
|-------|---------|--------|--------|---------|
| P 1,2 | Trimmer | Carbon | 100 kΩ | PG 4107 |
| P 3 | - | - | 220 kΩ | PG 4203 |
| P 4 | - | - | 1MΩ | PG 5107 |

RESISTORS:

| | | | | | |
|----------|--------|-------|-----|--------|---------|
| R 1 | Carbon | 1/4 W | 5% | 330 Ω | RB 2330 |
| R 2 | - | 1/3 W | 10% | 100 Ω | |
| R 3 | - | - | - | 150 Ω | |
| R 4 | - | - | 2% | 20 kΩ | |
| R 5 | - | - | 10% | 80 kΩ | |
| R 6 | - | - | 2% | 380 kΩ | |
| R 7 | - | - | - | 780 kΩ | |
| R 8 | - | - | - | 1.2 MΩ | |
| R 9 | - | - | - | 8MΩ | |
| R 10 | - | - | 10% | 10MΩ | |
| R 11, 12 | - | 1/4 W | 5% | 820 Ω | RB 2820 |

PRINTED CIRCUIT:

XC 1018 with components ZG 0031

TRANSISTORS:

| | | | | |
|-----|---------|-----|--------|---------|
| V 1 | Silicon | NPN | 2N3704 | VB 0028 |
| V 2 | - | - | BC109 | VB 0047 |
| V 3 | - | PNP | 2N4289 | VB 0049 |
| V 4 | - | NPN | BC107 | VB 0032 |

MISCELLANEOUS:

| | | |
|-----|-----------------------------|---------|
| | Feet | DF 7015 |
| | Handle | DH 0052 |
| | Front Panel | FA 0405 |
| | Cover Panel | FA 0406 |
| | Rear Panel | FB 0304 |
| | Side Panel | GV 0673 |
| | Bottom Plate | GV 0914 |
| | Top Plate | GV 1108 |
| M 1 | Moving Coil Instrument 40µA | IM 0020 |
| | Miniature Socket, 28 V DC | JJ 0031 |
| | Screened Socket, Output | JJ 0108 |
| | 7-pin socket, Input | JJ 0705 |
| | Socket, Pol. Volt. Heating | JT 8344 |
| O 1 | Switch | OH 3001 |
| | Elements 1.5 V | OB 0004 |
| | Knob | SN2022+ |
| | Battery Component | YQ 0399 |



