

Consisting of:

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

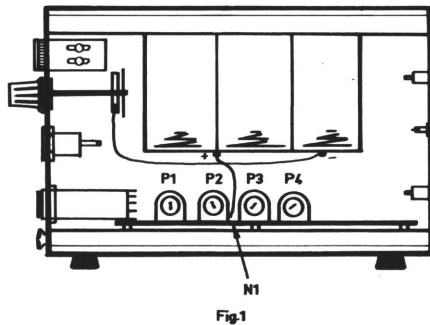
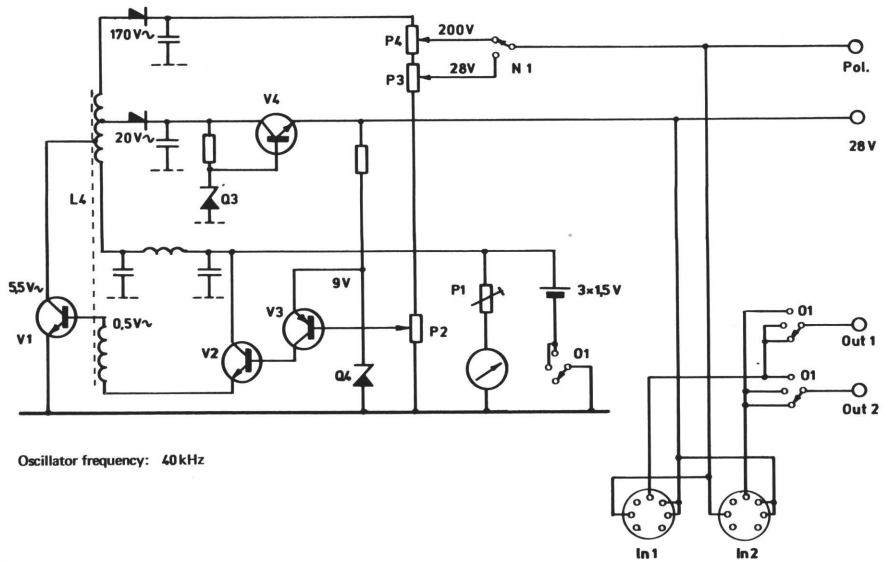
Please state serial number of apparatus when spare parts are ordered.

Instruments and accessories necessary for repair

Multimeter (50  $\mu$ A)  
DC Power Supply  
Electronic DC Voltmeter ( $R_i > 10 \text{ M}\Omega$ )  
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.

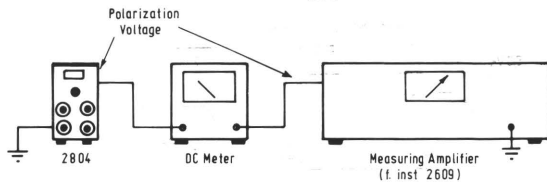
## 1.3 Stability of Output Voltage

- a. Supply a voltage of 5 V to the terminals of the battery compartment.

Check the voltage on "28 V DC Outlets": 28 V tolerance  $\pm 10\%$ .

- b. Change the supply voltage to 3.5 V and load the "28 V DC Outlets" with a 7 k $\Omega$  resistor.

Check the output voltage: 28 V tolerance:  $\pm 10\%$ .



## 1.4 Polarization Voltage

N1 in position 28 V

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

Polarization voltage:  $28\text{ V} \pm 0.1\%$

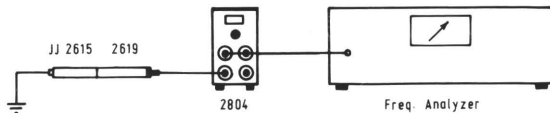
If necessary adjust P3. (Check that the supply voltage is 4 V)

N1 in position 200 V.

- b. 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 OV 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  $30\mu\text{V}$  (lin 20 Hz - 20 kHz)  
max  $70\mu\text{V}$  ( selective 1/3 octave band from  
20 Hz - 80 kHz)

Simplified Diagram

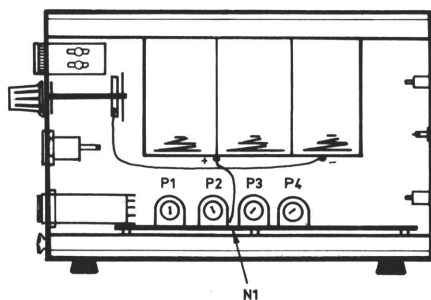
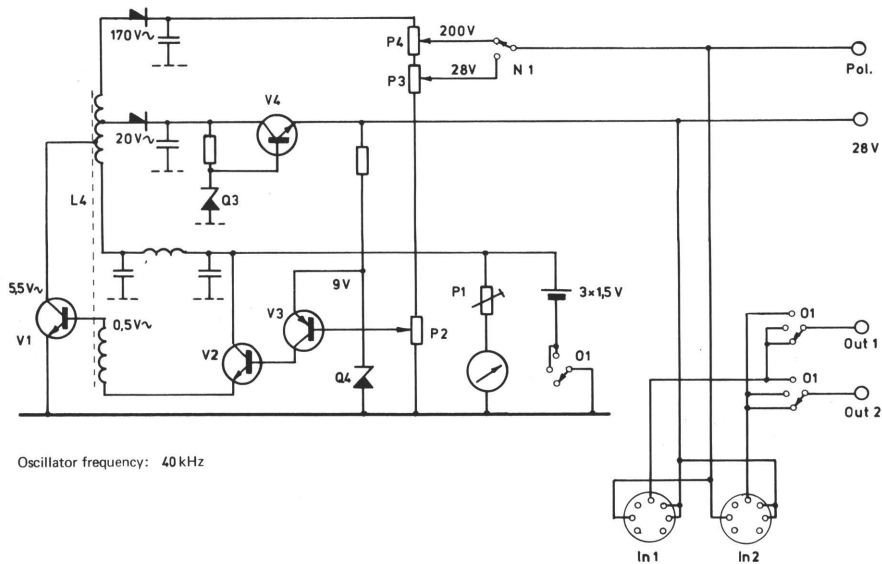


Fig.1

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.

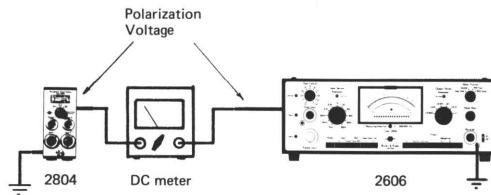
If necessary adjust P1.

### 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.

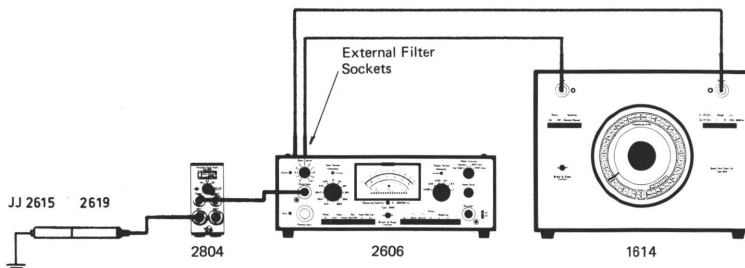
Polarization voltage:  $28\text{ V} \pm 0.1\%$   
If necessary adjust P3. (Check that the supply voltage is 4 V)

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 (1–3 V range)

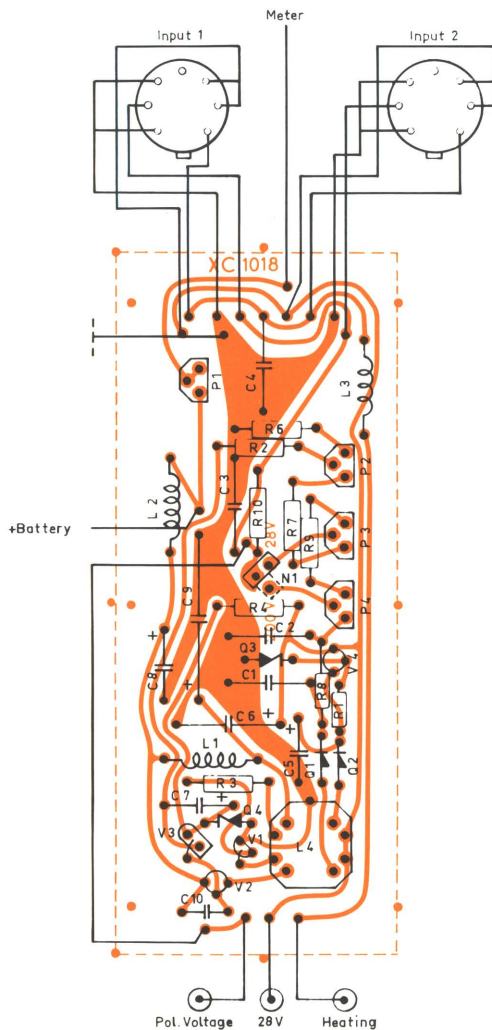
Remember ground connection between the two instruments.



### 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  $10\text{ }\mu\text{V}$ .





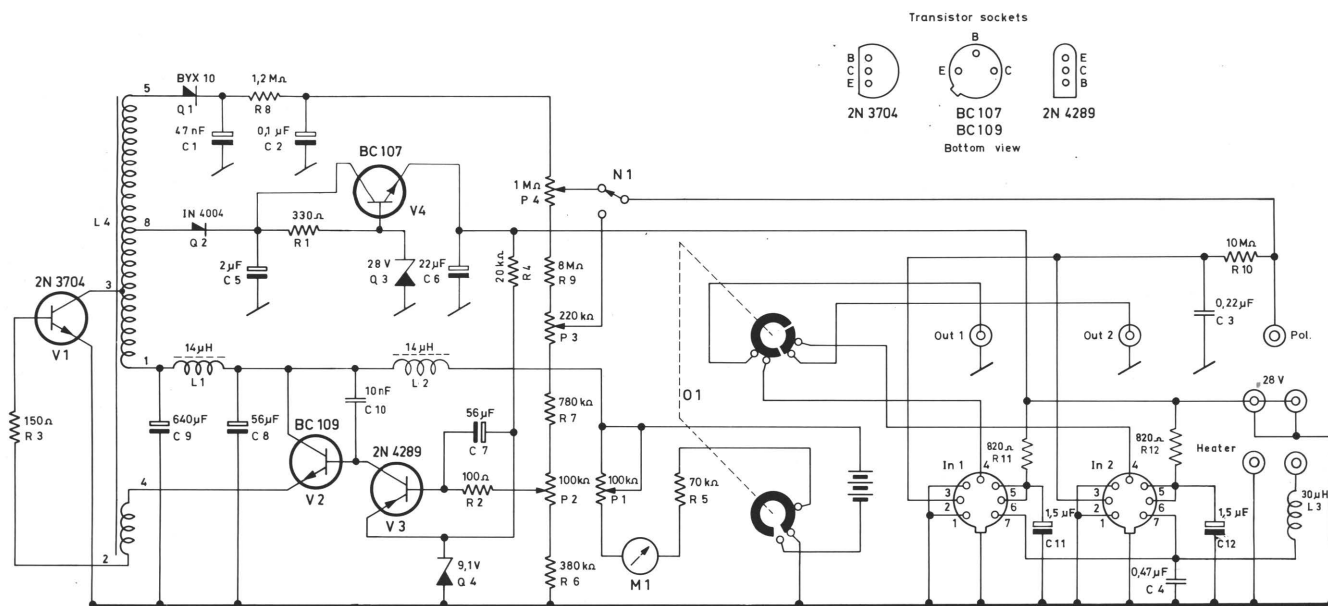
ZG 0031  
Printed Circuit XC 1018



valid from serial no. 408601

CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REF.	CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REF.
<u>CAPACITORS:</u>				<u>TRANSISTORS:</u>			
C 1	Polyester	47nF/400 V	CS 0109	V 1	Silicon	NPN	2N3704 VB 0028
C 2	-	0.1µF/250 V	CS 0013	V 2	-	-	BC109 VB 0047
C 3	-	0.22µF/250 V	CS 0017	V 3	-	PNP	2N4289 VB 0049
C 4	-	0.47µF/100 V	CS 0335	V 4	-	NPN	BC107 VB 0032
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				
<u>COILS AND TRANSFORMERS:</u>				<u>MISCELLANEOUS:</u>			
L 1,2	Coil	14 µH	LJ 0009		Feet		DF 7015
L 3	-	30 µH	LJ 0008		Handle		DH 0052
L 4	Transformer		LB 0679		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		QB 0004
					Knob	SN2022+	YQ 2003
					Battery Component		YJ 0399
<u>DIODES:</u>							
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			
<u>POTENTIOMETERS:</u>							
P 1,2	Trimmer	Carbon	100 kΩ	PG 4107			
P 3	-	-	220 kΩ	PG 4203			
P 4	-	-	1MΩ	PG 5107			
<u>RESISTORS:</u>							
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		
<u>PRINTED CIRCUIT:</u>							
	XC 1018		with components	ZG 0031			





13-03-1969	273565		
22-08-1972	302246		
22-08-1972	408601		



