CE INSTRUCTIONS 1613

3639 CTAVE FILTER

TILLHÖR AM55

Consisting of:

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How to open the instrument.

Unscrew the frequency knob by means of a 2 mm Allen key. Unscrew the two screws in the lower part of the case. The filter unit can then be pulled out of its housing.

Trouble Shooting.

If any problems should occur with this instrument, then use the Simplified Diagram in order to localize the trouble to be located in one specific circuit.

When a fault has been found and corrected, the adjustments 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 Manuel 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.

Spare Parts.

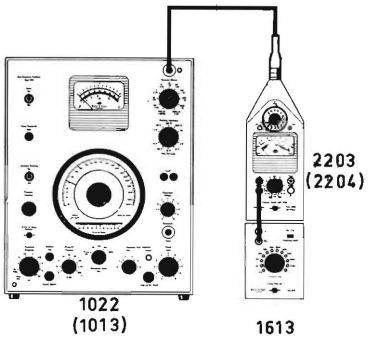
Please state type and serial number of apparatus when spare parts are ordered.

Instruments necessary for Service and Repair.

Precision Sound Level Meter Type 2203 (2204)
Beat Frequency Oscillator Type 1022 (1013)
Frequency Analyzer Type 2107
Frequency Counter
2 mm Allen Key (QA 0043)
Coaxial cable for connecting 1613 to standard B & K sockets AO 0007 (AO 0034)
The same cable with built in shunt resistance 162k ohm in plug AO 0035

CHECK OF FILTER CURVES

Valid from Serial No. 81978



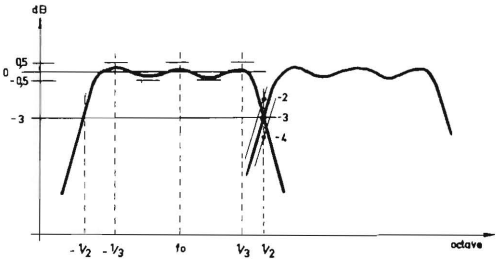


Fig.1

1.1. Check of the Filter Curves

a. Reference adjustment.

2203 SWITCH 03: "Ext.Filter"
SWITCH 01 (black): "100 dB"
SWITCH 02 (transp): "Fully Clockwise"
1613 FREQUENCY: "Lin"
WEIGHTING SWITCH: "Off"

Set the frequency from the Beat Frequency oscillator to the center frequency of the filter and adjust the input voltage for an 8 dB deflection on Type 2203.

b. Filter Band-pass

1613 FREQUENCY to required position 31,5-16 000 Hz

Vary the frequency around the center frequency at the filter and check the filter curve. According to Fig.1.

Deflection on Type 2203: 8,0-8,5 dB for the tops
7,5-8,0 dB for the valleys

1613 FREQUENCY to "31,5 kHz" Band limit

To check this filter it is necessary to use a high frequency oscillator f.inst. Type 1013.

As the frequency response for Type 2203 is only flat up to around 25 kHz it is necessary to compare the deflections on Type 2203 in the two positions "31,5 kHz" and "Lin" of the FREQUENCY switch.

Tolerance of the filter curve: 0,5 dB for the tops
-0,5 dB for the valleys
with reference to "Lin" position of FREQUENCY switch.

c. Attenuation at ± 1/2 octave

1613 FREQUENCY to required position 31,5-31 500 Hz

At the band limit i.e. ± 1/2 octave from the center frequency the attenuation is approx. 3 dB, see Fig.1.

Set the frequency to a point where the deflection on Type 2203 has decreased 3 dB with reference to "Lin" position of FREQUENCY switch. When the FREQUENCY switch is turned to the next filter the deflection on Type 2203 must not change more than ± 1 dB.

continued

d. Attenuation at ± 1 octave.

1613 FREQUENCY to required position 31,5-31 000 Hz

Check the attenuation at ± 1 octave from the center frequency.

To prevent overloading of the input amplifier of Type 2203, increase the sensitivity of the output amplifier only (transparent knob) for a suitable reading.

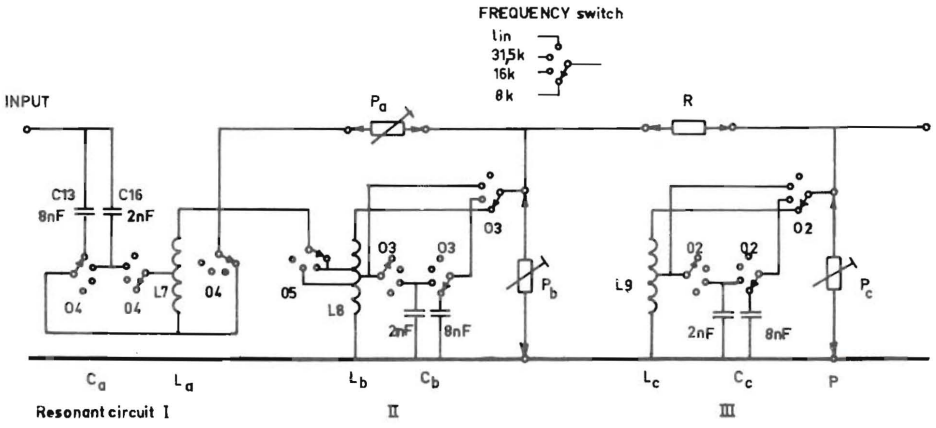
Attenuation at ± 1 octave: Approx. 25 dB.

ADJUSTMENT OF FILTER CURVES

Valid from Serial No. 81978

Attention

Adjustment of the filter curves requires use of a frequency counter as the accuracy of the signal frequency should be within 0,1 - 0,2%.



Simplified diagram

Fig. 2

The resistors P_a, P_b, P_c and R are, changed with each frequency range.

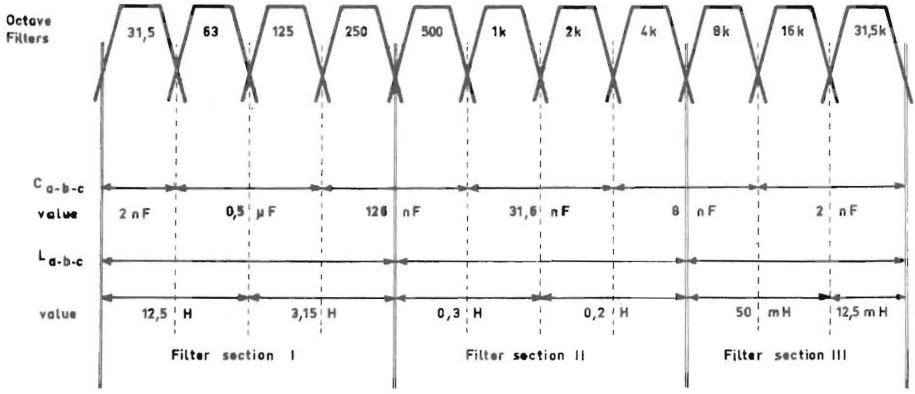


Fig. 3

These drawings show the combination at the various coils and condensors in the resonant circuits for the octave filters. After adjustment of one of the octave filter it is then necessary to check the other filters which might be influenced by the adjustment.

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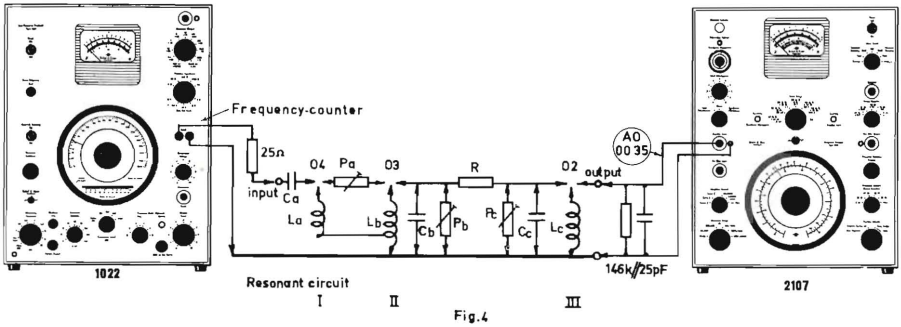


Fig.4

MODULATION: "Off"
COMPRESSOR: "Off"
MATCHING IMP.: "6 ohm"

INPUT SWITCH: "Direct"
WEIGHTING NETW: "Lin 2 - 40 000 Hz"
METER SWITCH: "RMS fast"
FUNC.SELECTOR: "Sel. section off"

2.1. Adjustment of the Filter Curves

a. Reference adjustment

1613 FREQUENCY to required position 31,5-31 500 Hz

2107 RANGE MULT: "X1"
METER RANGE: "1V"

Connect the input of 2107 direct to INPUT of 1613.

Set the frequency of the input signal to the center frequency of the filter in question and adjust the input voltage for an 18 dB deflection on Type 2107.

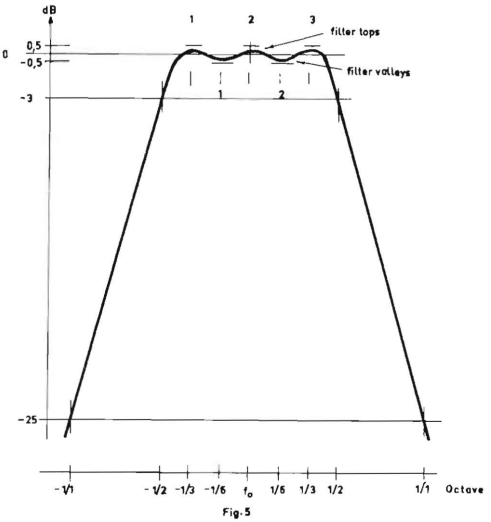


Fig.5

continued

b. Adjustment of pass-band.

1613 FREQUENCY to required position 31,5-31 500 Hz

Connect the input of 2107 to OUTPUT on 1613

Vary the frequency around the center frequency of the filter and check the tops and valleys.

2107 RANGE MULT: "X1"
METER RANGE: "1V"

Deflection on Type 2107: 18,1 - 18,5 dB for the tops
17,6 - 17,9 dB for the valleys

if necessary, adjust the level at: top 2 to 18,2 dB by P_c
top 1 and 3 to 18,2 dB by P_b
if the level for the two tops 1 and 3 are not equal adjust L_c

top 3 to 18,2 by P_a if any (some of the filters have no P_a)

Valley 1 and 2 by changing the value of the resistor R, or by adjustment of L_a and L_b

If the resonant frequency of circuit I is changed to a higher frequency by L_a and circuit II is changed to a lower frequency by L_b. Valley 1 will have a higher level and valley 2 a lower level and at the same time the frequencies for the band limit will change.

After any adjustment of $L_{a\text{-}b\text{-}c}$ or $C_{a\text{-}b\text{-}c}$ check all filters which might be influenced by the adjustment. See Fig.3.

c. Adjustment of band limit

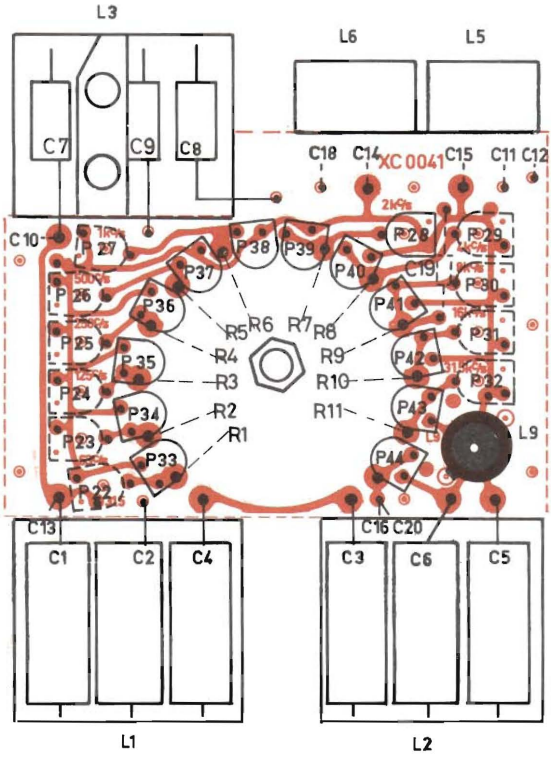
Change the frequency $\pm$1/2 octave.
Deflection on Type 2107: 14,3 - 15,7 dB.
If necessary adjust: L_a at 1/2 octave
L_b and L_c at $-$1/2 octave.

If the band limit of the filters are checked by increasing the frequency to the band-limit (-3 dB point) and then change FREQUENCY switch to the next filter, the output level must not change more than 1 dB.

After any adjustment of $L_{a\text{-}b\text{-}c}$ check all filters which might be influenced by the adjustment.

Position of Components

Valid from Serial No. 223328



PRINTED CIRCUIT XC 0041

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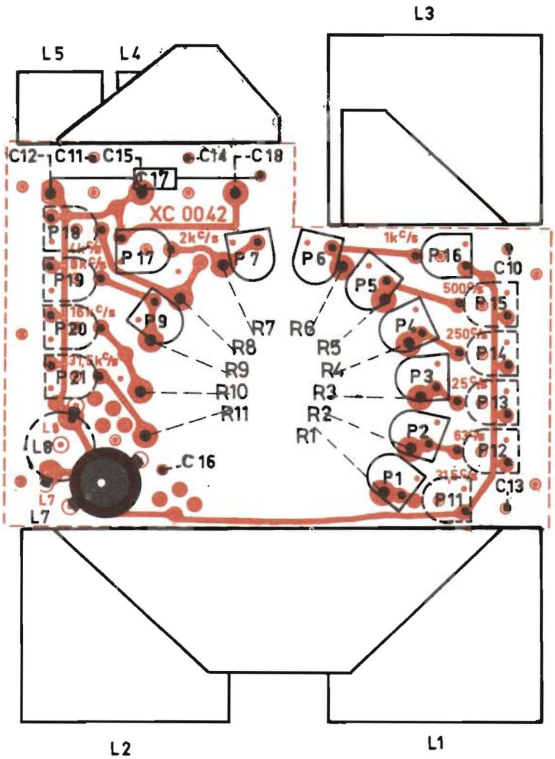


PRINTED CIRCUIT XC 0042

Parts-List

1613.4

valid from serial no. 223328

CAPACITORS:

CIRCUIT DIAGRAM REF.	COMPONENT TYPE		STOCK REF.
C 1-6	Polystyrene	1 µF/125 V ± 10%	CS 0025
C 7-9	"	126,6 nF/100 V ± 1%	CT 1601
C 10-12	"	31,8 nF/100 V ± 1%	CT 1600
C 13-15	"	7,92 nF/100 V ± 1%	CT 1101
C 16-18	"	1,98 nF/400 V ± 1%	CT 1303
C 19	"	250 pF/500 V	CT 0108
C 20	Electrolytic	1 µF/350 V	CE 0512

RESISTORS:

R 1	Carbon	1/3 W	1%	10 kΩ
R 2	"	"	"	20 kΩ
R 3	"	"	"	10 kΩ
R 4	"	"	"	20 kΩ
R 5	"	"	"	10 kΩ
R 6	"	"	"	20 kΩ
R 7	"	"	"	10 kΩ
R 8	"	"	"	20 kΩ
R 9	"	"	"	10 kΩ
R 10	"	"	"	20 kΩ
R 11	"	"	"	10 kΩ
R 12	"	"	"	146,2 kΩ

POTENTIOMETERS:

P1	Trimmer	Carbon	lin.	250 kΩ	PG 4251
P 2	"	"	"	1 MΩ	PG 5102
P 3	"	"	"	500 kΩ	PG 4502
P 4	"	"	"	1 MΩ	PG 5102
P 5	"	"	"	250 kΩ	PG 4251
P 6	"	"	"	1 MΩ	PG 5102
P 7	"	"	"	500 kΩ	PG 4502
P 9	"	"	"	500 kΩ	PG 4502
P 11	"	"	"	150 kΩ	PG 4151
P 12	"	"	"	80 kΩ	PG 3800
P 13	"	"	"	30 kΩ	PG 3301
P 14-16	"	"	"	50 kΩ	PG 3502
P 17	"	"	"	30 kΩ	PG 3301
P 18-20	"	"	"	50 kΩ	PG 3502
P 21	"	"	"	30 kΩ	PG 3301
P 22	"	"	"	150 kΩ	PG 4151
P 23	"	"	"	250 kΩ	PG 4251
P 24	"	"	"	80 kΩ	PG 3800
P 25	"	"	"	25 kΩ	PG 4151
P 26	"	"	"	80 kΩ	PG 3800
P 27	"	"	"	150 kΩ	PG 4151
P 28	"	"	"	50 kΩ	PG 3502
P 29	"	"	"	150 kΩ	PG 4151
P 30	"	"	"	80 kΩ	PG 3800
P 31	"	"	"	150 kΩ	PG 4151
P 32	"	"	"	80 kΩ	PG 3800
P 33-43	"	"	log.	500 kΩ	PG 4503
P 44	"	"	"	50 kΩ	PG 3503

SWITCHES:

01-5	Frequency Hz	OR 1613
	Weighting Switch	NN 0005

PRINTED CIRCUIT:

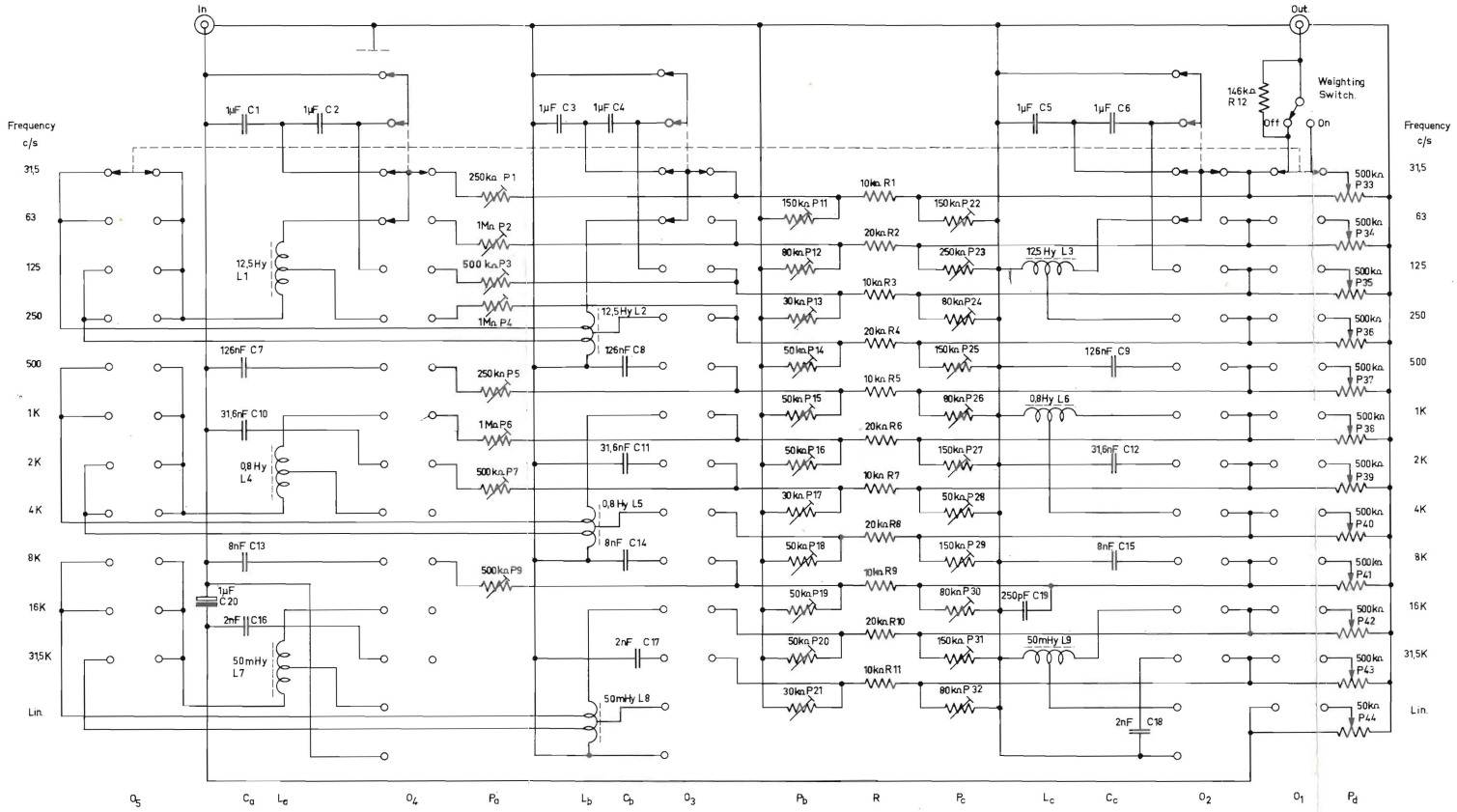
	without components	XC 0041
	" "	XC 0042
XC 0041	with components	848 1613
XC 0042	" "	848 1613

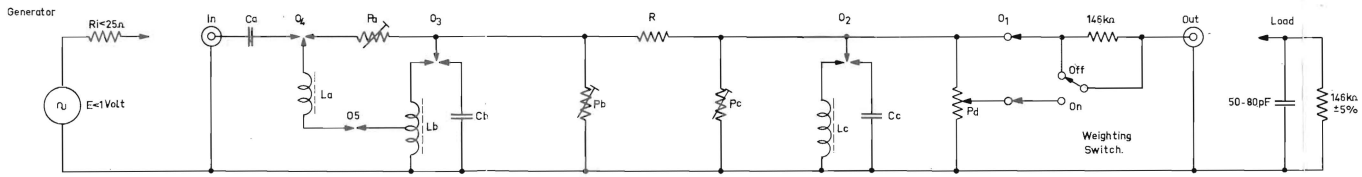
COILS:

CIRCUIT DIAGRAM REF.	COMPONENT TYPE	STOCK REF.
L 1	12,5 Hy	LB 0190
L 2	" "	LB 0191
L 3	" "	LB 0190
L 4	0,8 Hy	LB 0192
L 5	" "	LB 0193
L 6	" "	LB 0192
L 7	50 mHy	LB 0194
L 8	" "	LB 0195
L 9	" "	LB 0194

MISCELLANEOUS:

Metal case upper part	FA 1613
Metal case lower part	FB 1613
Screened socket	JJ 0006
Connection bar	JP 0400
Knob	SN 4021
Short bolt	YS 0406
Long bolt	YS 0417





Simplified diagram of one octave filter.

22-3-62	66430		
23-10-67	223328		

Brüel & Kjær
Copenhagen

Octave Filter
Type 1613

BD 1613