



Amendment due to Introduction of the Audio Frequency Spectrometer Type 2111.

General Description.

The Audio Frequency Spectrometer Type 2110 has been extensively modified, whereby the typenumber has been changed to 2111.

The automatic switching is now carried out electrically, and the mechanical connection between the level recorder and the spectrometer shown in Figs. 11, 15 and 16 is, by automatic recording of spectrograms, no longer necessary. Instead of using the Flexible Shaft UB 3003 and the Speed Multiplier UG 3004 the automatic switching is carried out by mounting a special switch UG 3006 on the Level Recorder Type 2304 and connecting the contacts of this switch electrically to the "Remote Control" terminals on the back of the Spectrometer. It is thus possible to record spectrograms automatically, even when the Recorder is placed a considerable distance away from the Spectrometer.

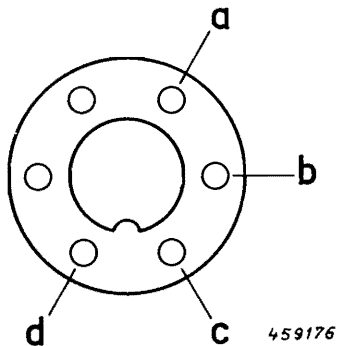


Fig. A. 1. The socket marked "Remote Control" as viewed from outside the instrument.

This also enables complete synchronization between the preprinted frequency scale on the recording paper and the "sweep" of the Spectrometer to be carried out in a very simple way.

It has not, unfortunately, been possible to make the switch completely noiseless. The switching noise will, however, only occur during the switching from one filter to the next, that is when the instrument is not measuring, and will consequently be of little or no importance in most cases.

If desired the switch UG 3006 may be replaced by a normally operated or programmed switch, or a switch in series with a 24 volts voltage supply. The connections to be made to the "Remote Control" socket are shown in Fig. A 1. In case an external switch is used only, it should be connected to the pins marked a and b, while the pins c and d should be short circuited. When the external switch is connected in series with a 24 V DC voltage supply, connections should be made to the pins marked b and c (+ to b and — to c), while a and d should be left open.

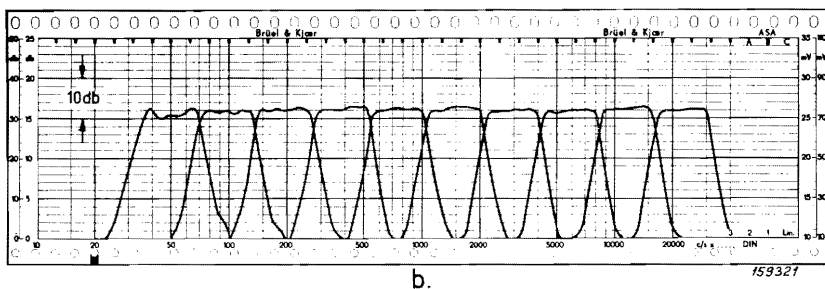


Fig. A. 2. Typical frequency characteristics for the octave band filters.

The "Function Selector" switch has furthermore been modified and does now include a position for *full octave band measurements*. Frequency analyses can thus be made *either in third octave bands or in full octave bands*, depending upon the setting of the switch. (The full octave filters are obtained by internally combining three $\frac{1}{3}$ octave filters). A separate switch marked "Automatic Switching" is used for selection of manual or automatic measurements.

Both the "Filter Input" and "Remote Control" terminals are located on the back of the instrument.

The reference voltage circuit of the Spectrometer Type 2111 is based on the voltage stabilizing effect of a zener diode. The reference circuit employed is so designed that a 10 % variation in the mains voltage applied to the instrument effects the reference voltage to less than 0.3 %.

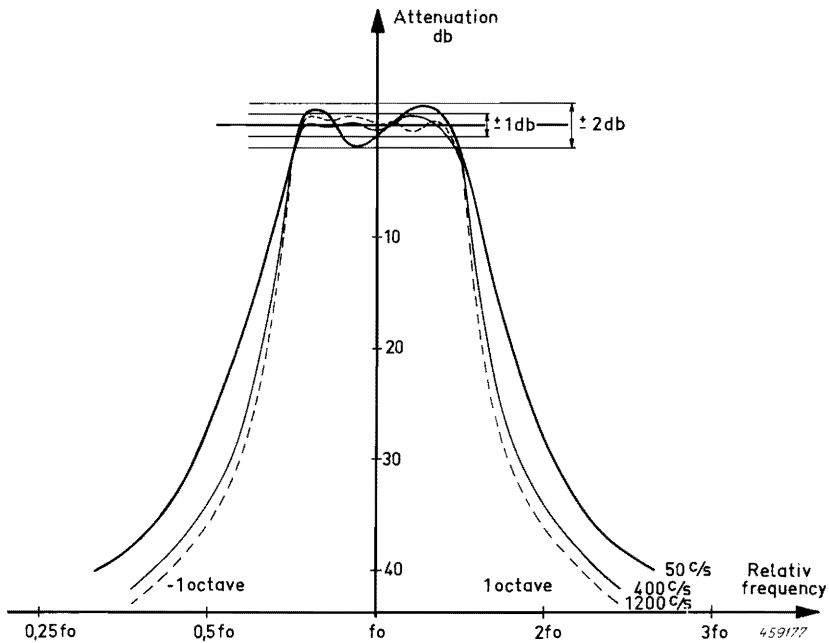


Fig. A. 3. Detailed filter characteristics.

Operation.

The operation of the Spectrometer Type 2111 is essentially the same as previously for Type 2110. The following corrections refer to the "Automatic Recording of Voltage Analyses", p. 15:

Delete item 1 (p. 15), and read instead:

1. Connect the instrument as shown in Fig. A 4. and set the switch marked "Automatic Switching" to "Off".

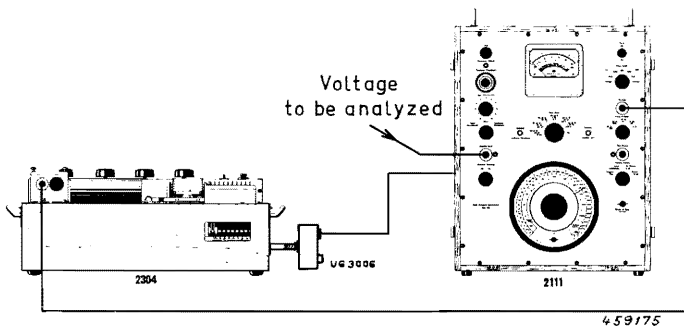


Fig. A. 4. Measuring arrangement for automatic recording of voltage analyses.

Delete item 8 (p. 15), and read instead:

8. Range Multiplier: "x1".

Delete item 10 (p. 16), and read instead:

10. Allow two minutes warm-up time. The meter pointer should now deflect to the red mark on the meter scale. Possible deviations should be corrected by turning the potentiometer marked "Sensitivity Amplifier Input" with the aid of a screwdriver through the hole in the front panel of the instrument.

Delete item 18 (p. 16), and read instead:

Input Potentiometer Knob: The knob should be turned until the deflection of the Level Recorder stylus is 36 db.

Remarks: The above settings on the Level Recorder is based on the use of a 50 db potentiometer.

Delete item 22 (p. 17).

Delete item 30 (p. 18), and read instead:

30. Set the switch marked "Automatic Switching" to "On", and the "Function Selector" switch to " $\frac{1}{3}$ -octave—0 db" or "Octave—10 db", depending upon which type of analysis is desired.

Remarks to item 33 (p. 19):

If octave band analysis is used, the reference level is no longer 0.1 Volt but 0.315 Volt.

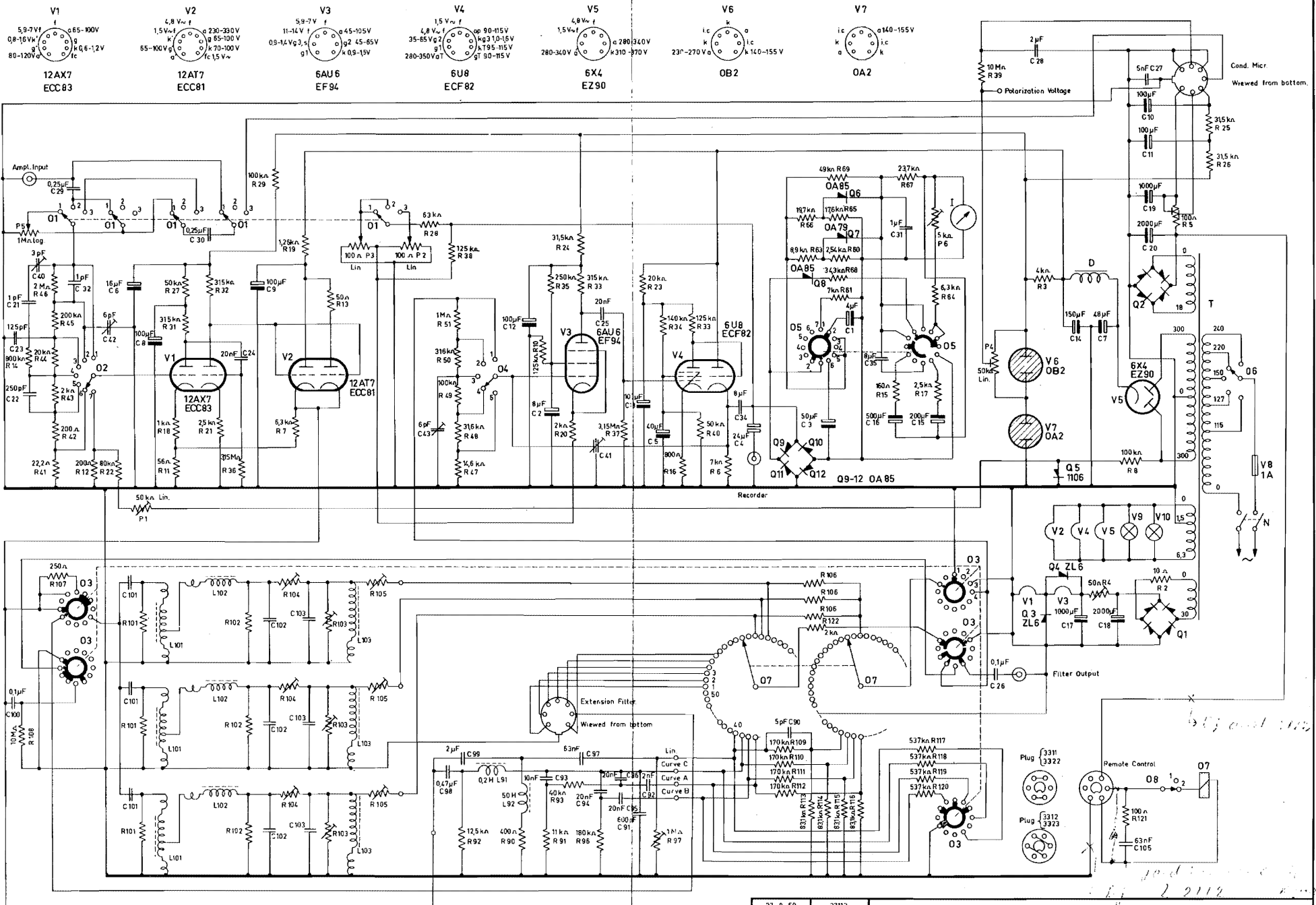
Corrections to chapter "Calibration of the Combination Spectrometer and Condenser Microphone for Sound Surveys":

Delete item 11 (p. 24), and read instead:

11. Turn the "Sensitivity-Condenser Microphone" potentiometer by means of a screwdriver until the meter pointer deflects to the red mark on the scale + K db.

Delete item 13 (p. 24), and read instead:

13. Set the switch marked "Automatic Switching" to "Off", and the "Function Selector" switch to " $\frac{1}{2}$ octave—0 db" or "Octave—10 db" depending upon which type of measurement is desired.



27-8-59	37112
22-10-59	42527
4-3-60	48175

Brüel & Kjær
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Audio Frequency Spectrometer
Type 2111

Filter No	Frequency c/s	L101, 102 and 103H	C 101 C102nF	C 103 nF	C 104 pF	R101 k Ω	R102 k Ω	R 103 k Ω	R 104 k Ω	R105 k Ω	R106 k Ω
ZS 0045	10	100	2500	2500					200	200	170
	12,5	80	2000	2000							
	16	63	1600	1600							
	20	50	1250	1250							
	25	40	1000	1000							
	31,5	31,5	800	800							
ZS 0029	40	25	630	630					200	300	
	50	20	500	500							
ZS 0030	63	16	400	400						150	
	80	12,5	315	315							
ZS 0031	100	10	250	250				ap.300		150	
	125	8	200	200							
ZS 0032	160	63	160	160						150	
	200	5	125	125		ap.800					
ZS 0033	250	4	100	100		" 400					
	315	3,15	80	80		" 315					
	400	2,5	63	63		" 150					
ZS 0034	500	2	50	50		" 100		" 200			
	630	1,6	40	40		" " ap.400					
	800	1,25	31,5	31,5		" " " 315					
ZS 0035	1000	1	25	25		" " " 200					
	1250	0,8	20	20		" " " " " " " "					
ZS 0036	1600	0,63	16	16		" 80					
	2000	0,5	12,5	12,5		" " " " " " " "					
ZS 0037	2500	0,4	10	10		" " " " " " " "					
	3150	0,315	8	8		" " " " " " " "					
ZS 0038	4000	0,25	6,3	6,3		" " " " " " " "					
	5000	0,2	5	5		" " " " " " " "					
ZS 0039	6300	0,16	4	4		" " " 400	" 125				
	8000	0,125	3,15	3,15		" " " 315	" " " " " " " "				
	10000	0,10	2,5	2,5	40	" " " " " " " "	" " " " " " " "				
	12500	0,08	2,0	2,0	" " " " " " " "	" " " " " " " "					
	16000	0,063	1,6	1,6	" " " " " " " "	" " " " " " " "					
ZS 0141	20000	0,050	1,25	1,15	" " " " " 250	" " " " " " " "					
	25000	0,040	1,0	0,9	" " " " " " " "	" " " " " " " "					
	31500	0,0315	0,8	0,7	" " " " " " " "	" " " " " " " "					

Switch Positions.

01: Input Switch

- 1: Potentiometer
- 2: Direct
- 3: Condenser Microphone

02: Meter Range

- 1: 10mV
- 2: 100mV
- 3: 1V
- 4: 10V
- 5: 100V
- 6: 1000V
- 7: Ref

03: Function Selector

- 1: External Filter
- 2: Linear 2-35000%
- 3: 1/3 Octave 0db
- 4: Octave -10db

04: Range Multiplier

- 1: x 0,01
- 2: x 0,03
- 3: x 0,1
- 4: x 0,3
- 5: x 1

05: Meter Switch

- 1: Average Fast
- 2: Peak "
- 3: R.M.S. "
- 4: Off
- 5: R.M.S. Slow
- 6: Peak "
- 7: Average "

07: 50 Positions

- 1-6: External Filters
- 6-36: 1/3 Octave or Octave Filters
- 37-40: Weighting Network
- 41-50: Ground

08: Automatic Switching

- 1: Off
- 2: On

P1: Ref. Voltage Adj.

P2: Sensitivity Condenser Micr.

P3: Sensitivity Ampl. Input

P4: Polarization Voltage Adj.

P5: Input potentiometer