Type BKF5

Distortion Meter

Engelsk

Brugsanvisning
Originalkoncepter
må ikke udleveres

Erst.:

Erst. af:

Skrevet af: PN/BV d. [illegible] 1948 Kontr.:

Der indsættes:

Strømskema 445-A3 BKF5a

551-A3 BKF5b

592-A3 BKF5c + d

Bemærk:

Rettelse på side 2.
rettes i stencil

934-BKF5
EB1-front page (348)

TYPE BKF5 DISTORTION METER

The type BKF5 Distortion Meter measures distortion or hum in audio-frequency circuits.

This instrument is continuously adjustable in frequency in the range from 20 cycles to 20,000 cycles. Frequencies up to 60,000 are passed unattenuated by the amplifier circuits so that distortion measurements can be made on fundamental frequencies up to 20,000 cycles. The distortion is read directly from the meter, and values as low as 0.1% can be measured since the lowest range is 0.5% full scale.

The Distortion Meter consists of a three-stage high-gain amplifier with an RC interstage coupling unit that balances to a sharp null, a calibrated attenuator for adjusting the sensitivity followed by a two-stage amplifier with a square law copper-oxide rectifier meter. A high-pass or a low-pass filter can be connected between amplifier and meter. The built-in power supply is voltage regulated. Line surges will have no appreciable effect except when the instrument is operated on the 0.5% scale.

The highest sensitivity of the instrument is about 0.5 volts and the residual distortion less than 0.1% - in the greatest part of the frequency range less than 0.05%.

The input impedance is about 250 kilohms in series with 0.25µf.

The Distortion Meter operates as follows:

With the vacuum-tube voltmeter in its least sensitive position ("%" switch in position C) the input controls are set so that the meter gives full deflection. When the "%" switch is set to one of the other positions, the balancing RC coupling unit is switched on and if the RC unit is tuned to the fundamental frequency, this frequency can be completely eliminated when the "Balance" potentiometer is turned to its correct position. The meter then indicates directly the distortion in per cent of the fundamental plus harmonics. When the fundamental frequency is higher than 400 cycles, it is possible to measure the hum and the harmonics separately by connecting either the low-pass or the high-pass filter between amplifier and copper-oxide rectifier meter.

The high-pass filter attenuates 50 cycles by about 50 db, 100 cycles by about 33 db and 150 cycles by about 13 db. The low-pass filter attenuates 800 cycles by about 28 db, 1200 cycles by about 39 db and 1600 cycles by about 47 db.

The input voltage of the copper-oxide rectifier meter is obtainable at the jack marked "Oscillograph" and can be used for tracing Lissajous figures on an oscillograph. The input voltage of the Distortion Meter is then fed to the horizontal deflecting

plates of the cathode-ray tube and the harmonics are fed to the vertical plates from the jack "Oscillograph".

Directions

Before connecting the instrument to the line, set the line switch to its correct position. When leaving the factory the line switch is in its 220 volt position, but the following positions are available: 110 - 127 - 150 - 200 - 220 or 240 volts. The switch is accessible when the instrument is removed from its case, and it is located below the line transformer together with a 1 amp fuse.

Connect the instrument to be measured to the input jack of the Distortion Meter. Use a shielded cable if the output impedance of the instrument is high so as to avoid hum. A voltage of about 0.5 volts is required. Set the "%" switch to its right-hand position (C), the filter switch to its mid position, and the frequency range switch so that the fundamental frequency is within the range chosen. Set the meter needle to the last division on the scale of the meter by means of the knobs "Output coarse" and "Output fine". Then turn the "%" switch from position C to position 100 and tune the main dial and the balance potentiometer to minimum deflection. Afterwards repeat the tuning with the "%" switch set to the lowest position possible. Now the minimum deflection of the meter needle indicates the amount of harmonics plus hum. If the fundamental frequency is higher than 400 cycles, the harmonics and the hum components can be measured separately by switching in either the high-pass or the low-pass filter.

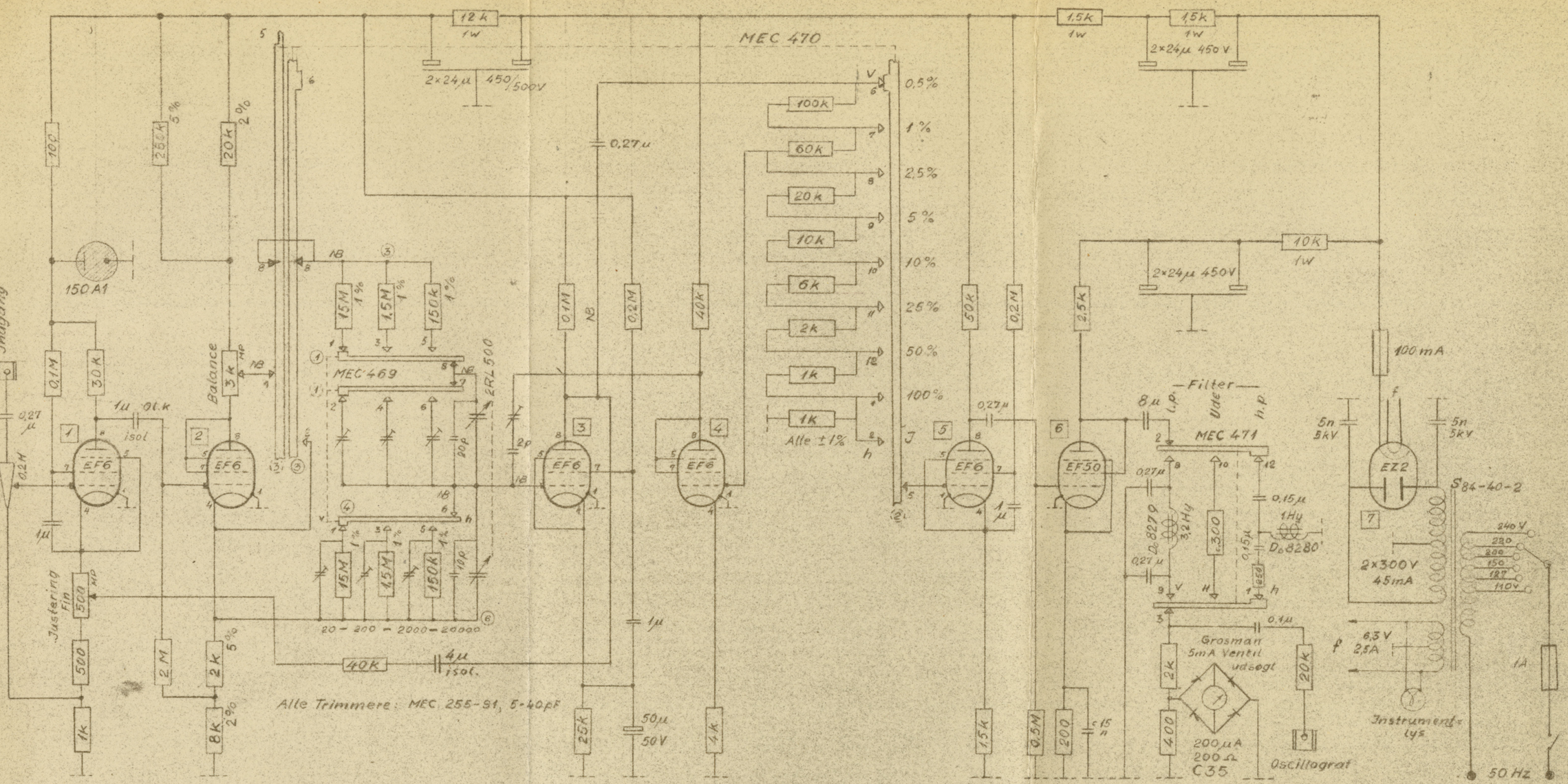
If you want to establish whether one of the harmonics is dominating, this can be done by tracing a Lissajous figure on the screen of a cathode-ray tube. In that case also connect the vertical amplifier of the oscillograph to the input jack of the Distortion Meter and the horizontal amplifier to the jack "Oscillograph". A figure resembling a U or ∞ will then indicate the second harmonic, while a ∩ or ∞ indicate the third harmonic. In general, however, the figures are not so simple.

Accuracy

The distortion factor is defined as the r-m-s value of the harmonics in per cent of the r-m-s value of the fundamental frequency. However, the Distortion Meter measures in proportion to the total value of the fundamental plus harmonics. This does not affect the accuracy at low distortion factors. At higher values the reading has to be corrected by the formula:

$$d_{actual} = \frac{d_{read}}{\sqrt{1-\left(\frac{d_{read}}{100}\right)^2}}$$

Besides the accuracy is affected by the copper-oxide rectifier meter which does not give the precise r-m-s value under all conditions. In general the accuracy is about 5% of full scale for each range ± residual distortion.



Bl. Nr.	Forhold Nr.	Dato	Kontr.	Norm.
1		9/6 48	GR	AA

RADIOMETER
KØBENHAVN

Klirfaktormaaler
Type BKF 5a
Strømskema

Udgave 3 19/9 47
Erstatter
445 – A 3.
Erstattet af