RESEARCH DEPARTMENT

AKG MICROPHONE TYPE DYN 60K

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SUMMARY

Laboratory tests have been carried out on a single specimen of the AKG microphone type DYN 60K. Measurements of frequency response, sensitivity, impedance and susceptibility to interference from magnetic fields have been made and are described.

1. INTRODUCTION.

The DYN 60K microphone is a pressure-operated moving-coil instrument manufactured by the Akustische und Kino-Geräte Gesellschaft of Vienna. It is stated to be comparable in performance and price with the moving-coil microphones manufactured by Standard Telephones and Cables and is therefore of interest as a possible alternative to these.

2. DESCRIPTION OF MICROPHONE.

Fig. 1 shows the dimensions and general appearance of the microphone. The case is cylindrical, the front portion being slotted as shown and lined with wire gauze
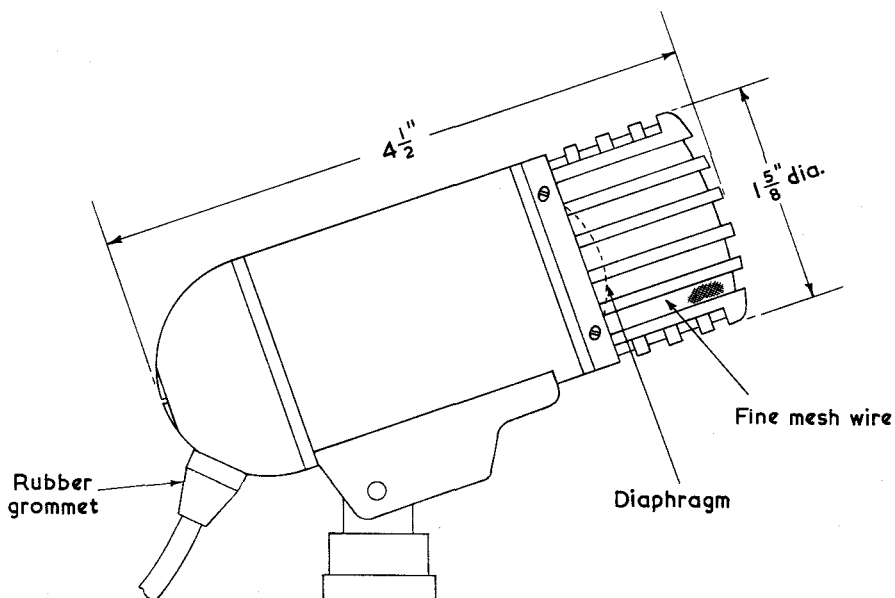

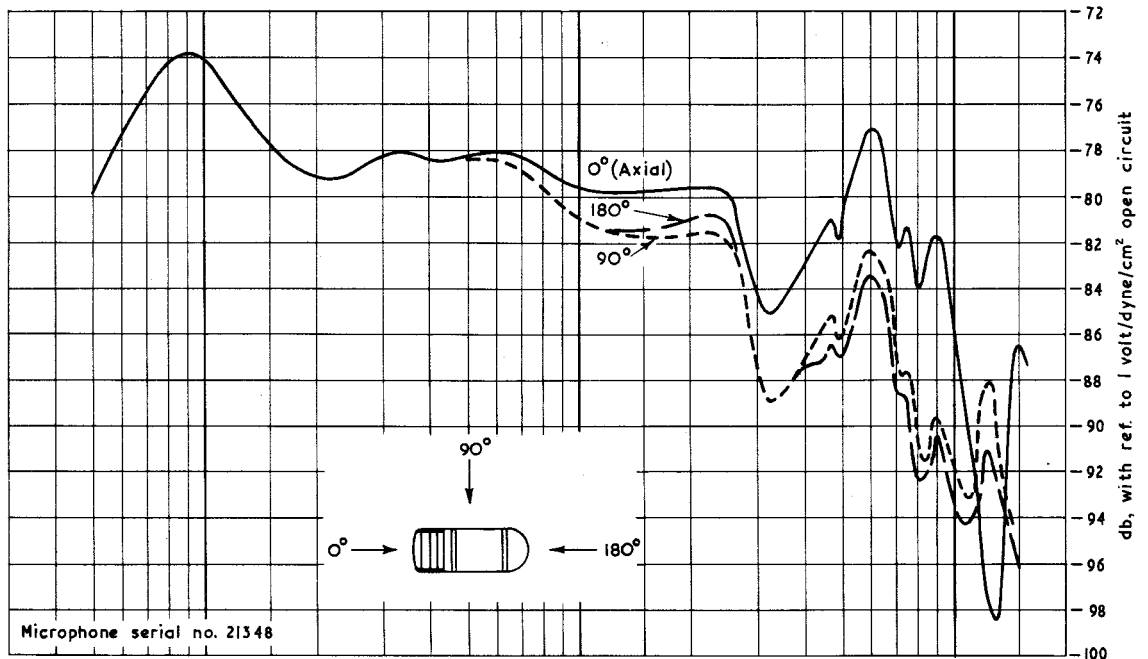Fig. 1 - External view

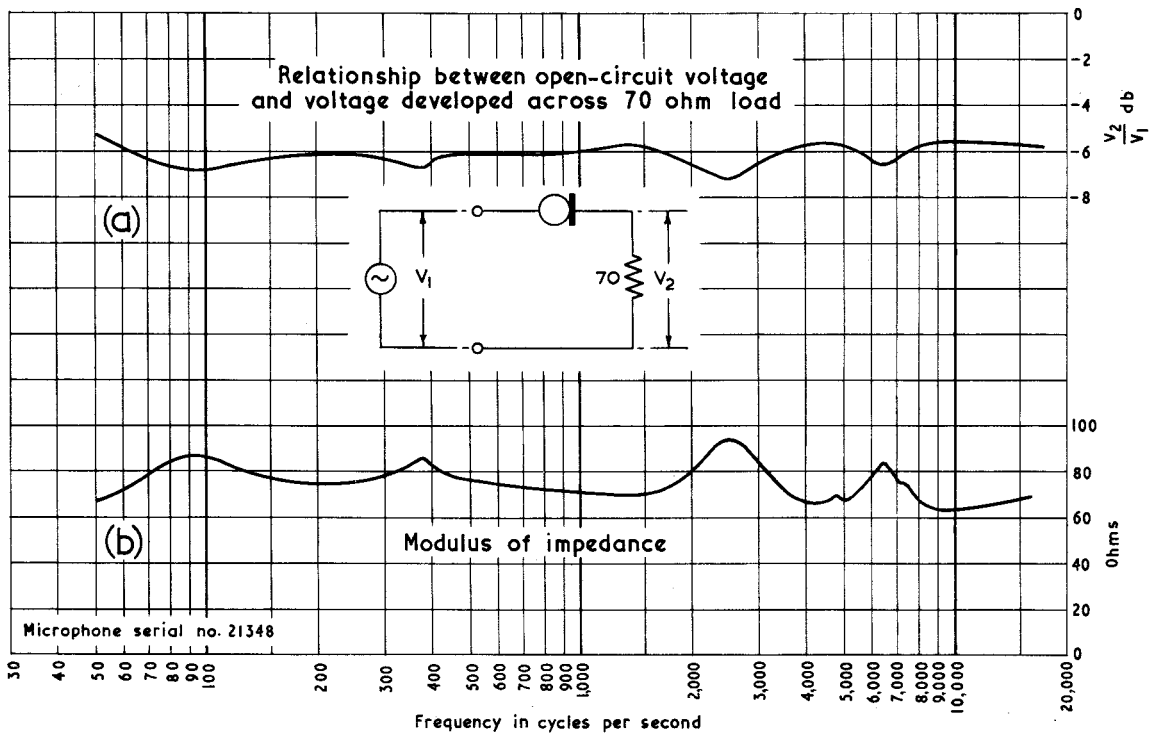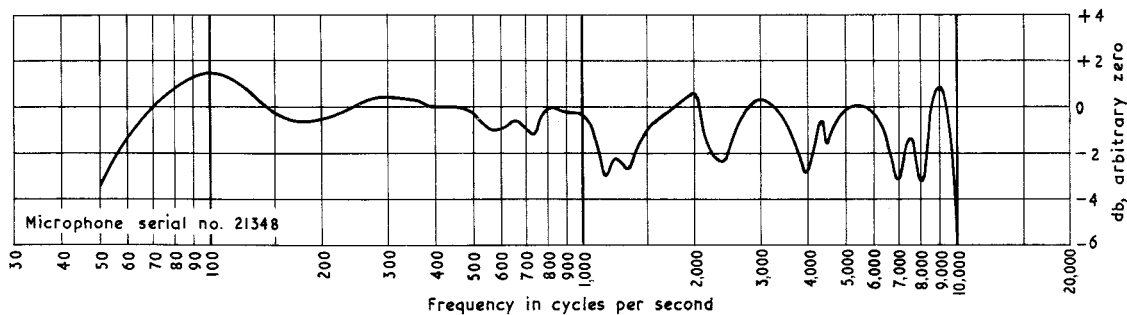Fig. 2 - Frequency Characteristics

Fig. 3

Fig. 4 - Frequency characteristics given by manufacturers

through which the domed diaphragm is visible.   Connections to the output lead are
made inside the hemispherical rear cover which is secured by a single screw.

The weight of the microphone without cable is 15 oz. (420 g).

3. METHOD OF MEASUREMENT.

The microphone characteristics were measured in the dead room by the method
of substitution using a calibrated pressure microphone.   The accuracy of comparison
with the standard is within $\pm \frac{1}{2}$ db, and the calibration of the standard itself is
known to the same degree of accuracy.

4. FREQUENCY CHARACTERISTICS.

Fig. 2 shows the open-circuit frequency characteristics of the microphone
for sound incident at angles of $0°$, $90°$ and $180°$ while Fig. 3(a) shows the correction
to be applied to these curves to obtain the response into a resistive load equal in
magnitude to the impedance of the microphone at 1,000 c/s.   The salient features of
the response curves are the rise around 90 c/s, the dip at 3,300 c/s, the peak at
6,000 c/s and the general downward trend of the axial characteristic towards the high-
frequency end.

Fig. 4 is replotted from a frequency response curve provided by the manufac-
turers and purporting to apply to the particular specimen tested.   The acoustic
conditions are not specified but the curve probably refers to axial incidence;   the
nature of the electrical load, if any, was not stated but the disparity between
Figs. 2 and 4 is too great to be accounted for by this ambiguity.

5. IMPEDANCE.

Fig. 3(b) shows the variation of microphone impedance with frequency.   It
will be seen from Fig. 3(a) that the variation is sufficient to modify the response
characteristic slightly when the microphone is worked into a load resistance comparable
with the microphone impedance.

6. SENSITIVITY.

The open–circuit sensitivity in the mid–band region is approximately – 80 db with reference to 1 volt/dyne/cm². If an ideal transformer were used to raise the impedance to 300 ohms at 1,000 c/s, the open–circuit sensitivity at the secondary terminals would be approximately – 74 db with reference to 1 volt/dyne/cm². For comparison, the corresponding figure for an AXBT microphone is – 71 db.

7. NOISE.

7.1. General.

In the absence of interference the noise output of· the microphone is due to the resistive component of its impedance. The r.m.s. open–circuit noise voltage in the band 0 to 10,000 c/s is hence – 139 db relative to 1 volt unweighted and – .133 db when weighted by an aural sensitivity network type ASN/3. The sound level in the mid–band region which would produce a microphone output equal to that due to the weighted noise is therefore + 21 db relative to 0·0002 dyne/cm². The corresponding figure for an AXBT microphone is + 18 db.

7.2. Interference from Magnetic Fields.

The open–circuit output of the microphone due to a uniform magnetic field was measured at 50 c/s, 1,000 c/s and 10,000 c/s, the orientation being chosen at each frequency to give the greatest output. The figures for a field of 1 milligauss are given in the table, together with the sound level in the mid–band region required to give the same output. The corresponding figures for an AXBT microphone are given for comparison.

8. TRANSIENT RESPONSE.

The microphone was tested for transient response by the method described in Report No. M.002. Low–damped resonances were observed at 4,750 c/s and 4,850 c/s; a further mode, more heavily damped, appeared at 380 c/s.

9. CONCLUSIONS.

In dimensions, weight, sensitivity and susceptibility to magnetic interference, the DYN 60K does not differ greatly from other modern moving–coil microphones, while the frequency characteristics are in some ways inferior.

The peak in response at 90 c/s, unusual in a microphone of this type, is a highly undesirable feature as it will tend to produce boomy quality. If the variation in response between individual specimens is not too great it might be justifiable to use electrical equalisation to remove this peak. The falling off in high–frequency response with angle of incidence is no greater than is usual in a moving–coil micro-phone of this type. Since however the axial response characteristic already shows a slight downward trend towards the higher frequencies, the oblique angle response is

even more deficient in this region and care would therefore be necessary in using the microphone for interviews.

FREQUENCY	I OPEN–CIRCUIT VOLTAGE AT 300 OHM OUTPUT DUE TO MAGNETIC PICK–UP IN A FIELD OF ONE MILLIGAUSS O db = 1 v.		II SOUND LEVEL IN MID–BAND REGION TO GIVE OPEN–CIRCUIT OUTPUT SHOWN IN I O db = 2×10^{-4} dyne/cm^2	
	(a) AKG DYN 60K*	(b) AXBT†	(a) AKG DYN 60K*	(b) AXBT†
c/s	db	db	db	db
50	−113	−133	+35	+12
1,000	−111	−121	+37	+24
10,000	−100	−107	+48	+38

*At output terminals of ideal 70 ohms : 300 ohms transformer.

†Figures given represent typical microphone.