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The Frequency Tests--Some Notes in Explanation

By W. J. Bellingham



A LARGE number of letters have been received from listeners giving their experiences in the reception of the frequency test, and many of these ask for explanations

on various points.

In the following notes Mr. Bellingham covers the ground of these questions.

THE test dealt with frequencies up to 16,000, the 30,000 frequency being put over in the form of a novelty. It was not expected that 30,000 would be received by any loudspeaker, and it is a frequency not essential to music. The frequencies from 10,000 to 16,000 represent those of the highest overtones in music, and they would naturally be heard only very softly, and are not absolutely essential to good reception, being present in only a few of the very highest tones on certain instruments. A number of people have received these frequencies, but they would naturally receive them very faintly, and their reception would merely indicate a very sensitive and responsive speaker, which could be relied upon for a most accurate reproduction of timbre.

Since approximately 4,000 represents the highest fundamental in music a listener would understand that these notes would bound to be softer in frequencies above 4000 or 5000 for the reason that these frequencies represent overtones only, which are of course much softer than fundamental tones. Any speaker which received frequencies from 4000 up to 9000 or 10,000 with decreasing intensity, could be relied upon faithfully to reproduce practically the whole of the musical scale in almost every instrument.

FULL volume would not be heard much above 3000 and though frequencies above this number were put out with

equal volume by the station, they would be heard less loudly by listeners, for the reason that neither the speaker or the human ear would have the same capacity to respond to these vibrations.

The most commonly misunderstood feature of the test is the meaning of the term quality or timbre. The timbre or characteristic quality of the notes, is that which distinguishes one instrument or voice from another. If the frequencies which represent overtones are not



Mr. W. J. Bellingham,

heard, then the tone is not more impure but is actually purer but less characteristic and more monotonous and dull, that is to say each tone will have a more or less similar quality.

A USUALLY well-informed and capable writer, touching on this question, assumed that the lack of high over-

tones would give more or less of a gramophone quality. This is of course entirely wrong. The lack of overtones would give a purer quality, but no character. The peculiarity of the quality of a gramophone or a loudspeaker to which this writer refers, is obtained not from the lack of high overtones, but from the association of regular musical vibrations with irregular vibrations which represent noise. These irregular vibrations or noise come from many very different sources, such as from the needle scratching on the face of the record, or from the irregular vibration of various mechanical parts of the gramophone or the loudspeaker, or from the manner in which the electric current is handled.

FROM our reports, we find that the average loudspeaker has accepted with even volume frequencies somewhere in the region of 3000, and among better results fading intensities have been received in many cases up to 8000 or 9000 only a very few having received anything beyond 10,000.

It will be clearly understood that it is not necessarily the speaker alone that is responsible for these results, but that the efficiency of the speaker depends also on the whole audio circuit.

The matter of the matching of the audio circuit and the loudspeaker will be the subject of further articles in the "Radio Record."

A very large number of coupons and replies have been received by both the Company and the "Radio Record," in connection with our offer of a guinea prize for the best coupon and most informative letter. This matter is being carefully perused, but it is so voluminous that it is impossible, in justice to competitors, to make an award this week. —Editor, "Radio Record."