

JMS
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DEPARTMENT OF COMMERCE
WASHINGTON

NATIONAL BUREAU OF STANDARDS RESUMES BROADCASTING STANDARD OF MUSICAL
PITCH

The standard frequency radio service of the National Bureau of Standards, Department of Commerce, which has been conducted on a reduced basis since last November when fire destroyed the Bureau broadcasting station WWV has been extended by the resumption of the standard musical pitch and of seconds intervals. Barring unforeseen developments due to the current use of temporary equipment, it is pointed out, the service will henceforth be on the air continuously day and night. The radio frequency is, as formerly, 5,000 kilocycles per second.

The standard musical pitch carried by the broadcast is the frequency 440 cycles per second, corresponding to A above middle C. In addition there is a pulse every second, heard as a faint tick, when listening to the 440 cycles. The pulse lasts 0.005 second, and provides an accurate time interval for purposes of physical measurements.

The 440-cycle tone is interrupted every five minutes for one minute in order to give the station announcement and to provide an interval for the checking of radio measurements based on the standard radio frequency. The announcement is the station call letters (WWV) in telegraphic code (dots and dashes).

The accuracy of the 5-megacycle frequency, and of the 440-cycle standard pitch as transmitted, is better than a part in 10 000 000. Transmission effects in the medium (Doppler effect, etc.) may result in slight fluctuations in the 440-cycle frequency as received at a particular place; the average frequency received is however as accurate as that transmitted. The time interval marked by the pulse every second is accurate to 0.000 01 second. The 1-minute, 4-minute, and 5-minute intervals marked by the beginning and ending of the announcement

periods are accurate to a part in 10 000 000. The beginnings of the announcement periods are so synchronized with the basic time service of the U. S. Naval Observatory that they mark accurately the hour and the successive 5-minute periods; this adjustment does not have the extreme accuracy of the time intervals, but is within a small fraction of a second.

The broadcast is from a 1-kilowatt transmitter. It is most useful for moderate distances in the daytime and long distances at night. For reception in locations reasonably free from interference, it is receivable in the summer at all distances up to about 500 miles from Washington in the middle of the day. The distance range increases after about 4 P.M. (EST) until at night the broadcast is receivable throughout the United States (i.e., the 5-Mc carrier frequency; the 440-cycle tone is sometimes not receivable at night beyond about 1300 miles). Sometimes at night it may be difficult to receive either the 5 Mc or the 440 cycles at distances between about 50 and 500 miles, while it is easy to receive them beyond 500 miles. In the autumn the daytime distance range will increase, rising to about 1000 miles in the winter.

The service from the temporary transmitter will continue for some months. As rapidly as possible the Bureau will establish a new station to provide more fully than in the past, standard frequencies reliably receivable at all times throughout the country. These will be transmitted on more adequate power, and several radio carrier frequencies will be used, in order to provide more certain coverage of all distances and times.