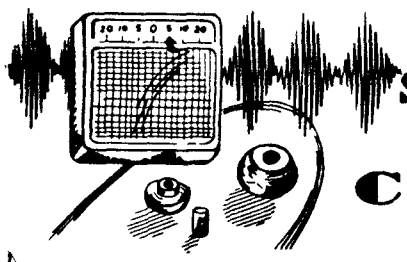

STANDARDS AND CALIBRATION

Changes in NBS Radio Broadcasts

Adjustment of Time Pulses

In accordance with the Bureau's policy of giving monthly notices regarding changes in phases of time pulses, notice is hereby given that there will be an adjustment in the phase of seconds pulses emitted from radio station WWVB, Fort Collins, Colo. On December 1, 1965, the clock at the station was retarded by 200 ms at 0000 hours UT (7 p.m., EST, of November 30). The successive time pulses emitted from station WWVB are one second apart. The carrier frequency of WWVB is 60 kHz, and is broadcast without offset.

Notice is also hereby given that there was no change in the phases of time pulses emitted from radio stations WWV, Greenbelt, Md., and WWVH, Maui, Hawaii, on December 1, 1965. These pulses at present occur at intervals which are longer than one second by 150 parts in 10^{10}, due to the offset maintained in carrier frequencies, as coordinated by the Bureau International de l'Heure (BIH).

The phase adjustments ensure that the emitted pulses from all stations will remain within about 100 ms of the UT2 scale. They are made necessary because of changes in the speed of rotation of the earth with which the UT2 scale is associated. Daily UT2 information is obtained from forecasts of UT2 provided weekly by the U.S. Naval Observatory in accordance with the close cooperation maintained between the two agencies.

Frequency Offset for 1966

The carrier frequencies of broadcasts by National Bureau of Standards radio stations WWV in Greenbelt, Md., WWVH in Maui, Hawaii, and WWVL in Fort Collins, Colo., will be offset during 1966 by -300 parts in 10^{10} from their nominal values. These nominal values are taken with respect to the United States Frequency Standard (USFS). The adjustments in carrier frequencies will be made at 0000 UT on January 1, 1966.

The new offset value was announced on September 21, 1965 by the Bureau International de l'Heure (BIH), after an evaluation of predictions of the trend in the UT2 scale. The fractional offset is twice the value -150×10^{-10} used in 1964 and 1965. In accordance with the announcement, changes will be made in the carrier frequencies of all broadcasts which follow the coordinated universal time (UTC) system.

The standard carrier frequency of broadcasts by radio station WWVB in Fort Collins, Colo., will not be changed. It is not offset from its nominal value of 60 kHz, taken with respect to the USFS.

As a result of the new offset, the intervals between timing pulses for the UTC system will differ in length from a second by a greater amount than in 1964 and 1965. The intervals will be longer than a second by 300 parts in 10^{10}. By contrast, the time intervals between pulses broadcast from WWVB will continue to be one second in length as referred to the standard atomic time scale, NBS–A, based on the USFS and in accordance with the definition of the unit of time agreed upon internationally.

Metrologia, Vol. I, No. 3

Articles in the latest issue of this new journal deal with four major areas of scientific metrology: temperature standards, interferometric determination of length, the acceleration of gravity, and time and frequency standards.

A paper by C. R. Barber and A. Horsford (National Physical Laboratory, Teddington, England), "Differences between the thermodynamic scale and the International Practical Scale of Temperature (IPST) from 0 °C to -183 °C," presents data of the sort needed to pave the way for an extension of the IPST to temperatures below -183 °C (about 90 °K). Of interest to those engaged in precise length measurement is the article "An air refractometer for interference length metrology," by J. Terrien (BIPM, Sèvres, France). This article describes the construction, method of use, and performance of a device for measuring the refractive index of the ambient air.

By far the longest paper is "The absolute determination of the acceleration due to gravity," by A. H. Cook (NPL, Teddington, England). This paper begins with a consideration of the place of measurements of g in the system of fundamental constant of physics and celestial mechanics and the history of gravity measurements down to around 1950. It then launches into a critical review of theory, recent measurements, and present status of the subject.

"Cesium beam atomic time and frequency standards," by R. E. Beehler, R. C. Mockler, and J. M. Richardson (NBS, Boulder, Colo.) discusses the metrologically significant characteristics of devices that generate radiation whose frequency has been temporarily designated by the International Committee of Weights and Measures as a basis for the physical measurement of time and frequency. From results of a fairly large number of comparisons of cesium standards one with another, it is concluded that frequency differences are within $\pm2\times10^{-10}$ for all standards and $\pm1\times10^{-10}$ for laboratory-type standards.

For further information on standards and calibrations, see Peak Pulse Power Initiated *on p. 210, and* WWV to Be Relocated *on p. 215.*