

RR
Road Recordings

long play 5013

IONOSPHERE

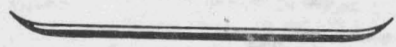


Synchronized Ionosphere Observations
Washington, D.C. - - Hanover, N.H.

IONOSPHERE

5013

The ionospheric observations recorded binaurally here were taken simultaneously on two independent tape recorders as follows.



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The date was March 1, 1955, time identified through monitoring of WWV signals.

Of course a fine synchronization could not readily be accomplished at distances of this sort without rather elaborate equipment. Therefore both tape machines were driven from the conventional 60 cycle lines at each point.

A finer synchronization was established at Cook Labs by observing the corresponding "crashes" and "bonks" (see #5012). The comparative incidence of whistlers at these respective locations is interesting. By means of a persistent-screen oscilloscope or other suitable means, an extremely precise observation of the causative bonk may be established for each track or point.

The relative time delay between the two locations is then available, and although no quantitative analysis has been made here, a casual listening test displays substantial variations in time of arrival between Hanover and Washington. The explanation of such differential arrival time will of course be the responsibility of the basic Storey theory.

In the many cases where a clear whistler arrives at both places, a sound spectrograph analysis should verify the differential arrival time between the two points, the point (Hanover) with the higher latitude having the more pronounced $v \sim \frac{1}{\sqrt{f}}$ frequency rate of decline.

Working on an assumption of the Storey theory it should then be possible thru knowledge of the geomagnetic earth-field line lengths thru the respective locations, to arrive at an approximation of electron density (at that moment) in the area traversed by the signal.

Rain static in Hanover is present on the first portion of the "A" side, and WWV announcement of the 10:10 A.M. signal is heard.

Hum cross-talk of an F-M station synch signal is heard in the latter part of "B" side.

The record is intended for playing binaurally, simultaneously with two pickups on the same or separate arms. Signals were recorded on the same radius, but the accuracy of synchronization is not great enough to permit absolute measurement without separate analysis of discrete whistlers. The use of two arms, one of which is adjustable in position for synchronization of the bonk is a procedure alternative to the long-persistence screen with electron switcher.

It is probably a valid assumption that the bonk arrival time is for practical purposes simultaneous in both locations, since its propagation velocity will be much higher and over a very short path as compared with the resulting whistler.

Backing up in the groove is permissible only with diamond points which bear a vertical incidence to the record.

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