



DEPARTMENT OF NATIONAL DEFENCE
CANADA

DEFENCE RESEARCH BOARD

Defence Research Telecommunications,
Establishment,
(Radio Physics Laboratory),
Defence Research Board,
Shirley Bay,
Ottawa, Ont.

September 25, 1953.

Dr. Grote Reber,
Wailuku, Maui,
Territory of Hawaii,
U.S.A.

Dear Dr. Reber:

I was most interested in your remarks concerning cosmic noise and spread F.

An analysis of the time and position distribution of spread F was made here some years ago but never reached report stage.

All Canadian stations are reporting spread F on a "scale of spreadiness" which is detailed in section 4-2 of "Ionospheric Observer's Instruction Manual" by J.H. Meek and C.A. McKerrow.

As a consequence of a very large amount of work done in preparation of a new Arctic Prediction Service for high frequency communication I have made an analysis of the geographical and time distribution of F region monthly average critical frequencies above 35°N latitude.

This shows regions of maximum critical frequency centred at the latitude of the auroral zone and the longitude of the geomagnetic meridian both in the western and eastern hemispheres. Regions of low critical frequency are found over the north Pacific and north Atlantic.

This I believe does not contradict your finding of low spreadiness near longitude 90°W. This is because spreadiness increases with magnetic storm activity which reduces F critical frequencies (when they are measurable).

There is of course a very marked diurnal variation (at least at high latitudes) in spreadiness, with the maximum at night. There is also an increase in the occurrence of spreadiness in the winter due to the longer period of darkness.

However we find F spread to be very dependent on receiver gain settings so that the comparison of records taken over a long period or at different stations is very unreliable unless special precautions are taken.

I am interested that at Kihau you find "Spreadiness" largely independent of the equipment. This must definitely is not the case at high latitude stations and I remember a large change in Spreadiness at Washington when the C2 was first put into operation.

Spreadiness definitely follows the sunspot cycle rising as the sunspot number rises.

These statements are based on analysis of records taken since 1945 at all operating Canadian ionospheric stations.

I hope this information will be of some use to you.

I would be interested to know at what frequencies you are studying cosmic noise.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "James C.W. Scott".

JCWS/AG

James C.W. Scott,
Deputy Superintendent,
D.R.T.E. (RPL)