

Section 4 Whistlers and VLF Emissions

Kagoshima Observatory— The construction of Kagoshima Observatory, established in 1966 as reported in the previous report, was completed in co-operation with Kagoshima University in May, 1967. Routine observations on whistlers and VLF emissions have started since June 21, 1967. The observing frequencies of VLF emissions are as follows;—

ch. 1. 800 Hz \pm 100 Hz	ch. 5. 6 KHz — 8 KHz
ch. 2. 1 KHz — 2 KHz	ch. 6. 8 KHz — 9.5 KHz
ch. 3. 2 KHz — 4 KHz	ch. 7. 12 KHz — 14 KHz
ch. 4. 4 KHz — 6 KHz	ch. 8. 27 KHz \pm 1 KHz

The antenna system used at Kagoshima is a square loop antenna of 2 turns, having the dimension of 20 meters height and 45 meters length. Considerable numbers of whistlers are being observed at this station, in spite of the low geomagnetic latitude such as 20°.

Sakushima Observatory— In order to resume the routine observation of whistler at Toyokawa, which was interrupted since June 1966 because of increasing man-made noises, a new field station, Sakushima Observatory (34° 43' 25" N, 137° 03' 49" E) of our Research Institute, is now under construction at Sakushima, about 32 kilometers away from Toyokawa. Sakushima is a small island in Mikawa Bay and is a very suitable place for the observation of atmospheric and whistlers, etc., because of the isolation from man-made noises. Preceding the completion of the construction, the whistler observation as the pioneering item has been opened since February this year by means of a VHF telemeter system linking to Toyokawa.

Moshiri Observatory— At this station, the routine observations on whistlers and VLF emissions have been made and will be continued for the time being. The observation of low latitude nose whistlers up to 100 KHz will be made at Moshiri this winter.

Observations in the Antarctic— The observations on whistlers and VLF emissions have been made by Mr. M. Nishino at Showa Base in the Antarctic since January, 1967. The intensity spectra of VLF emissions are now being observed with three sweep receivers in three frequency ranges, 100 Hz—1 KHz, 1 KHz—10 KHz, and 10 KHz—80 KHz, respectively. The polarization of VLF emissions is also being observed at 750 Hz, 12 KHz and 25 KHz with a pen-recording polarimeters and at 12 KHz with a oscilloscope photographic recorder. The intensity observation of VLF emissions at 750 Hz, 2 KHz, 5 KHz, 8 KHz, 12 KHz, 25 KHz and the oscilloscope observation of the polarization and incident angle of VLF emissions at 750 Hz, 5 KHz, 25 KHz will be added from January, 1968. Our staff at Showa Base will be replaced and Mr. Y. Tanaka will be in charge of our project from January, 1968.

Observation with rockets— The observations of VLF radio wave noise were made twice in 1967 with the rockets L-3H-3 and K-9M-22. Due to interfering noises, available data obtained on the two observations are not sufficient yet to confirm the electro-static waves. To minimize the interfering noises from other apparatus riding together on the same rocket, a rocket K-9M-26 is allocated for the exclusive use of radio noise measurement and now under construction, expecting the flight in this winter.

Automatic location of the source of atmospherics— It is necessary accurately to locate the position of the source of atmospherics for the study relevant to them. An automatic location of the source will be achieved with a triangulation network consisting of three direction finding stations, Moshiri, Sakushima and Kagoshima. Two types of antennas are going to be placed at each station, a crossed loop antenna and an Adcock antenna. The system of crossed loop antenna, tuned to 10 KHz, is planned to be used for the location of distant sources, several hundreds kilometers away from each station.

The system of Adcock antenna, which is more free polarization error, will take over the location of near-by sources occurring within several hundreds kilometers. The codified informations about direction and time of arrival of atmospherics will be sent to Toyokawa by means of radio links and the positions of the sources will be plotted on a map without delay through the electronic computer. The routine observation is expected to start in Spring 1968 for the loop antenna system and in Spring 1969 for the Adcock system.

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