April 26, 1937
212 W. Seminary Ave.
Wheaton, Illinois

Mr. Karl G. Jansky
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Red Bank, N.J.

Dear Sir:

I have been reading your articles in the Dec. 32, Oct. 33, Oct. 35 IRE with considerable interest. The following questions have occurred to me. Possibly you can answer these without undue trouble.

1. The directional characteristic of the antenna array in the verticle plane (90° to paper in Fig. 3 page 1922 Dec. 32)?

2. Effective height of the array? You give the results for the third group of static in DB above 1 microvolt per meter for a one kc band width.

3. What is the percent of the energy taken out of the wave front in the maximum acceptance direction by the array? Or in other words what part of the available energy from this direction is the array able to convert into watts at the set input terminals?

4. What is the absolute watt level represented by set noise at -25 DB in Figure 14 page 1931 DEC 32 IRE? Or if you have the information in another fashion what absolute voltage level does this represent across how many ohms resonant impedance at 14.6 meters? A description of the coil, wire size, diameter, turns, spacing and type of tube used in the first circuit will do.

5. The record on page 1388 Oct. 33 IRE shows the set noise at 10 DB with a maximum intensity of signal at 16 DB. The curve at right of Fig. 2 Page 1389 I then assume to be average intensity

variation for all the different forms of curves exhibited in Fig. 1 What is the absolute watt level of set noise represented by 10DB in Fig. 1? Is it same as in question 4? You extend this data on Page 1159 Oct. 35 IRE. Are these curves for a 1 KC or 26 KC band width?

These questions all relate to the general question of how much energy is collected by the array and the direction it comes from. If these facts are known then Eddingtons figure of 15000° can be checked. Certain other discrepancies can be cleared up, namely the lack of detectable radiation from the sun. By application of Plancks radiation equations the dark nebula in the milky way will give the sought for material having the high ratio of energy radiated at 14.6 meters to energy radiated in the heat spectrum. Using Plancks work and making certain assumptions tosuffice for the data in the above questions it is possible to show that the distance and size of the radiating object are not of direct importance but only the appearant angle it subtends on the celestial sphere and that the energy radiated upon the array by the sun is approximately one percent of that arriving from the milky way in Sagittarius.

I will be pleased to hear from you upon the above questions and upon any new work you may have done since the three articles were published.

Yours very truly,

Grote Reber