Astronomy Group
Department of Physics

15th July 1968

Mr Grote Reber,
Research Corporation,
405 Lexington Avenue,
New York, N.Y.,
U.S.A.

Dear Mr Reber,

I have read with very great interest your article entitled 'Cosmic static at 144 metres wavelength' which appeared in the January 1968 issue of the Journal of the Franklin Institute. May I first of all congratulate you on a most impressive piece of observational astronomy ?

I am quite sure that I am not as well known to you as you are to me. I have been working in the field of long-wave astronomy since 1965, first with Martin Ryle's group in Cambridge, and then at Penticton, Canada. I was fascinated to hear of the progress of your work from Rob Roger of the Penticton group after he visited you in Tasmania several years ago.

I have been particularly interested in trying to relate your new data to some work I did in 1966 on the magnitude of the isotropic extragalactic background which is made up of the integrated emission of the radio galaxies. The relatively steep spectrum of this emission makes it particularly important at very long wavelengths. I enclose the manuscript of a small effort of mine which may interest you, and also some reprints of my work in this field.

I would greatly appreciate receiving a reprint of your article, and would like to ask if you could put me on your mailing list for future publications.

Yours sincerely,

Alan H. Bridle
Assistant Professor of Physics

The Ohio State University Radio Observatory

Established 1951

Operated by the
Department of Electrical Engineering
in cooperation with the
Department of Astronomy

Observing site:
Ohio State-Ohio Wesleyan Radio Observatory
Box 293, Delaware, Ohio 43015

~~**Campus office and laboratory:**~~
~~**2024 Neil Avenue**~~
~~**Columbus, Ohio 43210**~~

16 Aug 68

Dr. Alan H. Bridle
Department of Astronomy
Queen's University
Kingstown, Ontario, Canada

Dear Dr. Bridle:

Thank you for your good letter of 15th July and interesting enclosures. I am pleased that my article in JFI was useful in formulating the ideas expressed in your manuscript "The Extragalactic Radio Background at 2.1 Megacycles". Much of your discussion seems to hinge on my figure 2. I showed this merely to demonstrate the existence of the phenomenon; not to put a quantitative figure on its magnitude. The LMC is at a poor place for observation, near dawn in the spring and rather far south.

Viewing a dark object on a bright background is more difficult than a bright object on a dark background. The edge of hole in ionosphere is usually fluttering and boiling like limb of sun on a hot day. This activity scatters energy from bright surroundings into dark object and makes dip more shallow. Also the observer is viewing LMC across the columns of residual ionization which line up along earths magnetic field. These cause additional scattering. Furthermore the dark material in LMC may not fill the beam. In my opinion, a smaller beam with lower side lobes used under better observing conditions would give a dip three or more times that shown in Fig. 2.

Recently I have been going over some cosmic ray shower data taken during 1954-1957. The beam diameter was 33°. Considering a strip 20° wide along galactic equator, there is a bump at 125° longitude. Shower density from this region is more than 1.3 times as great as from longitudes 75° and 175°. It is tempting to associate this bump with your paper "The Non-Thermal Emissivity of the Galactic Disk near ℓII-140°".

There is an awkward factor of two between my figure for intensity at 2.1 mc and that given for satellite observations. I have attempted to correspond with Hartz on this matter without success. The top of ionosphere is a good diffuse reflector at 2.1 mc. Thus the dipole on satellite sees not only a bright sky over head; but also a very bright diffuse image of the sky below. If the satellite people have overlooked this matter, they will arrive at a brightness for sky hemisphere which is high by a factor of two.

Recently I have reworked my figure 5 into form giving equal area with minimum distortion at south galactic pole. A print is enclosed. This clearly shows the polar region is very bright with dark band along galactic equator. As the frequency is lowered, the dark band will get darker and broader. The bright patch near pole will get brighter and smaller. At sufficiently low frequency the former will overpower the latter. Thus the total integrated sky intensity will decrease with frequency below some value near two megacycles in accord with satellite observations. Here we have not only a hole in ionosphere, but also a steadily contracting hole near pole of our galaxy. In order to view the cosmos at some low frequency like one hundred kilocycles, it will be necessary, not only to get above the ionosphere; but also to get up outside the Milkyway!

Fortunately all is not lost. I have been gazing into the crystal ball at intervals. I predict it will be possible to carry present ground-based techniques to even greater refinement and resolution and successfully apply them at a frequency near one megacycle during the next period of low solar activity in the middle 1970s. The most auspicious place in northern hemisphere is somewhere in northeastern USA or southeastern Canada.

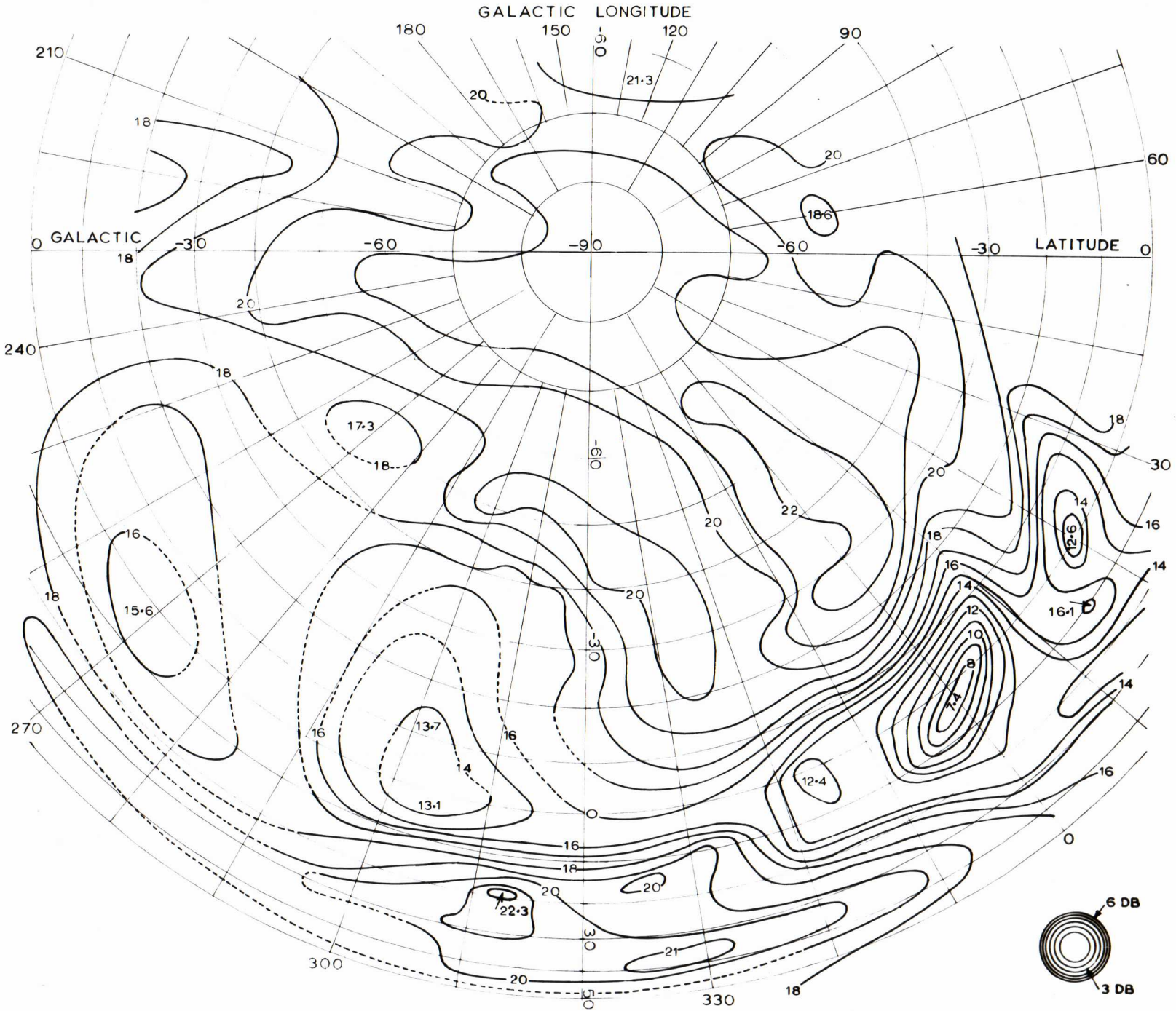
The reprint you requested is enclosed. Best wishes.

Sincerely yours,

Grote Reber

Grote Reber

The Andromeda nebula would probably show a marked dip if viewed with a two degree beam at two megacycles.


GALACTIC LONGITUDE
180
150
120
90
60
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330
300
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240
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-60
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-90
GALACTIC LATITUDE
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