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CSIRO DIVISION OF RADIOPHYSICS

THE AUSTRALIA TELESCOPE

13th April, 1983.

MEMORANDUM TO: J.R. Forster, AT Project Scientist.

FROM: J.B. Whiteoak, Spectral-Line Observer.

SUBJECT: High-Frequency Spectral-Line Observations on the AT

It seems to me that there are a couple of matters regarding use of a 'super compact' configuration (as for high-frequency spectral-line (non-maser) studies) on the AT:

1. A spacing quantum of 20 m is being used in configuration discussions. In a 'super compact' configuration, it will be desirable to have one spacing as small as possible. With 22 m dishes and 20 m spacings this means that the minimum spacing would have to be 40 m. I would prefer a minimum spacing of 25 m. Of course, this may produce 'shadowing' at some hour angles and declinations, but this will be of lower importance as one goes to higher frequencies and illuminates only the inner regions of each antenna (I'm thinking of operation at 100 GHz).

2. One of the problems with the VLA is the lack of zero-spacing information. I think we could provide this by getting the sum of all the antenna total powers, autocorrelating the resultant signal with the same correlator parameters used for the antenna-pair correlations, and integrating the spectra over the duration of the observations. I recall that you, Jim Caswell and I discussed the need for a channel to provide an integrated overall spectrum for the selection of features, and it seems to me that these data could be the same results used to provide zero-spacing information. Is there now a provision in the specs. for this possibility?

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