

JOINT COLLOQUIUM

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Long Range Detection of Thunderstorms -
Bearing Errors in the Southern Ocean Sferics Network

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Dr. Eccles of the Bureau of Meteorology gave an outline of the sferics network of the Bureau, firstly the Queensland network with stations at Brisbane, Charleville, Townsville and Cloncurry and secondly the Southern Ocean Network with stations at Guildford (near Perth), Laverton (near Melbourne) and Wilkes (south of Perth, on the edge of the Antarctic continent).

The former network is giving very satisfactory service, particularly in the Coral Sea area, while the second is rather disappointing in its performance in areas east of 130°E but is moderately satisfactory to the west of this longitude.

Work is being carried out in the Bureau to investigate this poor performance. Observer errors and errors due to poor communications (particularly at Wilkes) are eliminated during tests by the use of photographic recording of the flashes produced by sferics on the screen of the Cintel CRDF equipment at each station. The cameras are time-lapse 16 m. m. cameras. The exposures are four seconds long and are made once a minute. Care is taken at each station to ensure that the cameras remain in synchronism.

For these four seconds, then, the record from the equipment becomes similar to that from the narrow sector recorder of Lugeon, and analysis can lead, almost unambiguously, to centres of activity. Repeated fixes in the same location confirm each other and the analysis of the records.

The analysis shows that at Wilkes the correction to the observed bearing to yield the true bearing, is $+10^{\circ}$ over Central Australia and $+15^{\circ}$ over eastern Australia for the two days 19 and 20 February 1962. On February 20th, Guildford had a $+6^{\circ}$ bearing error in the direction of eastern Australia.

In all other directions the bearings of the three stations appeared to be accurate and therefore past and present fixes over the Indian Ocean should be reliable.

Further study has shown that the errors remain nearly constant over 12 months at particular azimuths and can be called "site errors". The study has also shown that there are small variations up to $\pm 3^{\circ}$, that are added to site errors and which can be called "path errors". Corrections can be made for "site errors". Fixes should then be accurate to 200 miles over the whole of the area of interest to Australia. Correction of the "path errors" is difficult, but if accomplished would lead to fixes accurate to 50 miles or better over this same area.