



NATIONAL RADIO ASTRONOMY OBSERVATORY

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August 2, 1985

Memorandum

To: Addressee

From: K. I. Kellermann

Subject: Notes on UK - Hawaii Remote Telescope Operations

The following information was obtained during a visit to the Royal Observatory Edinburgh, which is the location of the remote control of the UKIRT telescope on Mauna Kea. Although not as convenient as the system based on leased lines planned for the VLBA, the use of a commercial service may be cost effective for the operation of the Hawaii and Caribbean VLBA sites, particularly during the early (<1993) years, when operation will be less than full time, and sufficient funds may not be available to support full time leased lines. A system such as this may also be the most practical way of communicating between the VLBA Control Center and "foreign" telescopes where the cost of dedicated lines cannot be justified.

Communication between Edinburgh and Hawaii is via a Public Packet Switching Network known as "Packet Switch Stream" in the UK and "Telenet" in the US, which is connected by the International Packet Switching Service. At each end, a dedicated line connects the computer with the local Packet Switch Exchange. Transmissions and acknowledgement times are about 2 to 3 seconds which limits the effective data rate to about 300 baud. The cost of this service is (based on current exchange rates):

- | | |
|-------------------------------|---------------------|
| 1) Dedicated lines to the PSE | \$9500 per year |
| 2) Connect time | \$ 9 per hour |
| 3) Data charge | \$ 0.07 per kilobit |

Currently connections are made with VAX 11/730 computers in Hawaii and Edinburgh. Other computers in the UK Starlink Network may also be used, as can any computer terminal using an ordinary dial-up line. Text and graphics data are transferred from the Hawaii VAX to a PDP 11/40 which in turn is connected to the telescope and instrument computers. Remote observers have access to data taken at the telescope, but unlike the VLBA they do not, in practice, control the data taking or directly control the telescope.

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The Network also contains a "CHAT" capability which seems similar to the VAX "PHONE" arrangement.

It may be worth exploring the use of one of the existing systems to facilitate current VLBI coordination between Europe and the USA. This would allow European scientists to participate in the centralized scheduling facility being set up in the USA as well as providing the "MAIL" connection between our VAX's, and the major European sites.

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