

## SPECIFICATIONS

## Digital Data Transmission System

July 24, 1980

- I. General Description - A wide-band digital data transmission system for use in radio astronomy is desired. The system will be used to transmit digital representations of signals received by a network of 25 meter radio telescopes located at points specified in Table I to a central processing facility which, at this time, may be assumed to be Albuquerque, New Mexico. The most likely method for this transmission is by recording the data on wide-band tape recorders and transporting the tapes by commercial air freight services to the processing center; the several day delay in data reception is acceptable. Alternative methods such as microwave satellite transmission, fibre-optic transmission, and terrestrial microwave links are to be considered and budgetary cost estimates and statements regarding feasibility are desired from vendors.

As a guideline to economic feasibility of alternatives to the tape transport system, figures of \$2 million of initial capital cost plus \$1.5 million per year of operating cost, both in 1980 dollars may be assumed. The estimated period of operation of the system is 1986 thru 1996.

- II. Data Rate - Data transmission in one direction only, from the points in Table I to Albuquerque, New Mexico at a rate of  $100 \times 10^6$  bits per second is required. An error rate of 1 error per  $10^4$  bits is acceptable.
- III. Transmission Time - The transmission service is desired continuously except for an eight hour maintenance period each week. Time sharing with some other service requiring up to several hours of each day may be acceptable. Transmission during times of severe weather such as heavy rain or snow is not required.

TABLE 1

<u>Location of Data Transmitters</u>	<u>Latitude</u>	<u>Longitude</u>
Haystack Observatory, Massachusetts	42.4	71.4
Owens Valley, California	37.0	118.3
Anchorage, Alaska	61.0	150.0
Honolulu, Hawaii	21.3	157.8
North Liberty, Iowa	41.6	91.6
Laredo, Texas	27.5	99.0
Boulder, Colorado	40.0	105.3
Boise, Idaho	43.6	116.2
Goldstone, California	35.2	116.8
Salem, Oregon	45.0	123.0
<u>Location of Data Receiver</u>	<u>Latitude</u>	<u>Longitude</u>
Albuquerque, New Mexico	34.0	107.4