

UNCLASSIFIED

AD 295 728

*Reproduced
by the*

**ARMED SERVICES TECHNICAL INFORMATION AGENCY
ARLINGTON HALL STATION
ARLINGTON 12, VIRGINIA**



UNCLASSIFIED

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

63-2-3

CAT...
A. K.
29 SEP 63

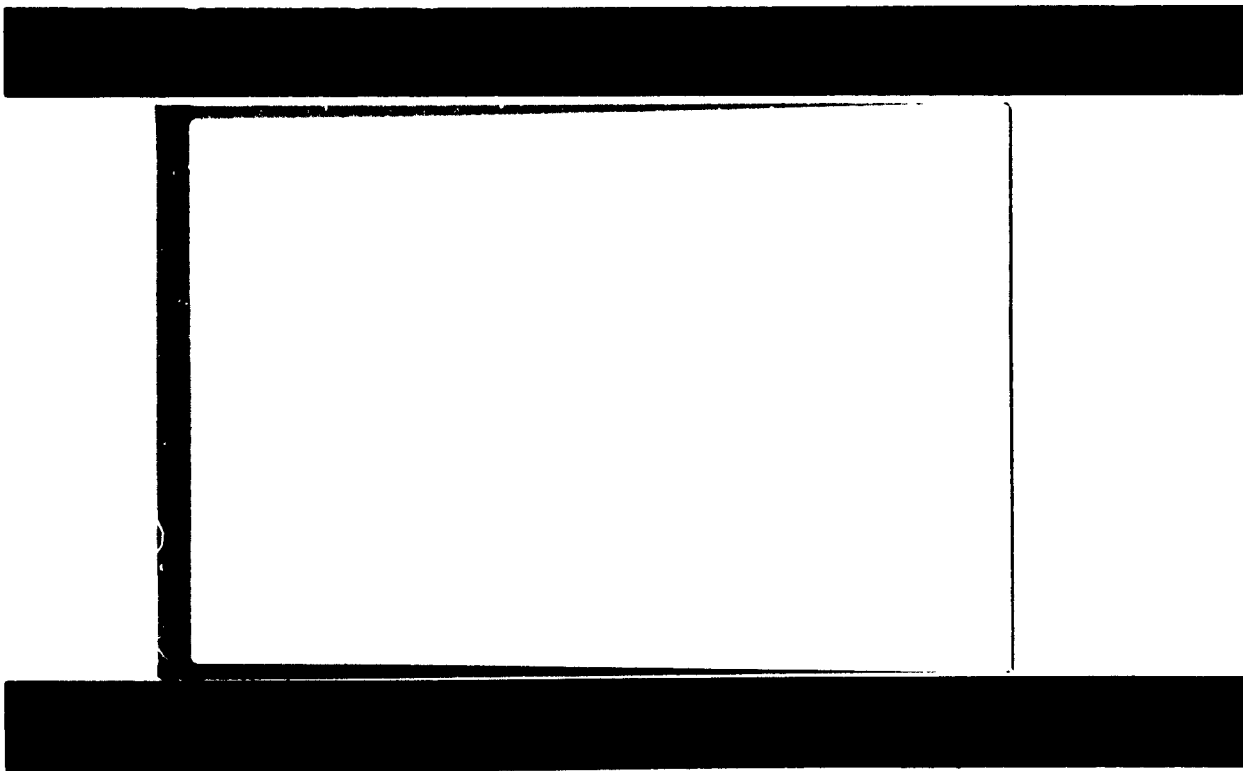
295 728

ASERA
FEB 9 1963

CORNELL UNIVERSITY

Center for Radiophysics and Space Research

ITHACA, N. Y.



Prepared under U. S. Navy Contract Nonr-401(27)

Reproduction in whole or in part is permitted for
any purpose of the United States Government

Center for Radiophysics and Space Research
CORNELL UNIVERSITY
Ithaca, New York

Research Report RS43

RADIO ASTRONOMY

Status Report No. 25

14 December 1962

STAFF

The following personnel have been associated with this program:

T. Gold	Director, Center for Radiophysics and Space Research
M. H. Cohen	Associate Professor
P. Weaver	Assistant Professor
*S. M. Colbert	Research Associate
G. Peter	Project Associate
*D. M. Teeter	Technician
*W. Zandi	Graduate Student
C. Cotner	Graduate Student

STATUS

1. Danby Station

A hillside station approximately one-half mile from the main laboratory building has been established as the far end of a range for the measurement of antenna parameters. Electrical service into the main building has been expanded by the addition of an extra transformer on the main line, which provides power only to receivers and other nonvarying loads.

2. 430 Mc/s Radiometer

A 430 Mc/s total-power radiometer, suitable for solar burst studies, has been constructed. Its components are either identical or compatible with the corresponding components of the radar receiver at Arecibo. Good

*Supported by Contract No. Nonr-401(27)

drift curves of the sun have been obtained with this receiver and the 17-foot dish. Echoes from the moon have also been obtained and are discussed below.

All components of the radiometer are installed in the main observing room of the observatory, which is air-conditioned. The antenna is on the roof overhead and connects to the receiver by a 35-foot length of RG-17/U cable.

3. 430 Mc/s Polarimeter

A polarimeter for 430 Mc/s is being designed and constructed. It will be similar to the 200-Mc/s polarimeter formerly used for solar-burst studies, but most of the components will be new. This instrument will have three major uses: (1) for studies of 430-Mc/s solar bursts, (2) for studies of the polarization of 430-Mc/s echoes from the moon, and (3) as a prototype for the design of a polarimeter for use in radio astronomy at Arecibo.

The antenna for the polarimeter will consist of crossed folded-dipole antennas at the focus of the 17-foot dish. A new balun arrangement for the two dipoles has been designed and tested.

4. Echoes from the Moon

On the nights of December 10 through December 15, echoes from the moon were recorded at 430 Mc/s. The transmitter was the Arecibo radar, operating at 1.8 Mw peak power, with a pulse length of 1 ms. The antenna at Arecibo was a horn with a 16-foot square aperture. Oscilloscope traces of individual echo pulses were photographed at Arecibo and at Danby simultaneously. A preliminary analysis shows that the fading recorded at the two stations was uncorrelated, as expected. An analysis of the echo

strength gives a provisional value of 0.2 as the reflectivity of the moon. This value is substantially larger than that reported by others (0.07), therefore we suspect a substantial error in one of the transmitter or receiver parameters. This experiment will be repeated in January, when the moon again passes near the zenith at Arcibo.