guess; convergence is rapid for initial guesses that err by factors of 100. A numerical solution is presented which maintains the constancy of the flux to five parts in 10^6 .

Plane-Polarized Component of Several Radio Sources Measured at 8000 Mc/sec. F. T. HADDOCK AND R. W. HOBBS, *Radio Astronomy Observatory, University of Michigan*.—During the summer and fall of 1962 several radio sources have been observed with a broad-band TWT radiometer covering the band from 7500 to 8500 Mc/sec (4 to 3.5 cm wavelength) with a motorized rotating feed horn on our 85-ft radio telescope. The radiometer noise fluctuations have a rms value of 0.03°K with a 10-sec integration.

The feed horn was specially designed to have well-matched *E*- and *H*-plane radiation patterns over the above band of frequencies. The circular antenna beamwidth was about 0.1 deg. The horn was rotated at a uniform rate of 0.5 rotation per sidereal minute while the antenna beam tracked the radio source. The output was compared to similar off-source measurements. On thermal radio sources, such as the Orion Nebula, the radiometer output showed no detectable correlation with the position angle of the feed horn. On the nonthermal sources Taurus A (Crab Nebula) and Cygnus A, the phase and amplitude of the sine-wave variation of radiometer output gives position angle and percent plane-polarized components consistent with values obtained by Mayer and his co-workers on these sources at nearly the same frequency.

The plane-polarized component has also been observed in several additional sources; Centaurus A, 3C273, and Tycho's supernova of 1572.

Cosmic Radio Intensities at 1.2 and 2.0 Mc/sec Measured at an Altitude of 1700 km. F. T. HADDOCK, H. F. SCHULTE, AND D. WALSH, *Radio Astronomy Observatory, University of Michigan*.—On 22 September 1962 at 01:46 a.m. EST a four-stage Journeyman rocket was launched from Wallops Island, Virginia, with a radio astronomy payload of 144 lb. Maximum altitude attained was 1700 km (1050 miles) and the duration of the flight was 1524 sec (25.4 min). Five ground-based telemetry stations, including one at Bermuda Islands, obtained clear recordings of the six FM/FM channels on 240 Mc/sec throughout the flight.

The experiment payload consists of three radiometers operating simultaneously at 0.75, 1.225, and 2.0 Mc/sec connected to a common electric dipole antenna 12.5 m over-all length; this is only 0.03λ

long at 0.75 Mc/sec. A solid-state noise diode for receiver gain calibration and a circuit designed to measure antenna capacitance operated satisfactorily with a 12-sec sampling period throughout the flight. The free-space antenna radiation resistance and capacitance was measured before flight on a large conducting ground plane using the method of images.

The in-flight antenna capacitance at 1.2 Mc/sec measured beneath the ionosphere agreed with this pre-flight ground calibration. The measured apogee value of antenna capacitance at 1.2 Mc/sec was about 15% below the free-space value due to the presence of residual ionospheric plasma. This small reduction requires a simple correction to the measured cosmic intensity at this frequency to obtain the free-space value. Only a very small correction for ambient plasma is required for the 2.0 Mc/sec measured intensity. The 0.75 Mc/sec measurement was seriously affected by ambient plasma and the local gyrofrequency resonance. Further study is required to deduce even an approximate cosmic intensity at this frequency.

Preliminary analysis indicates that down to 2 Mc/sec there is no falloff from a power-law intensity spectrum with index 0.5, based on the best higher frequency values reported.

Origins of Interplanetary Dust. MARTIN HARWIT, *Center for Radiophysics and Space Research*.—We establish that most of the dust observed in comet tails is soon lost to interstellar space, because the sun's radiation pressure pushes grains out of the solar system. This argument differs from the usual hypothesis that only those grains can be ejected whose gravitational attraction to the sun is less than their radiative repulsion. Instead, one finds that grains are forced out of the solar system whenever the change in solar (gravitational plus radiative) potential is large enough for the grain's total energy to become positive. One can show that debris from short-period comets and from asteroids tends to be more easily retained in interplanetary space and can contribute to the zodiacal cloud. However, since short-period comets are weak emitters, it is not at all clear that their rate of dust supply can equal the Poynting-Robertson loss. Collision of asteroids should provide sufficient debris, but it is shown that this debris is only liberated sporadically in the catastrophic collisions of the largest asteroids. It is not clear whether a sufficient amount of dust can be liberated in this manner or whether, if liberated, this dust would not all descend into the sun during a brief interval of a few thousand years.