Rice’s ‘Sammy’ Probes Continue; Space Science Gets NASA Grant

By BILL McWHORTER

Rice’s “Sammy” program for rocket-carried upper atmosphere research was given a recent boost by the awarding of a $200,000 NASA grant to the Space Science Department. Three additional probes, tentatively scheduled for launching next February, will be financed by the grant.

The Sammy series of experiments began last January; five shots have been made, including the most recent one in July. All of the instrument packages were carried by Nike-Apache rockets launched from Ft. Churchill, Canada and Wallops Island, Virginia. The Nike-Apache is a two-stage solid-fuel booster, with a maximum altitude of about 200 kilometers.

Aigrlow, Aurora

Two types of experiments were carried out in these first attempts. Two shots, in January and July, were concerned with the airglow phenomenon, a widespread, low-intensity, high-altitude light emission.

Three shots in March were concerned with the aurora phenomenon, a high-intensity effect which fluctuates with time and has a peak occurrence at latitudes of about 67 degrees.

The airglow effect had previously been traced to emission by excited oxygen atoms, but the reason for excitation could be explained by two popular theories, chemical recombination and particle bombardment. The Sammy shots, carrying photometers and charged-particle detectors, were able to disprove the latter theory. The results will be published next January.

Aurora Payloads

The aurora payloads carried several instruments. These measured the light emission from the aurora, the energy deposited by low-energy particles, and the electron flux in different directions.

The three probes financed by the new grant will further investigate the aurora, but will take two different forms. Two shots, using the Nike-Apache booster, will concentrate on rapid time variations in electron flux.

The timing of these bursts of electrons, using new detector designs in several energy ranges, should indicate the source of emission of these particles.

An experiment of different type is also planned, using an Aerobee-Sparrow booster, which has one liquid-fuel and one solid-fuel stage and reaches a maximum altitude of about 450 kilometers.

Ballistics Only

The payload will measure the energy spectrum of protons and electrons, and also find the ratio in the aurora of protons to alpha particles (helium nuclei). This latter measurement should give an idea of the source of the particles.

Despite the name ‘Satellite Techniques Laboratories,’ the Rice project has used only ballistic missiles. The payloads are non-recoverable, the information being radioed to the ground during flight.

The Sammy series is directed by Professor Brian J. O’Brien of the Space Science Department; Mr. Curtis D. Laughlin is Chief of the Satellite Techniques Lab. Dr. Raymond Allum, Research Associate, and five graduate students are assisted on the project by technicians and associated personnel.