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RADIOMETER FOR NASA HURRICANE EXPERIMENTS

DESIGNED BY GEORGIA TECH

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ATLANTA, GA.....A multichannel millimeter wave radiometer, designed and built by Georgia Tech's Engineering Experiment Station (EES) Electromagnetics Laboratory, is being flown on NASA's Convair 990 aircraft in support of hurricane penetration flights. The radiometer, used to detect electromagnetic energy radiating from a storm, was installed on the Convair by EES research engineers Joe Gagliano and Jim Stratigos. The system was developed for NASA's Goddard Space Flight Center for use in collecting storm-related data. During any hurricane penetration mission, data is collected and is stored on tape for future analysis.

Gagliano and Stratigos will operate the EES radiometer onboard the aircraft during the hurricane penetration flights. The multichannel radiometer installed in June will remain on the Convair 990 until early October. Following the end of this program, the radiometer will be returned to Georgia Tech and modified for further, even higher, altitude flights in the summer of 1979 aboard NASA's modified B57 aircraft. The feasibility of using this type of instrument on geosynchronous (stationary) weather satellites to profile atmospheric water vapor will be demonstrated by the B57 flight program. Collecting such information onboard a satellite would be a valuable aid in the observation and prediction of severe storms.

Millimeter wave radiometry can contribute significantly to the understanding of significant meteorological parameters involved in the storm. The temperature

effects in the eye of the storm, the air flow near the eye wall as well as precipitation rates in the rainclouds are some of the parameters to be measured with the radiometer which is designed to measure water vapor concentrations about the peak of the atmospheric water vapor absorption line centered at 183.3 GHz (less than one tenth of an inch wavelength). The radiometer uses three frequency channels to gather data needed to determine the shape of the water vapor absorption line, and another portion of the instrument operating at 94 GHz can obtain data on the sea brightness temperature and on areas of rain near the ocean surface.

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