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News Release

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RELEASE ADVANCE - HOLD FOR RELEASE IN EDITIONS OF FRIDAY, MAY 8, 1964 - WILL ADVISE VIA WIRE SERVICES IF FLIGHT SCHEDULE DELAYED

HIGH ALTITUDE COSMIC RAY EXPERIMENT SCHEDULED SATURDAY MORNING AT PALESTINE BASE; WILL IDENTIFY PARTICLE TYPES, RECORD VARIATIONS

One hundred pounds of cosmic ray recording instruments will travel to 125,000 feet above the Earth in an experiment to be conducted by scientists of the Graduate Research Center of the Southwest.

The balloon-lift experiment is scheduled at 4 a.m. Saturday, May 9, from the National Center for Atmospheric Research station west of Palestine, Texas.

Rising above the bulk of the Earth's atmosphere, the instruments will record very short time variations in the cosmic ray flux. Cosmic ray activity generally increases as the atmosphere thins. The planned flight will place a large detector, with high counting capabilities, where atmospheric pressure will be only four grams on a square centimeter of surface, compared to 1,000 grams at ground level.

The study will provide data in a world-wide search for more knowledge about the behavior of cosmic radiation in the solar system. Reports will be made to the National Aeronautics and Space Administration, under terms of a funding grant that provides for several flights at Palestine and at Fort Churchill, Canada.

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Scheduled flight duration is 24 hours, with instrument recovery expected at a point 600 miles or less from the launch site. Prevailing high-altitude winds are expected to carry the instrument package to a parachute drop location in the southeastern United States, possibly in Georgia.

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The instrument package, contained in an 18 cubic foot frame, includes a newly-devised plastic-and-liquid detector. Constructed like a two-foot square sandwich, plastic scintillator material forms top and bottom, and six liters of liquid scintillator is enclosed in the center.

The large surface area of the detector contributes to its high counting capabilities. The unit should show cosmic ray flux changes of a few parts in 1,000, taking place within three minutes.

Principal interest in the study will be the behavior of low-energy cosmic rays, up to 600 million electron volts (MEV). The instruments will be able to classify electrons, protons, and alpha particles, and will also monitor gamma rays and neutrons.

Each particle will produce a tiny flash of light as it strikes the scintillator materials. Sensed by four photo-multiplier tubes, the light flashes will die out in billionths of seconds. But there will be as much as five nanoseconds -- billionths of seconds -- difference between the dimming of an electron's light flash and the die-out from a proton's arrival.

The flashes' intensity and dimming, or "decay", will be converted into electrical pulses. Measurement of the decay times will provide the way to sort out differences among particles. Logic circuits -- a small

computer -- will do the scorekeeping, providing data for transmission by radio and for a small tape recorder built into the flight package. The back-to-back systems will provide recording at a ground receiver as long as the flight is within transmission range, and full recording from the recovered tape.

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The experiment is being conducted by Jon G. Ables, an Oklahoma State University graduate student who is fulfilling part of his doctoral degree requirements at the Center's laboratories. The data processing system which transmits to the ground station is designed by Richard Bickel, electronics engineer on the Center's staff.

Cosmic ray studies are grouped in the Division of Atmospheric and Space Sciences, Southwest Center for Advanced Studies, which is the basic research arm of the GRCSW.

Two previous balloon flights, with smaller instruments, have been equipped by the group. Four additional flights are scheduled this year.

The cosmic ray group, headed by Prof. Kenneth G. McCracken and including Research Associate U. Ramachandra Rao and Electronics Scientist William C. Bartley, is also operating two super neutron monitor stations, gathering energetic particle data at ground level; the stations are located on the SCAS campus north of Dallas, and at Fort Churchill, on Hudson's Bay, Canada.

In addition, the group will supply five detector units for solar system probes. At least two of these units are expected to fly on the Pioneer deep space probes, providing recordings at distances up to 50 million miles from the Earth.

-A--Al Mitchell--5-4-64--L-