METEOROLOGY

Camera Watches Weather

A NEW AND simple electronic space camera that can take a continuous strip of weather pictures around the world, then turn them into television signals is under development for satellite use.

The compact device uses an electrostatic tape and an electron gun similar to that in TV camera tubes.

These are built into a glass vacuum tube resembling a mushroom. The "stem" is a television pick-up tube containing the electron gun. The "head" contains the roll of electrostatic tape mounted in an automatic assembly for winding and re-winding during exposure and read-out.

Radio Corporation of America scientists report that the camera unit would be associated with a lens system of a type used in conventional photography, and a low-power transmitter to broadcast the picture information to earth.

The tape consists of thin layers of conducting, photo-sensitive, and insulating materials on a transparent base. Before each exposure, the area of tape unrolled before the lens is given a uniform electrical charge by "flooding" from the electron gun at the rear of the tube.

When the exposure is made, the charge is driven from the tape in accordance with the intensity of light in the scene viewed through the lens. The result is an electrical charge pattern on the tape, corresponding to the light pattern of the image. The tape can then be moved ahead automatically for the next exposure, storing the image until it is to be read out.

In laboratory tests, images have been stored in this fashion on the tape for up to two weeks without noticeable deterioration.

When the pictures are to be sent to earth, the automatic winding mechanism is reversed. The exposed tape passes before a scanning beam from the electron gun, which "reads" the electrical charge pattern to produce television-type signals for transmission to the ground station.

Scientists said the read-out process does not completely destroy the charge image on the tape, so that a picture can be read out several times, if desired, before the information becomes illegible. When the tape is to be re-used, however, the "flooding" beam from the electron gun removes all traces of the previous image.

Science News Letter, November 21, 1959

AERONAUTICS

Jet Airport Problems

INTRODUCTION OF KEROSENE as a jet fuel has created the problem of fume dissipation at airports with scheduled jet operations. The kerosene smell permeates a large area and must be combatted with extensive air-conditioning and ventilating systems in terminal buildings and hangars.

These observations were made in Los Angeles by Thomas M. Sullivan, deputy director of aviation of the Port of New York Authority. He told the national aeronautic meeting of the Society of Automotive Engineers about New York International (Idlewild) Airport's first year of jet operation experience.

In addition to the problem of fuel smell, he said, there is that of the tremendous amounts of fuel that jets demand. In the past year, Idlewild has increased its fuel storage capacity by almost 50%. It now stores 9,800,000 gallons, half of which is jet fuel. By 1965 the jet fuel need alone will be about 700,000,000 gallons.

Idlewild has sought to confine excessive noise levels to the airport itself. Specific rules on runway use have been established to minimize the number of take-offs over residential property.

From the start of scheduled jet operations at Idlewild on Oct. 4, 1958, through the end of July this year, there have been 3,286 jet take-offs, 73% of which have conformed to the Port Authority's noise abatement program. About half of all take-offs have been made over water.

Obviously the percentage of non-compliance must be reduced, Mr. Sullivan said. Reduction of noise at its source can be accomplished by suppressors, more efficient engine design, and methods of accelerated take-offs that put the aircraft higher.

Jet blast is another problem as this incident shows: A starting blast from a jet plane once picked up a 530-pound baggage cart and blew it over and beyond a blast fence for a distance of about 75 feet.

Corrective methods include installation of blast fences, additional paving, and restriction on engine operation on terminal apron areas.

Current procedures at Idlewild permit taxiing in under power, but require that planes be towed from the ramp to a remote point before starting engines on departure.

As to plane size, Mr. Sullivan said that some decision must be reached as to what constitutes a practical limit. Every time a new plane is built, he said, the airport operator has to lengthen runways, provide more apron space and enlarge hangars.

A new instrument runway at Idlewild, when fully equipped, will have the best system of landing aids of any airport in the world, he said. These aids include precision-approach radar, high-intensity runway edge lights at 100-foot spacing, and high-speed taxi exits to permit turn-offs at speeds up to 70 miles an hour.

Science News Letter, November 21, 1959

PAPER CURTAIN — This young lady is peering through a "paper curtain" nearly as strong as iron, literally, when it is fastened between thin metal or plastic sheets. The extraordinary strength stems from the design of the "honeycomb," stuck together with phenolic resins made by Bendix Aviation Corporation, Troy, N. Y., and the way the honeycomb is bonded to the sheets. The resin is similar to those used in automotive brake linings. The paneling is used in doors, walls, floors, shelving and other places where lightness-with-strength is the need.

ENGINEERING

Cable-Laying "Ship" Built on Mountain

A "SHIP" for laying communication cables is being built near Chester, N. J., high atop a mountain and 28 miles from the nearest ship lane.

The ship actually is a mockup which Bell Telephone Laboratories engineers will use to modernize cable ship equipment and techniques.

The mockup will enable engineers to simulate deck layouts and cable handling operations of present and future cable ships. A winch pulls the cable out of the cable tank, down the hill and around a sheave. This simulates the cable being pulled into the sea by gravity.

In a proposed new cable system for carrying greater traffic, larger amplifying repeaters may be used. But, encased in metal cylinders three feet long and a foot in diameter, these repeaters must be payed out with the cable smoothly and rapidly. To achieve this, "a technical revolution in shipboard machinery and techniques is being brought about," Bell officials said.

Using a mockup was found to be more economical than chartering a cable ship.

Science News Letter, November 21, 1959