

Technology Notes

SOVIET LAUNCH TECHNOLOGY

Electric Space Launch Cannon

An electric cannon more than 300 miles long that would shoot two-million-pound cargo capsules into space has been proposed by a Russian researcher.

The cannon would take the form of a huge tubular solenoid, through which the capsule would be accelerated by the magnetic field from a series of automatic sequence-switching coils.

There is a drawback, however, admits V. Mikhalev, in the Moscow publication *Nauchno-Tekhnicheskiye Obshchestva SSSR*. Electrically launching a single capsule of such size would require some 320 million kilowatts of peak power, roughly twice the amount currently produced by all Soviet power plants.

On the other hand, if the cannon were used to launch 20 such capsules a day—a staggering 40 million pounds of payload in 24 hours—the average power requirement would drop to a mere seven million kilowatts, which could be met by a single large hydroelectric plant.

NUCLEAR POWER

10-Year Atom Generator Developed

A nuclear system to supply electrical power underwater continuously for 10 years has been developed by Aerojet-General Corp., San Ramon, Calif.

The one-watt thermoelectric generator might power equipment such as well-head markers and unattended data links. Electricity is produced by heating thermocouples in the strontium-isotope-fueled generator. This principle was chosen to enable maximum output to be produced at moderate temperatures, adding to long-term reliability.

About the size of a small beer keg, the standard lead-shielded unit weighs 800 pounds. Use of a depleted-uranium shield can reduce weight and size by half. The unit can reportedly be used at depths as great as 20,000 feet.

DATA PROCESSING

Fast Computer Data on Microfilm

By firing electron beams onto a new type of microfilm, an electron beam recorder developed by 3M Co., St. Paul, Minn., will convert computer information into human-readable language, reportedly at 25 times the speed of conventional computer printers.

Signals from a computer are fired through an electron gun and written in standard or enlarged symbols at speeds of 60,000 characters per second or some 30,000 lines per minute on 3M Dry-Silver microfilm. This film uses a newly-developed emulsion which can be processed and fixed almost instantly by heat, without the need for a darkroom.

COMMUNICATIONS

Libraries on the Airwaves

Facsimile transmission of library materials within

hours has been successfully demonstrated at the University of California.

The Davis campus was linked experimentally to the Berkeley campus library with telephone equipment and facsimile reproducers. Images were transmitted from the Berkeley library to an antenna on the Davis library roof.

Printed material, which has doubled since World War II, is too voluminous for any one library to store, according to Davis librarian J. Richard Blanchard. The experiment transmitted in hours material that formerly took days to ship through the mails.

The messaged copies were sometimes superior to the original, because the reproduction by the facsimile machine could be heightened in contrast to suit the library's needs.

FLUIDICS

Fluidics Check Cigarettes

A fluidic control system (SN: 1/21) is being used by R. J. Reynolds Tobacco Co. to inspect cigarettes for possible defects.

Air blown backwards through the cigarettes is used to spot leaks due to crumpled ends, wrapper damage and weight variations. Resistance to air flow determines the ease or difficulty of puffing.

The fluidic system, designed by Corning Glass Works, Corning, N.Y., correlates and controls three functions of a high-speed cigarette-making machine: pressure is applied to the cigarette, the pressure is sensed, and a threshold pressure level is established. If faults in the cigarette allow the pressure to fall below the threshold, the cigarette is automatically rejected.

BIOTECHNOLOGY

Color TV from Inside Body

Color television broadcasts from inside the human body, the first from within the bladder, are now being made by Dr. Irving Bush, chief of the department of urology at Cook County Hospital in Chicago.

He uses a cystoscope into which is built a fiber optics light pipe in order to attain the necessary illumination of the bladder. The cystoscopic tube, with its mirrors and light pipe, is linked on the outside to a television camera that projects the internal scene on a large screen. The color pictures are also recorded on video tape for later replay.

The system will be used not only for medical teaching but also to check on whether cancer has returned after surgery, to determine the exact spot for an operation and to look for structural anomalies of the bladder lining.

Development in Japan of a fiber optics camera for the stomach (SN: 5/6) followed a report made there by Dr. Bush about his work on color TV photographs from inside the bladder. Dr. Bush tackled the bladder first because he considers it the most difficult internal hollow organ to reach. (See also SN: 4/15.)