technology

SATELLITES

First African satcom center

The first commercial satellite communications center in Africa is scheduled to go into operation in December near Rabat, the capital of Morocco.

Initially, the station will carry nine channels, suitable for telephone, telegraph, telex and television communications. Operation is expected to expand in two to three years to 132 channels, leased from the International Telecommunications Satellite Consortium.

The center's 100-foot-diameter antenna has just been completed atop a two-story-high pedestal located at Ain-el-aouda, 20 miles southwest of Rabat.

METALLURGY

Stress corrosion test

A discovery by an Air Force researcher holds promise of a quick test method for spotting stress corrosion, a problem which has long plagued designers of aircraft and other metal structures.

Just before an alloy fails due to stress corrosion—a combined chemical and mechanical attack—it loses all its ability to form the protective oxide coating that would otherwise prevent the corrosion from spreading. It is at this point that the metal is ready to crack. This was the discovery of Major William E. Craven of the Air Force Metallurgy and Ceramics Research Laboratory at Wright-Patterson Air Force Base, in Ohio.

In his experiment, Major Craven made a series of scratches on a titanium-vanadium-aluminum alloy in a methanol and saltwater solution. His observations, when correlated with other alloys in other corrosive media, may lead to a quick nondestructive test method of spotting the danger point. The test instrument might be an electrode device which would measure the metal's surface potential. At a certain reading an indicator would signal danger in time for corrective action to be taken.

ELECTRONICS

High-power integrated circuit

Researchers in Japan have developed an integrated circuit powerful enough to be used in such household appliances as television sets and high fidelity amplifiers.

Integrated circuits, though increasingly used in a variety of electronic equipment, have been limited in application by their low power characteristics. The new IC, developed by the Isamu Kobayashi and Kinji Wakamiya of the Sony Corp. in Tokyo, is rated at 26 watts maximum linear output, which corresponds to 18 watts continuous effective power. This is believed to be the highest power capability yet produced in a monolithic IC device.

Two processes are the keys to the device's development. A new way of controlling crystal growth selectively enables very fine crystal structures to be grown in accordance with the specified IC pattern. The second process controls the concentration and diffusion velocity of impurities during fabrication. This contributes to the most important qualities of the new IC: higher breakdown voltage, lower saturation resistance and immunity to deviation under varying temperatures.

OCEAN PROSPECTING

Phosphates found off New South Wales

The discovery of phosphate rock deposits off the central and northern coasts of New South Wales has given new impetus to plans for offshore mining around the coast of Australia.

The deposits were discovered on guyots, undersea mountains, about 200 miles from Sydney, by Oceanic Exploration Pty. Ltd. of Brisbane. Early investigations indicate that the deposits may be significant, and certainly large enough to warrant further dredging supported by drilling, according to G. A. M. Alcorn, Oceanic's managing director. The company plans to conduct a study of the area's economic potential.

TRANSPORTATION

Introducing the Eel

A new concept in ocean freight transportation was proposed at the 1969 Underwater Technology Conference of the American Society of Mechanical Engineers in Coronado, Calif. Called the Eel, the nuclear vessel is an underwater freighter 1,400 feet long and 38 feet in diameter that can travel at speeds of 40 knots. It would be powered from the rear and loaded from the front.

Dr. Robert L. Whitelaw, professor of mechanical engineering at Virginia Polytechnic Institute, says, "It is now possible to visualize a practical means of achieving fully automatic ocean shipping with economies in time, manpower and investment that can reduce the cost of trans-ocean shipping by over 50 percent."

The nuclear Eel could accommodate four trains of freight, 25 freight cars each, parallel on two decks. Maximum payload for the 1,400-foot Eel would be about 5,000 tons of containerized cargo. Loaded automatically, the craft would submerge to design depth and stay there by means of bow planes, plus depth-sensitive ballast controls along its length.

A long slip or channel would be required for docking the Eel, which would emerge from the sea on an inclined ramp.

SALVAGE

Divers to be taught archaeology

Both amateur and professional salvage divers often pick over wrecks more for their value in materials than for their value as objects; a 350-year-old brass swivel gun may be valued for its brass content alone. Yet the hundreds of wrecks in the waters around Britain often are of outstanding interest to marine historians, who have become distressed at the rough going-over these wrecks may get at the hands of free-lance divers.

As a result the Committee for Nautical Archaeology in London has founded a school in Plymouth to train divers who are not archaeologists in the techniques of gathering accurate location and condition data and of careful recovery of artifacts. The school, which will be able to handle 90 students at a time for weekend classes, is headed by Lt. Cmdr. Alan Bax, known for his work on the 1711 wreck of the Dutch ship Liefde in the Shetland Islands.