considered, however, that the system would basically serve all of the 50 states and Puerto Rico with television, telephone, telegraph, public broadcasting and high-speed data transmission services. Added public interest options of some of the proposals include free educational television, service to cable TV, the health care and medical community and news media, and individual links between company facilities. Questions such as the number of synchronous orbital spaces to be used and the allocation of the satellites' services are among those expected to be resolved at the FCC's public rule proceedings with all interested parties contributing in April and May. Whether the communications system will be awarded to one or several companies is a key question to be determined. The proportion of channels to be used by common carriers or specialized services and the feasibility of using frequencies of 7, 12 and 13 gigahertz in addition to the 4 to 6 gigahertz range are also major issues.

The eight proposals call initially for either one or two operational satellites and one spare satellite in orbit and anywhere from 6 to 132 ground stations of varying capacities. Cost estimates range from $66 million to $248 million. Most of the satellites would have 12 or 24 transponders, but the technological capability varies. Lockheed's one operational satellite with a 48-transponder capability would handle simultaneously more than 33,600 business or data circuits, or 48 television channels. On the other hand, Fairchild Hiller's satellite, patterned after the Advanced Technology Satellites the company is building for the National Aeronautics and Space Administration, could handle simultaneously 24 color TV channels and 50,000 duplex telephone circuits, or the 24 TV channels and 3 billion bits per second of high speed digital data. The satellite would carry a 30-foot diameter antenna, the largest proposed. COMSAT's two satellites, proposed earlier this month, could each handle 14,400 telephone circuits or one billion bits or 24 color TV channels.

While each company is competing for the system, they are also competing for the one big financial variable: the three major television networks as users. The networks have an additional two weeks to decide if present proposals are adequate for their needs or if they will submit a system of their own.

Further complicating the picture are proposals to build and operate the earth stations, also due in two weeks. One company, TelePrompTer Corp., submitted its plan this week, however, or five receiver-only stations for its cable TV network system. □

"JUST LIKE A FIGHTER"

Supercritical wing tested

NASA

The supercritical wing on an F-8: Flights test the wind tunnel predictions.

A large portion of the aviation research and development conducted by the National Aeronautics and Space Administration involves the testing of aerodynamic designs and systems for the next generation of transport planes. The advanced transport NASA envisions incorporates many of the theories of Dr. Richard T. Whitcomb of the agency's Langley Research Center at Hampton, Va. (SN: 11/28/70, p. 413).

One such theory is the supercritical wing, designed to increase the over-all efficiency of airplane performance at supersonic speeds. A prototype of the wing, built by North American Rockwell, was successfully flown last week at NASA's Flight Research Center at Edwards, Calif. The new wing was attached to an F-8 jet fighter. In this first flight to test the data acquisition system, the plane reached 350 miles per hour at a peak altitude of 10,000 feet, and "handled extremely well—just like a fighter," says the test pilot, Thomas C. McMurtry.

Unlike conventional aircraft wings, which are curved on the upper surface, the supercritical wing's surface is flattened on the top to slow down the speed of airflow. On conventional models, the air flowing over the surface travels faster than the speed of the aircraft itself and causes local shock waves at supersonic speeds. These increase the drag and result in loss of flight efficiency. The new wing should allow airplanes to cruise at higher speeds—with no increase in fuel consumption.

Tests resumed this week. Eventually the new airfoil will be flown at or above 660 miles per hour at altitudes of 35,000 feet or more.

A thicker version of the same wing, attached to a Navy T2-3 (Buckeye) aircraft, has shown during initial flight tests significant improvement in buffet-free maneuvering capability up to speeds of 0.7 Mach. This design should permit structural weight savings on any of the moderate-speed aircraft.

Preliminary plans have been drawn up for an agreement between NASA and the Air Force for testing of the wing on an F-111 to verify the potential of increased maneuvering capability at transonic speeds (600 to 900 miles per hour) with variable swept wings. When the agreement is in final form, the Air Force will contract for the wing. □

ALASKA PIPELINE

Trio of doubters

There can be little doubt now that the Nixon Administration is having second thoughts about the proposed Trans-Alaska Pipeline System. First, Russell Train, chairman of the Council on Environmental Quality, expressed reservations. Then Interior Secretary Rogers C. B. Morton mused about possible alternatives at a Senate hearing (SN: 2/27/71, p. 143). This week, William Ruckelshaus, head of the Environmental Protection Agency, completed the roster of the top Administration environmental spokesmen.

In a letter to Morton, Ruckelshaus suggested Interior has not adequately examined the possibility of oil spills from loading facilities at the lower terminus of the pipeline at Valdez and from tankers carrying the oil to the West Coast.

He suggested that Interior consult with EPA on pipeline design, because "tremendous pressure" would be placed on Interior if it were the sole arbiter, and carefully examine alternatives, such as an all-land route for the oil through Canada. Ruckelshaus also called for more study of the effects of the pipeline on the Alaskan permafrost, with special reference to unconsidered alternatives for changing the temperature of the oil, and further development of seismic and leak monitoring systems. □