

# Technology Notes

## AVIATION

### SST Flight Priority Bad for Air Traffic

After four years of study, the Federal Aviation Agency has concluded that giving the supersonic transport automatic priority over other airplanes in the sky would be "most detrimental" to air traffic control.

High priority for the SST would result in "substantial lowering of airport acceptance rates; excessive holding and delays for subsonic traffic; and an increase in workload for terminal approach controllers and for enroute controllers whose sectors serve the terminal area," according to Joseph D. Blatt, associate administrator for development of the FAA. "However," he told the Institute of Electrical and Electronics Engineers, "limited preferential treatment can be provided SST aircraft without major adverse effects on the air traffic control system."

One of the FAA's specific recommendations, he said, is that SST traffic over a given route should travel in the same direction. The safety distances between opposite-traveling planes, and the loads on traffic controllers, would be too great with the SST.

For its study, which is still in progress, the FAA has been using an SST flight simulator at the National Aeronautics and Space Administration's Langley, Va., research center, plugged into the FAA's national air traffic simulator in Atlantic City, N.J.

## SPACE STERILIZATION

### U.S. Spacecraft Called Too Clean

The rigid standards of the U.S. for sterilization of spacecraft going to other planets may well be both unnecessary and harmful to the space program, according to two groups of space scientists. Mars is much too dry to support life that has grown up on earth, and Venus is probably too hot, three California Institute of Technology scientists wrote in *SCIENCE* (March 24). U.S. sterilization requirements, therefore, have already delayed the search for interplanetary life, they said, and may have added to the cost of future explorations.

Two other Caltech scientists and one from the Rand Corp. said that if the nearby planets can support life, they probably have already been contaminated by spacecraft from the Soviet Union.

"Current spacecraft sterilization policies should be revised accordingly," the scientists concluded.

## SPEECH RECOGNITION

### Machine 'Understands' Speech

A compact (0.8 cubic feet), simple machine that can recognize 10 different spoken words with an error rate of less than one percent has been developed by Philco-Ford Corp., Blue Bell, Pa.

Previous speech recognition devices have been bulky and complex because they had to be able to correlate as many as 16 separate components of frequency and timing data for each word. The Philco unit operates on only three components: the pitch, amplitude and timing of the "single equivalent formant," which is a means of representing the broad spectral distribution of a speech wave as the frequency of a single "perceptual equivalent."

The device's vocabulary presently consists of the num-

bers zero through nine. Experimental versions have maintained their low error rate with as many as 10 different speakers.

## NONDESTRUCTIVE TESTING

### Infrared 'Signatures' Check Circuits

A device that checks electronic components by their infrared emissions instead of their electrical characteristics is enabling automated trouble-shooting to be done on the production line.

Developed by Raytheon Co., Wayland, Mass., the checker is based on the discovery that "every operating mode (good or faulty) of an electronic assembly is characterized by a typical, unique infrared radiation pattern, or signature." The signatures of properly-operating components can be measured, as can those of "standard failure conditions."

Heart of the checker is an electronic computer which automatically compares the signatures of each component going through the assembly line with the previously stored signatures of normal and malfunctioning parts. Besides analyzing failures detectable by conventional equipment, the tester reportedly can locate less-detectable conditions including wrong-wattage components, incorrect-value resistors, reversed capacitors and missing elements.

## GEODETICS

### Satellites Help Aim Weapons

A backpack used to translate satellite radio signals into accurate position fixes has been developed for the Navy by the Johns Hopkins University Applied Physics Laboratory.

An operator in a forward outpost could use the portable tracking station to call fire on an enemy target from a source as much as 100 miles away. Two sets are used in such a system. The forward operator sends position information on himself and the target back via satellite to the control point. The rearward operator's set is connected to a computer that uses data from both sets to determine the relative distance between the stations and, by using the forward operator's input, calculates the range and elevation of the target.

As a survey instrument, the backpack system can provide accurate determinations between points separated by any kind of terrain, and has been designed to be compatible with existing satellites. The system is an extension of the Navy Satellite Navigation System developed by Johns Hopkins for the Navy. Weight of each unit is about 50 pounds.

## STRUCTURAL ENGINEERING

### Loading Computer for Ships

A computer has been developed which calculates in a few seconds the stresses placed on a ship's hull during loading and unloading of cargo.

Developed by Elliott Automation Ltd. in London, it is a simple analog computer which figures out bending moments, shear force at predetermined sections of the hull, trim displacement and dead weight. These data provide a ready indication of weight distribution, enabling maximum payloads to be carried.