• Major airports are already overtaxed in handling traffic at busy periods because of lack of channels. Only one two-way conversation can be held at a time on one channel.

• Signaling applications, as distinct from message communications, are limited for lack of frequencies. These include automatic electric power outage reporting, emergency call boxes for highway accident and breakdown and numerous remote control applications, such as circuit breakers, cranes, locomotives and hazardous industrial processes.

In addition to current pressures for additional uses of the spectrum, the IEEE-EIA report points out that new communications techniques will soon be clamoring for spectrum space. Systems for improved highway safety, for instance, will include automatic guidance and control, in-car visual and audible hazard warnings, highway sign control, and computerized traffic flow control, all requiring radio communications.

According to the report, "High density urban living, increased mobility of people, and our natural desire to keep in touch have brought us to the point where there are unsatisfied demands, conflicts and constraints in further utilization of the electromagnetic spectrum."

Says Richard P. Gifford, chairman of the study committee and general manager of General Electric's Communications Products Division in Lynchburg, Va.: "Through the application of spectrum engineering, the economic and social yields from the electromagnetic spectrum (estimated at $17 billion a year) can be quadrupled over the next 20 years by increasing the use of the spectrum."

The report, titled "Spectrum Engineering—The Key to Progress," avoids such political considerations as what type of Government organization or body is needed to do the required job of spectrum management. Instead, the report deals primarily with how the radio spectrum is now being utilized and with the technical aspects of maximizing the effective use of the spectrum.

It recommends increased research to find ways to better utilize those parts of the electromagnetic spectrum that are now largely unused—the ultra high and very low frequencies. The report also indicates a need for increasing our knowledge of man-made radio noise and side effects.

The report calls for the establishment of a central information clearing house on ways in which the spectrum is or can be used, and recommends the formation of a pilot project which would put its frequency selection concept into experimental operation in a trial region.

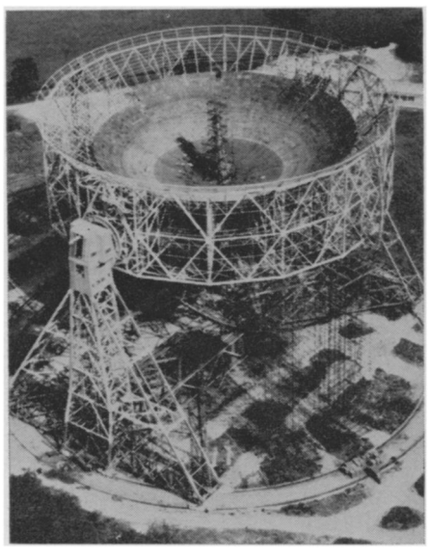
RADIO ASTRONOMY

Shutdown at Jodrell Bank

Modifications are expected to start next summer on the 250-foot radio-telescope at England's Jodrell Bank. They have been planned for several years.

The modifications, which will take not more than nine months, come after 11 years of virtually continuous operation of the University of Manchester's Mark I antenna. Nearly a million dollars has been allocated by the Science Research Council to cover the cost of repairs and engineering changes.

Besides relieving the stresses on the tracks and towers, engineering modifications are planned to improve the performance of the telescope at shorter wavelengths, particularly the 21 centimeter range, important in determining the distribution of hydrogen in the universe.



Jodrell Bank as it neared completion

Fatigue cracks that appeared in 1967 in the towers carrying the 800-ton bowl have already been repaired; some of the modifications are aimed at preventing new trouble by taking up some of the weight.

During the nine months the 250-foot is down for modifications, many of its programs will be carried on by other Jodrell Bank instruments, especially the Mark II and Mark III radio telescopes, each 125 feet in diameter. Although the international interferometry program to determine the size of quasars will definitely be continued, Sir Bernard Lovell, director of the experimental station, says, exactly which other programs will have to be curtailed has not yet been decided.

"We still have a year before shutdown to decide that," he says.

Dr. Lovell says he hopes some of the foundation work for an additional railway track will be started this fall, but that this should not interfere with the telescope's operation. The two 180-foot cone-shaped towers supporting the 250-foot dish at present roll on a track 350 feet in diameter. The new track will be 76 feet in diameter, and the steel structures on it will relieve about 100 tons of the existing weight.

FOOD IRRADIATION

Throwing out the bacon with the ham

Two years ago the Food and Drug Administration gave its blessings to the Army's use of radiation to preserve canned bacon. The Army and the Air Force then fed irradiated bacon to troops at 12 military bases twice during December 1966.

Dr. James L. Goddard, then FDA commissioner, ate some irradiated bacon at Oak Ridge in February 1967, and later in the year ate it again in the office of the then Secretary of Health, Education and Welfare John W. Gardner. Dr. Goddard liked it.

Now ham has queered the bacon. This April FDA told the Army that the data provided in its petition for the high-dose gamma processing of canned ham, which had been under evaluation for over a year, did not establish the ham's safety. The petition was contained in 31 loose-leaf notebooks holding some 10,000 pages of data.

As a consequence of the FDA decision, the Army has announced that it will stop serving irradiated bacon. The FDA has let it be known that it plans to rescind the permission it issued earlier on irradiated bacon.

The turndown of the ham precipitated hearings by the Joint Committee on Atomic Energy on the entire subject of irradiated foods. The committee wants to know, among other things, why the FDA had earlier approved irradiated bacon and now rejects the irradiated ham.

Dr. Daniel Banes, associate commissioner for science of the FDA, explains the shift in attitude as the result of better data. "We apply our best judgment based on the facts available to us at any given time," he says. "We always bear in mind that we may have to change our conclusions in the light of later information."

The later information is the data supplied with the petition on ham which