

## Radio Astronomy: FCC Proposes Compromise to Share Frequencies with UHF Television Broadcasters

Though science and society are constantly affecting each other in profound ways, it is a rare occasion when their needs or preferences are in direct conflict. Science pays constant homage to society, and society is most respectful of science, but cases are few when one must yield an important interest to the other. Thus, the current plight of the nation's radio astronomers (*Science*, 1 February 1963) is of particular interest, for it tells a great deal about how seriously the nonscientific world takes the needs of a relative handful of specialists whose work means a great deal to science but—let's face it—literally nothing to the average man.

At issue is space on the ultrahigh-frequency (UHF) band, which radio astronomy had pretty much to itself until Congress last year required all television manufacturers to equip their sets to receive UHF. The result has been a rush to broadcast all along this spectrum, including the 608- to 614-Mcy/sec portion of it, which is the piece utilized for radio astronomy.

On the TV dial, 608–614 comes out as channel 37, and, according to the Federal Communications Commission's long-standing channel allocations, Paterson, New Jersey, is in one of the areas that may use channel 37 for TV broadcasting. In other parts of the country the FCC has been able to juggle its allocations to protect radio astronomy, but in Paterson it has run out of maneuvering room, and the issue is a clear-cut one—television or radio astronomy, specifically the observatory at Green Bank, West Virginia, which is close enough to Paterson to be affected by its TV transmissions.

Also affected by TV's interest in channel 37 is the University of Illinois radio telescope at Danville. The University has, accordingly, asked the FCC to protect Danville, as well as all other radio astronomy observatories, by reserving channel 37 on a nationwide basis for radio astronomy.

The final decision is yet to come, but earlier this month the FCC issued a "notice of proposed rule making," which seeks a compromise arrangement that is not causing any noticeable joy among radio astronomers. The proposed rule, on which interested persons are invited to comment to the FCC by 1 May, would do the following:

- 1) Prohibit television from using

channel 37 within 600 miles of Danville until 1 January 1968. Presumably, after that date channel 37 would be made available for television in the Danville area.

- 2) Limit channel 37 TV broadcasting, in all parts of the country, to hours between 7 A.M. and midnight, thus leaving that part of the radio band for the exclusive use of radio astronomy during the remaining hours.

From the FCC's point of view the proposed solution is not ungenerous to radio astronomy. Infinitely more citizens are interested in the late show than in the crackle of static from the heavens, and in the politically volatile business of assigning TV channels, any government agency would be hard put to defend upholding the interests of a few score radio astronomers at the expense of those of the mass of citizens who look to TV for entertainment and information. But it is interesting to speculate on what would have happened with channel 37 if the exclusion of TV had been presented as a military necessity.—D.S.G.

## M.I.T.: Prime Contractor Contentends with Problems Produced by Solving Government's Problems

There is a temptation for the visitor to Massachusetts Institute of Technology who sees the striking evidence of growth and change there, much of it financed through federal support of research, to remember the doctrine of the separation of school and state and to wonder, "Will success spoil M.I.T.?"

The visitor is also likely to take away the impression that M.I.T. represents the future for university research in science and technology in the United States; that at M.I.T. the scale is larger, the pace swifter; that this is where the trends begin.

Though neither federal agencies nor universities arrange their bookkeeping in a way that makes comparisons easy, the payment to and through M.I.T. of something on the order of \$80 million a year in federal funds puts M.I.T. with the leaders among universities in which, in matters of research and development, the government puts its confidence and money.

As to experience in adjusting work in the national interest to the needs of the institution, M.I.T. has few rivals; and on the record of results, perhaps no other university has been more use-

ful to the nation. This experience and success, and the problems which they have produced, really date back to World War II, when not only were Tech faculty members engaged in highly productive war research but the Institute managed many projects and M.I.T. administrators took a decisive hand in making wartime science policy.

After the war, reconversion for M.I.T. meant a reconstruction of graduate education to reconcile educational purposes and the demands imposed by the federal government's new reliance on the universities for research. M.I.T. faculty members were prominent among the scientists and engineers who began commuting to Washington to give advice to the military, the science-oriented agencies, and the White House. What men like Karl T. Compton, Vannevar Bush, and Edward L. Bowles had begun in working close to the seats of power in the war era, other M.I.T. men like James R. Killian, first science adviser to President Eisenhower, and Jerome Wiesner, first director of the new Office of Science and Technology, have carried on.

The question of why M.I.T. was so ready and able to plunge successfully into the war effort seems answerable, at least in part, by noting that M.I.T. historically has devoted itself to getting results. As one senior faculty member recalls, "at least until the 1930's the engineers were in the saddle here," and engineers stand for the useful application of knowledge. Their tradition is not of the ivory tower. A generation ago at M.I.T. there was an assumption that a capable faculty member could double his salary through consulting. Many of them in fact belonged to prosperous firms in Boston and were as much at home in the board room as in the lab.

But what is now recognized as the M.I.T. touch seems to have developed only when the scientist reached parity with the engineer. This new partnership in research was hastened by the urgencies of wartime, and nowhere was it more dramatically exemplified than in the Radiation Laboratory at M.I.T.

The Radiation Lab was a civilian laboratory located on the M.I.T. campus and managed by the Institute, but with a staff recruited from among scientists and engineers from all over the country. The lab's main assigned task was microwave research, and its great work was in the development and applications of radar on the basis of a British invention, the magnetron.