# WORLD OF WIRELESS

## *Post Office Receiving Station Refurbished*

THE TRANSITION from Nissen huts and manually operated equipment to brick buildings and automatically tuned radio receivers is now complete at the G.P.O. high-frequency (4 to 27 MHz) radio receiving station at Bearley in Warwicks. The new installations cost about £0.5M. This station will combine efficient and reliable reception of long-distance radiotelephone and radiotelegraph communications with the maximum possible economy. Although much of the future transoceanic signal traffic will be carried by submarine cables and Earth satellites, h.f. radio can still play a useful role in world communications in lightly loaded routes for communicating with ships and for auxiliary and standby purposes alongside cable and satellite systems.

An outstanding feature of Bearley is the frequency generating equipment which controls the accuracy of the receiver synthesizers. It consists of three 100 kHz crystal controlled oscillators sunk into 30 feet deep boreholes where the temperature remains within about 0.5°C of 10°C without any artificial control. The accuracy of this master frequency can be maintained to within one part in ten million, with adjustment at about yearly intervals, or, if required, to 1 in $10^8$ with adjustments about once a month. This central master frequency source provides, by synthesis, the extremely accurate beat oscillator frequencies. The majority of the 60 receivers at this station are solid-state i.s.b. types suitable for the reception of telephony or multi-channel telegraphy and were designed by Plessey Electronics Group to a Post Office specification. The PVR 800, as it is called, is a quadruple superheterodyne receiver capable of remote control for tuning either to any one of the six predetermined frequencies or by fully synthesized control selecting any one of the 200,000 discrete channels available (in increments of 125 Hz). Because of the accuracy of the synthesized frequencies the receiver can carry out an automatic carrier search process for, and identify, a wanted carrier signal. When the wanted transmission is found, the receiver can automatically maintain correct tuning, providing the transmitter frequency variations do not exceed internationally agreed limits.

The original aerial system has been retained more or less unchanged. A ring of rhombics (70ft high), efficient over the important band of frequencies above 8 MHz, combines global coverage with facilities for special aerial diversity reception.. Diversity operation is necessary to achieve efficient reception of telegraph transmissions. In this case, two similar aerials spaced several wavelengths apart feed two separate receivers whose outputs are combined. This method of space-diversity reception (compared with single aerial reception) is said to be equivalent to increasing the power of the distant transmitter by upwards of 30 times. All rhombics at Bearley are bi-directional, each rhombic end being terminated at the internal aerial distribution board, where, by means of a wideband passive hybrid network, it can serve up to four receivers simultaneously

## *New Earth Satellite Station in Australia*

WITH work well up to schedule, the new Earth station being built at Moree, in northwest New South Wales, by the Australian Overseas Telecommunications Commission, is expected to be in service by the beginning of the year. The total cost of the project is more than $A4 million. It is the eighth space communications establishment built or in the planning stage in Australia. The Moree satellite communications station will be employed to link Australia into the Intelsat II satellite system, providing commercial communications and television transmission and reception with North America and major points in the Pacific. Countries which will be served will include the U.S., Canada, Japan, the Philippines, Hong Kong and other countries of Eastern Asia. It will supplement the $A250 million broad band coaxial cable system which Australia and other Commonweath partners have built across the Pacific and Atlantic Oceans. The new station will send and receive signals via the Intelsat satellite positioned directly over Fiji. Intelsat II was launched from Cape Kennedy for the International Satellite Consortium of which Australia is a foundation.

A high degree of accuracy was required in siting the structure of the Moree Earth station. It had to run precisely due north and south. Margin for error was only 0.000008 % or 10ft in 23,000 miles. The station has been built on a 257-acre site and it includes a 90ft parabolic antenna weighing 200 tons, mounted on a four-storey operations building. Australia's other space communications establishments are at Cooby Creek, Queensland, three stations near Canberra, in the Australian Capital Territory, two stations associated with the Woomera Rocket Range installations, and two in Western Australia, at Muchea and Carnarvon. NASA is reported to be considering establishment of a further station in the Canberra area, but no official announcement has yet been made about this project. Altogether more than $A100 million has been spent in Australia on these projects in the past six years.

## *Changes in Maritime Radio Regulations*

SUBSTANTIAL amendments have been made to those parts of the 1959 Radio Regulations and Additional Radio Regulations which apply to the maritime mobile service. This is a result of the World Administrative Radio Conference which was convened in Geneva on the 18th September by the International Telecommunication Union and which completed its work on 3rd November with the signing of the Final Acts. These will come into force on the 1st April 1969. The amendments have been determined substantially by the fact that since the last revision of the regulations in 1959, there has been a significant drop in the number of passenger ships owing to the growth of air travel, and a notable increase in the number of cargo ships. There has also been a rapid expansion in fishing fleets and other craft. Thus requirements for radiotelephone and radiotelegraph channels have increased considerably.

Among the decisions of the Conference are the following: the gradual introduction up to 1st January 1982 of s.s.b. radiotelephony in the bands allocated to the maritime service between 1605 and 4000 kHz; the gradual introduction up to 1st January 1978 of s.s.b. radiotelephony in the bands between 4 and 23 MHz; allocation of frequencies for narrow-band direct printing telegraph systems (teleprinters) and data transmission systems; assignment of frequencies for the transmission of oceanographic data; and in general measures to increase safety at sea (signal code, watch on distress signals, etc.), including conditions governing the use of emergency position-indicating radio beacons.