

SHORT-WAVE SECTION

BRITISH COASTAL RADIO STATIONS

By A. W. Mann

Even though the thermionic valve had been developed and was available, spark transmitters were still in use. The valve was, however, used for signal amplification.

The effective range of the short-range transmitters was between 150-300 miles. At times traffic at the coastal stations was light due to ships being out of range. As they came within range, however, the operating staff were extremely busy.

The Devezes long-range station using a continuous wave transmitter covering a tuning range of 1,875-2,730 metres had an effective range of 1,500-2,000 miles, and could keep in contact with several of the larger ships when they were several days from port.

At this station the transmitters and receivers were located in the same building. This arrangement, however, had certain disadvantages.

When the new Burnham station was built and equipped the transmitters were transferred 20 miles distant to Portishead and operated by remote control from Burnham.

This proved to be most satisfactory as it enabled the simultaneous working of several ships to be carried on, and thus speeded up the work of the station.

Long-distance Developments

The long-distance service which in 1925* was transferred from Devezes to Burnham, was carried

IN 1898 the East Goodwin lightship off Ramsgate, and the South Foreland lighthouse were equipped with wireless transmitting and receiving apparatus which established the first ship to shore radio contact.

Following this a number of shore stations were built and equipped. These were operated by Lloyds and the Marconi company respectively.

The stations were as follows: G.C.S., Caister, Norfolk; G.N.F., North Foreland; G.N.I., Niton, Isle of Wight; G.L.D., Lizard; G.L.V., Seaforth, Liverpool; and Cullercoats, together with two stations in Ireland which are no longer under the control of the British authorities.

While the fitting of wireless apparatus on board ship was not then compulsory, a number of far-seeing shipowners realised the advantage of being able to make direct contact with their vessels when some distance at sea, and commissioned the Marconi company to install the necessary equipment.

Later it was made compulsory that all ocean-going ships of 1,600 gross registered tons be equipped with wireless apparatus.

In 1909 the coastal radio stations operated by the two private companies previously mentioned were taken over by the Post Office authorities.

Compared with modern standards, the apparatus used in the early days of the coastal service was somewhat primitive. Those were the days of spark gaps, secondary and Leclanche cells, etc.

Developments

Previous to the first world war, traffic was light, and station staffs few in number. The war, however, brought about a considerable increase in traffic and was responsible for further station developments and increased staff in order to cope with it efficiently.



The H.F. operating position at Burnham Radio Station. (Photo by courtesy of P.M.G.)

out by three 110-160 kc/s transmitters and associated receivers, one to each transmitter unit. In the following year the first short-wave receiver was installed. At the beginning of the last war the number of transmitters at Portishead was increased to six and additional receivers were installed at Burnham, making a total of 15. As the traffic amounted to 3½ million paid words per year the additional equipment enabled the authorities to cope with the rapidly increasing demands made on it. In 1953 over 10 million paid words were handled.

Modern G.P.O. Coastal Radio Stations

Between the earlier coastal radio stations and their modern counterparts there is a vast difference. Not only are the station buildings built to house the radio and associated electrical equipment but to utilise it to the full.

Careful planning as to choice of site, suitability of

Reconstruction

Increasing traffic may tax the available facilities to such an extent that eventually a major reconstruction, as was the case at Burnham in 1946-1948, may be necessary. At Burnham 32 CR.150 Marconi communication type receivers are installed and the station staff number 115 members. The Portishead station includes eight two-channel transmitters amongst a grand total of 13.

Long watches with headphones, and tuning the receivers, can be rather fatiguing for commercial operators. That this is officially appreciated is denoted by the method of receiver mounting employed at the G.P.O. coastal stations, the receiver being sunk into the operating desk so that it may be tuned and the dials viewed at the most suitable angle.

Those who are interested in short-wave radio appreciate the value and usefulness of maps. This applies more especially to commercial radio operators, as maps greatly assist in the re-routing of messages and the locating of ships called, calling and worked by the G.P.O. coastal stations.

Super Maps

Burnham receiving station has what may be rightly considered as some outside wall maps which are painted on sheet steel, one of them being 35ft. wide by 16ft. high. The reason why sheet steel is used is because it enables magnetic markers to be employed as the means of denoting the position and sailing direction of ships in various parts of the world and in defined areas.

This map shows the recognised ship and air routes, while another one shows the distress areas surrounding the British isles.

Services

The services provided by the G.P.O. coastal stations include short range traffic, telegraphy and telephony, medical aid, distress and casualty services, weather and warnings service, direction finding and long distance communication.

Working Ships

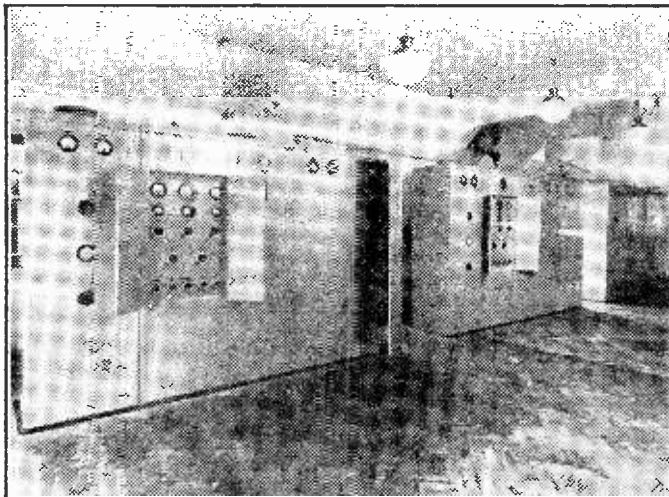
Working procedure varies, the long-distance area scheme being used in the case of ships of the British Commonwealth. This scheme divides the world into eight areas, each with its own radio station. This method has been found to be far more satisfactory than previous ones.

Aircraft

Communication between foreign ships and aircraft is carried out by direct contact. The procedure used in the case of the long-distance area scheme is somewhat complicated.

Traffic Handling

The busiest G.P.O. coastal radio stations are Wick in the north of Scotland, and Land's End. Wick deals with trawler traffic such as those fishing in the White Sea and Bear Island areas. Land's End handles traffic to and from ships in the English Channel.



The transmitter room at Wick Radio Station.

subsoil, buildings layout and future development, and provision for the effective application of anti-electrical interference methods are essential.

When it is required to operate distant transmitters from the receiving station by remote control a high standard of efficiency and reliability is desirable.

Where both transmitters and receivers are located on the same site it is necessary, in order to assure trouble-free operation, to build anti-interference screening into the walls and to glaze all window frames with wire mesh glass and effectively bond together and earth all metal ducting, etc.

Taking into account the amount of electrical machinery and associated equipment installed in modern coastal radio stations, the possibility of electrical interference and its effective suppression is a major problem.

As the number of radio-equipped vessels increases, so also does the amount of paid traffic handled by the coastal radio services. Lost time during which the station might be off the air due to breakdown must at all costs be avoided, and to insure against this, duplicate and other forms of stand-by apparatus is installed and available if and when required.

Medical Aid

Trawling is an arduous and at times a dangerous calling, especially in bad weather. There may be at some time an accident, or sudden illness which necessitates medical advice being sought, or the transfer of a member of the crew to hospital. The coastal services when contacted make the necessary arrangements with the minimum delay. If the trawler is fitted with radiophone apparatus the coastal station can make a direct link-up with the hospital via telephone land lines.

Distress Warnings

Some of the larger ships are fitted with alarm apparatus. The idea of fitting such apparatus is so that notice of urgent messages about to be transmitted may be given in cases where the ship's operator is not always on duty. The coastal stations being equipped with apparatus which enables them to, as it were, trigger the alarm into operation.

Safety

In order to assure the safety of his ship and crew, it is necessary that the captain should know just what kind of weather is to be expected, and act accordingly. The coastal services broadcast weather bulletins, gale warnings, and details as to navigational dangers, wrecks, etc.

Subscribers

All coastal stations are fitted with apparatus for duplex working, and telephone subscribers can be put into direct contact with ships. Owners can call up their skippers, etc. In other stations, however, duplex apparatus is not available and the send-receive or "over" method must be used. Oban and Burnham, however, do not provide facilities for this service.

While many ships have direction-finding equipment available, this does not apply to all. A request from

ships to the shore station for bearings to be taken enables the position of the craft at that particular time to be marked on the ship's chart. This, as a recent newspaper account proved, is very useful, especially in foggy weather.

Short Range

This service is carried out by eleven G.P.O. coastal stations with a range of approximately 300 miles. As the various areas overlap effective coverage is assured. The international distress frequencies are 500 kc/s for the larger ships, using WT, and 2,182 kc/s for small craft using radiophone. Continuous day and night watch is kept on these frequencies.

The task of the coastal station operator is an exacting one calling for systematic searching and concentration, especially during stormy weather. While at intervals it may provide a thrill, busy periods with traffic piling up call for snappy operating. In spite of the long watches and hard work, some operators find time for a busman's holiday as licensed amateur operators during their off-duty periods.

Super Efficient

As the illustrations which accompany this article show, the G.P.O. coastal radio stations combine orderliness with efficiency and are typically British.

Licence Note

With reference to listening on the trawler and shipping bands secrecy regulations apply and should be observed, and interested readers are advised to re-read the regulations as outlined on the reverse side of their wireless receiving licence.

It may interest readers to know that British deep-sea trawlers fish as far south as the coast of Morocco. Other fishing grounds being near the Arctic Circle, Novaya Zemlya, Iceland, Faroes, and Lofoten Islands.

New G.E.C. Transistor

THE General Electric Co., Ltd., has introduced a new germanium transistor, the GET2, which is available for home constructors as well as for equipment manufacturers. The new transistor is a low voltage operation version of the GET1, which is still available only to equipment manufacturers, and will provide home constructors with a readily obtainable transistor for experimental work.

The connections, dimensions and operating precautions which apply to the GET1 transistor also apply to the new GET2. The ratings and characteristics of the two types are different, however. Since low voltage operation is the special feature of the GET2, the knee of the curve is important, and this is checked at $I_c = 5.5$ mA, $I_e = 3.0$ mA, instead of at $I_c = 2.0$ mA, $I_e = 1.0$ mA, as with the GET1. The collector current at $I_e = 0$ is measured at 10 volts instead of 30. To ensure good gain the minimum limit for alpha is 2.5 instead of 2.0. Maximum collector voltage, V_{ce} , is -30 volts; the maximum collector current, I_{ce} , is 15 mA D.C.; the maximum operating temperature, T_{op} , is 35 deg. C.; and the maximum collector dissipation, p_{ce} , is 75mW.

All transistors are tested to ensure stability under emitter short circuit conditions up to a maximum collector voltage of -25 volts. The price is 37/6 each.

Ship/Shore F.M. Link

IN order to facilitate harbour communications at Hong Kong a comprehensive V.H.F. system has been installed there. The equipment was manufactured by The General Electric Co. Ltd., of England, and was installed by Cable and Wireless Ltd. It provides direct communication between ships in harbour and subscribers on the main Hong Kong telephone exchange and also affords a communication link between the ships themselves. The new system greatly simplifies loading and unloading operations.

When a ship enters the harbour, a portable battery-operated V.H.F. transmitter/receiver is taken on board and set up in a suitable situation. The ship is thus at once incorporated in a V.H.F. network covering the harbour and connected to the main Hong Kong telephone exchange.

Essentially the network comprises four groups of sub-stations, each group being allotted two wavelengths, one for transmitters and one for receivers. All the groups are linked directly to a main station set up at a permanent site on shore. This is connected to a C.B. cordless switchboard, which has five lines to the main Hong Kong telephone exchange.

The sub-stations are made up of mains-operated transmitter/receivers (fixed sub-stations) and battery-operated transmitter/receivers (mobile sub-stations).