

Marconi tropo for NATO

Tropospheric scatter equipment is featured in two recent orders received by Marconi Communication Systems for use in NATO.

The first is for the supply of equipment worth nearly £150,000 to replace an existing h.f radio link between the important NATO bases in Lisbon and Gibraltar. The overall contract which was awarded to Page Europa, Spa of Italy includes the provision of a Marconi tropo terminal at each of the two bases. Delivery will begin early next year.

Unaffected by the drawbacks of fading and interference, which are characteristic of h.f communications, tropospheric scatter has obvious technical, geographical, political and economic advantages.

The Lisbon and Gibraltar bases which are 280 miles apart, will each be supplied with latest drive and receiver equipment and a Type H1230 900MHz klystron amplifier, which has an output from 2 to 10kW. The system is capable of providing up to 300 communication channels.

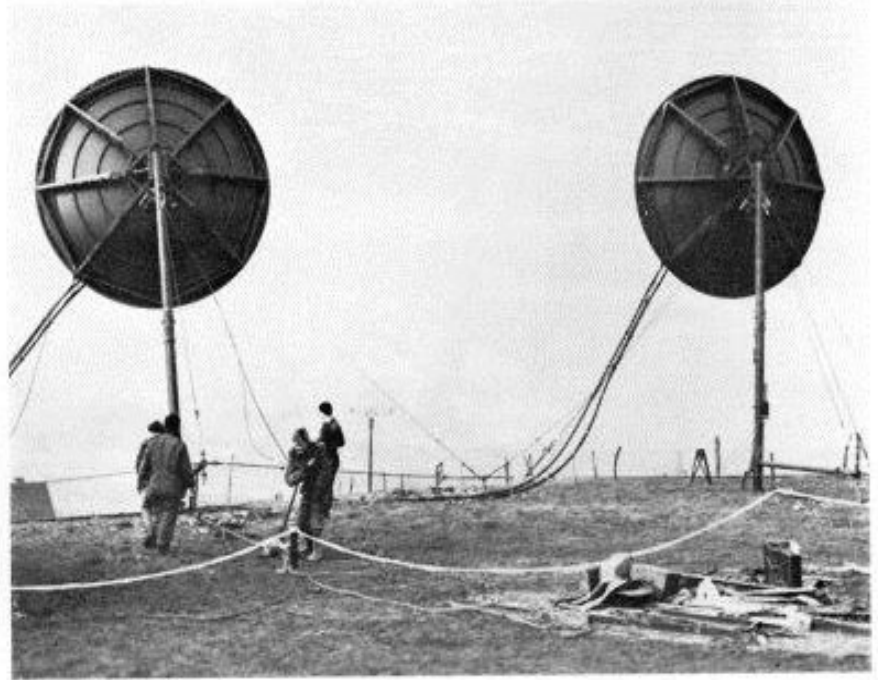
The other order is for the supply of nine mobile tropospheric scatter terminals for use in a NATO battlefield support missile system. The contract, which is worth about £180,000, was placed by Elekluft, who are prime contractors to NATO for the whole project.

Delivery of the tropo systems will start next year.

The nine terminals will be used in conjunction with NATO's PIA ground-to-ground missile system. The selection of Marconi tropo for the vital systems communications is based on the reliability of this mode of transmission over distances of more than 100 miles, ir-

respective of terrain, and the security and the interference-free nature of the system.

The equipment employed in the system includes the Marconi Italiana MH170 drive and receiver equipment together with the new Marconi 4-4 to 5-0 GHz 1kW amplifier and a new pre-detection combiner which substantially improves carrier-to-noise ratio.



A temporary tropospheric-scatter system from Marconi

Marconi Communication Systems Limited has just handed over a containerized tropospheric-scatter communications system to Marathon Oil UK Limited. It is to be used to provide the link between British Telecoms' Mormond Hill shore-station and the South Brae offshore oil field during this summer's hook-up phase.

Communications are vital at all times in offshore operations and tropospheric scatter systems provided by Marconi are the main link for all the production platforms in the British North Sea Sector. South Brae is no exception and the permanent tropo equipment is at present being installed in a module for the platform that is being built in Cadiz, Spain. However Marathon Oil UK Limited requires effective communications covering the period when the platform is being fitted together.

South Brae is probably the most sophisticated offshore production platform yet developed for the particularly

harsh North Sea environment. Built in modular form in shipyards as far apart as Spain and Scotland, the modules are to be floated out to the well-head site some 230 kilometres off the Aberdeenshire coast. There they will be lifted onto the pre-positioned legs of the massive platform to provide its superstructure.

Throughout this operation several hundred men will live offshore, on a semi-submersible accommodation platform called a 'flotel'. It is onto this that the containerized tropo system is to be fitted, providing a link whilst the permanent system is installed and commissioned. It will also be one of the first times that tropo has been used aboard a floating base.

A tropospheric-scatter system requires pinpoint accuracy in the alignment of the antennas and it has always been considered that any movement, such as may be caused by the rise and fall of the sea for example, would degrade seriously the signals to

and from a ship-based system.

Marconi has calculated that, in this particular instance, this problem can be overcome. This containerized system, bought by Marathon Oil UK Limited, confirms Marconi's claim to be a world-leader in this highly complex technology.



Dennis Watts, Instrumentation and Electrical Inspector with Marathon Oil, signing the acceptance certificate in the equipment container.

A temporary tropospheric-scatter system from Marconi

Marconi Communication Systems Limited has just handed over a containerized tropospheric-scatter communications system to Marathon Oil UK Limited. It is to be used to provide the link between British Telecoms' Mormond Hill shore-station and the South Brae offshore oil field during this summer's hook-up phase.

Communications are vital at all times in offshore operations and tropospheric scatter systems provided by Marconi are the main link for all the production platforms in the British North Sea Sector. South Brae is no exception and the permanent tropo equipment is at present being installed in a module for the platform that is being built in Cadiz, Spain. However Marathon Oil UK Limited requires effective communications covering the period when the platform is being fitted together.

South Brae is probably the most sophisticated offshore production platform yet developed for the particularly

harsh North Sea environment. Built in modular form in shipyards as far apart as Spain and Scotland, the modules are to be floated out to the well-head site some 230 kilometres off the Aberdeenshire coast. There they will be lifted onto the pre-positioned legs of the massive platform to provide its superstructure.

Throughout this operation several hundred men will live offshore, on a semi-submersible accommodation platform called a 'flotel'. It is onto this that the containerized tropo system is to be fitted, providing a link whilst the permanent system is installed and commissioned. It will also be one of the first times that tropo has been used aboard a floating base.

A tropospheric-scatter system requires pinpoint accuracy in the alignment of the antennas and it has always been considered that any movement, such as may be caused by the rise and fall of the sea for example, would degrade seriously the signals to

and from a ship-based system.

Marconi has calculated that, in this particular instance, this problem can be overcome. This containerized system, bought by Marathon Oil UK Limited, confirms Marconi's claim to be a world-leader in this highly complex technology.



Dennis Watts, Instrumentation and Electrical Inspector with Marathon Oil, signing the acceptance certificate in the equipment container.

Satellite earth stations in London's dockland

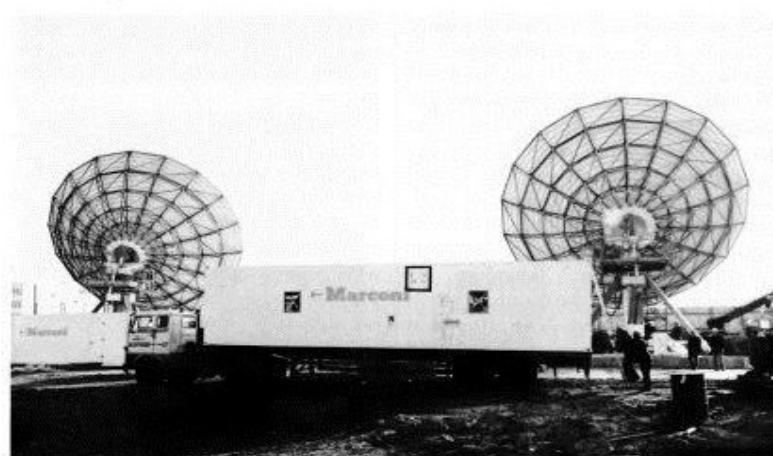
Engineers from Marconi Communication Systems are at present working on two different projects that will bring the space age to London's dockland.

On the Isle of Dogs, Marconi is supplying Mercury Communications Limited with two complete satellite earth stations to provide international links for leased-line and other switched services. One station will link to North America via the INTELSAT V satellite, using a 13m diameter dish antenna. The other station, with an 8m dish, will provide a service to Europe.

At Woolwich, Marconi is supplying British Telecom International with three terminals, each with a 13m antenna. Again the link will be via INTELSAT V and also the ECS satellite. By the substitution of a few components, any terminal in this project will be capable of assuming the role of one of the others.

Ground communication equipment will be fully duplicated in both these projects.

Both orders are now well in hand. At Woolwich the first antenna and the container with the ground communi-



The second container seen on arrival at BTI's Woolwich site. The first can be seen in position at the left of the photograph with the first two of the three antennas in the background.

cation equipment are in position, and work has started on the second antenna.

In addition to these two projects, Marconi has received an order from Mercury Communications for the supply of a complete earth station for the first terminal to be built at a site

near Kidlington in Oxfordshire.

On completion of these projects, Marconi will have been involved in the installation of over 22 separate earth stations in the UK. At Goonhilly and Madley, Marconi engineers are at present working on seven new systems as well as updating the existing terminals.

£7.6 million contract for army communications

Marconi Communication Systems has been awarded a contract potentially worth more than £20 million by the Ministry of Defence for transportable u.h.f radio relay equipment, code-named TRIFFID, for the British Army. Although the initial contract covers the design and manufacture of 450 sets worth £7.6 million, the final requirement

is expected to be for 1,500 sets worth more than £20 million.

In collaboration with two other European companies, Marconi has entered into a contract to supply equipment of the latest design within a specified time and at a minimum development cost. The equipment will be used to form a radio relay network, and will be

designed to operate with the British Army's 'Ptarmigan' tactical communication system which is planned for the 1980's.

The equipment is based on the FM200 type which is already in full-scale production with Siemens AG, Munich and AEG-Telefunken, Backnang, who jointly originated the design for the Netherlands Army with whom the FM200 is now in service. The contract calls for modifications to this basic design to meet the specific requirements of the British Army. The equipment will be suitable for operation in a wide range of military vehicles and in adverse environmental conditions, and will be simple to set-up, operate and maintain.

The design and development phase of the TRIFFID programme is due for completion in the spring of 1976 with deliveries commencing during 1977 and building up to a rate of 220 sets per year.

Marconi, as prime contractor, will manufacture approximately two-thirds of the equipment, the remaining production being shared between Siemens AG and AEG-Telefunken.



A Centurion tank of the British Army on manoeuvres

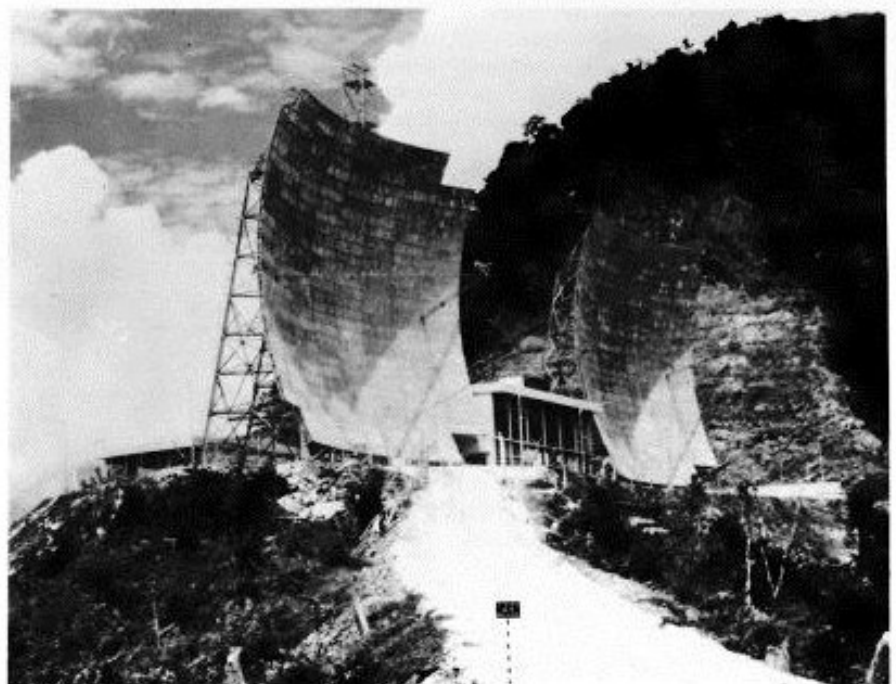
Marconi uprates Malaysian tropo

Another major order underlines the claim of Marconi Communication Systems, to be a world leader in the field of tropospheric scatter communications systems.

The order, from GEC Malaysia on behalf of the Malaysian Post and Telecommunications Authority, is to uprate the link between Johore and Kuching in North Borneo provided by Marconi in 1970. Originally installed as a 48 channel link spanning 738 kilometres (460 miles), mainly across the South China Sea, the system is now to be increased to 72 channels.

Marconi is to provide, install and commission the new system, and to train operators in the use of the new H1230 amplifiers and H3102 series drives and receivers. Special monitoring consoles are included which will be used for functional performance monitoring of the whole system.

Marconi is Europe's major supplier of tropospheric scatter systems, well over 50 systems having been commissioned world-wide for defence, diplomatic, commercial and telecommunication use so far. Many of these are multiple links reaching out over 2000 kilometres. The Company has also provided all the links currently in use in the North Sea oil production area.



View of Kuching antennas

New tactical Tropo system

Marconi Communication Systems has been awarded a contract by the British Government to develop a new tropospheric scatter communication equipment, the H7450, which will provide the long distance multichannel tactical communications links necessary on the modern battlefield.

A novel feature of this equipment will be a single antenna option which can be supplied for particular military applications. The use of only one antenna, in place of the two normal in tropospheric scatter systems, makes the new system particularly suitable for tactical employment. It will require only a small crew and can be deployed in the field with minimum effort. The basic components have a high degree of flexibility which ensures that the equipment can be used in a wide variety of applications ranging from fixed site strategic to fully transportable tactical field systems.

Designed to the rigorous environmental standards set by the British Ministry of Defence the equipment can be used for either digital or analogue transmission and will carry up to 300FDM voice channels.

Carrying out its original work in the early 1950s, the Company has become the largest supplier of tropospheric scatter communications systems in Europe and has designed, installed and commissioned some 50 major systems, many for military applications.



A Marconi transportable tropo antenna design

Marconi ICS3 for US Navy

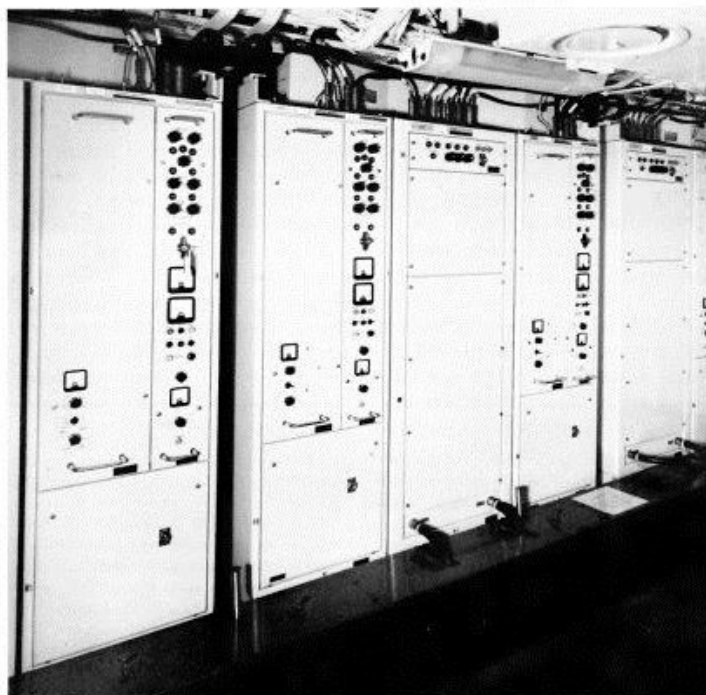
Marconi Communication Systems is to provide its latest integrated h.f. naval communications system (ICS3) to the United States Navy Department under a contract signed recently.

H.F. networks are the backbone of all defence tactical communications, providing highly reliable and very secure means of communicating at all times. ICS3, the Royal Navy's third generation integrated system, designed and developed by Marconi, is the world's most advanced naval external communications system for tactical and strategic circuits.

ICS3 offers voice, telegraphy and data-communications capabilities covering ship-to-ship, ship-to-shore and ship-to-air services in the 15kHz to 30MHz frequency band. It also interfaces with v.h.f., u.h.f. and Satcoms circuits as well as the ship's internal communications systems. Marconi is also developing an extension to ICS3 for submarine communications for the British Ministry of Defence, and ICS3 is being reconfigured for installation in patrol vessels.

So far, the Royal Navy has invested some fifty million pounds in ICS3, with the system being installed in the 'Invincible' Class Anti-Submarine Cruisers, Type 22 and Type 42 frigates as well as being retro-fitted aboard modernized 'Leander' Class frigates and other fleet units.

Marconi naval communication systems have been widely sold abroad. Prominent among recent sales are those for twelve new 'Kortenaer' Class frigates of the Royal Netherlands Navy which are being equipped with ICS3 as they come into service.



ICS3 power-bank amplifiers in high-power room of HMS Broadsword

Rain forest communications

Marconi Communication Systems has supplied mobile radio equipment to the Royal Geographic Society for use during a 12-month exploration of the Macara rain forest in Brazil.

The project is organized jointly by the Society and SEMA, the Brazilian Department of the Environment. Forty British scientists of various disciplines will make a thorough study

of a small island in an Amazon head-water formed by the splitting and rejoining of the river and will spend a year studying flora, fauna, forest regeneration, soils, hydrology, entomology and land development.

Marconi equipment will be used for short-distance communication and will comprise three RC516 v.h.f. f.m hand-portable radios, durable, weather-resistant units

which were designed for use in high humidity, and an RC627 v.h.f. f.m mobile radio which is rugged in construction and can be mounted in a vehicle.



The RC627 v.h.f. f.m mobile radio



The RC516 v.h.f. f.m radio

New submarine communication equipment

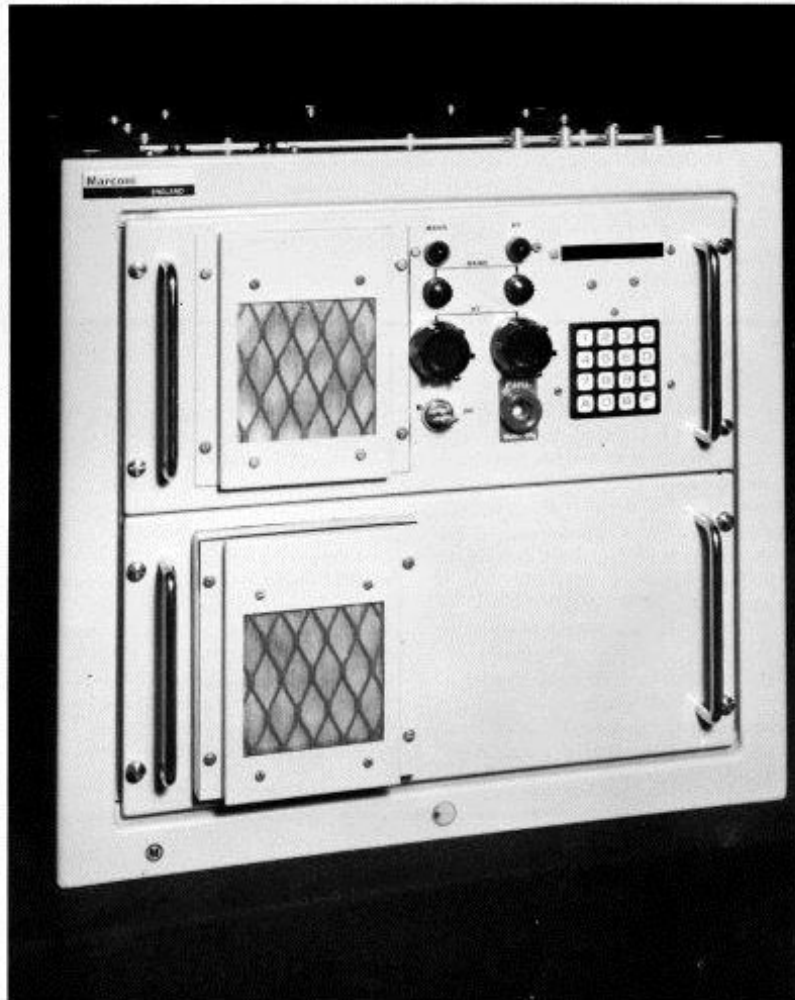
The Ministry of Defence has placed a contract valued at over £1 million with Marconi Communication Systems for the design and development of an m.f./h.f. communication system for fleet and patrol submarines.

The system is designed around existing ICS3 equipment but will use a 250W amplifier of Marconi propriety design which is automatically tuned. Also included are new antenna and operator control panels and a remote operating system allowing users to have full remote frequency channel selection for the first time for submarines.

The new equipment is designed to interface with v.h.f., u.h.f., satellite communication and radioteletype equipment. Much of the equipment will also be directly suitable for light forces such as patrol vessels, strike craft, minesweepers and the like. Also the design is such that it can be used in conjunction with existing ICS3 equipment as used in major warships, and will thus extend the existing naval communication system.

The new design allows for more flexibility particularly for countries which can work into the ICS3 system.

ICS3 is an integrated naval communication system designed and developed by Marconi Communication Systems which is in use with the Royal Navy and other overseas navies. The system is highly flexible and provides for the transmission and reception of signals with speed and reliability in the l.f., m.f. and h.f. bands as well as providing interfaces for communications in the v.h.f. and u.h.f. bands and via satellites.



Solar energy powers mobile radio repeaters

Radio repeaters powered by solar energy are part of a project recently completed by Marconi Communication Systems Limited in the Wadi Hadhramaut, Peoples' Democratic Republic of Yemen.

The Wadi Hadhramaut, stretching for nearly 200 miles into the Empty Quarter from the east coast, is the largest of the many valleys that crease the face of Arabia. Over a mile deep, it meanders along throwing off side-wadis almost casually. They are equally deep and tortuous. It is a fertile valley with scattered towns and villages nestling amongst their palm-groves in protected corners. It is historic too, as the 'lubaan' trees, creators of incense, attest; for this was Saba, the land of the Queen of Sheba whose relics, ruined cities and countless carved inscriptions can still be found.

A power house near Shibam, towards the centre of the Wadi, provides electricity for the settlements, and Marconi Mobile Radio received a contract to provide a mobile radio network for the Public Corporation for Electric Power. Comprising base-stations at the Power-House and at the towns of al-Ghuraf and al-Qatan, some 40 miles east and west respectively, the network was designed to provide the Corporation's maintenance engineers with radio contact whilst travelling between the various areas serviced by the power station.

The problem of providing coverage into the side-wadis, and along the winding course of Wadi Hadhramaut itself, was resolved by the provision of two repeater sites, located so as to provide maximum coverage of this difficult area. Roughly sited by map at Chelmsford, they were surveyed in the

Wadi Hadhramaut by Installation Engineer Clive Warner who located one, as planned, at Buheira near Shibam, and then resited the second near al-Ghuraf, making the base-station planned for that location redundant. This base-station was redeployed to a fresh site at Tarim where it enables the maintenance engineers to extend contact into two side-wadis it had previously been thought impossible to cover.

Power is available to the base-stations through the local grid but both repeaters are remote. The cost of supplying a mains power supply was far more than that of providing solar

panels. These, fitted on top of the repeater housing, make use of abundant local sunshine to charge the batteries used to operate them at night, as well as providing power for day-time operation.

Both repeaters can be converted to base-station use merely by plugging in a handset and 2-channel operation ensures a flexible and reliable system. It was inaugurated on 17th March, 1982 after a total installation period, including surveys, of less than six weeks. So successful has it been that Marconi Mobile Radio is now actively involved in replying to a number of other customers for similar systems.



One of the two repeater stations. The solar panel can be seen on top of the building

World First in underwater telegraphy

Marconi Communication Systems have completed the design and development of what is believed to be the first telegraph error detection and correction equipment designed specifically to provide teleprinter to teleprinter communication under water. The equipment, designated Sonar 2010 by the Royal Navy, was designed in collaboration with the Admiralty Underwater Weapons Establishment for the Royal Navy for underwater tactical communications.

The programme to produce the type

2010 equipment started in 1967 with a series of studies in which research equipment was taken to sea in vessels of the Royal Navy to determine the techniques that could be best employed to overcome the many difficulties that face the underwater communicator. The problem is particularly acute in data transmission, which has to cope with the effects of fades, multipath, noise bursts and doppler shifts caused by the relative motion between communicating vessels.

From the early research trials, a

combination of techniques was involved, and this was followed by the design and manufacture of prototype production equipment. A further series of sea trials took place and the equipment was evaluated under a variety of propagation conditions chosen to represent those found in service use.

During the sea trials the new Marconi Underwater Telephone, designated Sonar 2008 by the Royal Navy, and was used as the transmitter and receiver of the telegraph signals.

The trials were highly successful and beat the target of 98 per cent error free copy under a wide range of propagation conditions from shallow water to deep sea and rough sea to calm tropical conditions. It was also shown that the 2010 can pass traffic at a greater transmission rate than can be achieved by speech, and together with the greatly increased range provided by the type 2008 Underwater Telephone has extended the communications abilities of the submariner by many times.

Production is scheduled to start this year and will cover a shipfitting programme of existing and new Royal Navy vessels over a period of years. Interest has also been expressed by NATO and Commonwealth countries.



The control room of nuclear submarine Warspite

Big Saudi Arabian order for Eddystone Radio

In the face of fierce international competition, Eddystone Radio Limited, has won an order to supply 300 of its high-grade general-purpose radio receivers for use in Saudi Arabia. Worth nearly £300,000 this is Eddystone Radio's largest ever single order for this receiver - the Type 1830/1 - and represents more than one receiver sold for every Eddystone employee.

Under the terms of a contract placed with Electronic Equipment Marketing Establishment, the 300 Eddystone receivers are to be supplied to the Saudi Arabian Posts, Telegraphs and Telecommunications Authority. These will be deployed throughout the country and used by the authority for general monitoring purposes.

Delivery of the first 50 equipments

started in May of this year and is continuing in batches of 50 over the following 12 months. A follow-up order for a further quantity of receivers is expected to be placed in the near future.

The Type 1830/1 receiver is part of Eddystone's range of medium-cost high-grade equipments for general-purpose applications in the 120kHz to 31MHz band. It is also approved by the Posts and Telecommunications Division of the United Kingdom Department of Industry as a reserve receiver providing c.w, m.c.w and a.m reception facilities for maritime installation. Standard features include ten-channel crystal facility, incremental tuning (± 50 kHz) and provision for synthesized operation. Variants are available with special facilities for s.s.b,

modified coverage and 50-channel crystal capability.



'The road from Jeddah to Riyadh in the Al Hoda Mountains'