



RADIOCOMMUNICATIONS AGENCY

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R E P O R T

EXHIBIT
EX. 1010



The Radiocommunications Agency is an Executive Agency of the Department of Trade and Industry

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Management



John Michell
Chief Executive

Foreword by Chief Executive

1991/92 has been another successful year for the Agency in which we have met or exceeded most of the performance targets set by Ministers.

We set out in 1991/92 to improve the quality of our service to our customers and, for the first time, commissioned a professional survey of our customers' views of the Agency. This has yielded important findings on which we are already acting and I should like to thank all who contributed to it. The radio spectrum is an increasingly valuable economic resource, as well as being the means of providing many life-saving and entertainment services. It is important that we should manage the spectrum as efficiently as possible and respond as flexibly as we can to the requirements of all who wish to use radiocommunication for legitimate purposes.

The report of the Second Stage Independent Spectrum Review Committee was published during the year, containing important recommendations on future spectrum management. We expect to announce a Third Stage Review shortly.

We have been increasingly successful in dealing with un-authorized broadcasters, using the new powers contained in the 1990 Broadcasting Act. This has resulted in a decrease of more than 40% in complaints about interference from this source.

We have continued to fund research on radio propagation including specific projects related to

individual services or bands. We spend some 10% of our annual budget on research projects.

Important international developments have included the World Administrative Radio Conference (WARC 92), progress on European harmonisation of standards and regulatory matters and agreement within the European Community on the Electromagnetic Compatibility (EMC) Directive.

In 1992/93 we intend to continue our emphasis on quality of service, strengthening our resources to provide a more effective overall spectrum management service. We shall also be picking up action arising from WARC 92 and anticipate the final publication of a large number of European telecommunications standards.

Our principal resource remains our personnel, and we shall continue to improve the training and expertise of our staff to meet the needs of customers. I should like to thank all our staff for their dedicated efforts in 1991/92.

JOHN MICHELL
Chief Executive

part one

The Agency's Role, Performance and Targets

The role of the Radiocommunications Agency is to regulate the use of the civil radio spectrum in the national interest.

This we do by

- negotiating and planning the UK's use of the spectrum, with the rest of the world where necessary
- research into ways of increasing the usability of the available spectrum
- agreeing equipment standards with industry
- licensing users so as to enable them to co-exist with each other, or determining the basis for exemption from licensing
- investigating interference and enforcing the relevant legislation

Table 1: Quality of service targets: 1991/92 Results

RA set specific work targets for 1991/92 in seven main areas of activity. The targets and the results were:

TARGET	ACHIEVED
Aeronautical Radio 90% of new applications to be processed and despatched within 1 working day.	96%
Aircraft Radio 90% of new applications to be processed and despatched within 2 working days. 90% of amendments to be processed within 3 working days.	97% 96%
Ships Radio 80% of licences to be issued within 1 month.	90%
Maritime Business Radio 90% of cases to be actioned within 1 month.	97%
Private Mobile Radio Average time for processing applications: <i>New</i> - within 15 working days <i>Amendments</i> - within 30 working days	5 days 8 days
On site paging 90% of new applications and amendments to be processed and, where appropriate, despatched within 3 working days.	95%
Enforcement 100% of safety of life services complaints to be handled within 24 hours. 95% of business complaints to be handled within 5 working days. 95% of domestic complaints to be handled within 1 month	100% 100% 100%

The Agency works to a number of annual quality of service targets, and to an overall annual efficiency gain target, which was set at 3% for 1991/92. The Agency met, and in some cases exceeded, all of these targets last year. Table 1 provides details.

Targets for 1992/93 are set out in Table 2. These include a new quality of service target on turnaround times for Private Mobile Radio licence applications. The percentage of cases covered by other targets has been increased wherever possible.

The overall efficiency target for 1992/93 will be 2%.

Table 2: RA Quality of Service Targets: 1992/93

The Agency's targets for Quality of Service in 1992/93 are:

Aeronautical Radio

99% of new applications to be processed and despatched within 2 working days.

Aircraft Radio

99% of new applications to be processed and despatched within 3 working days.

99% of amendments to be processed within 4 working days.

Ships Radio

88% of licences to be issued within 1 month.

Maritime Business Radio

96% of cases to be actioned within 1 month.

Private Mobile Radio

90% of new applications and amendments to be processed within 30 working days.

Average time for processing applications:

New - within 10 working days

Amendments - within 20 working days

On site paging

99% of new applications and amendments to be processed and despatched within 4 working days.

Enforcement

100% of safety of life services complaints to be handled within 24 hours.

98% of business complaints to be handled within 5 working days.

98% of domestic complaints to be handled within 1 month.

part two

Customers and Quality

CONSULTATION

The Agency values its contact with its customers, including manufacturers, dealers and users. We have continued to maintain a network of consultative committees covering all aspects of radio. The principal committees are

- the Broadcast Spectrum Advisory Committee (BSAC), chaired by Ronald Bedford, which advises the Agency on broadcasting spectrum matters. It comprises representatives of broadcasters, cable and satellite operators, manufacturers and other government departments. Subjects discussed during the year included digital audio broadcasting, Channel 5 TV, High Definition Television (HDTV), Multipoint Video Distribution Systems (MVDS), AM stereo sound broadcasting and the implications of the EC Directive on Electromagnetic Compatibility (EMC).
- the Civil Land Mobile Radio Committee (CLMRC), which brings together representatives of manufacturers, dealers, network operators and users under the chairmanship of Stephen Spivey. During the year the committee was streamlined and made more fully representative of the mobile radio community. It contributed to a variety of subjects including Agency research policy, use of data on PMR channels, continental interference to services in UHF bands and local processing of PMR licence applications.

- the Microwave Fixed Links Committee (MFLC) chaired by Ronald Bedford, representing manufacturers, suppliers and users of fixed radio links and scanning telemetry. Sub-groups dealt with EMC, video and radio systems and the cable TV trunking specification. Work continued on a number of equipment specifications, five being completed and published during the year.

Details of these and other main committees are set out in Part 10.

CUSTOMER SURVEY

We commissioned Market & Opinion Research International (MORI) to undertake a customer survey during 1991. The objective was to gauge perceptions of the quality of service which we currently provide, and to obtain information which would help us to set targets and deploy resources in a way which reflected customer priorities. Feedback from the survey will provide the basis for a review of quality of service measures planned for 1992/93.

The survey was aimed at five groups: Private Mobile Radio, Maritime Business Radio and Fixed Link licensees; manufacturers; and dealers and specialist providers of radio services. What they told us in some cases confirmed our own views, but highlighted other areas which we had not thought a problem.

The clear message was that although the Agency has become much more approachable and responsive in the

last few years, there is plenty of scope for improvement. We need in particular to improve awareness of our services, the accessibility of our staff, the accuracy of some of our records and turnaround times on the more difficult cases.

Customers also want more and better information. We provide a good range of information sheets, but we could make them clearer. There is also a demand for basic information about the availability of spectrum and the Agency's role as spectrum manager.

Finally, Agency staff must become more aware of commercial realities;



Gerald David receiving his company's LMRQAS accreditation certificate from John Redwood MP, then Minister for Corporate Affairs

for instance, in the time taken to deal with enquiries about the acceptability of new services or devices.

The Agency will respond to all of these messages. Since MORI's report was received we have already:

- *introduced new performance targets to reduce worst-case turnaround times;*
- *taken steps to improve the accuracy of licence schedules and records;*
- *set ourselves the firm target of reviewing all our licence documentation and information sheets on a rolling two-year cycle; and looking every 3 years at the licence conditions for each licence category;*
- *announced our intention to set up a central Agency Enquiry Point, which will help route calls to the right person and make us more accessible at a local level.*

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The other points raised require further work before decisions are taken on how to proceed.

CITIZEN'S CHARTER

In accordance with the principles of the Citizen's Charter we intend shortly to announce a formal complaints procedure. This will guarantee a reply within 14 days to anyone who wishes to write to the Chief Executive if they are dissatisfied with the way in which they have been treated by the Agency.

We are considering seeking accreditation to BS 5750 for parts of our work.

The Agency's Radio Technology Laboratory already holds National Measurement Accreditation Service (NAMAS) accreditation for most of its work; similar accreditation is being sought for our mobile EMC and Interference Laboratory.

QUALITY ASSURANCE IN THE RADIO INDUSTRY

Barry Maxwell chairs the Radio-communications Quality Council (RQC), which runs an industry-driven scheme for quality management in the radio industry - the Land Mobile Radio Quality Assurance Scheme (LMRQAS). The aim is to provide customers with a quality service based on BS 5750. Registration in the scheme continues to grow, and stood at 40 at the end of 1991, an increase of 170% since the previous year.

During the year the RQC encouraged competition and choice by appointing a further six certification bodies in addition to the three which existed, with the particular objective of encouraging smaller firms to participate in the scheme.

The Agency has made access to newly released frequencies for short term hire radio (see Part 5) dependent upon licensees following the industry code of practice and registering in the LMRQAS.

part three

Spectrum Reviews

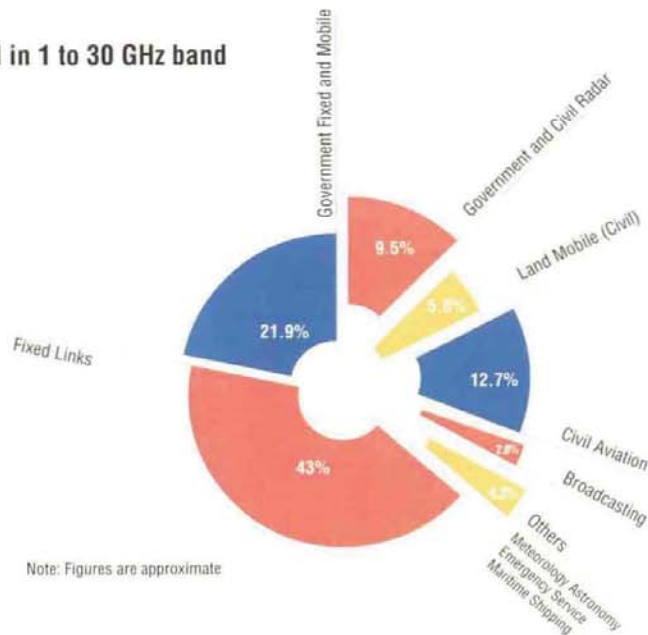
The Report of the Stage 2 Independent Spectrum Review Committee under the chairmanship of Sir Kenneth Corfield was published in September 1991. It detailed the results of the Spectrum Review Committee's examination of civil and defence uses of the spectrum in the frequency range 3.4 to 30 GHz, and made a number of recommendations, some of which have important implications for general policy towards radio spectrum management. Copies of

the report are available from our Library; contact details are given in Part 10.

The Government has announced its intention to issue a consultative document on spectrum management. This document is expected to address a number of the issues raised in the Spectrum Review Committee's report.

We expect to announce shortly the start of the Stage 3 Independent Spectrum Review by a newly

Fig. 1 - Services allocated in 1 to 30 GHz band





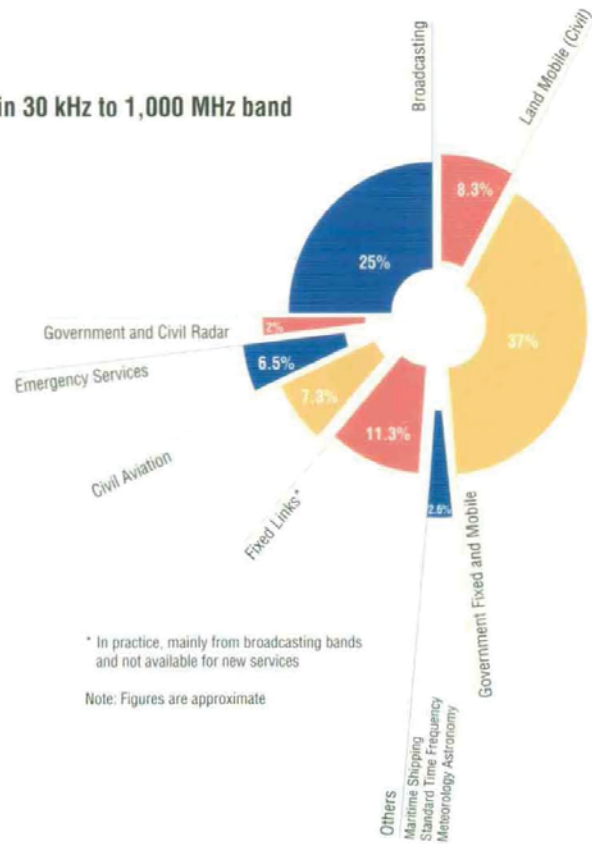
Sir Kenneth Corfield, chairman of the Spectrum Review with John Michell, Agency Chief Executive

constituted Committee, to review spectrum use in the range 28 to 470 MHz.

The European Radiocommunications Office of the CEPT in Copenhagen has commenced a series of detailed spectrum investigations (DSI) with a view to

producing proposals for a European table of frequency usage. The first DSI covers the frequency range 3.4 to 105 GHz. The Agency has contributed details of UK uses in the various frequency bands within the range.

Fig. 2 - Services allocated in 30 kHz to 1,000 MHz band



part four

The International Scene

EUROPEAN POSTAL AND TELECOMMUNICATIONS CONFERENCE (CEPT)

The European Radiocommunications Committee (ERC) of CEPT, chaired by Michael Goddard, has continued to make progress with a number of new recommendations and reports being agreed during the year.

Co-ordination between CEPT countries was maintained during the World Administrative Radio Conference 1992 (see next page). Most of the CEPT proposals were adopted by the conference.

CEPT is undergoing a major organisational transformation. It decided last year to become a body of European regulators in the field of telecommunications and posts, rather than representing both regulators and operators as it has done in the past. This decision is likely to be implemented by the CEPT Plenary in September 1992. The new organisation will consist of three committees below the Plenary level: the European Committee for Telecommunications Regulatory Affairs (ECTRA), the European Radiocommunications Committee (ERC) and the European Committee for Regulation of Posts (CERP).

EUROPEAN TELECOMMUNICATION STANDARDS INSTITUTE (ETSI)

The Agency has continued to contribute to the work of ETSI on radiocommunications standards.

The Agency has taken the initiative in defining the interface between ETSI and CEPT by introducing proposals for new working arrangements between the two bodies. Our prime concern has been to ensure compatibility of equipment and systems standards.

Major initiatives during the year included developing a policy on Intellectual Property Rights (IPR), and the completion of a number of standards for land mobile, maritime and radio relay equipments. These are listed in Part 10. Joint work with the European Broadcasting Union (EBU) on broadcasting equipment standards, and other standards work on Satellite Earth Stations and public telephones in aircraft (Terrestrial Flight Telephone System - TFFTS) is also proceeding well. Publications expected in the next year should result in over 200 European Telecommunications Standards (ETSS) and some 120 technical reports.

ETSI is also taking the lead in producing electromagnetic compatibility (EMC) parameters for radio equipment and systems, standards for which are being prepared in collaboration with the European Electrotechnical Standards Committee (CENELEC).

The Agency has published a comprehensive information sheet (RA 168) on ETSI and radio standards in the UK, which is available from our Library; contact details are given in Part 10.

INTERNATIONAL TELECOMMUNICATION UNION (ITU)

The ITU's High Level Committee has examined the structure and working methods of the ITU, and made recommendations which, if implemented, would have a major impact on the CCIR (International Radio Consultative Committee), the IFRB (International Frequency Registration Board) and the holding of future administrative radio conferences.

An Additional Plenipotentiary Conference (APP 92) will be held in December 1992 in Geneva to consider these recommendations, which would result in the work of the ITU being divided into three main sectors - telecommunications development; standardisation; and radiocommunications. The radio sector will combine some of the CCIR activities, the work of the IFRB, and radio conferences. Radio conferences would be put on a regular cyclical basis, possibly with a conference every two years. The split of present CCIR work to fit the proposed new structure is likely to be contentious. The Agency will participate in the conference.

INTERNATIONAL RADIO CONSULTATIVE COMMITTEE (CCIR)

The Agency played a major part in the shaping of the details of the new working methods and procedures of the CCIR which became effective during the year, following their introduction at the 1990 Plenary Assembly.

All of the Working Parties and Task Groups established by the CCIR Study Groups met, with Study Groups 4 and 9 holding their first meetings, thus completing the first round of studies using the new methods for those activities.

The UK CCIR General Purposes Committee (GPC), chaired by Les Barclay, continued to co-ordinate national CCIR activities, with the Agency providing secretariat support for the GPC and Study Groups.

Detailed work has been necessary under the new procedures to ensure that UK interests are identified at an early stage in the work and carried forward into Recommendations. In particular, the task groups associated with Study Group 12, the new Study Group established to deal with urgent Questions concerning frequency sharing, placed particular demands on Agency staff.

All the CCIR Study Groups, with the exception of 4 and 9, were due to hold meetings in April and May 1992, and the last part of the year was devoted to preparations for these meetings.

WORLD ADMINISTRATIVE RADIO CONFERENCE (WARC 92)

WARC 92 was held from 3 February to 3 March 1992 in Malaga-Torremolinos. Michael Goddard led a UK delegation of about 45 full-time delegates, with a large contingent from the Agency.

The most contentious issues of the conference were concentrated in the frequency range 1 to 3 GHz in which the conference was attempting to accommodate many new mobile and mobile-satellite services, and to provide new allocations for satellite sound broadcasting, whilst protecting existing users as far as possible.

The UK, which had submitted proposals jointly with many other European countries through CEPT, achieved most of its objectives. New allocations were made for mobile radio services around 2 GHz, thus giving support for the development of personal communications network (PCN) services and European digital cordless telephones (DECT), as well as other mobile systems in the longer term. Provision was made for public telephones in aircraft using the Terrestrial Flight Telephone System (TFTS); and for the Future Public Land Mobile Telephone Systems (FPLMTS) expected to be developed in the next decade.

Extensive provisions were made for mobile-satellite services, the bulk of

the spectrum being made available in the long term (2005). The new allocations, and the existing mobile-satellite bands, are available for both geostationary and non-geostationary satellite systems and new regulatory procedures were developed for the use of non-geostationary orbits. In addition some specific allocations have been made for low earth orbit (LEO) systems.

New allocations were also agreed for satellite broadcasting, both for new digital audio broadcasting systems and for high definition television (HDTV). Satellite sound broadcasting will be accommodated in the band 1452 to 1492 MHz and HDTV in the band 21.4 to 22 GHz in Regions 1 and 3. In both cases the bands will not become fully available in the UK until 2007. Further work is needed to assess the impact of the new allocations on existing UK fixed services.

Some increases were made to the HF (shortwave) broadcasting allocations, although with only a small increase below 10 MHz where the need was the greatest. As a result of the limited changes to the broadcasting allocations, it was not possible to align the allocations to the amateur service at 7 MHz where there remains a significant difference between the allocation in ITU Regions 1 and 3, and that in Region 2.

Further details of the outcome of WARC 92 can be obtained from our Library; contact details are given in Part 10.

5 *part five*

Radio Services: 1991/92 Highlights

MOBILE RADIO

AERONAUTICAL AND AIRCRAFT

Following consultations with users, fees for aircraft licences were adjusted to reflect a more equitable distribution of costs.

AMATEUR RADIO

A review of Amateur Radio licensing procedures, aimed at producing cost savings and better quality service for our customers resulted in a contract being awarded to Subscription Services Limited (SSL), who are now responsible for licence distribution. SSL is a subsidiary of the Post Office and probably best known for issuing television licences.

The Agency and the Radio Society of Great Britain (RSGB) have been working to improve the management of the Amateur repeater network. We would welcome comments on the operation of the new licensing procedure which resulted. We have also been working with the RSGB to establish a scheme for reporting interference in the amateur bands to the Agency. This has already led to some prosecutions.

With the end of the telecommunications duopoly, the Agency has sought views from the Amateur Radio community on the transmission of third party traffic by amateurs.

1991 saw the launch of the Amateur Radio (Novice) Licence, designed to

encourage young people into Amateur Radio. The first licensees were presented with their licences by John Redwood, then Minister for Corporate Affairs. We are now aiming to improve the scheme. Contributions have been invited from interested parties. We would particularly welcome comments from instructors and novices about the content of the training course and the novice examination.

The Agency also sponsored the "Young Amateur of the Year Award". This year's winner was 16 year old Gareth Ayre from Somerset. The runner-up was 17 year old Lee Rogers from Swanley. The Agency intends to sponsor the award again in 1992.

BAND III NETWORKS

The regional Band III operators continued to roll out their networks, in close consultation with the Agency's engineering staff. Major frequency replanning exercises were also completed for some private users, notably British Rail and the National Bus and Coach Council.

CITIZENS' BAND (CB)

A consultative exercise to seek views on the services provided by the Agency confirmed that CB should continue to be a licensed service. We have however established more cost-effective central licence distribution through SSL, thereby expecting to save some £200,000 per annum which would otherwise have

had to be recovered by increasing the licence fee.

A revised set of CB information sheets has also been published, and is available from our Library; contact details are given in Part 10.

LAND MOBILE SATELLITE SERVICES

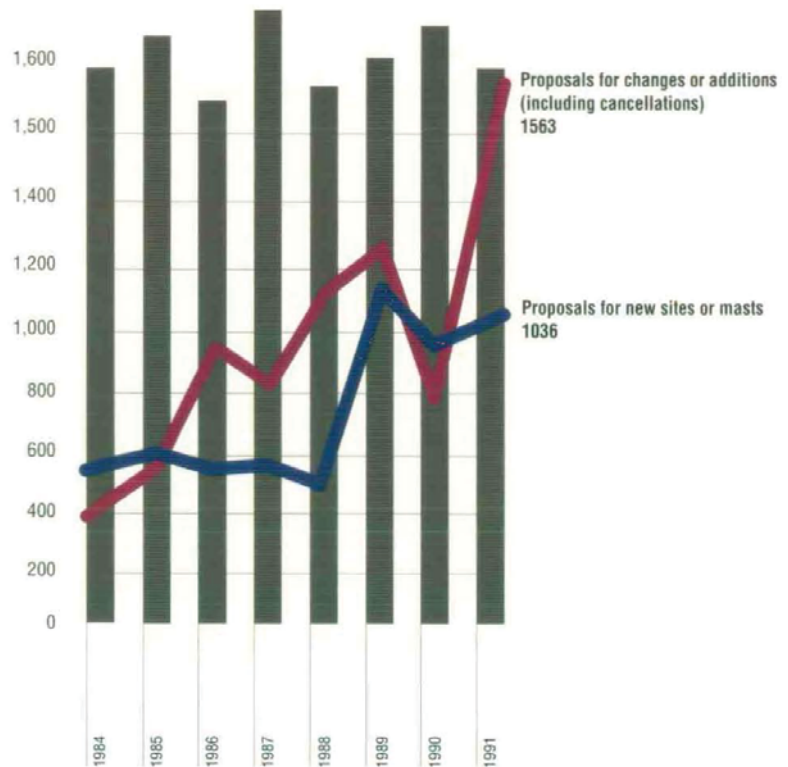
A scheme for broadcasters and Specialised Satellite Service Operators wishing to use INMARSAT-A terminals on land was introduced last year and has now been expanded to include applications for essential and emergency use by organisations such as the police and oil companies. The broadcasters are also considering using the system to receive messages from their reporters. The terminals are only used when no other

telecommunication systems are available and each deployment needs to be site cleared because of the relatively high powers involved. The Agency has no objections provided that the INMARSAT system can accommodate the additional demand without reducing the service available to maritime users.

LONG RANGE ALARMS

The licensing requirements for long range alarms were amended as a result of the duopoly review, which removed the requirement that radio alarms should be used only as a backup to a wired link.

Fig. 3 - Site clearance for non-Government radio users (at 31st December 1991)



LOW POWER DEVICES

We made two further sets of Exemption Regulations. In July 1991 licensing requirements were removed from a wide range of alarms used to protect buildings, vehicles, boats and caravans. Cordless audio equipment was exempted in March 1992.

A trial licensing system was introduced for Radio Local Area Networks (RLANS) providing wire-free links between computers and terminals. The licence authorises indoor use of equipment operating at 2.445 to 2.475 GHz and conforming to the amended specification MPT 1349. Licences will remain in force until a European Telecommunications Standard (ETS) has been agreed. Several meetings have been held with the Low Power Radio Association (LPRA), which represents low power manufacturers

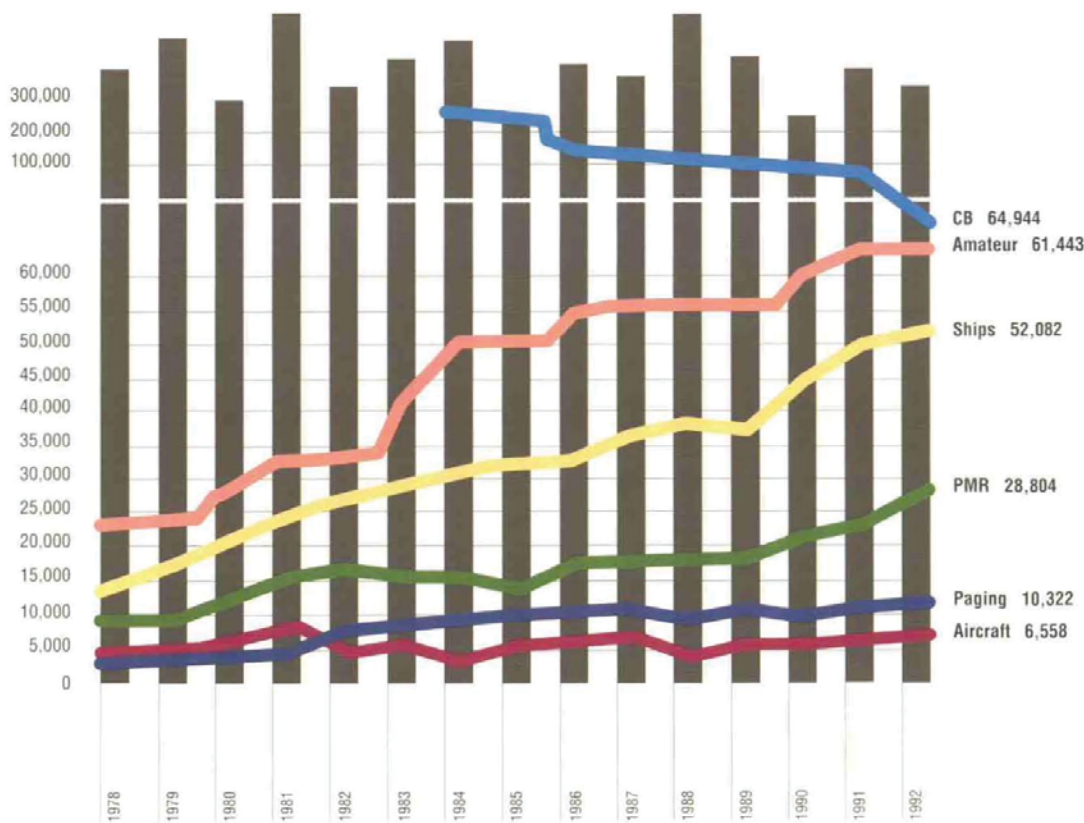
and suppliers. Discussions have included frequency and band planning, European developments and remote meter reading. The address of the LPRA Secretariat is given in Part 10.

MARITIME

Progress has been made on the splitting of Maritime Business Radio duplex channels in order to increase the number of simplex channels which are generally more popular.

In order to reduce congestion on the Marina Channel M (157.850 MHz), an agreement was reached with the Royal Yachting Association that use of channels M and M2 (161.425 MHz), should be offered to individual marinas as a pair for the single licence fee of £50.

Fig. 4 - Trends in major licence groups



ON SITE PAGING

A new licence has been introduced to regulate the short term hire of on-site paging equipment. The licence allows for the hire of paging equipment for periods of up to six weeks. A similar licence regime was introduced last year for short term hire of private mobile radio (PMR - see below), and the two will probably be linked in the longer term.

PAN-EUROPEAN PAGING (ERMES)

Clearance continued of channels for the pan-European paging service (ERMES) which is due to become operational in 1993. At 31 March, over 90% of the PMR users formerly operating on those channels had been accommodated elsewhere.

PRIVATE MOBILE RADIO (PMR)

Despite a difficult year for much of the mobile radio industry, there was a net increase from 24,293 to 28,804 PMR licensees.

The Agency continued its efforts to improve quality and efficiency, and achieved significant improvements in the processing of PMR licence applications and renewals. The average processing time for the issue of new standard PMR licences was reduced from 11 to 5 working days, and for licence amendments from 30 to 8 working days.

The Agency continued its experiment of making frequency assignments and issuing standard PMR licences from our local District Offices in the North of England, Scotland and Northern Ireland, and extended it during the year to our South London District Office. The aim was to improve the quality of frequency assignments whilst maintaining turnaround times. The generally favourable reaction from customers was confirmed by the Agency's Customer Survey (see Part 2) and we are now considering whether local processing of PMR licences should be introduced more widely and, if so, on what basis.

We developed further our policy of reviewing licence conditions and considering detailed policy issues in consultation with interested parties. The PMR Trade Working Group, which includes representatives of the Mobile Radio Users Association (MRUA), Federation of Communication Services (FCS), Electronic and Business Equipment Association (EEA) and the construction industry tackled various issues including further development of the Short Term Hire licence, the introduction of the Parking and Demonstration licence, an information sheet on the use of radio in tower cranes and a proposed new licensing regime for motorway construction contracts. In addition, a large number of bilateral meetings were held with trade associations, representative organisations and individual customers.

The Agency discussed a number of proposals for self-management schemes under which users take responsibility for assigning frequencies within a block of spectrum. Such a scheme was established for the water industry, but proposals for the construction industry, local authorities and common base stations (CBS) did not proceed because there was insufficient support from users. The Agency remains committed to improving the service it provides in these areas. The CBS licensing regime is currently being reviewed in consultation with CBS representatives, and we have invited views from local authority users on how best to tackle the problems confronting them.

The Agency is considering the scope for adopting 5 kHz channel spacing for PMR. We commissioned and published a report by Bradford University on the feasibility of this approach, and we plan to carry out work on protection ratios as soon as equipment is available. A specification on co-existence is already in draft.

There is a growing requirement to use data transmission on PMR

channels. The Agency is encouraging this development for spectrum efficiency reasons and has been investigating how data transmission can be introduced on shared PMR channels. A consultative document was circulated last summer. The Agency has been involved in work to determine appropriate protection ratios and interference potential for voice and data services on shared channels. We will make an announcement shortly on the introduction of data transmission on shared PMR channels.

RADIOLOCATION

A formal licensing regime for radiolocation systems was completed ahead of schedule and assignments for the new 2 MHz Hyperfix frequencies are nearing completion. A number of companies are now able to offer precision position fixing services by providing differential corrections to the satellite Global Positioning System.

SPORTING AND OTHER PUBLIC EVENTS

The Agency has been considering arrangements to enable specialist short term use of radio at sporting and other public events. Radio requirements for such events range from ordinary use of existing arrangements to individual one-off requirements which need special frequency clearance. We hope shortly to publish general guidance for event organisers and participants.

TEMPORARY USE LICENCE

A new licence is being drafted to regulate the use of non-approved radio equipment that is sometimes used for short periods in the UK; or for demonstration of new equipment which has not yet received type approval. Licences should be available in the summer of 1992.

TYPE APPROVAL

The Agency has produced a guide to type approval in consultation with industry representatives. The guide, which is intended for use by the industry and by local Agency staff explains the procedures for obtaining type approval for mobile equipment, and answers questions which crop up frequently. The guide will be issued shortly as an RA Information Sheet.

The Agency has been leading work within CEPT to develop harmonised arrangements for type testing and type approval. Although this will take some time to realise for the majority of equipment, a good foundation has been laid for future harmonisation in this area.

BROADCASTING AND PROGRAMME MAKING

RADIO MICROPHONES

In April 1991 the Agency delegated to ASP Frequency Management Limited, who already acted as our agents in distributing licences to independent programme makers, responsibility for the distribution of licences for radio microphones used inside theatres and other buildings.

During the year we worked together to identify suitable radio microphone frequencies to replace those in the band 582-589 MHz which will become unusable in some parts of the country when Channel 5 begins transmissions. The band 856.10 to 859.65 MHz is now available throughout the UK for radio microphone use inside buildings. Five channels in the band 855.25 to 861.90 MHz are also available for radio microphones used in programme making.

SERVICES ANCILLARY TO BROADCASTING

Licences for broadcasting ancillary services continue to be distributed on the Agency's behalf by two

companies: the Broadcasters' JFMG Ltd, which covers the BBC and independent broadcasters, and ASP Frequency Management Limited, which covers independent programme making and other activities allied to the entertainment industry. During the year the Agency worked with its two agents to deal with increasing demand.

TELEVISION BROADCASTING: TERRESTRIAL

The Agency continued to provide technical assistance to the Home Office and worked with the broadcasters and other interested parties in the development of broadcasting opportunities, particularly those arising from the

Broadcasting Act 1990, and those which were likely to follow WARC 92.

During the year technical approval was given for twenty five new relay stations and seventeen self help stations for small communities, further extending the national coverage of BBC1, BBC2, ITV and Channel 4.

The map shows the latest predicted coverage for Channel 5. Following international clearance by the Agency of the original transmission plan, planned coverage of the UK has been extended to around 73% by the use of additional stations. All Channel 5 stations have now received international and national clearance. The network is planned to become operational in 1994.

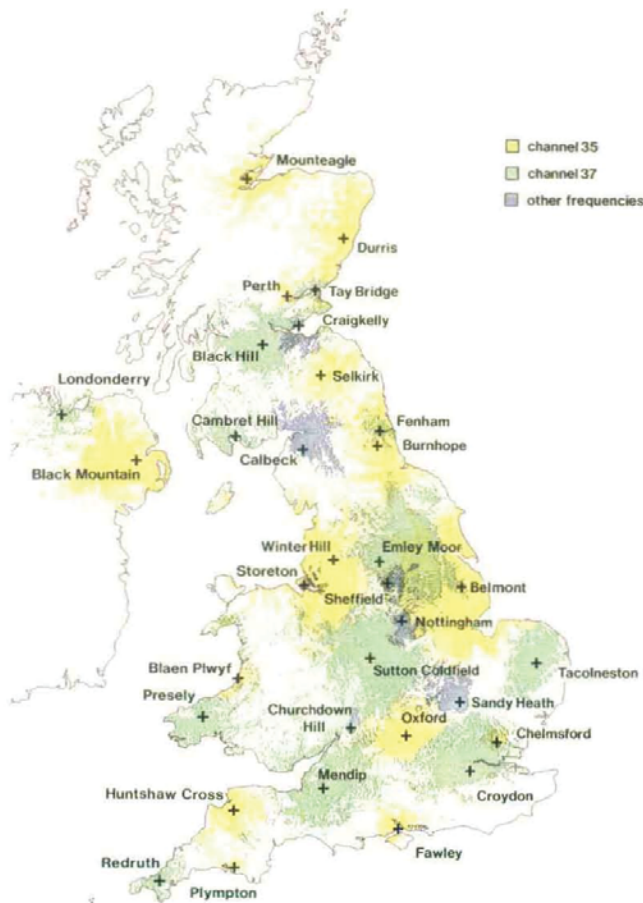
The Agency advised the Independent Television Commission (ITC) on the acceptability of the technical plans for the use of the spare capacity within television signals. The internationally agreed standard to be adopted aims to prevent harmful interference to other users of the spectrum.

A draft specification on Multipoint Video Distribution Systems (MVDS) at 40 GHz is currently under discussion in the UK. We hope thereafter to promulgate an agreed specification within Europe. Propagation experiments are being jointly funded by the Agency and the ITC.

TELEVISION BROADCASTING: SATELLITE

The Agency is working with the broadcasters to develop appropriate planning parameters for the new PALplus and digital transmission systems. PALplus enables enhanced quality pictures to be broadcast to suitably equipped 16:9 aspect ratio receivers, whilst maintaining compatibility with existing 4:3 PAL receivers. Digital television systems offer superior quality pictures within a standard terrestrial television channel, with improved spectral efficiency.

Fig. 5 - Predicted Coverage for Channel 5



The Agency has played a key role, through the appropriate CCIR and CEPT groups and the WARC 92 conference, in establishing a new 600 MHz wide allocation for satellite delivered High Definition Television (HDTV) at around 22 GHz.

BSkyB, the UK's only existing Direct Broadcast by Satellite (DBS) service, which currently operates from both the Marcopolo DBS satellite and the Astra satellite, has announced that after December 1992 its services will be available only from Astra. The Agency is however continuing to negotiate for additional UK DBS channels and for the protection of existing DBS channels, in the light of the planned re-advertising of the existing UK DBS franchise by the ITC later in 1992 and the increasing number of proposals for use of the 12 GHz DBS band for both national and large scale pan-European services.

Trials aimed at establishing whether both MVDS and DBS services can co-exist at 12 GHz are under discussion. The use of the 12 GHz band for MVDS in the medium to long term may be affected by the plans for developing new satellite broadcasting services using the same frequencies and by a WARC Resolution to review the 1977 12 GHz DBS plan.

SOUND BROADCASTING

Progress towards a Digital Audio Broadcasting (DAB) service in the UK and Europe has accelerated in the past year.

A consensus is forming within Europe that the present VHF/FM band should be replanned to accommodate DAB. Since there would need to be a reasonable phase-out period for existing FM services, the Agency is seeking to identify and allocate other temporary VHF spectrum to allow a DAB service to start up around 1995.

The Agency has led six years of negotiations which culminated in

February 1992 in the signing of a Memorandum of Understanding (MOU) between the UK, Ireland, Belgium and The Netherlands to set up and maintain a Unified Assessment Method which all the signatories will use to assess potential interference between the VHF/FM sound broadcasting band and the adjacent aeronautical band.

Two hundred short term restricted service licences were issued in the year for broadcasting at low power. Sound broadcasting has enhanced the success of local events, both in providing a commentary on the proceedings and in promoting the event in the surrounding area. Restricted services must not compete with local broadcasting stations. There are usually restrictions on time (four weeks) and coverage, but a special category of licence caters for hospitals and universities which can be licensed to broadcast without time restriction. The Agency is participating in trials to see whether free-radiating broadcasts at VHF/FM are a viable alternative to the current arrangements for hospitals and universities in the medium wave band.

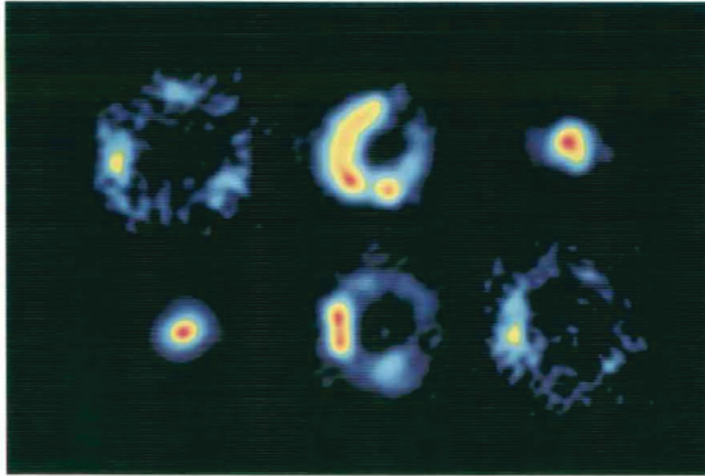
TRANSMITTERS

A technical sub-committee of the Broadcasting Spectrum Advisory Committee (BSAC) is preparing specifications for broadcasting transmitters, working closely with the Joint ETSI/EBU (European Broadcasting Union) Technical Committee.

FIXED SERVICES

Considerable potential exists to expand the use of fixed link radio-communication in the UK in the context of the Government's liberalisation of the telecommunications market. We are investing in additional modern spectrum management tools to help meet the expected extra demand.

We also intend over time to reduce the amount of spectrum historically



Merlin maps of OH maser shell at 1612 MHz



The Merlin 32m telescope at Cambridge

allocated for the exclusive management control of large single users.

A new licence fee structure for fixed services has been introduced.

Work continues within the Agency to make the 27.5 to 29.5 GHz band available during 1993.

The 37.0 to 39.5 GHz band has become available for use by Personal Communications Network (PCN) operators, private users and Public Telecommunications Operators (PTOs). Equipment and antennas have been type approved, and over twenty links are already in use.

The 54.25 - 57.2 GHz band is available for use, and applications for type approval are invited. A minimum hop length will be introduced in the 38 GHz band when the 55 GHz band becomes operational.

The experimental licensing arrangements for the 57.2 - 58.2 GHz band have been extended to 31 March 1993. Licensees select and notify the Agency of their frequency, to obtain immediate licence issue.

There was continued steady growth in demand for Scanning Telemetry services from the electricity, gas and water industries.

SPACE SERVICES

A new licensing regime for satellite services, which is open to any applicant, was established following the duopoly review. The new licences available are: Permanent Earth Station licence, Transportable Earth Station licence, Very Small Aperture Terminal (VSAT) licence and the Miscellaneous Earth Station licence.

The Agency was involved in the preparation and consultation leading to an EC Resolution designed to achieve harmonisation and liberalisation of the satellite communications market through frequency harmonisation and mutual recognition of procedures. We will continue to be involved in the implementation phase.

We also commissioned a study into the EMC threat posed to avionic and similar sensitive electronic systems from high powered radio transmitters, such as transportable earth stations. The report confirms the necessity of present UK site clearance procedures to ensure that safety of life systems are not compromised. The Agency is consulting colleagues in the UK and Europe, and we anticipate the commissioning of a phase II study within the next year.

Table 3: Number of Licences at 31 March 1992

Licence category	Number of Licences on issue at 31st March 1992	Equipment licensed (where appropriate)	Number of Licences on issue at 31st March 1991
AERONAUTICAL			
Aeronautical Ground Station (General)	155		148
Aeronautical Ground Station (Glider, Hang Glider and Balloon)	498		402
Aeronautical Ground Station (Special)	1,000		976
Aeronautical Ground Station (Special Mobile)	69		58
Aeronautical Navigational Aids and Radar	168		150
Aircraft	5,394		5,139
Aircraft (Glider, Hang Glider and Balloon)	1,164		978
Aeronautical Sub Total		8,448	
AMATEUR			
Amateur Radio A	33,280		32,954
Amateur Radio B	27,738		27,930
Amateur Radio Novice A	46		-
Amateur Radio Novice B	378		-
Amateur Radio Beacon and Repeater	1		1
Amateur Sub Total		61,443	
BROADCASTING AND PROGRAMME MAKING			
Transmission of Broadcasting Services	1		1
Transmission of Satellite Broadcasting Services	1		1
Transmission of Local Radio Broadcasting Services	26		25
Restricted Radio Services Transmission ¹	3		1
Services Ancillary to Programme Making Broadcasters and commissioned Programme Making Licences ²			
Television ³	124		42
Radio	70		54
Independent Programme Makers Licences ⁴			
Site Specific ⁵	30		9
Fixed Site - annual	93		86
Fixed Site - 4 monthly	5		-
RadioMicrophone	77		52
Broadcasting Sub Total		431	
CITIZENS' BAND			
Citizens' Band Radio	64,944		69,803
CB Sub Total		64,944	
FIXED SERVICES			
Fixed Microwave Radio-Relay Link	170	520 Class 1 Links 946 Class 2 Links 418 Class 3 Links 67 Class 4 Links 337 Class 5 Links	163
Fixed Millimetric Radio-Relay Link (58 GHz)	38	59 Links	21
Scanning Telemetry Link	56	6,743 Stations	54
Fixed Link Sub Total		264	

Notes

- 1** These licences are valid for up to 28 days – a total of 222 were issued during the year.
- 2** Licences distributed by Broadcasters JFMG Ltd.
- 3** The majority of these were for commissioned programme making licences, which may be valid for a short term. A total of 152 were issued during the year.
- 4** Licences distributed by ASP Frequency Management Ltd.
- 5** These licences are valid for up to seven days. A total of 4,654 were issued during the year.

Licence category	Number of Licences on issue at 31st March 1992	Equipment licensed (where appropriate)	Number of Licences on issue at 31st March 1991
FIXED SATELLITE SERVICES			
Tracking Telemetry and Command	2		2
Transmitting Earth Station Licence for specialised Satellite Services	4		4
Misc. Satellite Services	5		-
Satellite Sub Total		11	
MARITIME			
Port Operations Radio	395		395
Maritime Business Radio (inc Base Station only)	1,076		1,070
Maritime Navigational Aids and Radar	141		165
Ship Radio	4,147		4,073
Ship Radio (VHF)	45,688		43,029
Ship Radio (Transportable)	2,247		1,882
Maritime Sub Total		53,694	
MISCELLANEOUS			
Local Authority (Emergency Alarm) Radio	31		38
Police and Fire Service Comprehensive Radio	122		122
Telemetry, Telecommand and Teleapproach Radio	66		103
Testing and Development	795		600
Radio Microphone	64		66
Miscellaneous Sub Total		1,078	
PAGING			
Local Communications	824		727
Radio Paging (Standard)	9,243		9,214
Local Wide Area Paging	248		105
National Wide Area Paging	7		7
Paging Sub Total		10,322	
PRIVATE MOBILE RADIO			
Private Mobile Radio (Standard)	27,005		22,600
Private Mobile Radio Parking and Demonstration	198		86
Private Mobile Radio Short Term Hire	563		759
Private Mobile Radio Service Provider	1,023		749
Band III Private Mobile Radio - National Trunked Service	2	388 channels	2
Band III Private Mobile Radio - Trunked Service	11		13
Cellular Radio	2	1,160 channels	2
Private Mobile Radio Sub Total		28,804	
SPECIALS			
Special licences	7		40
Special Licences Sub Total		7	
GRAND TOTAL		229,446	

part six

Technical Issues

ELECTROMAGNETIC COMPATIBILITY (EMC) DIRECTIVE

The EMC Directive applies to virtually all electrical and electronic goods and requires them to meet EMC standards on both emissions and immunity.

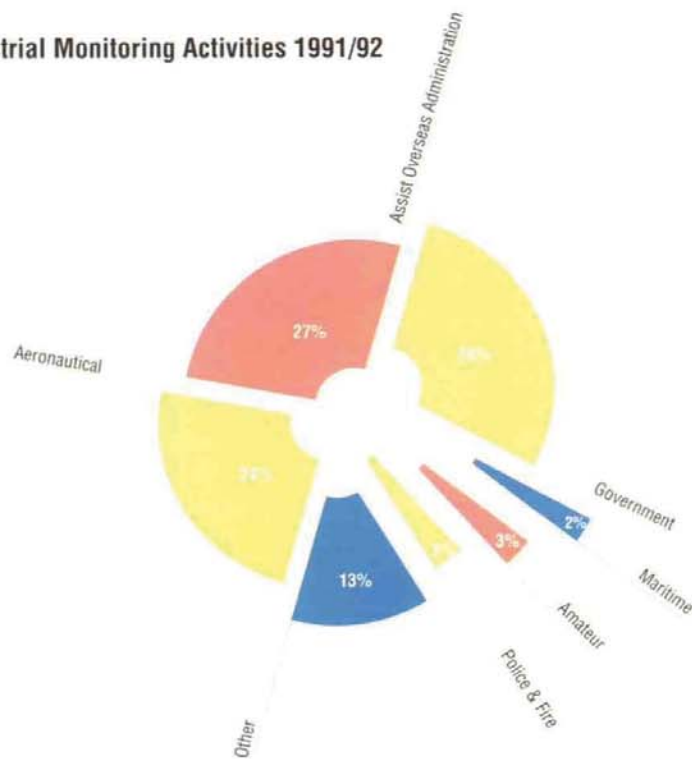
In December 1991, the Council of Ministers agreed a common position on the phasing in of the EC Directive, which provides for a transitional period to the end of 1995. During this period, manufacturers will have a choice

between compliance with the Directive, or conformity with existing national EMC requirements. At the end of the transitional period compliance with the Directive will become mandatory.

When the Directive is implemented in the UK the Agency expects to be appointed as the UK Notified Body for certifying EMC compliance on most types of radio transmitters.

An information sheet, RA200, is available from our Library; contact details are given in Part 10.

Fig. 6 - Baldock Terrestrial Monitoring Activities 1991/92



page 21

The EC Directive on telecommunications terminal equipment (91/263/EEC) also contains provisions on EMC. Implementation is due in November 1992 and will apply to radio equipment intended to be connected to the public telecommunications network. Further details are available from the Department of Trade and Industry's Telecommunications and Posts Division (DTI/TP); contact details are given in Part 10.

MONITORING

Our Radio Monitoring Station at Baldock in Hertfordshire provides a range of monitoring services.

The terrestrial monitoring station is continuously manned and its primary duty is to protect HF communications. During the year requests for assistance increased by 11.7%. The overall success rate has increased to 97% for clearance of

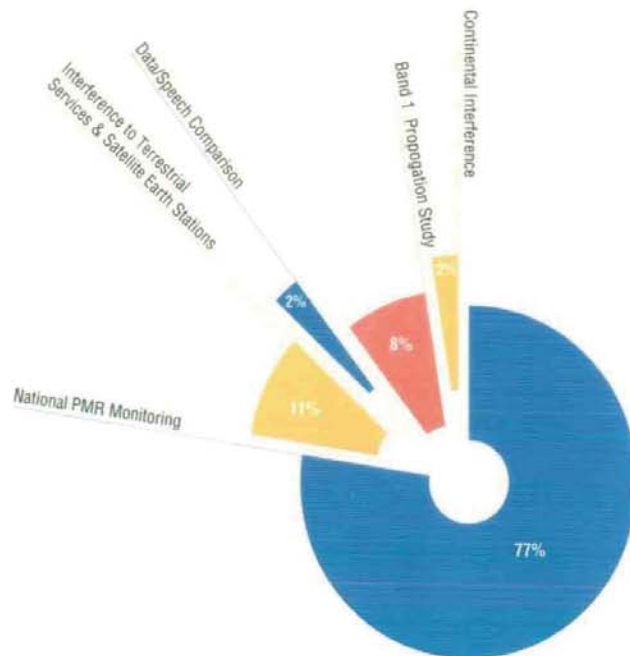
complaints of persistent interference. Further enhancements in automation will enable even faster response to requests to be made. Figure 6 gives more detail.

Following a review of the satellite monitoring station at Baldock, its main antenna systems have now been fully calibrated.

The mobile monitoring teams at Baldock have embarked on a comprehensive programme which will systematically monitor usage of PMR bands on a national basis. This ongoing programme will provide a basis for future decisions on frequency assignments. The mobile teams have also been engaged on the measurement of VHF and UHF continental interference and on Band 1 trials for PMR. See Figure 7.

The mobile EMC and Interference laboratory deals with complex measurement and interference work across virtually the whole radio spectrum. It also carries out survey work for customers on a repayment

Fig. 7 - Mobile Monitoring Activities 1991/92



basis. The Agency is seeking NAMAS accreditation for this facility. Prospective customers should contact the station manager; contact details are given in Part 10.

RESEARCH

The Agency committed some £3 million last year to research and extramural technical studies.

The research programme is overseen and co-ordinated by the Radio-communications Research Panel (RRP), chaired by the Chief Executive. Projects cover a wide area of activity and responsibility within the Agency, and in the last year have included antenna modelling, spread spectrum compatibility studies and studies on sharing between broadcasting and mobile radio services.

Radio propagation underpins the operation of all radiocommuni-

ications systems. Studies involving measurements and modelling, leading to the development of improved prediction procedures, took up about half of the research budget, reflecting the importance to the Agency of increasing knowledge of the nature and characteristics of radio propagation.

The National Radio Propagation Committee (NRPC), chaired by Michael Goddard, advises on the propagation programme, a major part of which is the comprehensive series of projects undertaken at the Rutherford Appleton Laboratory.

Four technical working parties cover the specific areas identified by the NRPC of millimetric, mobile, diffraction/scatter and HF propagation studies, offering the communications community, including industry and academic groups, the opportunity for collaborative work.



The Satellite Monitoring Station at Ballock

Biennial reviews have been held to assess the nature, emphasis and applicability of the propagation programme in relation to Agency requirements. A further review, due to report in August 1992, has recently commenced under an independent chairman.

During the year a sub-group of the CLMRC, chaired by Stephen Spivey, considered the scale, balance and direction of the Agency's research expenditure. It endorsed the scale, and made a number of recommendations, which have been generally accepted. These include the need for demonstrable benefits from research projects both to the Agency in performing its spectrum management role, and to the customer; the strengthening of links with other national and international organisations involved in research; more publicity for research activities and results; and more provision of advice by, and exchange of ideas and information with customers on research projects and propagation work.

STANDARDS

The Agency published eleven new or revised MPT standards during the year. These are listed in Part 10 and continue to be available free of charge from our Library; contact details are also given in Part 10.

ETSI European Telecommunications Standards (ETSS), which will increasingly replace national standards, published in the period up to end March 1992 are also listed in Part 10. They are sold through the British Standards Institute; contact details are given in Part 10.

TECHNICAL STUDIES AND TESTING

Our Radio Technology Laboratory (RTL) at Kenley in Surrey carries out technical studies and investigative testing on behalf of all parts of the Agency.

During the year, much of its work focused on potential compatibility

problems between new and existing radio systems. Projects included measurements relating to GSM, Digital Short Range Radio (DSRR), CT2, PCN, DECT, ERMES and DAB systems. RTL staff are leading a CEPT project team to consider the results.

The Agency has invested in new test equipment at RTL, including a Frequency Agile Signal Simulator and a GHz Transverse Electromagnetic Mode Cell, which together enable testing of systems in simulated free space conditions.

The recent completion of the 30 metre open area test site (OATS) with a full 45 metre CISPR ellipse enables RTL to carry out open field measurements on a wide range of devices. The OATS is available for hire; firms wishing to use it should contact the Laboratory Manager. Contact details are given in Part 10. RTL is responsible for the Agency's Mobile Measurement Laboratory, capable of calibrated field strength measurements from 9 kHz to 1 GHz and allowing remote off-site measurements.

UHF BAND INTERFERENCE FROM FOREIGN STATIONS

The Agency commissioned SD Scicon to report on the effect of foreign interference in the UHF band which affects mobile and fixed scanning telemetry services in the UK; and to identify and evaluate possible remedies. The Agency is now considering the report.

Meetings to discuss mutual interference problems have been held or are planned with neighbouring continental administrations and with the Republic of Ireland.

part seven

Enforcement

THE AGENCY'S DISTRICT OFFICES

The staff of the Radio Investigation Service (RIS) in our nationwide network of local District Offices are the Agency's main point of contact with the public. We aim to ensure that legitimate radio users can enjoy the highest possible standard of radiocommunication. This is done through a programme of installation inspections; by the delivery of many types of business radio licences to new licensees; and by resolving any interference problems that arise. Our District Offices are listed in Information Sheet RA 206, available from the RA library; contact details are given in Part 10.

RADIO SERVICES COVERED

The RIS deals with all types of radio services; the 1991/92 inspection programme included aeronautical and maritime radio, fixed services, broadcasting, paging and hobby radio. Private Mobile Radio is a major element of the work; last year we undertook 5,439 pre-licence inspections and 4,642 inspections of existing installations, covering 37% of PMR users. Discrepancies with the licence schedule were found in 25% of inspections, including the use of excess power, unauthorised move of a base station and incorrect frequency deviation. Such discrepancies are often the cause of another user's communication problems, and the RIS spend much of their time putting things right.

UNAUTHORISED BROADCASTERS

Unlicensed broadcasters (pirates) cause serious interference to other radio users, including safety of life services. In the past year the Agency has made use of the new enforcement powers contained in the Broadcasting Act 1990. 531 raids were carried out on pirate stations by the RIS during the year; and businesses which advertise on pirate radio and the organisations behind the larger pirate stations are being investigated under the new provisions of the Broadcasting Act.

There were 66 convictions for pirate radio offences. Apart from the increased penalties which may now be imposed by the Courts, anyone convicted of pirate broadcasting after 1 January 1989 is effectively banned by the Broadcasting Act from involvement in legitimate commercial radio for a five year period.

This strengthened campaign against pirate radio has resulted in a 41% decrease in complaints about pirate stations compared with the previous year. The Agency will continue vigorous pursuit of those who advertise on or manage pirate stations.



The Agency's stand at the Southampton Boat Show '91

Table 4: Prosecution Cases Concluded in the Courts and Warning Letters Issued for Financial Year April 1991 - March 1992

PROSECUTIONS

Categories	Number of Persons Prosecuted	Number of Persons Convicted	Total of Fines Imposed(£)	Amount of Costs Awarded(£)	Number of Forfeiture Orders	Number of Conditional Discharges	Number of Absolute Discharges	Number of Admonishments (Scotland)	Number of Warning Letters Sent
CB AM	69	69	7,350	7,468	51	11	2	2	67
CB FM	43	43	3,643	4,195	15	5	2	-	588
Unlicensed Broadcasters on Radio	67	66 ^A	19,715	18,046	45	8	-	1	6
Cordless Telephones	2	2	685	646	2	-	-	-	13
PMR	26	25	4,635	4,877	12	3	1	-	79
Amateur	4	4	1,000	1,637	-	1	-	-	3
Marine	4	4	500	325	-	-	-	-	20
6.6 MHz	4	4	475	200	1	-	-	-	-
Others	3	3 ^B	1,100	600	3	1	-	-	30
TOTAL	222	220	39,103	37,994	129	29	5	3	806

A 1 Sentenced to two months' imprisonment suspended for two years
1 Two years' Probation Order

B 1 Using frequencies belonging to another Government Department
1 Six months' imprisonment suspended for two years (Interference with Police-Section 13 offence)
1 Incitement to commit WT act offences by sale of illegal devices

PROSECUTIONS

The Agency aims first and foremost to help radio users, but where the rules are deliberately and persistently flouted we take prosecution action. A total of 222 prosecutions were brought during the year and 806 users were formally warned for breaches of the Wireless Telegraphy Acts. Details are at Table 4.

INTERFERENCE TO DOMESTIC RECEPTION

Domestic users of radio and television may also seek help from the Agency. We issue a booklet on how to improve television and radio reception, which has recently been revised and reissued in a shorter, more user-friendly format, including a self-help chart. Copies are available free of charge from our Library; contact details are given in Part 10.

Interference arising from poor immunity of domestic televisions

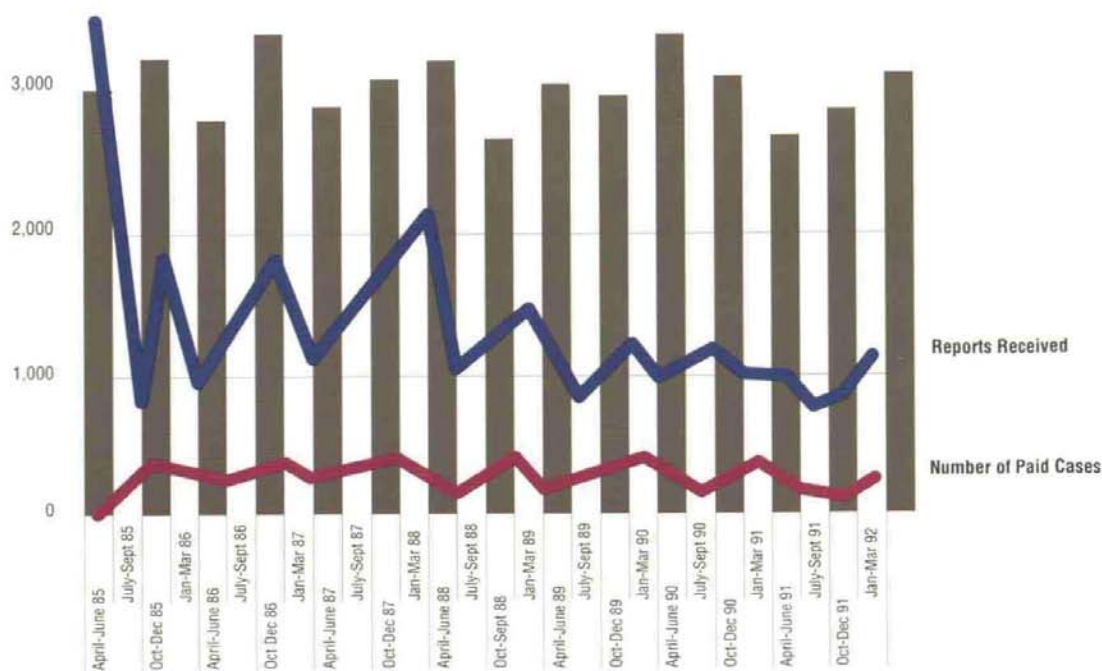
and radios, or poor aerial systems, is outside the Agency's statutory responsibility and should be dealt with by private contractors. However, if the private sector cannot solve the problem, the Agency offers an inspection service for viewers' and listeners' reception arrangements. The standard charge for this service is £31.

Table 5 gives statistics on domestic interference cases.

We also provide consultancy services to business users of radio. The standard consultancy charge to advise businesses on resolving problems in their radio systems is £45 per man-hour plus VAT. 89 users paid the standard charge during the financial year. The Agency also received 8,029 reports from businesses of interference for investigation.

There is no charge for investigating suspect sources of interference (such as pirate broadcasters) since this is part of the Agency's regulatory duties.

Fig. 8 - Television and Radio reception problems reported in financial years 1985-86 to 1991-92





Portable radio for safety work between the ground and a tower crane

Table 5: Domestic Television and Radio Interference problems reported in financial year 1991-1992

	April-June 1991	July-Sept 1991	Oct-Dec 1991	Jan-March 1992	Total for period
Number of reports received	999	741	893	1174	3807
Number of Paid Cases Received	137	81	70	128	416

part eight

Domestic Issues

PERSONNEL MANAGEMENT

During 1991/92 the Agency exercised full personnel management responsibility for the majority of our technical and engineering staff.

A review of the promotion arrangements for staff in the science and technology groups has been undertaken in co-operation with other DTI Agencies. The Agency expects as a result to assume responsibility for promotions in the Professional & Technology group from September 1992.

We have decided to take on personnel management responsibility for our junior administrative staff from September 1992, subject to the necessary arrangements being in place.

PROCEDURAL STUDIES

A study by Coopers & Lybrand Deloitte has made a number of recommendations aimed at improving the cost effectiveness and quality of our administrative licensing systems and procedures. The study takes account of the results of the Customer Survey (see Part 2).

A separate but linked computer networking study, also carried out by Coopers & Lybrand Deloitte, has made proposals for improving information flows within the Agency. These proposals will be evaluated in 1992/93. Any extensive installations within headquarters will await the forthcoming move

from Waterloo Bridge House, but a start will be made on connecting different Agency sites.

RELOCATION OF HEADQUARTERS

Ministers have agreed the relocation of the Agency's headquarters to London Docklands, provided that satisfactory terms and conditions can be negotiated. We expect to move from Waterloo Bridge House during 1993/94.

STAFF RELATIONS

The local Whitley Committee, chaired by the Chief Executive, met quarterly to discuss issues affecting Agency staff. Major issues during 1991/92 were relocation of the Agency's Headquarters and matters such as local arrangements for the training and career development of technical staff.

Meetings during the current year can be expected to continue to discuss those topics and to address training and development of staff and the anticipated assumption by the Agency of personnel responsibility for the administrative group.

A separate Health and Safety Committee, chaired by Roger Skiffins, also meeting quarterly, provided co-ordination of health and safety matters across the Agency.

TRAINING

The Agency has been developing its Training Strategy and the first phase has been successfully implemented. Training for new staff has been improved with an enhanced Induction Course.

Training facilities now available in Waterloo Bridge House, comprise a training room and a learning resource centre equipped with the latest computer-based and interactive video open learning training packages.

Staff consultation has been an important part of the Strategy. The results are being used to develop training courses and programmes for 1992/93 which will be part of the next phase of the Strategy.

Personal Training Plans have been introduced for staff and now form an integral part of the annual staff appraisal system. During the year work started on introducing a competence-based development scheme for Administrative Officers and Assistants.

We have a training target of at least three days off-the-job training per year for every member of staff.

In December, the Institution of Electrical Engineers (IEE) assessed the Agency's Graduate Trainee Engineer Scheme and awarded it accreditation for five years, thus enabling it to meet the training requirements for corporate membership of the IEE.

Table 6: Staff Numbers

	1.4.92	1.4.91
Agency complement	556	545
Staff in post	522½	506½
	Shortfall	33½
Total consultants, contract staff and casual staff (including part time) (see Note 1)	25	28
Overtime worked (man years) in year	7½	16½
Staff in post at 1 April		
Professional/technical/industrial	253	241
Managerial/executive/clerical/secretarial	269½	265½
	Total	522½
		506½
Located in:		
Waterloo Bridge House	324	311
Radio Technology Laboratory, Kenley	22	25
Radio Monitoring Station, Baldock	26½	21½
RIS District Offices	150	149
	Total	522½
		506½
Serving in:		
Top management (including secretarial support)	2	2
Branch 1 - International work, spectrum management	46	39
Branch 2 - Mobile radio, licensing, technical appraisal	114	112½
Branch 3 - Broadcasting, fixed and space services	57	55
Branch 4 - Finance, corporate planning	46½	39
Branch 5 - Monitoring/Radio Investigation Service	206½	205½
Branch 6 - Information, Personnel	50½	53½
	Total	522½
		506½

Notes

- 1** Part time workers are counted as half full time equivalents

part nine

Finance

Table 7: Agency Income and Expenditure (£'000)

	1991/92	1990/91
Receipts:		
Wireless telegraphy licence fees	28,312	26,654
Government Departments	5,503	5,370
Other income	312	408
Total Receipts	34,127	32,432
Costs:		
Staff	13,619	11,676
Accommodation	3,626	3,267
Sub-contracted work	4,199	3,158
Other current costs	5,558	4,456
Capital costs - depreciation etc	3,922	3,978
Total Costs	30,924	26,535
Work capitalised	(1,530)	
Total Operating Costs	29,394	

Table 8: Analysis of Income from Wireless Telegraphy Licences

Income - £'000		Category of licence	Number of licences at 31 March 1992
1991/92	1990/91		
854	781	Aeronautical	8,448
1,119	911	Fixed and Satellite Services	275
891	732	Amateur	61,443
985	875	Citizens' Band	64,944
1,468	1,263	Maritime	53,694
520	577	Paging	10,322
766	750	Programme Making	404
193	49	Local Radio Broadcasting	26
300	225	Satellite Broadcasting Services	1
14,407	14,660	Private Mobile Radio	28,804
583	248	Other	1,085
22,086	21,071	Sub Total	Sub Total 229,446
		Omnibus licences:	
2,289	2,433	Omnibus Licensees - Broadcasting	3
3,937	3,150	Omnibus Licensees - Others	3
28,312	26,654	Total	Total 229,452

Commentary on Financial Information

Table 7 provides details of the Agency's income and expenditure for 1991/92 (and 1990/91 for comparison). Receipts and expenditure are analysed more fully in Table 8 and 9.

Revised fees came into force on 1 April 1991 following the issue of new Regulations*, available from HMSO; contact details are in Part 10. Fees are generally reviewed annually.

As from 1 April 1990 government departments have been charged for services provided.

* The Wireless Telegraphy, (Licence Charges) Regulations 1991 (SI 1991 No. 542).

Notes		1991/92	1990/91		
1 The figures represent the Agency's memorandum trading account. They do not, therefore, follow the customary format of company accounts and balance sheets.	Staff costs				
	Salaries, wages, overtime	10,260		8,879	
	Employers' National Insurance	760		648	
	Superannuation and Insurance	1,644		1,435	
	Travel, subsistence, hospitality and incidentals	667		479	
	Training	288	13,619	235	11,676
2 The tables are prepared on a non-accruals basis except for the inclusion of certain notional amounts. Solicitors' costs, Pay Unit.	Accommodation				
	Rental charges	2,382		2,513	
	Maintenance, new works, utilities and security	1,244	3,626	754	3,267
3 The basis for amortisation is that expenditure on vehicles is written off over seven years (or expected life for RIS vehicles) and on other capital items over ten years.	Sub-contracted work				
	Licensing	839		809	
	Maritime radio management	-		-	
	Radio examinations	182		217	
	Non-ADP consultancies	49		38	
	Collaborative research (net)	2,800		1,962	
	Prosecutions	60		70	
	RIS agency services	21		44	
	Other	248	4,199	18	3,158
	Other current costs				
Equipment and stores	441		365		
Vehicles	291		239		
Computers	853		576		
Research and Development	-		-		
Departmental overheads, office supplies and services	2,966		2,244		
ITU radio subscription	1,007		972		
ITU radio conferences	-	5,558	60	4,456	
Depreciation etc					
Equipment	1,684		2,260		
Vehicles	577		212		
Computers	1,387		1,223		
Research and Development	204		228		
Furniture	70	3,922	55	3,978	
	Total Costs		30,924	26,535	
	Work capitalised		(1,530)		
	Total Operating Costs		29,394		

10 *part ten*

Information and Publicity

PUBLICITY AND EXHIBITIONS

During the year the Agency promoted its services at seven major exhibitions, including the International Boat Show at Southampton, Comex 91 at Wembley, the Telecommunications Industries Association exhibition at the National Exhibition Centre Birmingham and Fishing Industry '91 at the Scottish Exhibition Centre Glasgow.

Our staff also attended many smaller events such as trade association shows, and promoted a series of roadshows around the country to which radio equipment suppliers, local dealers and customers were invited. Staff from the Agency's licensing sections and local District Offices were on hand to answer questions and to demonstrate technical equipment.

INFORMATION SERVICE

The Agency has continued to produce information sheets on a wide range of topics in order to keep customers and industry aware of the Agency's policies and licensing requirements. During the year our Library staff distributed almost 250,000 publications to the public (a 40% increase over the previous financial year) and answered some 6000 enquiries.

PUBLICATIONS

The following publications are currently available free of charge from:

RA Information and Library Service
Radiocommunications Agency
Room 605
Waterloo Bridge House
Waterloo Road
London
SE1 8UA

Tel : 071-215 2352/2140 (enquiries and information)
: 071 215 2072 (24-hour answerphone service)

RA INFORMATION SHEETS AND LICENCE APPLICATION FORMS

(Items marked "*" have been introduced or revised between 1 April 1991 - 31 March 1992).

Aeronautical

- RA 21 Operations - Conditions
- RA 22 Operations (Ground Station) Radio Licence Application Form
- RA 23 Aircraft Wireless Transmitting Receiving Station in a Glider/Hang Glider or Balloon Licence Application Form
- RA 134* Aircraft Radio Licence Application Form March 1992

Alarms

- RA 56 Local Authority (Emergency Alarm) Application Form and Guidance Notes
- RA 62 Local Authority (Emergency Alarms) Radio Systems
- RA 72 Local Authority (Emergency Alarms) Licence Conditions
- RA 152 Long Range Alarms - Information Sheet
- RA 153 Long Range Alarms - Guidance Notes
- RA 154 Long Range Alarms - Service Provider - Application Form
- RA 155 Long Range Alarms - On-Site Systems - Application Form
- RA 156 Long Range Alarms - Additional Alarm Stations for Service Provider Systems - Application Form

Amateur Radio

- RA 65 Amateur Radio Beacon/Repeater Station Clearance Form
- RA 165* Amateur Radio (Novice) Licence Application Form April 1991
- RA 166* Amateur Novice Licence March 1992
- RA 178* Transverters & Transverter Drivers October 1991
- RA 180* Licensing March 1992
- RA 181* Morse October 1991
- RA 182* Amateur Radio Call Sign March 1992
- RA 183* Clubs and Societies March 1992
- RA 184* Examinations October 1991
- RA 185* RIS District Offices February 1992
- RA 186* CEPT - UK Licenses March 1992
- RA 187* CEPT visitors to UK March 1992
- RA 188* Amateur Radio Licensing Application Form October 1991
- RA 189* Temporary Licence for non-UK Residents October 1991
- RA 190* How to become a Radio Amateur March 1992
- RA 198* Abuse of Amateur Radio March 1992

Citizens' Band

- RA 174* Licensing September 1991
- RA 175* Equipment March 1992
- RA 176* Interference and Abuse September 1991
- RA 177* Emergency Monitoring and Channel 9 March 1992

Fixed Services

- RA 8 Fixed Microwave Radio-Relay On Shore Licence Application Form
- RA 25 Fixed Microwave Radio-Relay Links Off-shore Licence Application Form
- RA 106 Fixed Services 1400 Series Specifications
- RA 143* Fixed Links-Frequency Allocation Chart January 1992
- RA 151 Fixed Radio Relay Link Licence 58 GHz: Application Form
- RA 158* Fixed Services: Radio & Antennas Information Sheet July 1991
- RA 164* Fixed Links Information Sheet August 1991
- RA 171* Fixed Satellite Services October 1991
- RA 173 Fixed Satellite Services Licence Application Form
- RA 199* Fixed Services Licence Fees March 1992

Low Power

- RA 60 Radio Controlled Models Information Sheet
- RA 61 Telemetry etc for Data Buoys Application Form
- RA 77 Telemetry, Telecommand and Teleapproach Radio Licence Application Form
- RA 114* Low Power Devices Information Sheet July 1991
- RA 197* Radio Level Gauge Licence Application Form March 1992

Marine

- RA 109 Specifications List for 1200 Series Marine Equipment
- RA 129 Navigational Aid & Radar Licence Application Form
- RA 140* Maritime Business Radio Licence Application Form October 1991
- RA 141 Port Operations Radio Licence Application Form
- RA 145 Ship Radio Licence Application Form
- RA 148 Certificates of Competency
- RA 149 Changes between 4000 kHz - 27,500 kHz
- RA 167* Specific details of changes between 4000 kHz - 27,500 kHz: April 1991
- RA 194* Changes between 500 kHz - 2 MHz: December 1991

Paging

- RA 5 Local Radio Paging Licence (On-Site, Local Communications or Induction) Application Form
- RA 30 Wide Area Paging (VHF) Licence Application Form
- RA 46 Wide Area Paging Information Sheet
- RA 55 On-site Radio Paging Information Sheet
- RA 115 Wide Area paging (VHF Private) System Licence Application Form
- RA 196* Radio Local Area Network Trial Licence Application Form March 1992
- RA 203* On-Site Paging Short Term Hire Information Sheet March 1992
- RA 204* On-Site Paging Short Term Hire Licence Application Form March 1992

Private Mobile Radio

- RA 1* PMR Licence Application Form November 1991
- RA 45 Communications Service Providers
- RA 53 PMR Sharing of Channels

RA 66	PMR Band III
RA 71	Radio Security Alarms for Vehicles
RA 108*	Specifications List for 1300 Series Land Mobile Radio August 1991
RA 122*	PMR licence Fees Information Sheet March 1992
RA 123	PMR Licence Fee Information
RA 126	PMR Licence Application Guidance Notes
RA 132	Fixed Mobile Station for the Control of a Common Base Station Application form
RA 147	PMR - Short Term Hire Application Form & Guidance Notes
RA 150	PMR Direct Debit Payment Forms
RA 170*	PMR - Parking & Demonstration Licence Application Form August 1991
RA 191*	Local Authority PMR - Use by Independent Contractors November 1991
RA 193*	Cordless Telephones December 1991
RA 195*	Radiocommunications for Tower Cranes Information Sheet February 1992

Scanning Telemetry

RA 37	Scanning Telemetry Application Form
RA 93	Scanning Telemetry Information Sheet

Services Ancillary to Broadcasting

RA 157	Services Ancillary to Broadcasting: Code of Practice for Programme Makers
RA 159*	Ancillary Services for Independent Programme Makers Information Sheet April 1991
RA 160*	Services Ancillary to Broadcasting: Licence fees April 1991
RA 161*	Radio Microphones-Theatres - Application Form April 1991
RA 162*	Independent Programme Makers Licence Application Form April 1991
RA 202*	Radio Microphones and Services Ancillary to Broadcasting: Licence Fees March 1992

Testing and Development

RA 17	Test & Development Application Form
RA 127	Testing & Development of Radio Apparatus

Misc Licence Types Application Forms

RA 36	Earth Station (non-amateur)
RA 133	Radiating Cable

Misc Information Sheets

RA 2*	Information on Licence Details, Enquiry Points and Organisational Structure March 1992
RA 67*	The Radio Users Guide to the Law May 1991
RA 78	General Role of the RIS
RA 81*	Current List of Agency Publications February 1992
RA 97	Guide to Class Emissions
RA 98	Type Approval Land Mobile
RA 101*	UK Legislation & British Standards relevant to Radiocommunications April 1991

RA 119	Safety Precautions Relating to Intense Radio Frequency Radiation
RA 124	Mobile Radio Training Committee
RA 128	Spectrum Reviews
RA 139	Radiocommunications Agency - its Role
RA 144	Exhibitions - Guidance Notes for exhibitors of Wireless equipment
RA 146	Land Mobile Radio Quality Assurance Scheme* February 1992
RA 168*	ETSI Information May 1991
RA 169*	Receive Only - Scanners etc December 1991
RA 172*	Site Clearance Manual No.1 August 1991
RA 179*	Advice on TV and Radio Reception January 1992
RA 200*	Electromagnetic Compatibility March 1992

Master Lists of MPT Specifications

RA 109	1200 Series for Maritime Radio.
RA 108	1300 Series for Land Mobile Radio.
RA 106	1400 Series for Fixed Services.
RA 107	1500 Series for Radiation Limits & Measurement Standards.

MPT SPECIFICATIONS PUBLISHED BETWEEN 1 APRIL 1991 - 31 MARCH 1992

MPT 1326 (November 1985):Amendment no.3. Published and effective from 23 July 1991. Performance specification: Angle modulated VHF and UHF radio equipment for use at fixed and mobile stations in the Private Mobile Radio Service.

MPT 1327 (January 1988; revised and reprinted November 1991). A signalling standard for trunked Private Land Mobile Radio Systems.

MPT 1343 (January 1988; revised and reprinted September 1991). Performance specification: system interface specification for radio units to be used with commercial trunked networks operating in Band III sub-bands 1 and 2.

MPT 1347 (August 1988; revised and reprinted September 1991). Radio interface specification for commercial trunked networks operating in Band III, sub-bands 1 and 2.

MPT 1350 (October 1991). Performance specification: Radio microphone equipment requiring the issue of a licence for use in the VHF and UHF bands.

MPT 1350: Erratum sheet issued Feb 1992.

MPT 1352 (September 1991). Test schedule for the approval of radio units to be used with commercial-trunked networks operating in Band III sub-bands 1 and 2.

MPT 1404 Issue 3 (January 1992). Performance specification: Antennas for use by private fixed and mobile radio services operating in specified sub-bands in the band 1450 to 1690 MHz.

MPT 1414 Issue 8 (October 1991). Performance specifications and frequency assignment criteria for analogue and digital microwave fixed link radio equipment operating in the frequency band 37-39.5 GHz.

MPT 1415 Issue 13 (December 1991). Performance specification for fixed link radio equipment and antennas operating in the frequency band 57.2 GHz to 58.2 GHz.

MPT 1416 Issue 4 (March 1992). Performance specification for Analogue and Digital Microwave Fixed Link Radio Equipment operating in the frequency Band 54.25 to 57.2 GHz.

MPT 1418 (July 1991). Performance specification for private fixed link equipment for the transmission of television or radar remoting signals or equivalent for use in the 7.5, 13, 14, 22, 38 and 55 GHz private user bands.

**PAPERS PRESENTED BY AGENCY STAFF BETWEEN
1 APRIL 1991 - 31 MARCH 1992**

1. The Work of the Radio Investigation Service.
Michael Lipscomb, 1991.
2. The Harmonization of Broadcasting and non-Broadcasting HDTV Standards.
Ronald Bedford, 1991.
3. Broadband: Opportunities with Radio.
Graham Stemp, 1991.
4. Microwave Fixed Links - Regulatory developments.
Graham Stemp, 1991.
5. The World Administrative Radio Conference, 1992.
Graham Stemp, 1991.
6. The Role of the Radiocommunications Agency in EMC.
Oliver Wheaton, 1991.
7. WARC 92 "How we got to Malaga".
Michael Goddard, 1992.
8. WARC 92 "The Outcome".
Michael Goddard, 1992.
9. WARC 92 and its effects on the Region 800 MHz to 3 GHz.
Oliver Wheaton and Don Jayasuriya, 1992.
10. The Future of the Radio Spectrum: Electromagnetic Compatibility.
Laurence Green, March 1992.

**PRESS ARTICLES BY AGENCY STAFF PUBLISHED
BETWEEN 1 APRIL 1991 AND 31 MARCH 1992**

1. "WARC 92 A Golden Opportunity for Mobile Radio" in Pan-European Mobile Communications Autumn 1991.
Michael Goddard
2. "EMC - Navigating the Compatibility Maze" in Mobile Europe February 1992.
Laurence Green

VIDEOS

The following videos are available for short term loan periods on written request to the RA Librarian:

"Work of the Radio Investigation Service. - In Touch"
"Facilities at the Radio Monitoring Station at Baldock. -
The Listening Ear"

OTHER PUBLICATIONS

Radiocommunications Agency Annual Report 1990-91

RA Technical Note No.5 March 1992. Some aspects of site shielding and coordination.

J.A Lane.

Report of the Radio Spectrum Review Committee. Stage 2: 3400 MHz to 30 GHz. May 1991.

Report on Linear Modulation Trials by Bradford University

**PUBLICATIONS AVAILABLE ONLY FROM HER MAJESTY'S
STATIONERY OFFICE BOOKSHOPS OR HMSO AGENTS**

The Wireless Telegraphy Apparatus (Approval) (Test Fees) Order 1991 (S.I. 1991 No. 874) ISBN 0 11 013874 0 £1.00.

The Wireless Telegraphy Apparatus (Low Power Devices) (Exemption) Regulations 1991.
(S.I. 1991 No. 1523) ISBN 0 11 0145232 £1.00.

The Merchant Shipping (Radio Installations) Regulations 1992.
(S.I. 1992 No. 3) ISBN 0 11 0233003 5 £5.90.

The Wireless Telegraphy (Licence Charges) (Amendment) Regulations 1992.
(S.I. 1992 No.362) ISBN 0 11 023362 X £2.30.

The Wireless Telegraphy Apparatus (Low Power Devices) (Exemption) (Amendment) Regulations 1992.
(S.I. 1992 No. 484) ISBN 0 11 0234847 £1.05.

**EUROPEAN TELECOMMUNICATIONS STANDARDS
PUBLISHED UP TO 31 MARCH 1992**

ETS 300 067

Radiotelex equipment operating in the maritime MF/HF service.
Technical Characteristics and methods of measurement Published
April 1991

prETS 300 086

Draft ETS[B]

Radio Equipment and Systems Land mobile group
Technical characteristics and test conditions for radio equipment
with an internal or external RF connector intended primarily for
analogue Published Jan 1991

pr1-ETS 300 113

Draft 1-ETS [A]

Radio equipment and systems Land mobile service
Technical characteristics and test conditions for non-speech and
combined analogue speech/non-speech equipment with an internal
or external antenna connector, intended for the transmission of
data (draft 1-ETS A) Published Jan 1992

ETS 300 135

Draft ETS[B/A]

Radio Equipment and Systems
Angle-modulated Citizens' Band radio equipment (CEPT PR 27
Radio Equipment). Technical characteristics and methods of
measurement Published June 1991

ETS 300 151
Radio Equipment and Systems
9 GHz radar transponders for use in search and rescue operations.
Technical characteristics and methods of measurement Published
Jan 1992

ETS 300 152
DE/RES-1004[BC]
Radio Equipment and Systems
Maritime Emergency Position Indicating Radio Beacons (EPIRBs)
intended for use on the frequency 121.5 MHz or the frequencies
121.5 MHz and 243 MHz for homing purposes only Technical
characteristics and methods of measurement Published Jan 1992

ETSS may be purchased from

BSI Sales
Linford Wood
Milton Keynes
MK14 6LE
Tel: 0908 221166
Fax: 0908 320856

AGENCY CONSULTATIVE COMMITTEES AND GROUPS

Broadcast Spectrum Advisory Committee (BSAC) Secretary: A Cox
Tel: 071 215 2226

Civil Land Mobile Radio Committee (CLMRC) Secretary: S Webster
Tel: 071 215 2380

Microwave Fixed Links Committee (MFLC) Secretary: T Cawthorne
Tel: 071 215 2106

Radiocommunications Quality Council (RQC) Secretary: J Stread
Tel: 071 215 2068

CCIR AND ETSI - MAIN UK CONSULTATIVE GROUPS

CCIR UK General Purposes Committee (GPC) Chairman: L Barclay
Tel: 071 215 2279

Fixed Satellite Service: Study Group 4 B Last
Tel: 071 215 2138

Mobile Services: Study Group 8 Chairman: OJ Wheaton
Tel: 071 215 2100

Land Mobile: Working Group 8X Chairman: P Cockram
Tel: 071 215 2227

Maritime Mobile: Working Group 8Y Chairman: Dr D Jayasuriya
Tel: 071 215 2168

Mobile Satellite Services: Working Group 8D Chairman: Dr D
Jayasuriya
Tel: 071 215 2168

Fixed Services: Study Group 9 and UK TM4 GC Stemp
Tel: 071 215 2174

Broadcasting (Sound): Study Group 10 BTA Humphries
Tel: 071 215 2198

Broadcasting (Television): Study Group 11 KC Whittingham
Tel: 071 215 2111

Frequency Sharing - urgent questions: Study Group 12
Chairman: L Barclay
Tel: 071 215 2279

OTHER USEFUL ADDRESSES

ETSI Secretariat
B.P. 162 -F- 06561
Valbonne Cedex
France
Tel: 010-33 92 94 42 00
Fax: 010-33 93 65 47 16

TELECOMMUNICATIONS TERMINAL EQUIPMENT

G Worsley
DTI
Telecommunications & Posts Division
2nd Floor
151 Buckingham Palace Road
London
SW1W 9SS
Tel: 071 215 1820

IMPLEMENTATION OF EMC DIRECTIVE

AEJ Bond
DTI
Manufacturing Technology Division
1st Floor
151 Buckingham Palace Road
London
SW1W 9SS
Tel: 071 215 1408

LOW POWER RADIO ASSOCIATION

c/o ISM Limited
The Old Vicarage
Haley Hill
Halifax
HX3 6BR
Tel: 0422 359161

RADIO TECHNOLOGY LABORATORY

Whyteleafe Hill
Whyteleafe
Surrey
CR3 0YY
Tel: 081 660 8456
Fax: 081 668 9856 Laboratory Manager: M Hailstone

RADIO MONITORING STATION

Royston Road
Baldock
Herts
SG7 6SH
Tel: 0462 454547
Fax: 0462 435047
Station Manager: GL Cheaney

Mobile EMC and Interference Laboratory Manager: P Jarvis
 Tel: 0462 420428
 Fax: 0462 435047

RA LOCAL DISTRICT OFFICES

A list of Local District Offices is contained in RA 206, available from the RA Library.

ASP FREQUENCY MANAGEMENT LIMITED

Edgcott House
 Lawn Hill
 Edgcott
 Aylesbury
 Bucks HP18 0QW
 Tel: 0296 770458
 Fax: 0296 770423

SUBSCRIPTION SERVICES LIMITED

Radio Licensing Centre
 PO Box 885
 Bristol
 BS99 5LG
 Tel: 0272 258 333

LIST OF ABBREVIATIONS USED IN THIS REPORT

APP 92 ADDITIONAL PLENIPOTENTIARY
 CONFERENCE 1992

BS BRITISH STANDARD

BSAC BROADCAST SPECTRUM ADVISORY
 COMMITTEE

CCIR INTERNATIONAL RADIO CONSULTATIVE
 COMMITTEE

CCITT INTERNATIONAL TELEGRAPH AND
 TELEPHONE CONSULTATIVE COMMITTEE

GENELEC EUROPEAN ELECTROTECHNICAL
 STANDARDS COMMITTEE

CEPT EUROPEAN POSTAL AND
 TELECOMMUNICATIONS CONFERENCE

CERP EUROPEAN COMMITTEE FOR REGULATION
 OF POSTS

CISPR INTERNATIONAL SPECIAL COMMITTEE ON
 RADIO INTERFERENCE

CLMRC CIVIL LAND MOBILE RADIO COMMITTEE

CT2 CELLULAR TELEPHONE

DAB DIGITAL AUDIO BROADCASTING

DBS DIRECT BROADCAST BY SATELLITE

DECT DIGITAL EUROPEAN CORDLESS TELEPHONE

DSI DETAILED SPECTRUM INVESTIGATIONS

DSRR DIGITAL SHORT RANGE RADIO

DTI DEPARTMENT OF TRADE AND INDUSTRY

EBU EUROPEAN BROADCASTING UNION

EC EUROPEAN COMMUNITY

ECTRA EUROPEAN COMMITTEE FOR
 TELECOMMUNICATIONS REGULATORY
 AFFAIRS

EEA ELECTRONIC AND BUSINESS EQUIPMENT
 ASSOCIATION

EMC ELECTROMAGNETIC COMPATIBILITY

EPIRB EMERGENCY POSITION INDICATING RADIO
 BEACON

ERC EUROPEAN RADIOCOMMUNICATIONS
 COMMITTEE

ERMES PAN-EUROPEAN PAGING SYSTEM

ETS EUROPEAN TELECOMMUNICATIONS
 STANDARD

ETSI EUROPEAN TELECOMMUNICATIONS
 STANDARDS INSTITUTE

FCS FEDERATION OF COMMUNICATION
 SERVICES

FPLMTS FUTURE PUBLIC LAND MOBILE TELEPHONE
 SYSTEMS

GHz GIGAHERTZ

GPC GENERAL PURPOSES COMMITTEE

GSM SPECIAL MOBILE GROUP

HDTV HIGH DEFINITION TELEVISION

HF HIGH FREQUENCY

HMSO HER MAJESTY'S STATIONERY OFFICE

IEE INSTITUTION OF ELECTRICAL ENGINEERS

IFRB INTERNATIONAL FREQUENCY
 REGISTRATION BOARD

INMARSAT INTERNATIONAL MARITIME SATELLITE
 ORGANISATION

IPR INTELLECTUAL PROPERTY RIGHTS

ITC INDEPENDENT TELEVISION COMMISSION

ITU INTERNATIONAL TELECOMMUNICATION
 UNION

kHz KILOHERTZ

LEO LOW EARTH ORBIT

LMRQAS LAND MOBILE RADIO QUALITY ASSURANCE
 SCHEME

LPRA LOW POWER RADIO ASSOCIATION

MFLC MICROWAVE FIXED LINKS COMMITTEE

MHz MEGAHERTZ

MORI MARKET & OPINION RESEARCH
 INTERNATIONAL

MOU MEMORANDUM OF UNDERSTANDING

MRUA MOBILE RADIO USERS ASSOCIATION

MVDS MULTIPOINT VIDEO DISTRIBUTION SYSTEMS

NAMAS NATIONAL MEASUREMENT ACCREDITATION
 SERVICE

NRPC NATIONAL RADIO PROPAGATION
 COMMITTEE

OATS OPEN AREA TEST SITE

PCN PERSONAL COMMUNICATIONS NETWORK

PMR PRIVATE MOBILE RADIO

PTO PUBLIC TELECOMMUNICATIONS OPERATOR

RA RADIOCOMMUNICATIONS AGENCY

RIS RADIO INVESTIGATION SERVICE

RLAN RADIO LOCAL AREA NETWORK

RQC	RADIOCOMMUNICATIONS QUALITY COMMITTEE
RRP	RADIOCOMMUNICATIONS RESEARCH PANEL
RSGB	RADIO SOCIETY OF GREAT BRITAIN
RTL	RADIO TECHNOLOGY LABORATORY
SSL	SUBSCRIPTION SERVICES LIMITED
TFTS	TERRESTRIAL FLIGHT TELEPHONE SYSTEM
TP	TELECOMMUNICATIONS AND POSTS DIVISION (OF THE DTI)
UHF	ULTRA HIGH FREQUENCY
VHF	VERY HIGH FREQUENCY
VSAT	VERY SMALL APERTURE TERMINAL
WARC 92	WORLD ADMINISTRATIVE RADIO CONFERENCE 1992

ACKNOWLEDGEMENTS

Bayes Moores Partnership
 Courtesy Publishing Ltd
 Independent Television Commission
 Mobile Cellular Magazine
 University of Manchester

Designed and Produced
 by Daniel West & Associates Ltd
 London

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