

Proceedings of the Institute of Acoustics

RADIO MICROPHONES AND AUDIO LINKS

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TYPE APPROVAL:

Current Position

Radio microphones within the UK are presently covered by two Type Approval Standards, these are MPT 1345, for deregulated equipment, operating on five spot frequencies within the VHF band, and with a power limit of 2 Mw.

MPT 1350 covers devices in the VHF and UHF bands, with powers of 10 MW handheld and 50 Mw bodyworn. Equipment is also available on the earlier standard MPT 1311. Audio Links, at present, do not have a type approval standard.

Within Europe there are at least 16 different standards, with variations in power, frequency and bandwidth. Audio Link type approval standards are not in place for general use in the majority of countries. As with the UK, these have mainly been reserved for Official Broadcasters.

Future Position

The European Telecommunications Standards Institute (ETSI) has three standards out for Public Enquiry, which we hope will rationalise and harmonise the type approval of these devices. These are:

- pr I-ETS 300 422 Draft Radio Equipment and Systems (RES), Technical characteristics and test methods for wireless microphones in the 25 MHz to 3 GHz frequency range.
- pr ETS 300 454 Radio equipment and systems (RES);
Technical characteristics and test methods in the 25 – 3 GHz frequency range for wide band audio links with RF power up to 5 watts.
- pr ETS 300 445 Radio equipment and systems (RES);
Electro-Magnetic Compatibility (EMC) standard for wireless microphones and similar Radio Frequency (RF) audio link equipment

These standards take a radically new approach to these devices. Providing a "spectrum mask" and a choice of band widths, which it is hoped will encourage manufacturers to "break out" of the 200 kHz, FM, strait jacket which existing standards have placed them.

It is hoped that when the standards are adopted within the UK, it will provide a legal infra-

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structure for use of equipment within the audio reproduction field. Coupled with the ASP FM Ltd licensing regime, it provides the most flexible approach for these devices within Europe.

SPECTRUM MANAGEMENT

In recent years there has been a realisation that the use of radio frequencies requires harmonisation, as unfortunately radio waves do not conform to national boundaries. The European Conference of Postal and Telecommunications Administrations (CEPT) has overall charge of this work. It set up the European Radiocommunications Committee and in conjunction with the European Commission and European Free Trade Association, operates a number of committees covering Frequency Management (FM), Radio Regulatory (RR), Spectrum Engineering (SE) and two ad hoc groups. In addition the European Radiocommunication office (ERO) supports the work of the ERC, provides a focal point for consultation and undertakes longer term studies.

In order to have a basis of information to work from, the ERO undertook the first Detailed Spectrum Investigation (DSI) which covered frequencies above 1000 MHz. The report was presented to CEPT in 1993, and after adoption by CEPT, the Spectrum Engineering Committee (SE) was requested to carry out where ever possible, a harmonisation plan, based on the information contained within the DSI. A project team SE 19, was formed in February 1994, and is at present considering a plan of action, which it is hoped, will be implemented by member countries by the year 2008.

This work mainly concerns Fixed Links for Telecommunications uses Outside Broadcast television links, up links to Satellite and similar wide band applications. However one interesting input to the DSI (unknown author) had placed the use of radio microphones at 3500 MHz. Being part of the committee, I have pointed out that manufacturers have only recently come to terms with 860 MHz, and the possibility of 3500 MHz, given the propagation problems, and unknown health implications, is extremely unlikely within the time-scale. Members of the CEPT committees have, until recently, been unaware of the technical requirements of low power devices, such as radio microphones, and if looked at from their prospective, harmonisation of these devices, at this frequency would be extremely attractive.

Following considerable discussions between members of SE 19, myself and our BBC colleagues, it was decided that in order to have information available on radio devices used by the entertainment industry, to produce an outside broadcast handbook. Originally this was to cover television outside broadcast links, but I have managed to get this changed to include all devices used by the industry, including radio microphones, audio links and constant carrier talkback systems. It will be the first time such a reference work will be distributed to the thirty-seven CEPT administrations.

Another positive outcome of SE 19 has been a request to ETSI for the production of a Vision Link Type Approval standard. If agreed by ETSI, this would complete the family of standards required by the entertainment industry.

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Earlier this year the second stage of the DSI covering 26 to 960 MHz finished taking information. Both ASP FM and The Association of Service Providers, encouraged as many interested parties as possible, including Manufacturers, Hirers and Users, to input to the DSI, as unlike many previous activities undertaken by CEPT, where only administrations could reply, in this case, anyone with a legitimate interest in the use of the spectrum could input. In a meeting with the ERO in May '94, I was extremely pleased to be informed, that due to the strength of interest in radio microphones, the previous CEPT decision not to recommend harmonisation of radio microphone frequencies had been reversed, and that harmonised tuning ranges would be proposed.

Once the report on the second stage of the DSI has been compiled, and if accepted by CEPT, I would expect a similar process to take place, in as much that a project team, possibly SE 19, will be tasked with the detailed work of harmonisation. I will endeavour to ensure adequate representation of the industry in this arena.

Another project team, SE 21, has been tasked with consideration of a report produced on spurious emissions of radio devices. The limits proposed within this report are -67 dBm, which would cause considerable problems for manufacturers operating within the entertainment industry market, and of course will increase the cost of equipment to the end user by a considerable amount. We have put forward a series of papers on low power devices, with the view to returning these limits to their present values.

UK LICENSING OPTIONS FOR AUDIO REPRODUCTION

Radio Microphones

Following representations from the industry, a new Multi Channel licence for UK General Use has been agreed with the Radiocommunications Agency (RA). The licence is for the use of individuals or small companies who use radio microphones for their own use without "hiring on" equipment.

There are three licences available, the first covers five VHF frequencies, the second covers seven UHF frequencies, and is referred to as UHF Low, and the third covers an additional seven UHF frequencies, referred to as UHF High. Each licence costs £130 per annum, at the time of going to print. Hire companies may use the same frequencies, but with the standard IPM licences costing £110 per frequency, per annum, and using a form SAP 3 to extend the use of the licence to the hirer. *

The Multi Channel licence has proved popular with those who wish to get away from the congestion problems experienced on the deregulated bands.

A new user friendly form has been designed for radio microphone licence applications, referred to as RA 162a. This has been reduced to a single A4 sheet with appropriate tick boxes. The majority of manufacturers of MPT 1350 equipment are now packaging the form prior to distribution of their equipment.

Fixed Site licensing frequencies remain as previously published, but are now broken

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down into groups with a standard licence consisting of the VHF and Channel 69 frequencies, recognising the change from Channel 35 as a UK allocation to its replacement with Channel 69.

Changes in licensing fees are based on the amount of spectrum required (and geographically available) at a given site.*

Audio Links

Licences introduced in April '94 allow an annual licence on the ASP allocations in the 48 & 52 MHz bands using directional antenna with erp of up to 5 watts. A number of fixed site installations have already taken advantage of this licence and others are considering its use, either as a primary means of distributing services such as voice evacuation or feeding remote speaker stacks, or linking adjacent buildings. In some cases it is being considered as a back up option in case permanent wiring is damaged. Along with the use of radio microphones, it could allow a flexible approach to be taken to the design of permanent or temporary audio systems. *

Temporary licences are still available on all frequencies listed in ASP 11*, these have proved increasingly popular with Public Address contractors wishing to feed remote systems, especially in the case of difficult terrain such as across Aircraft Runways, or Islands.

ASP FM are always willing to discuss methods of achieving your requirements, and if they are not covered by their licensing regime, will do their best to provide telephone numbers and contacts for those who may be able to assist.

CONCLUSIONS

The radio spectrum is a finite resource which is under increasing pressure from the many new applications, mainly in the areas of mobile telephony which are of a Pan European appeal. As can be seen from the first part of this paper, extensive study of the spectrum is being undertaken, the only simple method of gauging use is by the number of licences issued for a specific purpose (e.g. radio microphones). From a national or international viewpoint, low licence numbers indicate a lack of use, and therefore reallocation of the spectrum concerned, to a service which may have thousands of users would be beneficial. This may be summed up in the term "use it (legally) or lose it".

** Further information, details and application form can be obtained from ASP FM at the address given on the front page.*

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