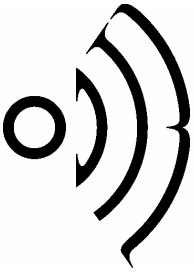

Extending Choice…

Opening the market for Terrestrial Trunked Radio (TETRA)

Consultation Paper

Document No. ODTR 00/11 14 **FEBRUARY 2000**

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FOREWORD BY THE DIRECTOR

This consultation marks a significant step in introducing further choice and diversity into the Irish mobile communications market. TETRA is a professional mobile communications service that combines the benefits of two-way business radio, mobile telephony and advanced data services. Please take this opportunity to influence these important developments through your response to this consultation.

Etain Doyle

Director of Telecommunications Regulation

EXECUTIVE SUMMARY

TETRA (Terrestrial Trunked Radio) is a mobile communications service aimed at professional business users, which can deliver a broad range of voice and data services in both public and private networks. TETRA is being rolled out in a number of European countries and experience with similar technology in the USA has shown there is a sizeable potential market for the functionality offered. The Director believes that the introduction of TETRA services in Ireland has the potential to create further choice and diversity for users of business mobile communications.

This consultation paper seeks to establish the likely future demand for TETRA services in Ireland. In that context expressions of interest are sought from those who may wish to operate either public or private TETRA services in the future. An expression of interest is not a pre-requisite for selection to any later competition which may be announced or to the award of licences. A decision on licensing TETRA services will depend upon the outcome of this consultation. If the responses indicate that there is a demand for TETRA services, the Director will give consideration to appropriate licence application procedures. If the demand for licences exceeds the number that can be offered in the available spectrum, a competitive application process may be required. **The consultation period will run from Monday 14th February to Friday 25th March 2000.**

TETRA is defined in a suite of standards developed over the last decade by ETSI. The standards were originally envisaged for use by the emergency services across Europe, however there has been increasing interest in using TETRA for public and private commercial applications. This has led to the adoption by CEPT of Decision DEC/ERC(96)04, requiring signatory countries to designate spectrum within four harmonised bands for commercial TETRA services.

Five European countries have so far licensed, or are committed to licence, TETRA Public Access Mobile Radio (PAMR) networks, namely Belgium, France, Germany, Portugal and the United Kingdom. In each case a single network has been licensed, although in Germany a consultation may be held this year on whether to introduce an additional network. Private TETRA networks are either operational or planned in Austria, Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden and the United Kingdom.

It has been assumed for licensing purposes that a minimum of 2 x 1.5 MHz would be required for a national TETRA PAMR network. To cater for future growth, it is proposed that a further 2 x 0.5 MHz per network should be available on the basis of demonstrable need. It is proposed to reserve initially 2 x 0.75 MHz for private TETRA systems, with a further 2 x 1 MHz reserved for public or private systems, depending upon future market developments. All spectrum currently proposed for civil TETRA services is in the 410 – 430 MHz band (see figure 6.1 on page 11 for details). Spectrum is also available for digital trunked radio in the 380 – 400 MHz band but this is currently intended for use by the emergency services only.

The Director is proposing to offer two national TETRA PAMR licences. This proposal is based on the current availability of suitable radio spectrum and the anticipated minimum radio spectrum requirement per operator to provide a national TETRA service. Should the Director proceed with licensing TETRA PAMR services, the following fees will be levied for the licence application, the WTA Licence and the Telecommunications Service Licence. Depending upon the demand for licences, a

spectrum access fee may also be required. Details of the proposed fees can be found in the main document (page 15).

Depending upon the responses to this consultation, the Director may further consider developing a licensing framework for PMR systems based on TETRA. It is envisaged that fees will be proportionate to those proposed for TETRA PAMR, taking account of the amount of spectrum, geographic coverage and/or the number of users. Fees will also be proportionate to those applying to analogue business radio, and trunked mobile radio services. Should any future licensing regime permit provision of service by TETRA PMR operators to third parties, such services may be subject to licensing under the Telecommunications Acts where connection to the PSTN is involved.

The Director is pleased to present this consultation paper for comment by interested parties. Comments received will be considered carefully as the process of licensing TETRA services moves forward. This represents a vital opportunity to assist in developing further choice and competition in the Irish mobile communications market.

A summary of the questions addressed in this consultation is presented in Annex B.

CONTENTS

1 INTRODUCTION

TETRA (Terrestrial Trunked Radio) is a mobile communications service aimed at professional business users. Although it has evolved from traditional two-way business radio, it is sufficiently flexible to address a broad range of mobile business communication applications, including:

- Private Mobile Radio (PMR)
- Public Access Mobile Radio (PAMR)
- Mobile telephony
- Mobile data

Further information on these applications can be found in the Glossary (Annex A)

TETRA technology is defined in a suite of open, multi-vendor standards developed by ETSI[1]. Harmonised spectrum is identified in a CEPT Decision[2] that requires signatories to set aside spectrum for civil TETRA services. Further CEPT Decisions[3] relate to free circulation of equipment, exemption from licensing and adoption of approval standards.

The Director believes that the introduction of TETRA services in Ireland would create further choice and diversity for users of business mobile communications. As an advanced digital technology, TETRA can provide users with mobile access to the latest on-line and electronic commerce applications, while retaining the traditional business radio benefits of instant, cost-effective communication between individuals and groups. TETRA services are currently being rolled out in a number of European countries and experience with similar technology in the USA has shown there is a sizeable potential market for the functionality offered.

This consultation paper seeks to establish the likely future demand for TETRA services in Ireland. In that context expressions of interest are sought from those who may wish to operate either public or private TETRA services in the future. An expression of interest is not a pre-requisite for selection to any later competition which may be announced or to the award of licences. A decision on licensing TETRA services will be made having regard, *inter alia,* to the outcome of this consultation. If the responses to the consultation indicate that there is a demand for TETRA services, the Director will give consideration to appropriate licence application procedures. If the demand for licences exceeds the number that can be offered in the available spectrum, a competitive application process may be required.

This consultation paper is not a legal document and does not constitute legal, commercial, or technical advice. The Director is not bound by it. The consultation is

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[1] Details of the TETRA standards are available from the ETSI web site at http://www.etsi.org/TETRA/TETRA.htm

[2] ERC/DEC/(96)04 on the Introduction of the Trans European Trunked Radio System (TETRA), March 1996

[3] See CEPT Decisions ERC/DEC(99)02, 03 and 04

without prejudice to the legal position of the Director or her rights and duties under relevant legislation and does not form part of any formal tender process.

2 STRUCTURE OF THE PAPER

- This paper is structured in a number of main sections as follows:
- Section 3 describes the consultation procedure and timetable for responses
- Section 4 provides background information on the TETRA standard
- Section 5 provides background information on the position of TETRA services in the mobile communications market,
- Section 6 addresses radio spectrum requirements and availability for TETRA
- Section 7 describes the proposed approach to introducing public and private TETRA services in Ireland.

3 CONSULTATION PROCEDURES AND TIMETABLE

The consultation period will run from Monday 14th February to Friday 24th March 2000. **Written comments should be marked "Response to ODTR TETRA consultation paper" and submitted before 5.00 p.m. on Friday 24th March 2000**, to:

Claire Nolan
The Office of the Director of Telecommunications Regulation
Abbey Court
Irish Life Centre
Lower Abbey Street
Dublin 1

All comments are welcome, and it would make the task of analysing replies much easier if comments reference the relevant question numbers from this document (for convenience a summary list of the questions is at Annex B). If you may be interested in the future in applying for a licence to operate any form of civil TETRA system, please make explicit reference to this in your response, indicating the likely time scale, geographic coverage and spectrum requirement.

The Director expects to make available the responses and to publish a report on this consultation . If there are elements of any response that are commercially confidential, then it is essential that these be clearly identified and placed in a separate annex to the main document. They will then be treated in confidence.

The Director regrets that it will not be possible to enter into correspondence with those supplying comments.

4 THE TETRA STANDARD

TETRA is defined in a suite of standards developed over the last decade by ETSI. The standards were originally envisaged for use by the emergency services across Europe, however there has been increasing interest in using TETRA for public and private commercial applications. This has led to the adoption by CEPT of Decision ERC/DEC(96)04, requiring signatory countries to designate spectrum within four harmonised[4] bands for commercial TETRA services. 28 CEPT administrations, including all EU members, have now implemented or are committed to implement this CEPT Decision.

TETRA uses radio channels of 25 kHz bandwidth, each providing up to four standard voice channels using time division multiple access (TDMA), or data transmission in multiples of 7,200 bits per second up to a maximum of 28,800 bits per second.

The TETRA standards address three principal areas, namely:

- voice and data (circuit switched)
- packet data optimised (primarily to provide high speed transmission of IP services by combining all four TDMA time slots)
- direct mode (enabling direct communication between mobile TETRA terminals without routing via the network)

Further details of the TETRA standards are available from the ETSI web site at http://www.etsi.org/TETRA/TETRA.htm

TETRA provides significantly enhanced capabilities compared to existing analogue services. These include the ability to integrate voice and data services, improved speech quality, handover between base stations and the possibility of international roaming. Whilst all of these advantages are shared with cellular telephony, TETRA retains the specific advantages of traditional PMR and PAMR services, notably fast call set up and group calling, although these can be emulated to a degree by the latest GSM standards.

[4] In this context "harmonised" means those frequency bands which have been identified in the ERC Decision ERC/DEC(96)04.

5 TETRA'S POSITION IN THE MOBILE COMMUNICATIONS MARKET

5.1 Introduction

The Director recognises the diverse range of mobile communication services in the market place. These include business radio, community repeaters, paging and cellular telephony. TETRA is capable of delivering all of these services via a single terminal and is likely to appeal particularly to users who require a combination of business radio and cellular telephony functionality.

Public Access Mobile Radio (PAMR) provides business radio functionality over a wide geographic area to users who do not wish to run their own systems. Over the last decade PAMR networks have been rolled out in a number of European countries, serving around a million subscribers in total. There are currently no PAMR networks in Ireland, however there are over 200 Community Repeater stations which provide similar functionality to PAMR but on a smaller scale.

Private trunked radio networks are operated typically by large organisations such as the emergency services, utilities and transport operators that need to communicate between large numbers of mobile users. In licensing terms there is a single licensee, and the system can only be used to provide services to the licensee's own authorised personnel.

It is feasible that in the future private trunked radio networks based on TETRA would be capable of "roaming" onto PAMR networks when out of reach of the private network, enabling users to enjoy the combined benefits of both public and private services.

5.2 The European TETRA market

Evidence from elsewhere in Europe, notably France, Germany and the UK, suggests there is a continuing demand for PAMR services even in the presence of mature competing cellular telephony networks. The number of PAMR subscribers is expected to grow considerably as digital TETRA services become available. In the USA, where Nextel launched a national digital trunked radio service in 1966, a population penetration of 1.2% has been achieved, six times that of analogue PAMR in Europe. This penetration level would equate to approximately 40,000 subscribers in Ireland, although it should be noted that PAMR and PMR penetration has been traditionally higher in the USA than Europe.

Five European countries have so far licensed, or are committed to licence, TETRA PAMR networks, namely Belgium, France, Germany, Portugal and the United Kingdom. In each case a single network has been licensed, although in Germany a consultation may be held this year on whether to introduce an additional network.

Private TETRA networks are either operational or planned in Austria, Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden and the United Kingdom.

5.3 How does TETRA compare with existing cellular services?

TETRA can replicate many of the services currently offered by GSM cellular services, however it is not generally regarded as a direct substitute. TETRA services, in common with analogue trunked radio services, are aimed exclusively at professional users and are unlikely to compete with GSM in the consumer market. The radio spectrum requirement is therefore considerably less: for example TETRA networks recently licensed in Europe have been granted typically one tenth of the spectrum available to GSM operators. TETRA will not in the short term be able to match the international coverage of GSM, although the largest European markets of France, Germany and the UK are likely to be covered by the end of the year 2000.

The latest GSM standards include enhancements that emulate PMR features such as group calling, although call set up times are longer and substantial modification to the GSM network infrastructure may be involved. Other GSM enhancements anticipated over the next 2 – 3 years, such as High Speed Circuit Switched Data (HSCSD) and the General Packet Radio Service (GPRS) will enable GSM to match or exceed the data transmission rate offered by TETRA, however it is unclear how many users will require these higher rates. The recently introduced Wireless Access Protocol (WAP), which can be delivered over GSM or TETRA networks, enables access to a wide range of web-based information services without the need for higher data rates.

What differentiates TETRA from GSM is that it combines high performance PMR functionality with access to PSTN and mobile data services. For users requiring such a service package, TETRA may provide the optimum mobile communication solution.

6 RADIO SPECTRUM REQUIREMENTS AND AVAILABILITY

6.1 Radio spectrum requirement for TETRA PAMR

The minimum spectrum requirement for a national PAMR network depends upon the required traffic capacity and the frequency re-use factor that can be achieved in a cellular radio network. TETRA can be used to deliver voice or data and it is possible for all four time slots to be combined to provide a high speed data connection. It is therefore assumed that at least two radio channels will be required at each base station, to provide sufficient capacity and flexibility for voice and data services.

In a cellular network, the frequency re-use factor is defined by the cluster size, a cluster being a group of cells in which each cell is assigned specific radio channels and which is repeated continuously throughout the network. According to a recent CEPT Report[5], the typical cluster size for PMR and PAMR networks is between 9 and 19. As a digital system, TETRA is capable of greater frequency re-use than traditional analogue systems and the smallest cluster size of 9 may therefore be assumed. It can be further assumed that each cell is divided into three 120-degree sectors, in line with established cellular network planning.

Since each cell sector within the cluster requires two radio channels, the minimum total radio spectrum requirement for the network is thus:

2 (per sector) x 3 (sectors per cell) x 9 (cells per cluster) = 54 channels

This is equivalent to 2 x 1.35 MHz. In practice, additional channels are likely to be required to cater for capacity "hot spots".

It has therefore been assumed for licensing purposes that a minimum of 2 x 1.5 MHz would be required for a national PAMR network. To cater for future growth, it is proposed that a further 2 x 0.5 MHz per network should be available on the basis of demonstrable need.

Question 1.Is there a requirement for TETRA PAMR services in Ireland?

Question 2.Is the proposed 2 x 1.5 MHz allocation for a national TETRA PAMR network sufficient for initial network roll out? (please provide supporting technical arguments if you do not feel it is sufficient)

Question 3.Is the proposed 2 x 0.5 MHz expansion likely to be sufficient for anticipated future PAMR market growth? (please provide supporting technical arguments if you do not feel it is sufficient)

[5] "Methodology for the assessment of PMR systems in terms of spectrum efficiency, operation and implementation", ERC Report no. 52, December 1997

6.2 Radio Spectrum Requirement for Private TETRA Systems

The spectrum requirement for private systems is less straightforward to predict, since it depends very much on the size of the user organisation, the area in which it operates and the nature of the services it requires. The number of users is likely to be much smaller than for a PAMR network, however, enabling larger, unsectored cells to be used. In many cases a single base station may provide sufficient area coverage.

Since a single TETRA radio channel provides up to four full duplex voice channels and a data capability, channel loading may be higher than for conventional business radio. It is anticipated that larger users will obtain most benefit and that exclusive area channel assignments would be required.

It is proposed to reserve initially 2 x 0.75 MHz for private TETRA systems, with a further 2 x 1 MHz reserved for public or private systems, depending upon future market developments. All spectrum currently proposed for civil TETRA services is in the 410 – 430 MHz band (see figure 6.1 on page 11 for details).

Question 4. Is there likely to be a demand for private TETRA services in Ireland?

Question 5. How much spectrum is likely to be required for private TETRA services?

Question 6. Should private TETRA channels be assigned on an exclusive or shared basis[6]?

6.3 Available Radio Spectrum for TETRA

6.3.1 ERC Decision

CEPT Decision ERC/DEC/(96)04 identifies four frequency bands for civil TETRA services, namely:

i) 380 – 400 MHz

ii) 410 – 430 MHz

iii) 450 – 470 MHz

iv) 872 – 876 MHz (mobile transmit) paired with 917 – 921 MHz (base transmit)

The CEPT Decision identifies options ii) and iv) as preference bands. In bands i) to iii) a duplex spacing of 10 MHz will be deployed, with mobile transmissions in the lower 10 MHz and base transmissions in the upper 10 MHz. The Decision requires signatory countries to allocate a minimum of 2 x 2 MHz for civil TETRA services.

[6] The reference to "exclusive" and "shared" in this context is to whether or not frequencies should be shared with other TETRA users in a given geographic area. In either case the frequencies may be shared with other radiocommunication services.

6.3.2 Spectrum availability in Ireland

6.3.2.1 380 – 400 MHz

CEPT Decision ERC/DEC(96)01 designates the lower 2 x 3 MHz of this band as harmonised spectrum for use by the emergency services, with a further 2 x 2 MHz to be also made available to the emergency services if required. The remaining 2 x 5 MHz (i.e. 385-390 MHz paired with 395 – 400 MHz) is in principle available for commercial applications. However, this is not one of the two preference bands identified by CEPT and the Director has therefore decided to postpone any decision on the future use of this band until there is greater clarity over the long term spectrum requirements of the emergency services in lower part of the band. Therefore emergency services interests are encouraged to respond to this consultation (see Section 6.6).

6.3.2.2 410 – 430 MHz

The lower 2 x 5.75 MHz (i.e. 410 – 415.75 MHz paired with 420 – 425.75 MHz) of this band is currently available and the band is earmarked in the Irish table of frequency allocations for civil TETRA. The upper portion of the band is used by analogue PMR services and a small number of legacy fixed links. Several major manufacturers are now producing TETRA equipment for this band, which has been chosen for TETRA networks in Belgium, France, Germany and the UK. This is therefore the favoured band for the introduction of civil TETRA services in Ireland.

6.3.2.3 450 – 470 MHz

Major long term replanning of this band will be needed, in co-ordination with the UK administration, to bring into line with the current CEPT channel arrangement. There is therefore no immediate prospect of introducing TETRA services into this band.

6.3.2.4 872-876 / 917–921 MHz

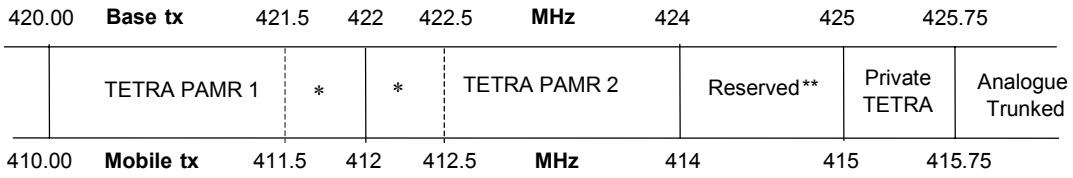
This band is also earmarked for civil TETRA in the Irish table of frequency allocations and is one of the two CEPT preference bands. However, there has been relatively little interest in this band in Europe so far. Radio propagation is less favourable than in the other frequency bands and additional base stations would be required to provide national or regional coverage. The band may be attractive in the longer term for providing high capacity voice or data services in urban centres, either using TETRA or other technologies. The Director does not propose to make any decision on this frequency band until there is greater clarity about equipment availability and the use of the band internationally. Comments are however invited on potential future uses for this frequency band, whether based on TETRA or other mobile technologies.

Question 7.Do you have any views on potential future uses for the frequency bands 872 – 876 MHz and 917 – 921 MHz?

6.3.2.5 Conclusion

Based on the above arguments, the Director has determined that radio spectrum for civil TETRA services should be made available in the bands 410 – 415.75 (mobile station transmit), paired with 420 – 425.75 MHz (base station transmit).

6.4 Proposed spectrum allocations to public and private TETRA services



* additional spectrum to be made available to PAMR licensees on the basis of demonstrable need

** for PMR or PAMR use according to market demand

Figure 6.1: Proposed spectrum allocations in the 410 – 430 MHz band

6.5 Requirement for international co-ordination

It should be noted that all of the radio spectrum shown in Figure 6.1 is subject to international co-ordination in areas close to the UK border or coastline or on some hilltop sites, to avoid mutual interference between UK and Irish services. Co-ordination typically involves apportionment of preferred channels to each country on an equal basis. Up to 50% of allocated radio channels may therefore not be useable in these areas, or may be subject to restrictions.

6.6 Status of emergency services spectrum in the 380 – 400 MHz band

This consultation document concerns the introduction of civil TETRA services in the 410 – 430 MHz band. Harmonised spectrum has also been set aside in a separate CEPT Decision in the lower part of the 380 – 400 MHz band, for operation of digital trunked radio for the emergency services[7]. The Department of Justice, Equality and Law Reform has already announced its intention to replace the existing Garda national radio network with a digital system, to be implemented over the period 2000 – 2003[8]. Unlike the CEPT Decision relating to commercial digital trunked radio, ERC/DEC(96)01 does not specifically mandate the use of the TETRA standard, but states that "other systems may be tested on the same basis if they become a European standard". Such a system would be licensed as a private network for use by the emergency services only. Any future provision of civil digital trunked radio services in the 380 – 400 MHz band would require separate licensing, on an equivalent basis to systems operating in the 410 – 430 MHz band.

To facilitate future planning of the 380 – 400 MHz band, the Director would welcome comments from emergency services or their representatives on the likely demand for emergency services digital trunked radio in this band.

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[7] CEPT Decision ERC/DEC(96)01, on the harmonised frequency band to be designated for the introduction of the Digital Land Mobile System for the Emergency Services

[8] Departmental Press Release dated 25th January 1999

Question 8.What demand do you foresee for emergency services' digital trunked radio in the 380 – 400 MHz band?

Should operators of emergency services network(s) in the 380 – 400 MHz band wish to provide services to other users, they would need to apply for licences under the Telecommunications and Wireless Telegraphy Acts for radio spectrum in the 410 – 430 MHz band, or such other band(s) that may in the future be made available for civil TETRA services.

7 PROPOSED APPROACH TO INTRODUCING TETRA SERVICES IN IRELAND

7.1 Introduction

The Director considers that the introduction of commercial TETRA services in Ireland has the potential to enhance choice and diversity in the provision of mobile communications and that the greatest benefit would be derived in the first instance by the introduction of PAMR services that could be accessed by any section of the business community. This consultation is therefore primarily concerned with the introduction of TETRA PAMR services. However, the Director recognises that some organisations may in the future wish to operate their own TETRA systems and is proposing to set aside radio spectrum for that purpose. Depending upon the response to this consultation, consideration may be given to development of a licensing framework for private business radio systems using the TETRA standard.

7.2 TETRA Public Access Mobile Radio (PAMR) services

7.2.1 General Principles of Licensing

A TETRA PAMR service providing PSTN connectivity will require a licence under Section 111 of the Postal and Telecommunications Services Act, 1983, as amended, and the Telecommunications (Miscellaneous Provisions) Act 1996, to provide public telecommunications services ("telecommunications service licence"). This licence will be based on the pro-forma terms and conditions of the existing telecommunications licences, primarily the General Telecommunications Licence with the addition of an annex specific to TETRA PAMR. Please refer to the ODTR web site (http://www.odtr.ie) for details.

A licence will also be required under the Wireless Telegraphy Acts, 1926 to 1988 (WTA). Should a licensing process be undertaken, an exemption order would be required to exempt TETRA mobile terminals from requiring a licence under the WTA. This exemption order would preclude direct mode operation (DMO), except under the following circumstances:

i) where harmonised European channels are identified by CEPT specifically for the purposes of TETRA DMO

ii) where DMO is entirely under the control of the network and restricted to the operator's own licensed radio channels

The Director is concerned to ensure the widest possible availability of TETRA PAMR services in Ireland. One means to achieve this may be to include coverage and/or roll out obligation in the telecommunications service licence. This may be set at a lower level than for GSM cellular services, on the grounds that TETRA is not intended for use by the general public but by business users with particular service needs. Operators will be encouraged to share radio transmitter masts with existing services and/or or other TETRA operators wherever possible.

Question 9. Should coverage and/or roll out obligations be included in the telecommunications service licence for national PAMR services, and if so should this be set at a lower level than for GSM cellular, to reflect the different nature of the market? Please indicate at what level you feel the coverage / roll out obligation should be set.

Question 10. How might mast sharing with existing services, or between new operators, best be promoted to minimise the need for new masts?

7.2.2 Number of Licences

The Director is proposing to offer two national TETRA PAMR licences. This proposal is based on:

a) the current availability of suitable radio spectrum.

b) the anticipated minimum radio spectrum requirement per operator to provide a national TETRA service

The proposal to limit the number of licences to two is consistent with Directive 97/13/EC of the European Parliament and Council ("the Licensing Directive"), as transposed by the European Communities (Telecommunications Licences) Regulations, 1998[9], the terms of which permit Member States to limit the number of individual licences to the extent required to ensure the efficient use of radio frequencies.

The Licensing Directive, *inter alia*, requires Member States to give due weight to the need to maximise benefits to users and to facilitate the development of competition. The Director is therefore minded to reserve one of the two licences for organisations who do not currently hold a mobile telecommunication licence under Section 111of the Postal and Telecommunications Services Act, 1983, as amended. Accordingly, existing mobile operators or companies in the groups to which they belong would not be eligible for that licence.

Question 11.Do you agree with the proposal to offer two national PAMR licences? (Please provide supporting arguments if you believe an alternative approach should be considered)

Question 12.Do you have a view on the reservation of one licence for organisations who do not currently hold a mobile telecommunications licence?

Depending upon the responses to this consultation, the Director may proceed with a licence application process for TETRA PAMR. The nature of this process will depend upon the level of interest expressed in the consultation and will be subject to further consideration by the Director. If responses suggest that the demand for TETRA PAMR licences will be more than can be made available, a competitive application process would be required. If there is only limited interest a "first come first served" approach may be appropriate.

In either case, the application process is likely to require the provision of the following information by the applicant:

[9] SI 98 of 1998

i) a business plan, including details of the applicant's ownership, its relationships with suppliers and customers and its financial and managerial resources;

ii) detailed proposals for geographic coverage and the timescale for network roll out;

iii) the nature of the services expected to be delivered and the customer requirements to be specifically targeted;

iv) the network design, including the likely demand for additional radio infrastructure such as point to point links

v) the opportunities the applicant may see for the promotion of new services such as mobile internet access or electronic commerce;

vi) likely sources of equipment for network infrastructure and user terminals

vii) confirmation that the technical standards to be employed comply with TETRA standards of the European Telecommunications Standards Institute (ETSI) either published or in preparation;

viii) the amount of radio spectrum required and, if this is greater than 2 x 1.5 MHz, a detailed technical justification for the amount required

ix) details as to how the security of the system proposed would be protected, with particular emphasis on issues such as preventing fraudulent use and eavesdropping.

7.2.3 Fee structure envisaged

Should the Director proceed with licensing TETRA PAMR services, the following fees will be levied:

i) A Telecommunications Licence Fee including an appropriate spectrum access fee;

ii) A WT Act Licence Fee , including an application fee;

iii) A Telecommunications Levy.

7.2.3.1 Telecommunications Licence Fee

This will be based on the current General Telecommunications Licence Fee, which is currently set at a level of 12,500 Euro plus an appropriate spectrum access fee in accordancewith the EU Licensing Directive. In the case of GSM, access fees of up to IR£10M were charged, but in the case of TETRA it is likely that , given the smaller amount of spectrum and the limited capacity which will be available, a significantly smaller fee will be charged. A maximum level in the range IR£1.5M to IR£2.5M (Euro 1.9 to 3.2) with the possibility of rebates being offered in return for the licensee meeting roll-out or coverage obligations is under consideration...

Question 13. Do you have a view on the proposed spectrum access fee and the possibility of rebates on it being tied to a roll-out or coverage obligation?

7.2.3.2 WTA Licence Fee

A WTA licence fee will be payable on an annual basis. The Director proposes to base the licence fee per unit spectrum for national TETRA PAMR networks on that currently applied to GSM mobile networks operating in the 900 MHz band. The proposed fee will therefore be IR£2,500 (= 1,969.91 Euro) per 2 x 25 kHz channel. There will also be an application fee to cover administration costs.

7.2.3.3 Telecommunications Levy

The standard telecommunications levy of 0.2% of turnover shall apply to all TETRA PAMR services.

7.2.4 PSTN Numbering Resources

Should the Director proceed with licensing PAMR services and assuming that these services require connection to the PSTN, numbering resources will be made available in accordance with the national numbering scheme. A mobile network code will also be made available where required.

7.2.5 Interconnection

A TETRA PAMR network that connects to the PSTN shall be required to comply with the European Communities (Interconnection in Telecommunications) Regulations 1998 and to undertake to participate in good faith in any negotiations or dispute resolution processes initiated pursuant to those regulations.

7.3 Private Mobile Radio (PMR) Services

7.3.1 General Principles of Licensing

Depending upon the responses to this consultation, the Director may consider developing a licensing framework for PMR systems based on TETRA. However, at the moment the Director is inclined to the view that such a framework would be best considered sometime after experience has been gained with the TETRA PAMR licences. This would be likely to involve the development of a common set of regulations under the WT Acts to apply to both analogue and digital trunked radio services.

Views are sought on whether, in addition to service to their own users, there may be a requirement for TETRA PMR operators to provide localised service to third parties, for example at locations where there is an absence of an alternative public mobile network such as a large construction site with multiple contractors, or for the provision of roaming between TETRA PAMR and PMR networks.

Question 14. Is there likely to be a requirement for TETRA PMR (i.e., private) operators, in addition to service to their own users, to provide a localised service to third parties and should this be catered for in any future TETRA PMR licensing regime?

Question 15. Is there likely be a requirement for roaming between TETRA PAMR and PMR i.e., public and private services respectively, and should this be catered for in any future TETRA PAMR and PMR licensing regimes?

7.3.2 Fee Structure envisaged

PMR services will be subject to licence fees under the WTA. A non-refundable application fee will also apply to each licence application. It is envisaged that fees will be proportionate to those proposed for TETRA PAMR, taking account of the amount of spectrum, geographic coverage and/or the number of users. Fees will also be proportionate to those applying to community repeater and trunked mobile radio services. Should any future licensing regime permit provision of service by TETRA PMR operators to third parties, such services may be subject to licensing under the Telecommunications Acts where connection to the PSTN is involved.

7.4 Managing spectrum as services develop

The director wishes to ensure that adequate spectrum will be available to facilitate future expansion of TETRA services. A proportion of the available spectrum will therefore be reserved for potential future use by either public or private services, depending upon market developments. The proposed apportionment of available spectrum is illustrated in Figure 6.1.

8 CONCLUSIONS

The Director is pleased to present this consultation paper for comment by interested parties. Comments received will be considered carefully as the process of licensing TETRA services moves forward. This represents a vital opportunity to assist in developing further choice and competition in the Irish mobile communications market.

ANNEX A: GLOSSARY

Business Radio	Two-way mobile radio service operated by the user organisation. Size may range from two individual mobiles to an extensive network comprising multiple base stations and thousands of mobiles. An individual licence under the WT Acts is required for any Business Radio system. Also commonly referred to as Private Mobile Radio (PMR).
CEPT	European Conference of Postal and Telecommunications Administrations, regional planning and regulatory body for telecommunications and radio communications services
Civil TETRA	Generic term covering all TETRA systems other than those operated by or for the emergency services under the terms of CEPT Decision ERC/DEC(96) 01
Community Repeater	Mobile radio base station that can be accessed by multiple user organisations that subscribe to the service on a commercial basis. Provides Business Radio functionality without requiring users to hold an individual licence. Community Repeater operators must hold a licence under the WT Acts. Typically provides service for up to ten user organisations or 100 mobiles.
DMO	Direct Mode Operation. Direct communication between mobile TETRA terminals without routing through a TETRA network. Requires dedicated radio channels on a harmonised European basis (not currently available).
ERC	European Radiocommunications Committee, a constituent body of CEPT, responsible for frequency management at a European level
ERC Decision	Measures approved by the ERC on significant harmonisation matters in the radiocommunications regulatory field, within the context of long term ERC strategy and policy. Administrations that formally endorse an ERC Decision are committed to implementing its terms.
ETSI	European Telecommunications Standards Institute, regional standards body responsible for development of harmonised telecommunications and radio communications standards at a European level.
IP	Internet Protocol
Mobile Data	Transmission of information in digital form across a mobile communication system or network.
Mobile Telephony	Conveyance of full duplex PSTN voice telephony over a mobile telecommunications network

PAMR	Public Access Mobile Radio, a public mobile communications network providing similar functionality to Business Radio on a national or regional basis. Typically provides service to a greater number of users and over a wider geographic area than community repeaters. A licence under the WT Acts is required by the operator, but not by users. If access to the PSTN is provided, a licence under the Telecommunications Acts is also required.
PMR	Private Mobile Radio, an alternative term for Business Radio. The term Professional Mobile Radio is also sometimes used.
Roaming	The use, by a customer of one mobile network operator, of another mobile network operator's network to make and/or receive calls.
Telecommunications Acts	The Postal and Telecommunications Services Act, 1983, as amended, and the Telecommunications (Miscellaneous Provisions) Act 1996.
Trunking	The pooling of multiple radio or voice channels in a communication system, enabling a large number of users to share a relatively small number of channels.
WT Acts	The Wireless Telegraphy Acts, 1926 to 1988

ANNEX B: SUMMARY OF CONSULTATION QUESTIONS

The following specific questions have been raised in this consultation document. The supporting arguments giving rise to each question can be found at the sections referenced below.

1. (Section 6.1): Is there a requirement for TETRA PAMR services in Ireland?
2. (Section 6.1): Is the proposed 2 x 1.5 MHz allocation for a national TETRA PAMR network sufficient for initial network roll out? (please provide supporting technical arguments if you do not feel it is sufficient)
3. (Section 6.1): Is the proposed 2 x 0.5 MHz expansion likely to be sufficient for anticipated future PAMR market growth? (please provide supporting technical arguments if you do not feel it is sufficient)
4. (Section 6.2): Is there likely to be a demand for private TETRA services in Ireland?
5. (Section 6.2): How much spectrum is likely to be required for private TETRA services?
6. (Section 6.2): Should private TETRA spectrum be allocated on an exclusive or shared basis?
7. (Section 6.3): Do you have any views on potential future uses for the frequency bands 872 – 876 MHz and 917 – 921 MHz?
8. (Section 6.6): What demand do you foresee for emergency services' digital trunked radio in the 380 – 400 MHz band?
9. (Section 7.2.1): Should coverage and/or roll out obligations be included in the Telecommunications Acts licences for national PAMR services, and if so should this be set at a lower level than for GSM cellular, to reflect the different nature of the market?
10. (Section 7.2.1): How might mast sharing with existing services, or between new operators, best be promoted to minimise the need for new masts?
11. (Section 7.2.2): Do you agree with the proposal to offer two national PAMR licences? (Please provide supporting arguments if you believe an alternative approach should be considered)
12. (Section 7.2.2): Do you have a view on the reservation of one licence for organisations who do not currently hold a mobile telecommunications licence?
13. (Section 7.2.3): Do you have a view on the proposed spectrum access fee and the possibility of rebates on it being tied to a roll-out or coverage obligation?
14. (Section 7.3.1): Is there likely to be a requirement for TETRA PMR (i.e., private) operators, in addition to service to their own users, to provide a localised service to third parties and should this be catered for in any future TETRA PMR licensing regime?

15. (Section 7.3.1): Is there likely be a requirement for roaming between TETRA PAMR and PMR i.e., public and private services respectively, and should this be catered for in any future TETRA PAMR and PMR licensing regimes?