



Commission for
Communications Regulation

Appendix A - Technical Conditions

Technical Conditions for Analogue Radio

**General conditions attached to a licenced analogue VHF
- FM, LF and MF - AM Broadcasting Station**

Document No:	11/95a
Date:	05, December 2011

Contents

1. TECHNICAL CONDITIONS FOR ANALOGUE RADIO 2
ANNEXES..... 11

1. TECHNICAL CONDITIONS FOR ANALOGUE RADIO

1.1. PURPOSE

1.2. This document specifies the general conditions attached to a licence issued by ComReg to: -

- (a) the Broadcasting Authority of Ireland (“BAI”) under Part 6 of the Broadcasting Act 2009, for the establishment, maintenance and operation of a LF-MF independent radio station in the frequency band 150 – 285 kHz or 525 – 1605 kHz and/or a VHF-FM station for an independent radio service in the frequency bands 87.5 to 108MHz. These conditions are set out in accordance with section 59(3) of the Broadcasting Act 2009;
- (b) RTÉ for the establishment maintenance and operation of analogue radio broadcasting stations. These conditions are set out in accordance with section 121(1) of the Broadcasting Act 2009.

1.3. The BAI, in accordance with section 50 of the Broadcasting Act 2009, shall ensure that these technical conditions are complied with by the sound broadcasting contractor concerned.

1.4. This document consolidates the technical conditions for VHF-FM and LF/MF – AM stations into one document. These conditions shall apply to all such stations in the frequency bands 150 – 285 kHz, 525 – 1605 kHz and 87.5 – 108.0 MHz. This document replaces the document published by the Department of Transport, Energy and Communications in September 1995 (T&RT 95/10) and the analogue radio technical conditions contained in the RTÉ licence of 2005, (ComReg document 05/13a).

1.5. GENERAL

1.6. These conditions detail the characteristics of the equipment required for the purposes of frequency spectrum management and safety and do not include detailed equipment specifications.

1.7. Evidence of type approval of equipment is not required by the Commission¹. Instead a procedure of station certification by a suitably qualified person, will apply.

1.8. Procedures for the modification of or addition of a station assignment are also specified in this document.

1.9. The technical parameters specified in this document are in accordance with values specified in the Radio Regulations (2008), in the Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3), Geneva 1975, and in the Final Acts of the Regional Administrative Conference for the planning of VHF Sound Broadcasting, Geneva 1984.

¹ It is recommended that broadcasting transmitters comply with any appropriate European Telecommunications Standard.

- 1.10. The conditions specified in this document may be varied or added to from time to time by the Commission as required.
- 1.11. In cases of doubt regarding the interpretation of these conditions, the decision of the Commission will be final.
- 1.12. **DEFINITIONS AND GLOSSARY OF TERMS**
- 1.13. Radio Regulations
Radio Regulations, Edition of 2008, as published by the International Telecommunications Union (ITU) as replaced or amended from time to time.
- 1.14. Assignments
A radio frequency or radio frequency channel for which authorisation by the Commission for Communications Regulation has been granted for its use at a specified station with specified characteristics.
- 1.15. Station
One or more transmitters or receivers, or a combination of transmitters and receivers, including the associated equipment necessary, at one location for the purpose of carrying on a broadcasting service.
- 1.16. Geneva 1975 Agreement
The Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3), Geneva 1975. An updated plan of assignments constitutes part of this Agreement.
- 1.17. Geneva 1984 Agreement
The Final Acts of the Regional Administrative Conference for the planning of VHF Sound Broadcasting, Geneva 1984. An updated plan of assignments constitutes part of this Agreement.
- 1.18. Effective Radiated Power (ERP) in a given direction.
The product of the power supplied to the antenna and its gain relative to a halfwave dipole in a given direction. This is usually expressed in decibels relative to one watt (dBW).
- 1.19. Effective Monopole Radiated Power (EMRP) in a given direction.
The product of the power supplied to the antenna and its gain in the horizontal plane relative to a short vertical antenna.
- 1.20. Maximum Effective Radiated Power.
The maximum value of the effective radiated power in any direction.
- 1.21. Effective Antenna Height (Eff. Ht.)
The height in meters, above the average level of the ground between distances of 3 and 15km from the transmitter. This is calculated for each of 36 evenly spaced radials (10 degree separation) starting from true North².

² This can be calculated by the Commission using the latitude and longitude in degrees minutes and seconds, for the transmitting station, provided the antenna height above ground level is supplied

1.22. Maximum Effective Antenna Height

The maximum value in meters for the effective antenna height in any one of the 36 directions referred to in 1.21 above.

1.23. Omnidirectional Antenna

An antenna having a horizontal radiation pattern with variations of 2 dB or less over 360 degrees.

1.24. Service Area

Locations where the field strength available (in the case of VHF at the reference receiver height of 10 meters above ground) exceeds both the minimum wanted field strength and the protected field strength (PFS) values as derived from the assignments in the appropriate plans.

1.25. Vertical Aperture

In relation to a VHF antenna system, the distance in wavelengths between the centres of the outermost radiating elements, plus one half wavelength, in the vertical plane.

1.26. Commission

Commission for Communications Regulation.

1.27. Contractor

The holder of a sound broadcasting contract entered into under Section 63 of the Broadcasting Act 2009.

1.28. **TRANSMITTER CONSTRUCTION**

1.29. General

The mechanical and electrical construction shall meet such requirements as can be reasonably set, taking the state of the art into account (see also 1.35 'Safety and Weather Protection').

1.30. All controls, meters, indicators and terminals shall be clearly labelled. Details of the power supply from which the equipment is intended to operate shall be clearly indicated. The equipment should normally consist of one complete unit.

1.31. Controls

Controls which, when wrongly adjusted, increase the risk of causing interference or of improper functioning of the transmitter shall be immediately accessible to qualified personnel only.

1.32. Manufacturer's Identification

The transmitter shall be provided with an indication showing the manufacturer's trademark, type designation and serial number. The indication shall be fitted on the outside of the transmitter, shall be clearly readable, non-removable and indelible.

1.33. **FACILITIES FOR TESTING TRANSMISSION INSTALLATION**

1.34. Adequate and accurately calibrated test equipment shall be made available for non-radiative measurement of transmitter power, modulation characteristics and spurious emissions while the station is undergoing initial alignment and regular maintenance.

1.35. SAFETY AND WEATHER PROTECTION

1.36. General Safety

The station and its premises must comply with all relevant statutory safety regulations.

1.37. Safety Controls

There shall be a single control to isolate power for the entire installation. If a form of auxiliary power (such as diesel generators or an uninterruptable power supply) is provided, then the same control should isolate these. The “on” position of such a device must be clearly indicated.

1.38. Safety Standards

The system must comply with

- the Safety Requirements for Radio Transmitting Equipment as per I.S./EN 60215 : 1989 ³
- any radiation emission standards adopted and published by the International Commission for Non-Ionising Radiation Protection (ICNIRP) or its successors from time to time; any radiation emission standards of the European Committee for Electrotechnical Standards and any other radiation emission standards specified by national and EC law. The Licensee shall ensure that non- ionising radiation emissions from apparatus operated by the Licensee or by its contractors are within the limits specified by the guidelines published by ICNIRP. The Licensee shall ensure that apparatus operated by the Licensee or by its contractors⁷ is not installed or operated at a location in such a manner as to cause the aggregate of non-ionising radiation emissions to exceed the limits specified by the guidelines published by ICNIRP.

1.39. Weather Protection

All apparatus and cables exposed to weather, corrosive atmosphere or other adverse conditions shall be so constructed or protected as may be necessary to prevent danger or interference to other services arising from such exposure.

1.40. SITE ENGINEERING

1.41. General

The practice of good site engineering is a necessary requirement to ensure good coverage, safety of personnel and minimum interference to other services. This is particularly relevant when considering other services, especially aeronautical systems and private mobile radio networks used by the emergency services, operating in frequency bands adjacent to the VHF-FM radio broadcasting bands. In addition, careful consideration is required for other services when operating from the same site or in close proximity to them.

1.42. Spurious Emissions

Careful consideration should be given to the levels of spurious emissions set out in 1.54.

³ This standard is available from the National Standards Authority of Ireland

1.43. Standard

The European Telecommunications Report ETR132 outlines site engineering practises for VHF-FM systems and is available from the National Standards Authority of Ireland. The Licensee shall ensure that all necessary precautions are undertaken to ensure good site engineering practise.

1.44. TRANSMISSION CHARACTERISTICS FOR LF AND MF AM BROADCASTING STATIONS

1.45. Frequency Aspects

The equipment shall be designed to operate on the assigned frequency in the frequency Band 150 – 285 kHz or 525 – 1605 kHz only.

1.46. The frequency tolerance of the main carrier shall be ± 10 Hz.

1.47. The transmit-frequency shall be derived from a crystal-oscillator. If use is made of a synthesiser and/or a phase locked loop system, the transmitter shall be inhibited when synchronisation is absent. The transmitter frequency adjustment control shall be accessible to qualified personnel only.

1.48. Maximum Permitted Levels of Spurious Emissions

The maximum permitted level of spurious emission shall be at least 40dB below the mean power level of the transmitter and at no time may exceed an absolute power level of 50mW.

1.49. Class of Emission, Bandwidth and Modulation Standards

In accordance with the Geneva 1975 Agreement, the transmission system used shall be double sideband amplitude modulation with full carrier. This is normally specified as 9K00A3EGN.

1.50. AF input and RF output Impedance

The nominal A.F. input impedance shall be 600 Ohm balanced to earth within the modulation frequency range 40Hz – 4.5 kHz. The R.F. output impedance of the equipment shall be in the range of 50 - 160 Ohm.

1.51. Transmit Power and Radiated Power

The transmitter power, stated in the licence, is the carrier power in the absence of modulation.

1.52. The radiated power is the sum of the nominal power of the transmitter (in dBW) and the gain of the antenna in dB (relative to a short vertical antenna) without taking any losses into account. It is expressed as the effective monopole radiated power (emrp in kW or in dB relative to 1 kW).

1.53. As the radiated power is the sum of the transmitter output power (in dBW) and the gain of the antenna (in dB) the output carrier power of transmitter shall be adjustable so that the value of the radiated power permitted for each station is not exceeded. If the equipment is designed to operate with different levels of carrier power, the rated output for each power level must be declared by the manufacturer.

1.54. SITE TRANSMISSION CHARACTERISTICS FOR VHF – FM BROADCASTING STATIONS⁴

1.55. Frequency Aspects

The equipment shall be adjusted to operate on the assigned frequency in the frequency band 87.5 to 108 MHz only.

1.56. The frequency tolerance of the main carrier shall be:

- ± 2 kHz, for transmitters of mean power greater than 17 dBW.
- ± 3 kHz, for transmitters of mean power less than or equal to 17 dBW.

1.57. The transmit-frequency shall be derived from a crystal-oscillator. If use is made of a synthesiser and/or a phase locked loop system, the transmitter shall be inhibited when synchronisation is absent. The transmitter frequency adjustment control shall be accessible to qualified personnel only.

1.58. Maximum Permitted Levels of Spurious Emissions

The maximum permitted level of spurious emission for a transmitting station shall be:

- 40 dB below the licensed E.R.P. for a transmitting station E.R.P. equal to or less than 4 dBW;
- 250 μ W E.R.P. for a transmitting station E.R.P. greater than 4 dBW and less than 49 dBW;
- 85 dB below the licensed E.R.P. for a transmitting station E.R.P. equal to or greater than 49 dBW.

1.59. These limits must be adhered to for the frequency range 87.5 to 137 MHz.

1.60. A band pass filter, which provides a minimum attenuation of 60 dB at frequencies outside the VHF-FM broadcasting band, shall be fitted. At frequencies close to the band edges where 60dB attenuation is more difficult, the Licensee may request that an alternative attenuation be permitted, subject to agreement with the Commission.

1.61. Designation of Emission and Maximum Permitted Bandwidth

1.62. The bandwidth of the radiated signal shall not exceed 270 kHz. The emission shall comply with the following designation :-

- 270KF9EHW for Stereophonic;
- 270KF9EGW for Monophonic, where:

270K	=	Necessary bandwidth	=	270 kHz
F	=	Type of modulation	=	Frequency modulation
9	=	Modulating signal	=	Composite analogue/digital signal
E	=	Information type	=	Sound broadcasting
H	=	Broadcast quality sound (stereophonic)		

⁴ ETS 300 384 (1995) is the applicable VHF-FM transmitter standard from the European Telecommunications Standard Institute.

G	=	Broadcast quality sound (monophonic)
W	=	Combination of frequency and time division multiplex

1.63. Modulation Standards

In accordance with the Geneva 1984 Agreement, the transmission system used shall be either Monophonic or Stereophonic pilot tone system.

(a) Monophonic Transmission

The radio-frequency signal consists of a carrier, frequency modulated by the sound signal, after pre-emphasis, with a maximum frequency deviation of ± 75 kHz.

(b) Stereophonic Transmission

The radio-frequency signal consists of a carrier, frequency modulated by a baseband signal according to the specifications of the pilot-tone system. The maximum frequency deviation is ± 75 kHz.

(c) Pre emphasis and low pass filter

The transmitter must be provided with a pre-emphasis filter with a time-constant of 50 microseconds, combined with a low-pass filter with an attenuation of at least 30 dB at an input modulation frequency of 20 kHz, relative to the level at 1 kHz.

1.64. It is possible, even while operating within the specified maximum deviation limit of ± 75 kHz, to infringe on the internationally agreed protection ratios used in planning. This is caused by a degree of audio processing resulting in an increase, beyond a reference level⁵, of the average power contained within the multiplexed signal envelope integrated over 60 seconds. Where this occurs, the audio signal level must be adjusted, at the responsible station, so as to eliminate any such infringement. Alternatively, an e.r.p. restriction may be imposed by the Commission.

1.65. Permitted subcarriers for the transmission of supplementary information

The addition of a sub-carrier on 57 kHz for the transmission of supplementary information using the Radio Data System (RDS), as specified in I.S. EN 62106 : 2001, is considered as being included in the above Designation of Emission and Permitted Bandwidth. The standard is available from the National Standards Authority of Ireland. Only certain features of this system are licensed⁶. The Licensee shall provide a completed Certificate of Compliance⁷ to the Commission within one month of the commencement of transmission of RDS features.

1.66. RF Output Impedance

The RF output ports of the transmitter and associated equipment shall be capable of interfacing with equipment whose input impedance is 50 ohms.

1.67. Vertically Radiated Power

Due to the proximity of the VHF-FM radio broadcasting band to frequency bands used by aeronautical services, it is important, in the interests of safety, that the power radiated in the vertical direction is restricted. This applies to the entire country due to the nature of the aeronautical services involved. Therefore, the minimum limits,

⁵As per ITU-R BS.412-9 or as subsequently amended

⁶An updated list of approved features shall be provided to the Licensee by the Commission on request.

⁷The Certificate of Compliance form is contained at Annex 3. In some cases only the sections of a certificate relevant to RDS operation may be necessary.

contained in table 1.0, for the vertical aperture of the transmitting antenna shall be complied with. For an effective radiated power of less than 30 dBW, a correction factor may apply, which allows the use of a single dipole. This will be applied by the Commission, and specified on the licence, when appropriate.

Maximum Total E.R.P.	Vertical aperture in Wavelengths
44 dBW <= E.R.P.	8
37 dBW <= E.R.P. < 44 dBW	4
30 dBW <= E.R.P. < 37 dBW	2
E.R.P. < 30 dBW	1

Table 1.0: Minimum limits for Vertically Radiated Power

1.68. MINIMUM FIELD STRENGTH

1.69. The minimum field strengths used in planning are:

- 1) +73dB(μ V/m) for LF (150 kHz to 285 kHz)
- 2) +60dB(μ V/m) for MF (525 kHz to 1605 kHz)
- 3) +54dB(μ V/m) for band II Stereo (87.5 MHz to 108 MHz)
- 4) +48dB(μ V/m) for band II Mono (87.5 MHz to 108 MHz)

1.70. The VHF values are for 10 metres above ground level.

1.71. Protection cannot be sought for locations with a field strength below the above mentioned values.

1.72. STATION CERTIFICATION AND MAINTENANCE

1.73. Access and Personnel

Only authorised personnel shall have access to the Transmission Equipment for the purpose of adjustment or maintenance of that equipment. The Licensee shall ensure that all authorised personnel are adequately trained for the functions they are to undertake.

1.74. Examination and Testing

When the installation of equipment is complete the Licensee shall inform the Commission and seek permission for on-air testing. Permission for on air testing prior to the examination and commencement of regular service can be obtained. On-air testing shall not be carried out with real programme material but with loop-around of sample programming not lasting more than fifteen minutes. The Licensee shall then examine the station and complete a Certificate of Compliance, contained in Annex 3. This will be maintained by the Licensee. The Licensee, when ready to commence operations, shall inform the Commission of the date of commencement of operations, indicating that the station is operating in accordance with the specified conditions and characteristics of the licence.

1.75. Maintenance

The transmission installation shall be so maintained as to always comply with these conditions. The Licensee and/or the sound broadcasting contractor where appropriate

shall ensure that a suitably qualified person has the necessary technical training, knowledge and practical experience so as to be able to certify that the installation and maintenance of the station complies with these conditions. The Licensee and/or the sound broadcasting contractor where appropriate shall examine each station annually to ensure compliance and shall keep a log indicating dates and results of these examinations. In the case of sound broadcasting contracts, the BAI will audit such stations on a regular basis and will agree its approach for such audits with the Commission.

1.76. Time Limit

A maximum period of one year will be allowed from the date of amendment of a licence for an amended station to come on air and the procedures outlined in this section to be completed. If a certificate of compliance has not been forwarded to the Commission within this period the approval for the station in question may be revoked by the Commission.

1.77. ADDITIONAL AND MODIFIED ASSIGNMENTS

1.78. Requisite Information

The Licensee shall provide the Commission with all the necessary details in support of an application for an additional assignment or a modification of an existing assignment. The standard information required is contained in Annex 1.

1.79. Examination

The Licensee shall have regard, in preparation of an application for an additional or modified assignment, to other Licensees having assignments in the same frequency segment and make an examination of the compatibility of the assignments. A report of this examination shall be provided to the Commission at the time of making an application.

1.80. Field Strength Measurements

It may be necessary to supply field strength measurements in support of an application or an interference complaint. In relation to VHF, these measurements shall be supplied in accordance with the procedures outlined in Annex 2.

1.81. International Agreements

The Commission is bound by the provisions of the Radio Regulations and various Regional Radiocommunications Agreements, including but not limited to the the Geneva 1975 Agreement, the Geneva 1984 Agreement and the LEGBAC Memorandum of Understanding⁸. These agreements require the Commission to undertake certain co-ordination and registration procedures when considering additions or modifications of the assignment plan.

1.82. A minimum of three months is allowed for co-ordination. However, co-ordination of additional or modified assignments cannot be guaranteed. The Licensee shall allow adequate time in planning and provide the Commission with the relevant information to ensure compliance with these agreements.

⁸ Limited Exploratory Group on Broadcasting to Aeronautical Compatibility. Memorandum of Understanding signed at the World Administrative Radio Conference, 1992.

ANNEXES

Annex1

Information for the Addition / Modification of a sound broadcasting assignment

- 1 Frequency (MHz/kHz):
- 2 Name of Transmitting Station:
- 3 Geographic Co-ordinates:
- 4 National Grid Reference:
- 5 Altitude of Site above Sea Level (m):
- 6 Height of Antenna above Ground Level (m):
- 7 Polarization:
- 8 Total Effective Radiated Power (dBW):
- 9 Maximum Horizontal ERP (dBW):
- 10 Maximum Vertical ERP (dBW):
- 11 Directivity of Antenna (D or ND):
- 12 Map, Ordnance Survey Maps such as the "Discovery Series" or equivalent are acceptable, outlining the intended service area. The map shall outline the complete area to be served by the programme service requiring the additional or modified assignment, where appropriate.

**Standardised Procedure for Making
Field Measurements of Signals Radiated from VHF and UHF
Broadcasting Transmitters**

Location of Tests

1. The precise location of the selected test point should be noted on a map. The scale of the map should be large enough to allow a national grid reference, accurate to 100m, to be easily read.
2. A general description of the test point vicinity should be noted (i.e. urban, suburban, rural, mountains, flat etc).
3. Particular note should be made of obstructions, if any, in the vicinity that may obscure the line of sight from the selected test point to a particular transmitter.
4. The test point should be selected as far as possible, so as to minimize electrical interference from ESB power lines, heavy traffic or high-power industrial electrical apparatus.

Taking Measurements

1. **Height of Antenna above ground level (agl)**
The internationally accepted reference height, used in VHF and UHF broadcast planning, for field strength values is 10 metres agl.
2. **Horizontal separation distance of the antenna from the mast**
The antenna should be separated a suitable distance from the mast. This minimises any distortive effects on the specified antenna gain pattern which may be caused by the proximity of the mast. A separation distance of at least one quarter wavelength between the antenna and the mast is recommended.
3. **Cable Loss**
Cable loss should be taken into account
4. **Voltage Standing Wave Ratio (VSWR)**
The VSWR of the antenna should be measured, for the frequency range in question, using a VSWR meter. This is done to verify the antenna impedance is matched to that of the cable. The VSWR should be between 1.0 and 1.5.

A form to plan and record measurements has been drawn up and is contained below.

5. **Conversion Formulae**

Equations for the conversion of voltage values to electric field strength values are contained in below.

Equations for conversion of voltage values to electric field strength values :

$$E = 4 * (\Pi / \lambda) * \sqrt{((30 * V^2) / (R * G))}$$

where

E = Electric Field Strength (volts/metre)

Π = 3.14159

λ = Wavelength of transmitted signal (metres)

V = Measured Voltage Reading (volts)

R = Input Impedance (50 ohms)

G = Receiving Antenna Gain (Linear Ratio)

$$E_{dB\mu V/m} = 20 * \text{Log}_{10} E_{\mu V/m}$$

Alternatively,

$$E_{dB\mu V/m} = V_{dB\mu V} + 20 * \text{Log}_{10} (F_{MHz}) - G_{rx} + L_{dB} - 29.78$$

where

F = Frequency

L = Feeder losses

Date:

Sheet No.

MEASUREMENTS

Download (Uncorrected) Values

Antenna Details:		
Type:	Height (m):	Gain (dB):
	Polarization:	VSWR:
Cable Loss at 100 MHz (dB):	Cable Loss at 200 MHz (dB):	
Cable Loss at 600 MHz (dB):	Cable Loss at 800 MHz (dB):	
Measuring Instrument Used:		

Test Point

NGR: Description:	NGR: Description:	NGR: Description:

Transmitter Site	Description of Terrain in Transmitter Direction		
Station	Freq (MHz)	Signal Level (dBμV)	

Transmitter Site	Description of Terrain in Transmitter Direction		
Station	Freq (MHz)	Signal Level (dBμV)	

Date:

Sheet No.

Test Point

NGR: Description:	NGR: Description:	NGR: Description:
----------------------	----------------------	----------------------

Transmitter Site	Description of Terrain in Transmitter Direction			
Station	Freq (MHz)	Signal Level (dB μ V)		

Transmitter Site	Description of Terrain in Transmitter Direction			
Station	Freq (MHz)	Signal Level (dB μ V)		

Transmitter Site	Description of Terrain in Transmitter Direction			
Station	Freq (MHz)	Signal Level (dB μ V)		

Certificate of Compliance

Programme Service Name _____

Name of Transmitter site _____

Transmitter Site National Grid Reference _____

Frequency (MHz/kHz) _____

On-Air date _____

Transmitter:

Operating Output RF Power of transmitter

FM sound carrier unmodulated carrier _____

AM sound carrier unmodulated carrier _____

Vision Carrier peak envelope power _____

Measured Frequency of transmitter

AM or FM Sound Carrier _____

Vision Carrier _____

Measured Frequency Deviation at 100 % Modulation _____

(FM sound carrier only)

Measured Maximum Bandwidth of Transmission _____

Measured Maximum Spurious Emission Level _____

Height of Antenna (above ground level) _____

Polarization _____

Aperture of Antenna in Wavelengths _____

Maximum Gain of Antenna _____

Azimuth of preferred Orientation (if N.D.) _____

Azimuth of Maximum Gain (if D) _____

Feeder, Transformer / Harness Loss (dB) _____

Describe any filtering or isolation equipment fitted between the Transmitter output and the Antenna system

I hereby certify that this station complies with the licence characteristics and conditions as issued by the Commission for Communications Regulation.

Signed _____
on behalf of _____

Date _____

RDS Features

Programme Identification (PI) Code (Hexadecimal)

Programme Service Name

Basic Features

--

Group Types OA/OB, 15B, 14A/14B, 1A/1B and 4A

including

Traffic Programme

Traffic Announcement,

Clock Time

Program Type

Music/Speech,

Decoder Information

Alternative Frequencies

Programme Item Number

Enhanced Other Networks

Alternative Frequencies	
Transmitter Site	Frequency

Enhanced Other Networks by PI Hexadecimal Code

Additional Features

Radio Text

*

Group Type 2A/2B

Transparent Data Channel

*

Group Type 5A//5B

In-House

*

Group Type 6A/6B

Radio Paging

*

Group Type 7A

Traffic Message Channel

*

Group Type 8A

* = authorised / not authorised

I hereby certify that this station complies with the licence characteristics and conditions as issued by the Commission for Communications Regulation.

Signed _____
on behalf of _____

Date _____