



Home Office

**Radio Frequency & Communications Planning Unit
Strategic Planning Group 1**

**TYPE APPROVAL
TECHNICAL
SPECIFICATION: MG 41
Issue 1.45**

Performance & Regulatory standards for Radio
Telemetry System for use by the Fire Service in
the 862-863 MHz band

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Radio Telemetry System for use by the Fire Service
in the 862 - 863 MHz band**

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FOREWORD

- a) It is a requirement of the 1949 Wireless Telegraphy Act, that all use of radio should be covered by a licence unless it has been made exempt. (Exempt services are mainly those in the low power area where use of the devices is unlikely to cause interference to other radio users.) All radio equipment, including that which is exempt from licensing, must meet certain minimum standards of performance and be type approved to an appropriate specification.
- b) The Home Office sets its own standards of performance for equipment to operate in the frequency bands that it manages. Currently these standards are based where possible upon the appropriate national "MPT" or European "ETSI" specifications. Where there are no such relevant documents, the Home Office publishes its own specifications. These set out the cardinal points to which equipment must comply before it is considered for licensing.
- c) The licensing arrangements for the Police, Fire & Home Office Departmental Services are under the control of the Home Office, and authority is delegated to the Radio Frequency & Communications Planning Unit (RFCPU). It is a condition of licensing that radio equipment operated in Home Office managed frequency bands must be of a type approved by the RFCPU.
- d) Type approval by the RFCPU does not indicate that the equipment will necessarily be licensed for a particular application within the Home Office frequency allocations, neither does it imply that the equipment may be operated in any other frequency bands without the prior approval of the relevant band managers.
- e) Type approval by the RFCPU is not intended to provide an endorsement or recommendation of particular equipment for operational use.
- f) Where equipment has not previously been approved by the RFCPU it may be necessary for it to be type tested by a recognised test house, acceptable to RFCPU and currently accredited by the Radiocommunications Agency.
- g) The tests should be performed against an agreed specification; the test report submitted to RFCPU for consideration and if satisfied, issue of a numbered Home Office type approval certificate to the applicant. Costs associated with the tests, including equipment and labour, will not normally be met by the Home Office.
- h) It should be noted that the above requirements will override the RT&TE directive on its inception in year 2000.

For further information write to: -

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Attention: Type Approval Liaison Officer

1. INTRODUCTION

1.1. Related Documents

This document is to be read in conjunction with the documents below which describe the agreed User Requirement and the Common Air and serial interface standard. It should be noted that equipment must satisfy the requirements of these documents in addition to complying with the radio type approval specification.

1.1.1. Fire Service User requirement, JCDD 40 Issue 2

1.1.2. At-Incident Telemetry Common Air Interface Document MG 41A Issue 1.4.

1.2. Scope

This specification defines the performance and radio regulatory standards required of a Radio Telemetry System for use by the fire service. The equipment may be operated by Home Office sponsored services on specially designated radio channels within the frequency bands managed by the Home Office in England, Wales, Northern Ireland, Channel Islands & Isle of Man.

The system will be designed to conform with JCDD 40 Issue 2, the Fire Service User Requirement for Telemetry at Incidents and its associated common air interface protocol. (MG 41A issue 1.4.)

References are made within this specification to the ETSI performance specification I-ETS 300 220-1 (1993) for regulatory purposes relating to the transmitter and EN 300 220-2 v1.2.1 (1997-08) which relates to supplementary parameters for the receiver. Electromagnetic compatibility and spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW.

1.3. Licensee's responsibility

The installation and use of radio equipment, either fixed, mobile or handportable, is subject to the issue of a licence granted by the Secretary of State. Under the conditions of the licence it will be the responsibility of the licensee to ensure that the equipment provided conforms with and is maintained to, the requirement of this specification.

Subsequent modification of licensed radio equipment will require assessment by RFCPU and possible further type testing before consideration will be given to licensing of the radio equipment in its modified form.

Separate additional approval is required from The Civil Aviation Authority (CAA) for radio equipment used in aircraft.

1.4. Operating frequencies

The radio equipment shall provide for operation on one or more carrier frequencies allocated within the Home Office managed frequency bands for use by Home Office sponsored services in England, Wales, Northern Ireland, Channel Islands & Isle of Man. The precise operating frequencies shall be quoted by the Secretary of State when the license is issued. For the purpose of type testing the equipment may be supplied on a mutually agreed channel within one of the designated frequency bands.

2. EVIDENCE OF COMPLIANCE TO BE SUBMITTED

- 2.1. Manufacturers or suppliers are required to submit samples of their equipment to a recognised test house, acceptable to RFCPU for type testing of radio equipment to this specification MG 41. On receipt of written evidence from the test house that the equipment is compliant, RFCPU will consider granting equipment type approval for use in Home Office managed frequency bands.
- 2.2. Alternatively, where the manufacturer has already received type approval from the Radio Communications Agency (RA) for use of the equipment in the civil frequency bands, consideration will be given to granting additional type approval for use in Home Office managed frequency bands, providing that written evidence is submitted showing that the equipment is compliant with the requirements of type approval technical specification MG-41.
- 2.3. This evidence should be in the form of a report completed by a recognised test house, acceptable to RFCPU for type testing of radio equipment or exceptionally, by prior agreement with RFCPU: -
- 2.4. RFCPU will accept evidence of type approval from any of the test houses currently accredited by the Radio Communications Agency.

3. GENERAL

- 3.1 References are made within this specification (MG-41) to the European Telecommunication Standard Specification ETS 300 220 as described above in 1.2
- 3.2 It is intended that in general ETS 300 220 is used as a guide to measurement method. Certain aspects of the specification are superseded by this specification MG41 and these are defined below.
- 3.3 If integral antennas are normally used on the equipment supplied, then two models are to be submitted for type approval testing; the first of which retains the integral antenna; the second having a temporary 50 ohm coaxial connector. The purpose of the second model is in order to undertake as many of the tests related to transmitter and receiver performance by conducted methods as possible. ETS 300 220-1, para. 4.1.12.2 refers.

3.3 Test conditions, power sources and ambient temperatures

Equipment will be tested to the conditions specified in ETS 300-220 excepting for the range of temperatures over extreme test conditions ETS 300-220 para. 5.4.1.2.

The revised temperature ranges are for:

Base equipment	-15 to 55°C
Portable equipment	-15 to 75°C

- 3.4 Operating frequencies The equipment shall provide for operation on any of the simplex channels allocated within the Home Office managed 862.000 to 863.000 MHz frequency band. The operating frequencies will be advised within the license.
- 3.5 Channel spacing The channel spacing within this band is 25 kHz. However to improve spectral efficiency frequency allocations are sometimes made at 12.5 kHz intervals and the datum for channel centres may be offset by 12.5 kHz.
- 3.6 Transmitter output

The maximum Effective Radiated Power (ERP) from the equipment is a condition of the user's licence. The maximum licensed ERP normally permitted within this frequency band is 1 watt.

- 3.7 Transmitter modulation Angle modulation to ITU designation 2SK0F1D.
- 3.8 Signalling standard The radio signalling and data transmission system shall comply with Home Office requirements for:

"A COMMON AIR INTERFACE DATA SIGNALLING
PROTOCOL FOR AT-INCIDENT TELEMETRY SYSTEMS
MG41A"

4. TRANSMITTER PERFORMANCE

Only the following parameters are required to be complied with. Section references are those in I-ETS 300 220-1

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|-----|------------------------------------|--|
| 4.1 | Frequency error | Measurements and limits to conform with section 8.1. Error limits for 25 kHz frequency separation (portable equipment) as defined in table 7 shall apply. To be measured at extremes of temperature range. |
| 4.2 | Effective radiated power | Measurement to conform with section 8.3. at ambient temperature only. This test is to be correlated with a test of the conducted power from the model with temporary 50-ohm connector such that conducted tests may be referenced accordingly.

Limit within 8.3.3. is revised to 1 watt. |
| 4.3 | Adjacent channel power | Measurements and limits to conform with section 8.5. but using conducted methods only. |
| 4.4 | Spurious emissions | Measurements and limits to conform with section 8.7. and are to be undertaken at ambient temperatures only. |
| 4.5 | Receiver spurious radiation | Measurements and limits to conform to section 9.1 and are to be measured only at ambient temperatures. |

5. RECEIVER PERFORMANCE

Only the following parameters are required to be complied with. Section references are those in ETS 300-220-2 Section 4:1.1. definition refers to a message acceptance ratio of 80%. This is to be eased to 50% and applies to all receiver performance tests where it is necessary to measure results over a number of readings.

5.1 Receiver maximum usable sensitivity

Measurements to section 4.1 and are to be measured only at ambient temperatures. The limit for receiver maximum usable sensitivity is 2 μ V PD (-101 dBm)

5.2 Adjacent channel selectivity

Measurements to section 4.4 and are to be measured only at ambient temperatures. The limit for adjacent channel selectivity is 50 dB

5.3 Spurious responses

Measurements and limits to section 4.5 and are to be measured only at ambient temperatures. section 4.5.2. refers to a recommended limit of 70 dB. The limit for spurious responses more than one channel removed from the nominal frequency is 60 dB.

5.4 Blocking or desensitisation

Measurements and limits to section 4.7 and are to be measured only at ambient temperatures.

END OF SPECIFICATION