

# Analogue Radio Technical Code

## Summary of proposed changes

This document provides a summary of the proposed changes to the Analogue Radio Technical Code. For a detailed outline of the background and reasoning for these proposed changes, see the Analogue Radio Technical Code Consultation.

Existing Document	Proposed New Document
<p>Title</p> <p><b>Ofcom Site Engineering Code for Analogue Broadcast Transmission Systems</b></p>	<p>Title</p> <p><b>Analogue Radio Technical Code</b></p>
	<p>Addition of numbered sections and paragraphs throughout. The addition of the introduction as a numbered section within the code has incremented the section numbering.</p>
<p><b>Introduction</b></p>	<p><b>1. Introduction</b></p> <p>The wording has been unchanged except for the addition of the words “Analogue Radio Technical” ahead of “Code” in the first sentence.</p> <p>“Other responsibilities” has been moved into this section and wording has been made consistent with that included in the Digital Radio Technical Code.</p>
<p><b>1. Scope, Tests and Inspections</b></p>	<p><b>2. Tests and Inspections</b></p>
<p><b>1.1 Scope of Code</b></p>	<p>The purely descriptive paragraph dealing with Scope has been removed for clarity</p>

Existing Document	Proposed New Document
<p><b>1.2 Other responsibilities</b></p>	<p><b>1.1 Other Responsibilities.</b> Moved to Introduction section and relabeled. Explicit references to general requirements that sit outside Ofcom’s direct regulatory locus such as compliance with current Health and Safety at Work legislation or legal liabilities relating to use of land or buildings have been removed.</p> <p>References to CE marking have been removed.</p> <p>Reference to Electromagnetic fields has been removed and is now dealt with in Section 5.</p>

### **1.3 Commissioning Tests and subsequent modifications**

The option for licensee to request that Ofcom carries out transmitter commissioning or acceptance tests has been removed to make practice consistent with that for Digital Radio.

*All transmission systems, other than those used by RSLs, require to be tested for compliance with this Code and associated WT. and B. Act licence conditions prior to coming into service, and to have permission granted by Ofcom to continue transmissions. If the licensee wishes these tests to be performed by Ofcom then they must book attendance at least 20 working days in advance of the desired commissioning date. If their system fails Ofcom compliance testing for reasons that might reasonably have been anticipated, and which cannot be rectified whilst Ofcom engineers are in attendance, Ofcom will postpone the tests and authority to transmit, until they can next attend site, and may charge the licensee for any additional visits.*

*Alternatively, licensees may opt to carry out their own commissioning tests or contract these out to a third party. They must advise Ofcom of this course of action at least 20 working days in advance of their intended commissioning date. Ofcom would then require documentary or electronic evidence of compliance within 5 working days of commissioning. If not forthcoming, or the results are not satisfactory, the transmitter in question will be required to be switched off and permission to transmit withheld until satisfactory evidence of compliance has been received and assessed.*

*Commissioning tests will be to ensure compliance with this specification and to ascertain that the stability of the equipment is such that the requirements therein should continue to be satisfied thereafter. Reference*

### **Commissioning Tests and subsequent modifications**

*2.1 All transmission systems, other than those used by Restricted Service Licences issued for the purpose of serving an event, require to be tested for compliance with this Code and associated Wireless Telegraphy and Broadcasting Act licence conditions.*

*2.2 Tests will need to be carried out by or on behalf of the licensee before it is permitted to transmit to air from any given transmitter. The licensee must hold a suitable Wireless Telegraphy Act licence for any on-air tests to be carried out. The test results and associated evidence of compliance with licence conditions must be provided to Ofcom within five working days of the transmitter coming on-air, and should provide a reasonable confidence level that transmissions will remain compliant after commissioning.*

*2.3 Ofcom reserves the right to conduct its own tests on-site before giving permission to transmit, or at any time thereafter. If such tests are deemed by Ofcom to be necessary because of inadequacies or ambiguities in the evidence supplied by the licensee, then a fee will be payable to Ofcom at its sole discretion.*

New paragraph:

*2.6 Ofcom will normally communicate with the licensee's prime contact as notified to us. We will deal with delegated contractors or other parties working on the licensee's behalf, although will copy any communication that Ofcom has with those parties to the licensee's prime contact. It is therefore important that licensees ensure Ofcom is notified of any changes to the licensee's prime contact details by sending any updates to [broadcast.licensing@ofcom.org.uk](mailto:broadcast.licensing@ofcom.org.uk)*

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<p><i>measurements taken will assist in the subsequent assessment of compliance.</i></p> <p><i>Ofcom strongly advises licensees to ensure that, subsequent to permission being granted to transmit, test transmissions are made over a period of at least 2 weeks in advance of the on-air date, in order to facilitate identification and resolution of possible</i></p>	<p>Other section wording remains the same, other than to include “<i>or adjustment</i>” in the sentence “<i>No change or adjustment to the transmitter, RF distribution system or aerals...</i>”.</p> <p>Also, an email contact address has been added to which licensees can advise Ofcom of changes to their transmission system</p>
<p><b>1.4 Documentation</b></p>	<p><b>Documentation</b></p> <p>The wording in this sub-section is largely unchanged other than some minor simplification and to change the word “commissioning” to “acceptance”</p>
<p><b>1.5 Inspections and Monitoring</b></p>	<p><b>Inspections and monitoring</b></p> <p>Wording in this section is unchanged</p>
<p><b>2. Characteristics and Limits of Transmission: (VHF: 87.5 – 108 MHz): frequency modulation</b></p>	<p><b>3. Characteristics and Limits of Transmission for FM radio services (87.5 – 108 MHz)</b></p>
<p><b>2.1 Transmission standard</b></p> <p><i>Transmissions must be compliant with ITU-R Recommendation 450-3</i></p>	<p><b>Transmission standard</b></p> <p>References to ITU-R recommendation 450-3 have been updated to ITU-R Recommendation BS.450-4</p>
<p><b>2.2 Spectral Occupancy</b></p> <p><i>ITU-R Recommendation 412-7 makes certain assumptions concerning the level of modulating signal power and peak deviation levels, in defining protection levels intended for use in FM Sound Broadcasting</i></p>	<p><b>Spectral occupancy</b></p> <p>Reference to ITU-R Recommendation 412-7 has been updated to ITU-R Recommendation BS.412-9</p>
<p><b>2.3 Spurious and Harmonic Emissions</b></p>	<p><b>Spurious and harmonic emissions</b></p> <p>Emissions limits have been moved to tabular form to improve clarity. There have been no changes to any of the levels that apply. We have slightly edited the wording of the final two paragraphs to improve clarity.</p>

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<p><b>2.4 Antenna design</b></p> <p><i>Although these assumptions are increasingly at odds with current usage, it is not possible to modify aeronautical databases and analysis software to account for every antenna design, so Ofcom has sought to provide a workable interpretation of compliance, as follows</i></p>	<p><b>Antenna design</b></p> <p><i>3.12 Ofcom will interpret licensees' compliance as follows</i></p>
<p><b>2.5 Field Strengths close to the Transmitter Site</b></p> <p><i>"...causes unacceptable interference to reception of a Band II frequency within its protected service area"</i></p>	<p><b>Field strengths close to the transmitter site</b></p> <p><i>"...causes unacceptable interference to reception of a Band II frequency within its licensed area"</i></p>
<p><b>2.6 Efficient Implementation of Cleared Transmission Parameters</b></p>	<p><b><i>Transmission parameter implementation and resilience</i></b></p> <p><i>New paragraphs added regarding resilience:</i></p> <p><i>3.20 It is important that licensees pay attention to the infrastructure they deploy to provide their service, and have in place plans for dealing with equipment breakdowns or failures of other infrastructure, so as to avoid prolonged loss of service.</i></p> <p><i>3.21 Licensees should consider the technical resilience of their service, and to have in place service continuity plans that are proportionate to the service they are providing.</i></p> <p><i>3.22 Licensees will not be required to report on their plans or show how they test implementation of those plans, although Ofcom may ask for details and evidence in the course of any investigation that may follow a prolonged failure.</i></p>
<p><b>2.7 Transmitter Carrier Frequency</b></p>	<p><b>Transmitter carrier frequency</b></p> <p>There are no changes to the wording of this sub-section other than to expand the abbreviation "WT" to "Wireless Telegraphy".</p>
<p><b>2.8 Programme material</b></p>	<p><b>Programme material</b></p> <p>There are no changes to this sub-section</p>

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<p><b>2.9 Supplementary Signals (RDS, Additional Services and Control/Monitoring Functions)</b></p> <p><i>No supplementary subcarrier systems other than those conforming to the RDS specification IEC 62106 are currently permitted</i></p> <p><i>The allocation of PI codes and control of certain other RDS features are of necessity made centrally by Ofcom, in co-operation with the BBC.</i></p> <p><i>Ofcom may, in due course, review the possibility of permitting other subcarrier systems also to be transmitted. This will require the definition of conditions which are adequate to secure protection from interference to adjacent and second-adjacent services. The provisions of ITU-R Rec. 450-3 in this respect may not of themselves provide adequate protection in all cases.</i></p>	<p><b>Supplementary Signals (RDS, Additional Services and Control/Monitoring Functions)</b></p> <p><i>3.28 No supplementary subcarrier systems other than those conforming to the RDS specification IEC 62106 are permitted</i></p> <p><i>The allocation of PI codes and control of certain other RDS features are of necessity made centrally by Ofcom, in co-operation with the broadcasters.</i></p> <p>Paragraph removed</p>
<p><b>3. Characteristics and Limits of Transmission: (MF: 531 kHz to 1602 kHz): amplitude modulation</b></p>	<p><b>4. Characteristics and Limits of Transmission for AM radio services (531 - 1602 kHz)</b></p>
<p><b>3.1 Transmission Standard</b></p>	<p><b>Transmission standard</b></p> <p>No changes to this sub-section other than to spell out “EMRP” in full as “Effective Monopole Radiated Power”</p>
<p><b>3.2 Spectral Occupancy</b></p>	<p><b>Spectral occupancy</b></p> <p>New paragraph:</p> <p><i>4.5 Exceptions to the above limits may be agreed with Ofcom on a case-by-case basis.</i></p>
<p><b>3.3 Spurious and Harmonic Emissions</b></p>	<p><b>Spurious and harmonic emissions</b></p> <p>No changes to the wording of this sub-section other than to expand the abbreviation “WT” to “Wireless Telegraphy”</p>

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<p><b>3.4 Transmitter Carrier Frequency</b></p>	<p><b>Transmitter Carrier Frequency</b></p> <p>No changes to the wording of this sub-section other than to expand the abbreviation “WT” to “Wireless Telegraphy”</p>
<p><b>3.5 Programme Material</b></p> <p><i>Unless otherwise specified in the licence, programme material shall comprise analogue audio signals confined to the nominal frequency range (-3dB) 0 to 6 kHz. The transmission of data signals, or any encrypted signals, is not permitted, other than may be detailed in Part II of the Annex to the B. Act Licence</i></p>	<p><b>Programme material</b></p> <p><i>4.9 Unless otherwise specified in the license, programme material shall comprise analogue audio signals confined to the nominal frequency range (-Ofcom may on a case-by-case basis consider proposals from licensees to operate transmitters with audio signals that have a wider audio bandwidth. Should any such proposal be agree agreed by Ofcom, the amended parameters will be recorded in the relevant Wireless Telegraphy Act licence.</i></p> <p><i>4.10 The transmission of data signals, or any encrypted signals, is not permitted, other than may be detailed in Part II of the Annex to the Broadcasting Act Licence</i></p>
<p><b>3.6 Supplementary Signals</b></p>	<p><b>Supplementary signals</b></p> <p>There is no change to the wording of this sub-section.</p>
<p><b>4. Transmitter equipment</b></p>	<p><b>5. Transmitter equipment</b></p>
<p><b>4.1 Access to Adjustments</b></p>	<p><b>Access to controls and adjustments</b></p> <p>No changes to the wording of this sub-section other than to expand the abbreviation “WT” to “Wireless Telegraphy”</p>
<p><b>4.2 Metering and Monitoring</b></p> <p>The transmitter must incorporate a suitable meter indicating, or uniquely related to, the RF output power. Also, for all VHF transmitters other than those used for RSLs, a calibrated bi-directional monitor point must be provided, presented as a fixed BNC or N Type coaxial 50Ω connector, fed via a suitable coupling mechanism from the transmitter RF output, downstream of all filters and combiners.</p>	<p><b>Metering and monitoring</b></p> <p>5.2 The transmitter must incorporate a suitable meter indicating, or uniquely related to, the RF output power. Also, for all Band II transmitters whose output is combined with other services to feed a common antenna system, a calibrated bi-directional monitor point must be provided, presented as a fixed BNC or N Type coaxial 50 Ω connector, fed via a suitable coupling mechanism from the transmitter RF output, downstream of all filters and combiners.</p>

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<p><b>4.3 Feeder Arrangements and Performance</b></p> <p><i>In the case of MF transmissions, the transmitter should be capable of meeting the requirements of this Code and of the licence, when transmitting into an aerial whose return loss is <math>\geq 20\text{dB}</math> at the carrier frequency, and <math>\geq 10\text{dB}</math> at <math>\pm 6\text{ kHz}</math> from the carrier frequency.</i></p>	<p><b>Feeder Arrangements and Performance</b></p> <p>Paragraph removed</p>
<p><b>4.4 Environmental and Reliability Requirements</b></p> <p><i>Compliance with the above requirements must be achieved over all the ranges of ambient temperature and relative humidity to which the equipment is likely to be exposed.</i></p> <p><i>Such compliance should also apply to variations in the range +6% to -10% of the nominal value of the power supply, these being the limits permitted for either the mains or locally sourced supplies.</i></p> <p><i>These requirements are included to give reasonable confidence that commissioning checks will adequately cover a range of circumstances external to the equipment itself.</i></p> <p><i>The licensee should apply sound engineering practice throughout, including that: i) The transmitter should be designed such that it will not suffer damage when operated continuously with the RF output connector either open or short-circuited. ii) Precautions should be taken to prevent switching or commutation spikes from being radiated or superimposed upon the incoming supply. iii) Sufficient space should be provided adjacent to transmission equipment (under cover) for location of the test equipment required to prove compliance with this code of practice</i></p>	<p><b>Environmental and Reliability Requirements</b></p> <p><i>5.7 Compliance with the above requirements must be achieved over all the ranges of ambient temperature and relative humidity to which the equipment is likely to be exposed.</i></p>

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N/A	<p>New heading: <b>Electromagnetic fields</b></p> <p><i>5.8 All transmitter equipment operating at powers above 10 watts EIRP (effective isotropic radiated power) must – as a condition of the service’s Wireless Telegraphy Act licence – comply with international guidelines on electromagnetic field (EMF) emissions for the protection of the general public. These guidelines have been issued by ICNIRP (the International Commission on Non-Ionizing Radiation Protection). More guidance on EMF requirements is available on the Ofcom website at <a href="https://www.ofcom.org.uk/manage-your-licence/emf">https://www.ofcom.org.uk/manage-your-licence/emf</a>.</i></p>