Performance Specification for Audible Equipment for use at Pedestrian Crossings
TR 2509 A

PERFORMANCE SPECIFICATION FOR AUDIBLE EQUIPMENT FOR USE AT PEDESTRIAN CROSSINGS

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INTRODUCTION

1.1 This specification covers the essential requirements for Audible Equipment for use at signalised crossings on public highways.

1.2 This specification supersedes TR 0155 B from the date of issue and the approval process described therein.

1.3 As a statutory requirement equipment manufactured according to this specification must be approved before its use is permitted on the public highway.

1.4 Statutory Approval (Approval) shall be in accordance with the requirements for Self-Certification set out in TRG 0600.

1.5 Within this specification, “The Product” shall mean all components necessary to provide a complete operational system meeting the requirements of this specification and the Common Requirements defined in TRG 0600.

1.6 Guidance to potential users of this Product is given in Appendix A.

Implementation

1.7 This specification will be immediately implemented from the date of issue for all new approvals.

1.8 Equipment Approvals for this product issued under the previous procedures defined in TRG 0500 will remain valid and no retrospective action will be required providing the build state of that equipment remains unmodified.

Glossary of Terms

1.9 A comprehensive glossary of terms is given in Highways Agency document TA 84 Code of Practice for Traffic Control and Information Systems for All-Purpose Roads.
2 FUNCTIONAL REQUIREMENTS

General

2.1 The Product provides an indication to visually impaired pedestrians, at signal controlled pedestrian crossing facilities, the period during which they may use the crossing.

2.2 There are two types of audible products. The ‘single bleep’ version is for installations at single carriageway crossing sites and the ‘bleep and sweep version is specifically for use at ‘staggered’ crossing facilities.

2.3 The Product consists of an audio transducer, and control unit.

Performance

2.4 The Product shall emit an audible signal when a steady green pedestrian signal is being displayed and the signal controller’s audible/tactile drive output is present.

Output Sound Single Bleep

2.5 The fundamental frequency of the tone shall be between 2.0 kHz and 3.5 kHz, which is pulsed at 240 pulses per minute ± 60 pulses per minute with a mark space ratio of 1.5:1 ± 10%.

2.6 The output volume level shall be constant for the duration of the sounding period.

2.7 The Product shall provide a means to preset the intensity of the sound to between 47 and 83 dB(A).

Output Sound Bleep and Sweep

2.8 The audible signal output shall commence with a pulsed tone of constant frequency followed by a continuous cycle of constant tone and swept frequency tone.

2.9 Both tones shall be derived from a nominal square waveform of 50:50 mark-space ratio of ± 2.5% and frequency tolerance of ± 2.5%.

2.10 The frequency of sound emitted by the Audible Unit shall be:

i) Constant Tone - 1 kHz pulsed at 5.0 Hz with 50/50 mark, space ratio ± 2.5%. The duration of this tone shall be 0.8 seconds ± 2.5%.

ii) Swept Tone - 1.0 kHz rising either linearly or exponentially to 2.5 kHz. The duration of this swept Tone shall be 0.8 seconds ± 2.5%.

2.11 The level of the Swept Tone shall not exceed ±5 dB(A) (electrical power) or ±5 dB(A) (Acoustic) relative to the Constant Tone.

2.12 Means shall be provided to enable an adjustment to be made to the output volume level at site.

2.13 The range of adjustment shall be 0 dB(A) to +12 dB(A).

2.14 The output volume level shall be within ± 3 dB (A) of the Running Average Level used to fix the output level plus the Output Signal Level Control setting.
2.15 The output volume level shall be within the limits 47 dB(A) to 83 dB(A) plus the output volume level control setting.

2.16 The signal to noise ratio shall be greater than 10 dB.

**Ambient Sound Sampling**

2.17 This applies to the 'bleep and sweep' output sound and is optional for the single bleep unit.

2.18 The Product shall be capable of continuously sampling the ambient sound at the kerbside waiting area and automatically setting the sound output level to a predetermined value above the sampled average.

2.19 The running Average shall be a function of the ‘A’ weighted indication of the ambient sound level, in accordance with Table 2.1 and shall be obtained using a 2 second ± 0.5 second time constant where the attack and decay times are equal.

2.20 The Ambient Sound Level Sampling shall be capable of indicating ‘A’ weighted Average levels of between 50 dB(A) and 80 dB(A).

**Sensitivity**

2.21 For a fixed 80 dB (A) 1 kHz source, located 1m away from, and perpendicular to the axis, the input transducer shall have a response characteristic of 77 ± 3 dB(A).

**Output Sound Level**

2.22 At a distance of 1m from the perpendicular to the axis, the output sound level shall be 76 ± 4 dB(A) over 360° for a fixed 1 kHz 80 dB(A) output.

**Construction**

2.23 The enclosure housing the Product’s unit’s electronic circuitry shall be constructed to withstand the effects of the environment in which it is intended to operate.

**Degrees of protection provided by enclosures (IP Code)**

2.24 The Product housing located within the signal head shall be to BS EN 60529 IP 55.

2.25 The input and output transducers shall be to BS EN 60529 IP 55.

**Electrical Requirements**

2.26 The supply for the Product shall be the ‘normal’ and ‘dimmed’ signal aspect voltage range.

2.27 The signal controller’s audible/tactile derive supply shall be as defined in TR 2523.

2.28 “All wiring, termination, earthing and labelling shall be in accordance with BS 7671.

2.29 Where the Product is intended for installation within the Pedestrian Push Button box it should be noted that no voltage in excess of Extra Low Voltage supply shall be permitted in the Pedestrian push button box.

**Reliability**

2.30 The Product shall be designed and manufactured to deliver an MTBF prediction figure of 12000 hours or greater, continuous operation.
<table>
<thead>
<tr>
<th>Nominal Frequency (Hz)</th>
<th>A Weighting (dB)</th>
<th>Tolerance (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>-10.9</td>
<td>+2 - infinity</td>
</tr>
<tr>
<td>250</td>
<td>-8.6</td>
<td>+2 - infinity</td>
</tr>
<tr>
<td>315</td>
<td>-6.6</td>
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<td>500</td>
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<tr>
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<td>±5</td>
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<tr>
<td>&gt;4000</td>
<td>0</td>
<td>+6 - infinity</td>
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</tbody>
</table>

Table 2.1 A-Weighting
(Bleep & Sweep Only)
Reference sound pressure level: 1kHz at 0dB attenuation
3 NORMATIVE REFERENCES

General

3.1 Where undated references are listed, the latest edition of the publication applies.

British Standards

3.2 The British Standards Institution, London, publishes British Standards.

Contact: +44 (0) 1344 404 429

BS 7671 Requirements for Electrical Installations
BS 7987 Road Traffic Signal Systems
BS EN 50293 Electromagnetic Compatibility – Road Traffic Signal Systems Product Standard
BS EN 60529 Specification for degrees of protection provided by enclosures (IP Code).

Specifications

3.3 Specifications are published by the Highways Agency.

Contact: +44 (0) 117 372 8300

Email: tss_plans_registry@highways.gsi.gov.uk.

WEB address: www.tssplansregistry.org.

TRG 0600 Self-Certification Procedures for Statutory Approval of Traffic Signal Control Equipment
TR 2500 Specification for Traffic Signal Controller
TR 2523 Traffic Control Equipment Interfacing Specification
TR 2130 Environmental Tests for Motorway Communications Equipment and Portable and Permanent Traffic Control Equipment

Other Publications.

TSRGD Traffic Signs Regulations and General Directions
ZPPRGD The Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions.
TAL 4/91 Audible and Tactile Signals at Pelican Crossings
TAL 5/91 Audible and Tactile Signals at Signal Controlled Crossings
HISTORY

TR 0155 Issue B August 2001
TR 2509 Issue A July 2005

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APPENDIX A  INFORMATIVE GUIDE

General

A1 This Appendix is an informative guide to Systems Integrators and Highways Authorities who wish to purchase / hire and use Audible Equipment that has been declared conformant to this specification. Prospective purchasers/hirers should ensure that the procurement contract address the following issues.

A2 The procurement contract should specify that the enclosure housing the Product's electronic circuitry is constructed of materials that will withstand the rigours of the environment in which it is intended to operate.

A3 The procurement contract should specify that the enclosure is capable of being installed within any signal head of an approved type.

A4 The procurement contract should specify that the sound output transducer and microphone are of weatherproof construction capable of mounting externally to the signal head.

A5 The procurement contract should specify that the microphone is capable of being securely mounted to the base of the signal head and shielded to reduce the effects of vibration and wind noise.

Connections

A6 The procurement contract should specify that the connections to the Product be such that the unit is easily removed from its installed position.

Earthing

A7 The procurement contract should specify that all external metal parts of the audible signal, are bonded together and connected to earth.

Marking and Labelling

A8 The procurement contract should specify that all connections are clearly identified and that a label is fitted which displays the following:

i) The unique product identifier and serial number;

ii) The HA Specification and associated Appendix against which it has been declared compliant;

iii) The electrical supply requirements of the Product.