



INSTITUTION OF RAILWAY SIGNAL ENGINEERS  
MINOR RAILWAYS SECTION  
GUIDELINE  
ON  
**THE BASICS OF OPERATIONAL  
TELEPHONE SYSTEMS FOR  
MINOR RAILWAYS**

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Anyone who wishes to contribute additional items; or correct / amend any of the entries; or wants further information may contact the IRSE Minor Railways Section Document Co-ordinator at [mrdc@irse.org](mailto:mrdc@irse.org) or via the IRSE Headquarters.

Any railway seeking to follow the guidelines in this document should ensure that it is suitable for their particular railway concern. Duty holders are reminded that they must be satisfied that they are doing all that is needed under health and safety duties to control risks. Compliance with this guideline issued by the IRSE is not mandatory as it provides advice on how an issue may be addressed.

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## 1 INTRODUCTION

This document provides information on the equipment and systems of operational telephone systems on minor railways. .

This document does not include the provision or operation of general or administrative telephone systems and references to regional variations on how to achieve the end product have not been included.

Reference is made in this document to various documents intended for application to mainline railways. This is made to aid the understanding of the subject, the background technical requirements or specification for the system. Although these documents may detail practices that are mandatory on the main line, their application to minor railways is a matter requiring judgment and documented risk analysis.

Where necessary mandatory issues are specifically identified.

It is not intended to be a definitive document on how to design, install, test and maintain operational telecommunications but to disseminate information on best practice.

The IRSE Minor Railways Section has used its best endeavours to ensure that the contents of this document are factually and technically correct and is suitable for its stated purpose but the IRSE Minor Railways Section cannot be liable for any subsequent use to which the document may be put.

## 2 DEFINITIONS

The following is a list of the definitions particular to this document, for a fuller description please see the Glossary document.

In this document terms relating to gender equally apply to the opposite.

AHBC	Automatic Half Barrier Crossing
Box to Box Circuit	Direct Line running from one signal box to the next. The term may have described an omnibus circuit calling in at each signal box along a line of route.
CB	Central Battery CB Line – A telephone line where the power for the telephone is fed from the central equipment and the normal method of calling is by applying a telephone loop across the line. CB Telephone – Generally a telephone without a dial as used for signal post telephones.
Commissioning	The process of bringing into service including testing and hand over of a product or system.
Concentrator	A telephone switchboard, keyboard or key and lamp unit, allowing the operator to answer or make a call on any one of a number of incoming telephone lines, subject where necessary, to the safety provisions described in the text below.
Controlled Level Crossing	A level crossing protected by signals or stop boards where the passage of each train is the subject of specific action by a signaller, crossing keeper or train crew.
Designated Stopping Point	A position indicated by a notice, stop board, limit of shunt or other marker board.
Direct Line	A telephone that only connects the user to one pre-determined location.
DfT	Department for Transport
Dry Loop	A circuit, with no flow of direct current.
DTMF	Dual Tone Multi Frequency – A term for push button telephone dialling method or “Touch-tone” (an AT&T trademark), by using two out of five tones.

Hot Line	A telephony feature that provides a direct connection through a public or private automatic telephone system, initiated by lifting the handset, to a pre-determined destination without dialling.
Identification Label	Any sign or label fixed to the outside of a telephone, to help locate the telephone and indicate its function.
Information Label	A label usually fitted to an internal surface of a telephone housing, providing essential information to the user.
Is (are) required	Used to indicate choices where firmer guidance might be indicated.
Lineside Telephone	Any fixed telephone installed on or about the railway and used for day-to-day running of the railway.
Magneto	Magneto signalling; A simple low frequency ac ringing supply originally 16 $\frac{2}{3}$ Hz but latterly 25Hz at about 75 volts. Magneto Telephone; A type of local battery telephone fitted with an internal generator that will generate its own ringing supply. Magneto Circuit; A dry loop speech circuit with magneto signalling.
May	Used where guidance suggests optional choice.
Must	Used only where there is a legal or statutory requirement to the measures being described.
Omnibus Telephone	A type of telephone designed to be used in parallel with others along the length of a common line and using various means of selection and ringing. Often there is no provision for privacy between telephones. Alternatively a local battery powered telephone suitable for operation in parallel across a common line with single polarity or multi button polarised battery coded ringing.
Operational Telecommunications	Within this document this term refers to communication by voice or data used for (a) Authorising the movement of trains. (b) Safety- related communications in connection with the direct operation of the railway.
OS GR	Ordnance Survey Grid Reference
PABX	Private Automatic Branch Exchange – A private telephone system with facilities for a connection to the public telephone network.
PETS	Public Emergency Telephone System – A telephone connection system used principally at AHB crossings to provide a secure telephone system with monitoring of the integrity of the telephones.
Responsible Engineer	The person ultimately responsible and accountable for making decisions and taking responsibility for the design, installation, ongoing reliability and/or safety of any system.
RGS	Railway Group Standard published by RSSB
RSD	Railway Safety Directorate (formally HMRI), now a function within ORR.
RSP	Railway Safety Publication published by ORR

RSPG	Railway Safety Principles & Guidance by HSE (now ORR) most of these documents are now obsolete and some have been replaced by the ORR Railway Safety Publications.
Should	Used as the primary verb for statements of guidance.
SMS	Safety Management System
SPT – Signal Post Telephone	A direct line telephone provided adjacent to a signal and linked to the controlling signal box.

### 3 SAFETY CONSIDERATIONS

#### 3.1 Power Supplies

All mains voltage wiring should be in accordance with BS 7671 (IEE Wiring Regulations).

High Current- Battery backed power supplies can deliver very high current for a short period, which can cause damage, fire and injury. Particular safety precautions shall be observed when working directly on or near system batteries.

#### 3.2 Operating Heritage Systems

Difficulties may arise when installing or operating some heritage telephone systems because of a lack of any formally demonstrated safety analysis on which to base the safety argument for their proposed operation. In these cases the Responsible Engineer should carry out and document a risk assessment on the equipment and its operation to demonstrate that there will be no safety issues with the equipment when in service.

#### 3.3 Position of Telephones

All telephones on the trackside should be installed in a place of safety. Where such positioning is not possible for what ever reason, warning notices to identify the limited clearance may be provided positioned to be obvious to the user. In extreme cases an alternative means of communications should be considered.

### 4 THE ROLE AND PURPOSE OF OPERATIONAL COMMUNICATIONS

#### 4.1 Role

Telephones are usually provided on minor railways to address a specific need for communication between a fixed point on the trackside such as a signal or station platform to a signal box or controllers office to simplify, speed up or aid the operation of the railway.

When a telephone is used for the control and movement of trains it is classed as a Safety Critical system therefore the ROGS requirements apply (see later).

Other means of communication such as public mobile cellular telephones and radios operating to fixed networks or in back to back mode can also be used.

#### 4.2 Purpose

First start with a question which must be, who needs to communicate and why and then what do we need to achieve that goal.

If the need is to replicate a period or visual image or to add to the atmosphere of a site then a non safety critical system is quite suitable and the use of period artefacts, dc ringing omnibus telephones or bells which may be either original or replica. Alternatively a network or site wide PABX, either heritage or modern can be used.

Once the systems, however simple, are used for the movement of trains, that is to control movements on instruction from a controller or signaller, or to pass signals at danger, then the system becomes safety critical.

The use of well tried and proved systems and techniques backed up by well documented risk analysis where necessary should be used to remove the possibility of confusion and misinterpretation in the operation of the railway.

#### 4.3 Systems

Whatever system is used safety is paramount, the opportunity for error needs to be eliminated as far as reasonably possible and all parties involved in a call should take all precautions against misunderstandings which could lead to a mishap. This involves the designer, operator and users of the system.

It has been established from a long history that a multiplicity of telephones in a signal box is a possible distraction to the operator, so some form of concentration of telephones on to a single or multiple keyboard which is usually described as a Concentrator.

Concentrators have a multiplicity of line terminations to suit many different circumstances and types of telephone but the most used is the CB telephone as it is line powered and requires little maintenance. To prevent confusion caused by the situation of any one individual overhearing and acting on a message meant for another is mitigated by making sure that the operator (signalman!) can only speak to one telephone at a time.

## **5 AVAILABLE STANDARDS**

This section is a summary of the available standards, recommendations and Guidance cross referenced to its originating document. This list is intended informative but is not intended to be exhaustive.

### **5.1 ROGS**

As a safety critical system and when used for the movement of trains, railway operational telecommunications are subject to the ROGS regulations in regard to their design, installation, commissioning and maintenance.

### **5.2 General**

All communications facilities should have an appropriate level of priority, availability, reliability, safety integrity and the equipment should be resistant to unauthorised intrusion. See RSPG 2 part D clause 108.

Telephone communication (Box to Box circuit), is recommended to be provided between adjacent signal boxes on an exclusive speech circuit. See RSG GK/RT0041 clause 6; RSG GK/RT0061 clause 6.1.6.

Communication between adjacent signal boxes is essential and if critical to operation of the signalling system it may need high integrity discrete links. See RSPG 2 part D clause 109.

An effective means of communication should be provided between the signaller and the driver of any train held at a signal or designated stopping point. At installations with mechanical signalling, where signals are few and located near to the signal box, a member of the train crew visiting the signal box may be sufficient. See RSP 5 clause 255(a); RSPG 2 part D clause 112.

When radio is used as a means of communication, it should have a high level of availability and an appropriate level of integrity. See RSPG 2 part D clause 113.

A telephone should be located at colour light running signals capable of displaying a red aspect or at any other stop signal where there is a significant distance from the signal box; or at any other location at where there is an operational need or expediency. See RSG GK/RT0041 clause 6.

A signalman should be able to use any means of communication provided whilst keeping all indications in view See RSP 5 clause 307.

Means of summoning the emergency services should be provided at signal boxes and control offices, where appropriate See RSP 5 clause 311.

All new and changed safety critical systems must be tested and documented before being put into service. See ROGS and company SMS.

### **5.3 Calling the Emergency Services**

Communicating with external agencies such as the emergency services is an important part of the role of a railways telecommunications system so a well thought out and documented process for the use of the facilities offered to the user is a necessary part of the telecommunications policy of the railway.

Procedures for communications in the event of an emergency of any sort requiring the intervention of the emergency services, such as calling a paramedic to a passenger taken ill on a train, should be clear and understood by everyone.

Consideration should be given to the risks that may arise using mobile telephones during the operation of the railway. See RSP 5 clause 240.

### **5.4 Level Crossings**

#### **5.4.1 General**

The telephones at level crossings should conform to the DfT's requirements for level crossings and the provisions of RSP 7. At locally monitored crossings consideration should be given to the provision of a telephone to facilitate the reporting of malfunctions.

Where telephones are provided as part of the safety arrangements at the crossing, calls should always be routed to a suitable staffed railway location where a definite message on safe to cross or not can be given. See RSPG 7.

## 5.4.2 Barrier Crossings

Telephones for public use are not normally provided at barrier level crossings operated by railway staff, at AOCLs and at open crossings. See RSPG 7.

## 5.4.3 AHBC

Telephone Identification Labels on telephones at level crossings should be the retro-reflective yellow backed, black handset symbol to DfT Diagram 787(2002 Regulations). See RSP 7 and the Highway Code.

Clear and simple instructions should be provided inside the cabinet of level crossing telephones, legible at night, with no dialling needed to establish a call. See RSP 7 clause 253

In case of failure the telephone should detail, the level crossing name, OS GR and an alternative telephone number for the supervising point which is available whilst the line is open, should be included on the Information Label on level crossing telephones. See RSP 7 clause 254.

Where telephones are provided at user-worked and bridleway crossings, they should be positioned on both sides of the line, housed in cabinets, connected to the supervising point, should not require the user to dial a number and be two way calling. To achieve this PABX extensions or public network lines may be used, dial free operation being achieved by the use of Hot Line calling facilities or autodial telephones. See RSP 7 clause 258 to 261

## 5.5 Signal Post Telephone Systems

Where SPT systems are provided they should be designed to ensure that:

- Only one call can be established between the signaller and a remote party at any one time.
- No interruption by a third party shall be possible under normal working conditions.
- The level of overhearing shall be sufficiently low so as to eliminate the possibility of confusion with other calls.
- The unique identity of each telephone is presented to the signaller when an incoming call is received, and should be maintained for the duration of the call.
- All systems should incorporate a facility which enables the signaller to call the SPT See RGS GK/RT 0186.

All new equipment or changes to existing equipment must be tested prior to bringing into service. See RGS GK/RT0186 for further information.

## 6 SYSTEMS AND EQUIPMENT

### 6.1 General

All communications systems should have an appropriate level of priority, availability, reliability and safety integrity. These facilities should be resistant to access by unauthorised persons.

The provision of communications equipment and systems on heritage and minor railways should be considered with care and supported with fully documented risk analysis as required by the railways SMS. It is recommended that systems should be installed, maintained and operated to preserve their inherent levels of security which was originally specified, often as a result of serious mishaps, to prevent future misunderstandings which could lead to an unfortunate outcome.

Reference may be made to RGS GK/RT 0186 and also RSPG part 2 section D which although superseded is still a useful reference to the subject.

#### 6.1.1 Concentrator Systems

If a telephone concentrator is provided it should provide at least the following minimum requirements.

- Only one call can be established between the operator's handset and a remote party at any one time.
- No interruption by a third party should be possible under normal working conditions.
- The level of overhearing should be sufficiently low as to eliminate the possibility of confusion with other calls.
- The unique identity of each telephone shall be presented to the operator when an incoming call is received, which should be maintained for the duration of the call.
- All systems should incorporate a facility which enables the operator to call the remote telephone. (It should be noted that some older systems cannot do this through reasons of design or technology eg when used with a selective calling system. Where these are used for whatever reason (be it to preserve, re-create or simulate adherence to a particular period etc), the user of this requirement would possibly need a clear set of instructions backed by a risk assessment).

- The provision and disposition of SPT system facilities inside a signal box should be clear and unambiguous.

Ideal optional features of an operational system are:

- Incoming call indicated by a flashing lamp or indicator. with associated audible alarm.
- Call answered indicated by a steady illuminated lamp or flag.
- Outgoing call selection by the operation of one key.
- Ordering of answering calls to be decided by the operator.
- Presentation of all calling lines to the operator simultaneously.
- Each operator limited to a single connected handset at any one time.
- Ring tone returned to the caller when the call lamp illuminated.
- Audible alarm operates until the first incoming call has been answered, no alarm off switch or key should be provided although the alarm may be muted by the box closing switch.
- Active prevention of dual connection or interconnection between all lines.
- Outgoing call with ringing to CB lines.
- Outgoing calls to Exchange Lines with DTMF dialling and timed break recall.
- Box-to-Box circuit(s) which are often magneto ringing.
- Voice recording.

#### **6.1.2 If no concentrator is provided**

Where a telephone concentrator is not provided discrete point-to-point circuits may be used using the technology that is available to the railway.

Where these telephones are provided at a signal box or control point they should be clearly labelled to identify to the signaller, the signal number or location to which they are connected.

### **6.2 Between Signal Boxes**

Communications between adjacent signal boxes is essential to the efficient and safe running of a railway (RSP 5 clause 310), which may employ any appropriate communication system.

Communications, which form a critical part of a signalling system, may require high integrity discrete links. For instance where line plant between the signal boxes is limited, this could be (and often is), provided over the block circuit with suitable separation to prevent interference.

### **6.3 Between Signal Boxes and the Emergency Services.**

Means of summoning the emergency services should be provided in signal boxes and/or control offices as appropriate.

This could be via an individual public network exchange line terminating on a separate telephone, a mobile phone, or any system not dependant on mains driven equipment without suitable standby power supplies.

Communications from a signal box to its control office, dispatcher or regulator should be provided with an appropriate level of priority and reliability. There is no point having an exchange line in the control office if a signal box has difficulty getting through, if there is a railway wide PABX it could be a good idea to have an extension in the control dedicated to emergencies.

### **6.4 Between Signal Boxes and Trains**

An effective means of communication should be provided between the signaller and the driver of any train held at a signal or designated stop point. On manual block signalled systems where there are few signals and they are located close to the controlling signal box, face to face contact between driver and signaller may be possible and sufficient.

The system of communication should automatically identify to the signaller the signal and/or the train from which the communication originates. The signaller should be able to selectively communicate with specific signals or trains. The communications system should give priority to emergency calls.

Where instructions are to be given to a train driver over the communications system for the movement of trains, either as part of the normal signalling operation or in a degraded mode of operation, a discrete system that allows only the train driver concerned to receive the instructions, is required as the system is safety critical.

### 6.4.1 Recording

All oral communications employed in the control of signalling should be recorded.

Ideally this should be an electronic recording of communications through all telephones in the signal box but it needs to be recognised that on Minor Railways this requirement is often technically and financially impractical. In these circumstances a risk assessment should be undertaken and one of the traditional means of train recording undertaken through the use of a train register and/or an occurrence book.

## 6.5 Types of circuit which are provided on a concentrator

### 6.5.1 Central Battery (CB)

Provides a secure CB line connection for the termination of SPTs, direct lines and other lineside telephones.

This termination provides a dc feed with ac ringing outgoing and loop calling inwards to allow connection of any standard CB or auto telephone.

### 6.5.2 Exchange Line

May be used to terminate an extension connected to the railway's PABX system or a public network exchange line.

As this termination simulates the connection of a CB telephone it can also be used for the connection of a PETS system control unit.

This termination provides loop calling with DTMF or dial pulse signalling outwards and ac ring detection incoming.

### 6.5.3 Box to Box (Magneto)

Box to box circuits are traditionally dry loop operation with magneto ringing, with a circuit termination, which is also useable for any magneto phone line. As the dry loop circuits have no supervision on the concentrator, the incoming ringing should override an operated speak key and initiate the calling signal.

This termination provides ac ringing outgoing and ac ring detection incoming. It is possible on some systems for the speak key to be left operated after the call is finished. An incoming call should be able to accept an incoming ring even with the speak key operated.

The same termination may be used for circuits terminated on Magneto telephones.

Magneto telephones may be correct to the period but require high levels of maintenance and testing and being battery operated may not work when needed most.

### 6.5.4 Public Emergency Telephone System (PETS)

PETS was a system designed specifically for the control of telephones at AHB level crossing to meet the requirements of the DfT now published as RSP 7. There are two generations of PETS equipment, PETS1 and PETS2 both systems are the intellectual property of Bombardier.

The system consists of two boxes with identical circuits which communicate with DTMF signalling over a single pair of wires are arranged for signal box end/remote end by programming. The signal box end may be used with a connected telephone as a free standing unit or connected to an Exchange Line port on a concentrator. The remote end equipment, which needs to be supplied from a local dc supply at 24 or 50 volts, terminates up to 4 telephones at the crossing.

The equipment provides facilities for terminating up to four telephones each with integrity checking of the handsets and does not prevent one of the telephones calling in to the signal box if the handset of one of the other telephones is left off hook.

Equipment is available for the later types of signal box concentrator to terminate directly the signal box end of a level crossing circuit equipped with the original PETS trackside units. These terminations should have a distinct calling signal.

### 6.5.5 Omnibus

Battery call omnibus multi ringing-button telephones developed by a number of different manufacturers found a ready application on the railway due to the natural development of communication along lines of railway and between the various departments concerned. These were used until the extensive use of automatic telephony superseded them.

Specific types of specialised telephone were developed to meet the needs of the individual railway companies and later a standardised type for British Railways.

As these telephones operate in parallel along a single line pair anyone can listen in or join in as there can be no secrecy of conversation.

These telephones use dc ringing to operate a relay in all the telephones on the circuit which in turn rings the local bell. A measure of selection is available by the telephone being fitted with up to 4 ringing keys each applying a different arrangement of using an arrangement of the line pair and earth. Selection of an individual telephone is effected by a system of codes which depending on original operator may have been Morse code or distinct numbers of rings punctuated with a break. Thus it could have been dot dot dash or 2 rings pause 3 rings. Calling to switchboards or control points was effected by the use of slugged and polarised relays using a long ring or reverse polarity ringing.

To achieve period operation, a heritage railway often specifies the use of omnibus telephones for operating the railway but if used for safety critical activities a full risk assessment should be undertaken and the overall safety requirements adhered to.

Omnibus terminations are provided on some of the older concentrators currently in service.

Omnibus telephones may be correct to the period but require high levels of maintenance and testing and being battery operated may not work when needed most.

## **6.6 Level Crossing Telephones**

### **6.6.1 AHB Crossings**

A minimum of two Yellow telephones located on the off side of the road facing the crossing fitted with black handset on a reflective yellow background.

There should be a staff phone labelled appropriately at the local control adjacent to the crossing.

### **6.6.2 Barrier and Staff Operated**

There is no requirement to fit a public telephone but a staff telephone may be fitted where necessary for emergency operation of the crossing.

### **6.6.3 Bridleway and Footway**

Telephones should be provided on both sides of the line at locations where animals cross and at locations where the sighting distance is below the minimum specified in RSG 7.

## **6.7 What happens where no concentrator is provided**

Where a telephone concentrator is not provided discrete point-to-point circuits may be used or perhaps PABX telephones used on a Hot Line or dial up basis.

## **6.8 Use of the Public Network**

When a railway has no fixed telecommunications infrastructure the natural alternative is to use BT or other fixed network service providers network services or one of the public mobile service providers. This is a good way to start but a thorough risk analysis must be undertaken and documented with the benefits and disadvantages being explored and mitigated.

## **6.9 Public Fixed Network**

The use of fixed network lines is permitted for use at footway and bridleway level crossings but two way calling and operation with the user not having to dial a number by using Hot Line or autodial telephones.

Other communication needs can be fulfilled by the use of rented fixed network lines from BT or other fixed network provider.

## **6.10 Public Mobile Network**

The inherent design of mobile systems networks and radio propagation introduces uncertainties which makes them less suitable for safety critical applications – they are best reserved for fall back rather than first line applications. In rural areas the number of channels available is limited and a sudden burst of traffic uses them all up, on networks calls are likely to encounter busy conditions, and the phones themselves are not robust.

Use of mobile phone networks should be carefully tested, bad coverage spots identified and systems devised to overcome these. A fully documented and rehearsed fall back process should be prepared for situations when the public mobile network fails.

The use of fixed mobile network equipment for voice and data for routine and non-vital applications is worth exploring but power supplies in rural situations such as foot crossings may be a problem.

## **6.11 Omnibus Circuits**

Traditional railway battery calling omnibus telephones may be used in a point-to-point mode to provide a signal post telephone. Telephones at signals and the line side shall be clearly labelled as in 5.9 above. They require high levels of maintenance and testing and being battery operated may not work when needed most.

## 6.12 Magneto Circuits

Magneto telephones may be used in a point-to-point mode to provide a signal post telephone, but require high levels of maintenance and testing and being battery operated may not work when needed most.

## 6.13 Installation

Consideration should be given to the location of the telephones and the installation should reflect any liability to vandalism etc. This is particularly important on lines with only intermittent use.

## 6.14 Labelling

### 6.14.1 SPTs

SPT should be identified in accordance with the railways Telecommunications Standards and labels should give clear and concise information to the potential user of their function through an Identification Label and to users through an Information Label. For example the instruction should give the signal number; the name of the controlling signal box; the location (OS GR/mileage); operating instructions etc

Where trains run direct from the national network, or have the potential to do so, it is recommended that telephones should be labelled to the Railway Group Standards.

### 6.14.2 Level Crossings

AHB crossing telephones should be labelled in accordance with the DfT requirements with yellow reflective background with a black handset symbols either on the telephone or nearby. The internal label should give details of the crossing name; the OSGR; the hours of operation of the railway; and a public telephone number the user should call in the event that the crossing telephones do not work.

### 6.14.3 Other Telephones

These telephones should be labelled in accordance with the railways policy and SMS.

## 7 TESTING

### 7.1 Commissioning testing

All new equipment or changes to existing equipment must be tested prior to bringing into service, as this is a Safety Critical system and the ROGS regulations apply. See RGS GK/RT0186 for further information.

For example, for a signal post telephone system, the testing regime should ensure that after the installation of new equipment or a change or upgrade to existing equipment, tests are undertaken to ensure that as a minimum:

- No overhearing occurs between telephones.
- Only one call can be connected to an operator at any one time.
- No possibility for an operator to interconnect calls on any line.
- Each telephone correctly terminated and identified to the operator.
- Speech between telephone user and operator is clear and distinct.
- Correct labelling is fitted.
- That the maintenance information and records are provided and are correct.
- That the signal box can call the lineside telephone (where fitted).
- That the standby power system is operating as specified.

Installation and testing of Signal Post and Level Crossing telephones and systems is a Safety Critical task.

On completion of the work the records should be provided or updated to reflect the new or changed installation.

### 7.2 Maintenance testing

All operational telephones should be tested by making and receiving calls on a regular basis.

As a minimum the test should:

- Test and/or replace dry or rechargeable batteries.
- Inspect the condition of the telephone for faulty cords, damaged labels and the local tail cable.
- Test that the telephone can establish and terminate a viable call.

## 8 DOCUMENTATION

- Railways Telecommunications Standards
- Drawings and operational instructions
- Maintenance instructions
- Asset Register
- Maintenance and renewal strategy

## 9 MAINTENANCE REQUIREMENTS

### 9.1 Objective

To ensure that telephones are operational, clean and visible.

### 9.2 Maintenance Standards

The frequency of maintenance for operational telephone systems will be different for each railway, based on the following factors, although this list is not exhaustive:

- Usage of the telephone
- Weather and/or exposure to salt spray or other corrosive atmosphere.
- Liability to vandalism or misuse
- Presence of dry or rechargeable batteries
- Operational periods of the railway

Maintenance of telecommunications equipment and telephones is usually reactive, as preventative maintenance often does not produce any improvement in the fault performance of the equipment. However it can be helpful if visible defects such as damaged cables are reported by members of staff working on the railway such as the Permanent Way patrol.

### 9.3 Maintenance Intervals

An inspection and test should be made before running commences if there is a seasonal break and thereafter at regular intervals in accordance with a documented maintenance plan.

It is important that any dry or rechargeable batteries at the lineside are tested regularly according to the type and usage and that all telephones are tested before any running commences after a long break.

#### 9.3.1 Equipment

Routine maintenance should consist of a visual inspection of the equipment and to ensure that it is clean and dry.

Battery condition should be similarly inspected and the manufacturer's recommended routines adhered to.

A functional test as necessary.

#### 9.3.2 Telephones and Wiring

Telephones should be inspected and tested regularly and cleaned as necessary.

Replace the telephone for later rectification if faulty.

Replace or refix faulty or loose cables.

### 9.4 Maintenance Records

It is recommended that every test or replacement is recorded in a logbook, record card or database. Generally the following items are recorded:

- Date of the test
- Who undertook the test
- Condition of the equipment, including batteries if fitted.
- Who made the test
- What was replaced

Further information will be available in the Basic Records Guideline document.

#### 9.4.1 Development of Maintenance Plan

The use of the detailed maintenance records will enable the development of a maintenance plan, which will make the best use of the available staff or volunteers.

Further information will be available in the Basic Maintenance Scheduling Guideline document.

### 10 REFERENCES

RSSB Railway Group Standards see <http://www.rgsonline.co.uk/>

GK/RT 0041 Track Circuit Block

GK/RT0042 Absolute Block

GK/RT0051 Single Line Control

GK/RT0186 Safety Requirements of Signal Post Telephone Systems

GE/RT8048 Positioning & Labelling of Lineside Telephones

RSPGs and RSPs Issued by the Office of Rail Regulation see <http://www.rail-reg.gov.uk/>

Railway safety publications will eventually replace all railway safety principles and guidance (RSPG) documents, created when HMRI was part of HSE

Railway safety principles and guidance Part 1 (1996) (HSE 1996)

RSPG Part 2B - Guidance on stations (1996)

RSPG Part 2D - Guidance on signalling (1996)

Railway Safety Publication 3; Safe movement of trains – May 2007

Railway Safety Publication 4; Safety critical tasks - Clarification of ROGS regulations requirements – August 2007

Railway Safety Publication 5; Guidance on minor railways – September 2007

Railway Safety Publication 7, Level crossings; A guide for managers, designers and operators.

Department for Transport see <http://www.dft.gov.uk/>

The Traffic Signs Regulations and General Directions 2002. SI 2002/ 3113 – Schedule 3 Signs for railway and tramway level crossings.

Railways and Other Guided Transport Systems (Safety) Regulations 2006; Statutory Instrument No 2006/599.

IRSE see <http://www.irse.org/>

Railway Telecommunications

### 11 APPENDICES

None